International Space Station Payloads Office
Customer Satisfaction Survey
Final Report and Analysis of Results

Increments 7 & 8

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EXECUTIVE SUMMARY

The International Space Station (ISS) Utilization Survey is conducted by the ISS Payloads Office at NASA/Johnson Space Center in order to collect feedback from ISS research users on processes and services related to the development, integration and operation of ISS research investigations. The Survey was inaugurated following ISS Increment 5 and is designed to be conducted following each ISS Increment thereafter in order to identify trends in ISS customer satisfaction and integrate them into decision making on ISS process improvements. The current report presents and analyzes results from the third and fourth cycles of the Survey, which were conducted as follow-ups to Increments 7 and 8, respectively.

The Increment 7 interview group was comprised of 18 individuals from the total customer base of 25 Principal Investigators (PIs) and Payload Developers (PDs) who supported 17 Increment 7 research investigations. The Increment 8 interview group was slightly larger, consisting of 26 individuals from the total customer base of 31 PIs and PDs who supported 19 Increment 8 investigations. Feedback was collected from these groups using essentially the same methods and questions employed for Increments 5 and 6.

After appropriate tests of statistical significance were applied to the portions of the Survey based on quantitative rating-based responses, the Increment 7 Survey results include the following principal trends relative to Increment 6:

- Higher overall customer satisfaction based on the Survey's composite Overall Satisfaction Index.
- Improvement in 33% of Survey topic areas covering customer loyalty, research outcomes, Program processes and customer support, and no decrease in satisfaction in any of these areas.

Relative to Increment 7, the Increment 8 Survey results had the following principal trends:

- Lower overall customer satisfaction as reflected in the Overall Satisfaction Index.
- Lower Overall Satisfaction correlated to low scores coming mostly from customers whose investigations were initiated on Increment 8, as compared to investigations continuing from previous increments.
- Decrease in Satisfaction for 20% of Survey topic areas covering customer loyalty, research outcomes, Program processes and customer support, and no improvement in satisfaction in any of these areas.
- Despite decreasing satisfaction trends, satisfaction levels for 99% of all Survey topic areas, even those with decreasing trends, remained at Satisfied to Very Satisfied.

Repeating the approach of previous Surveys, verbal feedback was solicited to clarify rating-based responses and provide open-ended input on broader questions pertaining to Program strengths and weaknesses. Complete identity-blind transcriptions of all verbal feedback obtained in this manner are provided in the Report. These results include analysis and categorization of Program points of service that respondents cite as their most important drivers of overall satisfaction.

KEY FINDINGS

- **Increase in Increment 7 Overall Customer Satisfaction.** The Survey's Index of Overall Customer Satisfaction increased by a statistically significant four points between Increment 6 and Increment 7. The change largely reflects an improvement in how the ISS Utilization Program compares relative to customers' concept of an ideal organization. The Increment 7 Overall Satisfaction Index score of 77, compared to the Increment 6 score of 73, places the ISS Utilization Program above the aggregate scores for the Federal Government (70) and U.S. Retail Industry (75) in rankings based on the American Customer Satisfaction Index.
- **Decrease in Increment 8 Overall Customer Satisfaction.** The Survey's Index of Overall Customer Satisfaction decreased by a statistically significant seven points between Increment 7 and Increment 8. The change largely reflects a statistically significant decreases in the degree to which the Program met customer expectations. The decrease in this factor, as well as other statistically less-significant decreases in the other Overall Satisfaction factors, reflects proportionately lower scoring from customers whose Investigations were initiated on Increment 8, as compared to those whose investigations continued from previous Increments.
- **Increment 7 Improvement in 33% of Program Process and Customer Support Areas**. Of 24 surveyed topic areas pertaining to customer loyalty, research outcomes, Program processes and customer support, eight showed statistically significant Improvement and 16 showed no statistically significant change between Increments 6 and 7. No area showed a statistically significant decrease in respondent satisfaction between these Increments.
- **Increment 8 Decrease in Satisfaction for 20% of Program Process and Customer Support Areas.** The Increment 8 Survey showed a significant decrease in satisfaction in 5 topic areas pertaining to customer loyalty, customer expectations and satisfaction with the payload integration. These are the first downward satisfaction trends observed within the Survey's Program Process and Customer Support topic areas since inauguration of the Survey following Increment 5. The remaining Program Process and Customer Support topic areas in the Increment 8 Survey showed no significant change relative to Increment 7. The lack of significant improvement in satisfaction for any of the Increment 8 Program Process and Customer Support topics is a situation that has occurred in previous Survey cycles.
- **Increasing Variability in Satisfaction with Program Management Areas.** For both Increments 7 and 8, there was an increasing number of positive and negative shifts in respondent satisfaction with specific Program Management Areas relative to the generally static trends observed for these areas on Increment 6. Management areas whose Points of Interaction with their customers showed the greatest number of positive changes were Payload Engineering Integration and Real-Time Payload Operations. Those with the greatest number of negative changes were Payload Safety and Payload Physical Integration.
- **Satisfaction Maintained Despite Decreasing Trends.** Despite the observed decreases in satisfaction for a number of topic areas within both the Increment 7 and Increment 8 Surveys, the Increment 8 Survey cycle ended with only a single Survey topic area, Payload Safety Process, earning an overall Dissatisfied rating from customers. The majority of other topic areas had satisfaction ratings of Satisfied to Very Satisfied for both Increment 7 and 8, with a few topic areas scoring in the Neutral range for Increment 8.
- **Improved Satisfaction with PIM Services and the Payload Data Library.** Satisfaction with Payload Integration Manager (PIM) services and the Payload Data Library (PDL) improved markedly between Increment 6 and 7. PDL improved from Dissatisfied to Neutral and PIM Services improved from Satisfied to Very Satisfied.

1. Introduction

The International Space Station (ISS) Utilization Survey was developed under the direction of the ISS Payloads Office at NASA/Johnson Space Center in order to establish a methodology for collecting feedback from ISS research users on processes and issues related to the development, integration and operation of ISS research investigations. Complete Survey cycles, with final reports available at http://stationpayloads.jsc.nasa.gov/pd/custfb/index.cfm, have been performed to date for ISS Increments 5 and 6. Full background on the development history, rationale and implementation methods for the Survey are contained in the report for the inaugural Increment 5 Survey cycle. The Survey is a key feedback component within a set of integrated initiatives the ISS Payloads Office has taken to assess and improve the satisfaction of ISS research customers, defined explicitly as Principal Investigators (PIs), Payload Developers (PDs), and individuals who perform both roles in a dual capacity (PI-PDs). An overview of these initiatives is diagramed in Figure 1.

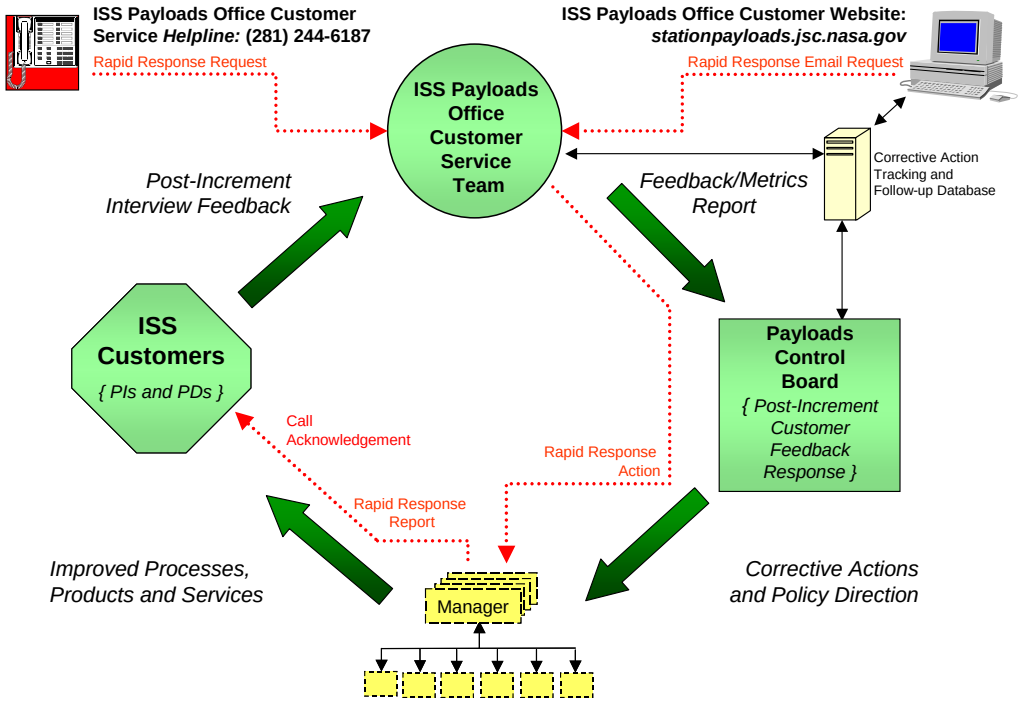


Figure 1. ISS Payloads Office Customer Feedback Process

This report summarizes the results for the third and fourth implementation cycles of the ISS Utilization Survey conducted following ISS Increments 7 and 8. The flight durations, ISS crew members and Survey interview periods for these Increments are summarized in Table 1. Customer feedback for Increments 7 and 8 was obtained following essentially the same questionnaire-based telephone interview protocols previously detailed in the *Increment 5 Final Report*. Modifications to the Increment 7 and 8 Survey questionnaires relative to the versions used for the Increment 5 and 6 Surveys are described below.

Table 1. Increment 7 and 8 Flight Durations, Crew Members and Survey Periods

Increment	Launch-Landing	Crew Members	Post-Increment Survey Period
7	April 25, 2003 – October 25, 2003	Yuri Malenchenko (Russia's Federal Space Agency) *ISS Commander* Ed Lu (NASA) *Flight Engineer / Science Officer*	May 11, 2004 – June 30, 2004
8	October 3, 2003 – April 29, 2004	Michael Foale (NASA) *ISS Commander / Science Officer* Alexander Kaleri (Russia's Federal Space Agency) *Flight Engineer*	June 24, 2004 – September, 2004

2. Increment 7 and 8 ISS Utilization Survey Questionnaire

A condensed listing of the questions utilized for the Increment 7 and 8 Survey questionnaires is provided in Appendix A. Questions that were added and deleted relative to the Increment 6 Survey questionnaire are noted. For Increments 7/8, a previous Increment 5/6 question pertaining to the Program's electronic reference material in general was replaced by specific questions designed to test respondents' familiarity and satisfaction with two information products, the *Payload Information Source* and the *Payload Developer's Web Portal*. In addition, starting with Increment 8 a new question pertaining to satisfaction with Program support for payload activities in Russia was added, and an Increment 5/6/7 question pertaining to satisfaction with accessing information was deleted, largely because the topic was considered adequately covered by a related question on locating information.

An additional change only partially shown in Appendix A was the implementation of a streamlined questionnaire version for "repeat" interviewees who had participated in Survey cycles for previous Increments. This change was made in order to encourage on-going Survey participation by repeat respondents by reducing their time burden. The changes took two forms: 1) deletion for repeat respondents of the question series 1.1.6 to 1.1.9 covering customer loyalty, and 2) implementation of "opt-out" options at the front of the questionnaire for other questions that were potentially unnecessary but where a determination by the respondent was required. The customer loyalty questions were deleted based on the rationale that a single initial determination of these factors was sufficient. Questions covered by the "opt-out" option were those pertaining to certain one-time payload integration tasks that were completed during initial payload integration and that were unlikely to be repeated for continued flight during follow-on Increments.

Other than the changes noted above, the Increment 7 and 8 questionnaires had the same multi-part content of earlier Surveys in which Part 1 – Cross-Program Feedback collects rating-based feedback that integrates across a respondent's experiences with all ISS Program areas, Part 2 assesses rating-based satisfaction with Specific Management/Functional Areas, and Part 3 collects thematically-directed verbal comments concerning Program Strengths and Weaknesses, Lessons Learned, and General Comments. Further information on the design and content of these parts of the Survey is contained in the *Increment 5 Final Report*.

3. Increment 7 and 8 ISS Investigations and Survey Interviewees

A comprehensive list of the research investigations performed on the ISS during Increments 7 and 8, together with the names of the PIs and PDs who supported these investigations, is provided in Table 2. The names of individuals who for one reason or another did not participate in the post-increment Survey process are shown in *italics* (Table 2). A straight-across comparison of the Increment 7 and 8 interview groups, showing repeat versus new Survey respondents, is provided in Table 3. For Increment 7, the overall response rate of 72% was down slightly relative to Increment 6 (78%), but the rate improved to 84% for Increment 8. From Increment 6 through 8, the fraction of repeat respondents decreases continuously from 73% to 58%.

Table 2. Increment 7 and 8 Investigation List with ISS Utilization Survey Participants

Investigation	*RPO*	*Increment*		*Increment 7 Interviewees*			*Increment 8 Interviewees*		
				Name	*Role*	*Organization*	*Name*	*Role*	*Organization*
InSPACE - Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions	MRPO	7		*Alice P. Gast*	*PI*	*Massachusetts Institute of Technology*			
				Jack Lekan	PD	NASA Glenn Research Center			
ISSI – In-Space Soldering Investigation	MRPO	7		Richard Grugel	PI	NASA Marshal Space Flight Center			
				Lucinda Murphy	PD	NASA Marshal Space Flight Center			
BIOPSY - Effect of Prolonged Spaceflight on Human Skeletal Muscle	HLS	7		Robert Fitts	PI	Marquette University			
				David Baumann	PD	NASA Johnson Space Center			
CEO - Crew Earth Observations	Code M	7	8	Kam Lulla	PI	NASA Johnson Space Center	Kam Lulla	PI	NASA Johnson Space Center
				Sue Runco	PD	NASA Johnson Space Center	Sue Runco	PD	NASA Johnson Space Center
EarthKAM - Earth Knowledge Acquired by Middle School Students	Code M	7	8	*Karen Flammer*	*Co-I*	*University of California San Diego*	*Karen Flammer*	*Co-I*	*University of California San Diego*
				Brion Au	PD	NASA Johnson Space Center	Brion Au	PD	NASA Johnson Space Center
CBOSS – Fluid Dynamics Investigation	MRPO	7	8	Josh Zimmerberg	PI	National Institute of Child Health and Human Development	Josh Zimmerberg	PI	National Institute of Child Health and Human Development
				John Love	PD	NASA Johnson Space Center	John Love	PD	NASA Johnson Space Center
Interactions - Crewmember and Crew-ground Interactions During ISS Missions	HLS	7	8	Jennifer Ritsher	PI	University of California San Francisco	Jennifer Ritsher	PI	University of California San Francisco
				Christian Maender	*PD*	*NASA Johnson Space Center*	Christian Maender	PD	NASA Johnson Space Center
PFM - Toward Understanding Pore Formation and Mobility During Controlled Directional Solidification in a Microgravity Environment	MRPO	7	8	Richard Grugel	PI	NASA Marshal Space Flight Center	Richard Grugel	PI	NASA Marshal Space Flight Center
				Linda Jeter	*PD*	*NASA Marshal Space Flight Center*	Joann Belt	PD-team	NASA Marshal Space Flight Center
MOBILITY - Promoting Sensorimotor Response Generalizability: A Countermeasure to Mitigate Locomotor Dysfunction After Long-Duration Space Flight	HLS	7	8	Jacob Bloomberg	PI	NASA Johnson Space Center	Jacob Bloomberg	PI	NASA Johnson Space Center
				Carla Guidry	PD	NASA Johnson Space Center	Carla Guidry	PD	NASA Johnson Space Center

Table 2 (con't). Increment 7 and 8 Investigation List with ISS Utilization Survey Participants									
EPO - Education Payload Operations	Code M	7	8	No formal PI	--	--	No formal PI	--	--
				Cindy McArthur	PD	NASA Johnson Space Center	Cindy McArthur	PD	NASA Johnson Space Center
Sub-Regional Bone – Sub-regional Assessment of Bone Loss in the Axial Skeleton in Long-Term Space Flight	HLS	7	8	Thomas Lang	PI	University of California San Francisco	Thomas Lang	PI	University of California San Francisco
				David Baumann	PD	NASA Johnson Space Center	Karin Bergh	PD	NASA Johnson Space Center
HPA – Hand Posture Analyzer	Code M	7	8	Valfredo Zolesi	PI	Kayser Italia SRL	Valfredo Zolesi	PI	Kayser Italia SRL
				Alejandro Norfini	PD	Kayser Italia SRL	Alejandro Norfini	PD	Kayser Italia SRL
MAMS - Microgravity Acceleration Measurement System	MRPO	7	8	*Kevin McPherson*	*PI*	*NASA Glenn Research Center*	*Kevin McPherson*	*PI-PD*	*NASA Glenn Research Center*
				Bill Foster	PD	NASA Glenn Research Center	*Bill Foster*	*PD*	*NASA Glenn Research Center*
SAMS-II - Space Acceleration Measurement System II	MRPO	7	8	*Kevin McPherson*	*PI*	*NASA Glenn Research Center*	*Kevin McPherson*	*PI-PD*	*NASA Glenn Research Center*
				Bill Foster	PD	NASA Glenn Research Center	*Bill Foster*	*PD*	*NASA Glenn Research Center*
CHROMOSOME - Chromosomal Aberrations in Blood Lymphocytes of Astronauts	HLS	7	8	*Gunter Obe*	*PI*	*University of Essen, Germany*	*Gunter Obe*	*PI*	*University of Essen, Germany*
				Mark Anderson	PD	NASA Johnson Space Center	Mark Anderson	PD	NASA Johnson Space Center
Renal Stone - Renal Stone Risk During Space Flight: Assessment and Countermeasure Validation	HLS		8				Peggy Whitson	Co-I	NASA Johnson Space Center
							Carla Guidry	PD	NASA Johnson Space Center
FOOT - Foot/Ground Reaction Forces During Space Flight	HLS		8				Peter R. Cavanagh	PI	Cleveland Clinic
							Christian Maender	PD	NASA Johnson Space Center
ADUM – Advanced Diagnostic Ultrasound in Microgravity	HLS		8				Scott Dulchavsky	PI	Detroit Receiving Hospital
							Carla Guidry	PD	NASA Johnson Space Center
Journals – Behavior Issues Associated with Long Duration Space Expeditions: Review of Astronaut Journals	HLS		8				Jack Stuster	PI	Anacapa Sciences
							Jodi Dyke-Eichblatt	PD	NASA Johnson Space Center
BCAT-3 - Binary Colloid Alloy Test 3	MRPO		8				Peter Lu	Co-I	Harvard University
							Amber Krauss	PD	NASA Glenn Research Center
MFMG-Miscible fluids in microgravity	MRPO		8				John Pojman	PI	University of Southern Mississippi
							Melanie Bodiford	PD	NASA Marshall Space Flight Center
Yeast GAP – Yeast Group Activation Pack	FBRPO		8				Tim Hammond	PI	Tulane University Medical Center
							Carla Goulart	PD-team	Bioserve Space Technologies

Note: Names that appear in gray italics *indicate individual did not participate in the survey/interview*

Table 3. Increment 7 and 8 Interview Groups

Name	Role	Investigation(s)	RPO	Incr 5	Incr 6	Incr 7	Incr 8
Fitts	PI	BIOPSY	HLS	✓	✓	✓	
Foster	PD	SAMS-II, MAMS	MRPO	✓	✓	✓	
Guidry	PD	Renal Stone, MOBILITY	HLS		✓	✓	
Lekan	PD	InSPACE	MRPO		✓	✓	
Murphy	PD	ISSI	MRPO			✓	
Lulla	PI	Crew Earth Observations	Code M	✓	✓	✓	✓
Runco	PD	Crew Earth Observations	Code M	✓	✓	✓	✓
Au	PD	EarthKAM	Code M	✓	✓	✓	✓
Anderson	PD	Chromosome	HLS	✓	✓	✓	✓
Bloomberg	PI	Mobility	HLS	✓	✓	✓	✓
Lang	PI	Sub-regional bone	HLS	✓	✓	✓	✓
McArthur	PD	EPO	Code M	✓		✓	✓
Grugel	PI	PFM	MRPO	✓		✓	✓
Ritscher	PI	Interactions	HLS			✓	✓
Love	PD	CBOSS FDI				✓	✓
Zimmerberg	PI	CBOSS FDI				✓	✓
Norfini	PD	HPA	Code M			✓	✓
Zolesi	PI	HPA	Code M			✓	✓
Maender	PD	Interactions	HLS	✓	✓		✓
Cavanagh	PI	FOOT	HLS		✓		✓
Berge	PD	Sub-regional bone	HLS				✓
Whitson	PI	Renal stone	HLS				✓
Belt	PD	PFMI	MRPO				✓
Lu	PI	BCAT-3	MRPO				✓
Hammond	PI	Yeast GAP	FB				✓
Goulart	PD	Yeast GAP	FB				✓
Pojman	PI	MFMG	MRPO				✓
Stuster	PI	Journals	HLS				✓
Dulchavsky	PI	ADUM	HLS				✓
Bodiford	PD	MFMG	MRPO				✓
Krauss	PD	BCAT-3	MRPO				✓
Engelhardt	PD	MISSE	Code M	✓	✓		
Kinard	PI	MISSE	Code M	✓	✓		
Stowe	PI	Epstein-Barr	HLS	✓	✓		
Thomson	PI	EVARM	HLS	✓	✓		
Kamman	PD	EVARM, Renal Stone	HLS	✓	✓		
Prisk	PI	PUFF	HLS	✓	✓		
McCollum	PD	PUFF, Xenon1	HLS	✓	✓		
Pietryzk	PI	Renal Stone	HLS	✓	✓		
Sacco	PI-PD	ZCG	SPD	✓	✓		
Baumann	PD	BIOPSY, Subregional Bone	HLS	✓			
Kanas	PI	Interactions	HLS	✓			
Meck	PI	Midodrine	HLS	✓			
Gabrielsen	PI	Xenon 1	HLS	✓			
Carter	PI	PCG-STES	MRPO	✓			
Kundrot	PI	PCG-STES	MRPO	✓			
DeLombard	PI	SAMS-II, MAMS	MRPO	✓			
Jeter	PD	SUBSA	MRPO	✓			
Ostragorsky	PI	SUBSA	MRPO	✓			
Zhou	PI-PD	ADVASC	SPD	✓			
Morrison	PI-PD	MEPS	SPD	✓			
Hoehn	PI-PD	PGPA	SPD	✓			
Goodwin	PI-PD	Stelsys	SPD	✓			
Silber		Stelsys	SPD	✓			
McPherson	PI-PD	SAMS-II, MAMS	MRPO		✓		
New Respondents (New + Continuing Investigations)				34 (100%)	4 (18%)	6 (33%)	11 (42%)
New Respondents (New Investigations)				10 (29%)	2 (11%)	5 (28%)	8 (31%)
Repeat Respondent (Continuing Investigations)				0 (0%)	16 (73%)	12 (67%)	15 (58%)
Total Respondents				34	22	18	26
Total Non-Respondents				1	6	7	5
Response Rate (%)				97%	78%	72%	84%

Demographic Core Group

Demographic information for the survey respondents was compiled from data collected on the questionnaire's Customer Information Page. For the present report, demographic analysis focused exclusively on scoring differences between groups within the four demographic categories listed in Table 4. These categories are the *Respondent Role* (PI or PD), *Respondent Research Integration Office* (Space Operations, Bioastronautics, Microgravity Sciences and Development, Cell Biology, Space Product Development), *Respondent Organization* (NASA, University, Private Sector, or Other U.S. Government Organization) and whether the respondent's investigation was *New* (flying for a first time on a given Increment) or *Continuing* (from a previous Increment). In order to better reveal demographic differences by increasing the statistical base, demographic analysis was performed using a "core" group of 31 respondents drawn from both the Increment 7 and 8 respondent groups . This core group is indicated in Tables 3 and 4, and consists of: (1) PIs and PDs interviewed for Incr. 7 whose investigations did not continue into Incr. 8, (2) PIs and PDs interviewed for Incr. 8 associated with investigations conducted on both increments, and (3) PIs and PDs from investigations started on Incr. 8.

Table 4. Increment 7 and 8 Respondent Demographic Summary

	Incr. 7	Incr. 8	Incrs. 7/8 Core Group*
TOTAL SURVEY RESPONDENTS	**18**	**26**	**31**
PARTICIPATED IN PREVIOUS SURVEY	**12**	**15**	**19**
TOTAL INVESTIGATIONS	**15**	**19**	**22**
Flight History (of Respondent's Investigation)			
No Previous Increment (New)	**6**	**8**	**9**
Previous (Continuation)	**12**	**18**	**22**
Role of Respondent			
Principal Investigator (PI) / Co-Investigator Only	**8**	**14**	**15**
Payload Developer (PD) Only	**10**	**12**	**16**
PI-PD Dual Role	**0**	**0**	**0**
Research Integration Office (RIO) of Respondent			
Bioastronautics	**6**	**10**	**12**
Cellular Biotechnology	**1**	**2**	**2**
Microgravity Sciences and Applications Directorate	**5**	**6**	**9**
Space Operations Mission Directorate	**6**	**6**	**6**
Space Product Development	**0**	**2**	**2**
Organization of Respondent			
NASA	**12**	**14**	**18**
University	**3**	**8**	**9**
Private Sector	**2**	**3**	**3**
Other U.S. Government Organization	**1**	**1**	**1**

**Consists of: (1) Incr. 7 Survey respondents whose investigations did not continue into Incr. 8, (2) Incr. 8 Survey respondents associated with investigations conducted on both increments, and (3) Incr. 8 Survey respondents whose Investigations started on Incr. 8 (see Table 3).*

4. Increment 7 and 8 Survey Analysis Methods

A principal design goal of the ISS Utilization Survey is to collect and analyze post-Increment feedback in a manner that supports quantitative tracking of Increment-to-Increment changes in ISS customer opinions and attitudes as related to satisfaction with Program processes and products. In keeping with this goal, the Increment 7 and 8 feedback results in the present report are analyzed and presented with emphasis on their changes relative to their respective preceding Increments (Increment 7 vs. 6, and Increment 8 vs. 7).

The comparison strategy that has been adopted combines the use of appropriate statistical measures to characterize Increment-to-Increment changes in response data, with a system of reporting metrics that supports efficient management decision-making on corrective actions. Arithmetic mean scores were selected as the principal basis for quantitative comparison of the response data from the rating-based questions in the Survey. The trade-offs associated with this choice are discussed in Appendix B – Statistical Methods. Appendix B also summarizes the statistical criteria that were applied to determine whether the Increment-to-Increment change in mean score for a given Survey question was statistically significant. These criteria are based primarily on a Student T-test statistic applied to the difference in mean scores, where T values outside of an 80% significance level are taken as an indication that the two mean scores are statistically different. However, other statistical tests were used as well (see Appendix B).

An integrated system of comparative metrics tied to mean score values was established for summary reporting and analysis of results from Part 1 of the Survey, and were used to a lesser extent for analysis of the Survey Part 2 response data. The system as detailed below is similar to the scheme used in the Increment 6 Survey Final Report, with a few modifications.

- The *Overall Satisfaction Index (OSI)* metric developed and reported for the Increment 5 and 6 Surveys has been repeated for Increments 7 and 8. The metric is calculated by taking the average of the mean scores of the three basis questions 1.1.1-Overall Satisfaction, 1.1.2-Expectations and 1.1.3-Ideal Organization, and recalculating it to a 0 to 100 scale. The basis questions are similar in form to those used in surveys for the American Customer Satisfaction Index (ACSI), a nationally recognized index that compares customer satisfaction across commercial industry as well as public-sector organizations. The OSI is therefore used as an approximation to the ACSI for the purpose of making a first-order comparison to ACSI data for other organizations.

- A *Current Level of Satisfaction* metric was established for all questions in the Survey that have rating scales anchored either directly to satisfaction or indirectly to satisfaction through "higher is better" measures of service. For a given Increment, the metric assigns a *Satisfaction Level* to each question based on its mean rating score recalculated to a 0 to 100 scale (scaled mean score), with Very Satisfied = 100 to 85, Satisfied = 85 to 55, Neutral = 55 to 45, Dissatisfied = 45 to 15, Very Dissatisfied = 15 to 0.

- For each Increment, an *Increment Comparison* metric is reported for each question based on the change in its mean score relative to the previous increment. Within the metric, questions are classified as either *Improving* for a given Increment if they show a statistically significant positive change in mean score relative to the previous Increment, or as *Getting Worse* if they show a statistically significant negative change in mean score relative to the previous

Increment. Questions whose difference in mean score is not determined to be statistically significant are put in a *No Significant Change* category. The analysis and criteria used to determine statistical significance in these cases are described in detail in Appendix B – Statistical Methods.

- The *Current Level of Satisfaction* and *Increment Comparison* results for Survey Part 1 questions are summarized in an *Overall Status* roll-up metric that uses a system of modifying adjectives and "stoplight" categories to summarize the satisfaction trend and satisfaction status for each question respectively. For the Increment 7 and 8 Survey data the determination of the Overall Status metric was modified relative to that used for Increment 6 in order to roll changes observed over both Increments into a single metric. Under the combined Increment 7/8 system questions are placed into "stoplight" categories according to the Satisfaction level corresponding *solely to their Increment 8 rating scores*, with Green = Very Satisfied /Satisfied, Yellow = Neutral, and Red = Very Dissatisfied/Dissatisfied. Modifying adjectives are then applied to these categories according to their Increment Comparison metrics *for both Increment 7 and 8*. Under this scheme, outlined in Figure 2, questions with an Increment comparison metric of Improving for at least one Increment, with the other Increment showing at least No Significant Change, are designated as "Super". Conversely, questions that were Getting Worse for at least one Increment, with the other Increment performing no better than No Significant Change, are designated as "Sub". The "Neutral" designation is then used for questions showing No Significant Change over both Increments. The "Mixed" designation is used for questions that were Improving on one increment and Getting Worse on the other.

5. Increment 7 and 8 Comparison Overview

5.1 Comparison Overview Data Plots

Data plots providing an overview comparison of the Increment 7 and 8 response results for Parts 1 and 2 of the Survey are shown in Figures 2, 3, 4 and 5. In Figure 2 the Increment 7 and 8 *Increment Comparison Metrics* for questions from Part 1 of the Survey are cross-compared in a 2 x 2 matrix, and a similar representation is used for the Part 2 questions in Figure 3. The quadrants in these plots are labeled with the modifying adjective used for the *Overall Status* metric.

In Figures 4 and 5 the Increment 7 and 8 mean scores for the Survey's Part 1 and 2 questions respectively are plotted as horizontal bars according to the 0-100 recalculated scale used for the Current Level of Satisfaction metric. The scale is then divided into the Satisfaction Levels and stoplight colors used as part of the Current Level of Satisfaction metric described above. For comparison the Increment 6 Satisfaction Levels are shown as short vertical lines. The bars are sorted and grouped vertically according to their Increment Comparison Metrics for Increments 7 and 8. Within each grouping the bars are sorted vertically according to their Satisfaction Level scores for Increment 8.

Figure 2. Increments 7 and 8 Satisfaction Trends – Survey Part 1

		Increment 7 to 8 Change in Satisfaction		
		Getting Worse	*No Significant Change*	*Improving*
Increment 6 to 7 Change in Satisfaction	*Improving*	▪ Payload Integration ▪ Cust. Loyalty-PD develop another payload ***Mixed****	▪ PDL-Direct Use ▪ PDL-Program Use ▪ Data & Doc-Schedule ▪ Communication ▪ PIM Services ▪ Ideal Organization ***Super***	***Super***
	No Significant Change	▪ Cust. Loyalty-PI Recommend ISS ▪ Cust. Loyalty-PI pursue another investigation ▪ Expectations Met ***Sub***	▪ Information Sources-Educational ▪ Overall Ease of Doing Business ▪ Program Reviews-General ▪ Res. Priority/Outcomes-Priorities ▪ Change Requests ▪ Information-Locating ▪ Interface - Crew On-Orbit ▪ Data & Doc-Amount ▪ Overall Satisfaction ▪ Cust. Loyalty-PD Recommend be PD ▪ RPO Support ▪ Crew Interface-Training ▪ Res. Priority/Outcomes-Raw Data ***Neutral***	***Super***
	Getting Worse	***Sub***	***Sub***	***Mixed***

Note: **Blue italic text identifies the overall status modifier*

Figure 3. Increments 7 and 8 Satisfaction Trends – Survey Part 2: Program Management

		Increment 7 to 8 Change in Satisfaction		
		Getting Worse	*No Significant Change*	*Improving*
Increment 6 to 7 Change in Satisfaction	*Improving*	▪ Mission Int. - Processes ***Mixed****	▪ RPO Proj. Mgt – Documents ▪ RPO Proj. Mgt – Deliverables ▪ Res. Plan. Int. – Processes ▪ Res. Plan. Int. – People ▪ Mission Int. – Deliverables ▪ Ops Int. – People ▪ Ops Int. – Deliverables ▪ R. Time Pay. Ops – Processes ▪ R. Time Pay. Ops – Documents ***Super***	***Super***
	No Significant Change	▪ NASA Pay. Dev. – Deliverables ▪ Pay. Safety – Processes ▪ Pay. Safety – Documents ***Sub***	▪ Pay. Phys. Int. – People ▪ Pay. Phys. Int. – Processes ▪ Pay. Safety – Deliverables ▪ Pay. Safety – Services ▪ Pay. Phys. Int. – Hardware Tools ▪ Pay. Phys. Int. – Software Tools ▪ Real Time Pay. Ops – People ▪ Ops. Int. – Services ▪ Ops. Int. – Documents ▪ Ops. Int. – Processes ▪ Ops. Int. – Software Tools ▪ PEI – Documents ▪ PEI – Software Tools ▪ PEI – Hardware Tools ▪ Mission Int. – People ▪ Mission Int. – Services ▪ Mission Int. – Documents ▪ Res. Plan. Int. – Deliverables ▪ Res. Plan. Int. – Services ▪ Res. Plan. Int. – Documents ▪ RPO – People ▪ RPO – Services ▪ RPO – Software Tools ▪ RPO – Processes ▪ NASA PD – People ▪ NASA PD – Hardware Tools ▪ NASA PD – Documents ▪ NASA PD – Services ▪ NASA PD – Processes ▪ NASA PD – Software Tools ***Neutral***	▪ PEI – Services ▪ PEI – Processes ▪ PEI – People ▪ PEI – Deliverables ▪ R. Time Pay. Ops – Services ▪ R. Time Pay. Ops – Software ▪ R. Time Pay. Ops - Deliverables ***Super***
	Getting Worse	***Sub***	▪ RPO Proj. Mgt. - Hardware Tools ▪ Pay. Safety – People ▪ Pay. Phys. Int. – Services ▪ Pay. Phys. Int. – Documents ▪ Pay. Phys. Int. – Deliverables ***Sub***	***Mixed***

Note: ***Blue italic* text identifies the overall status modifier*

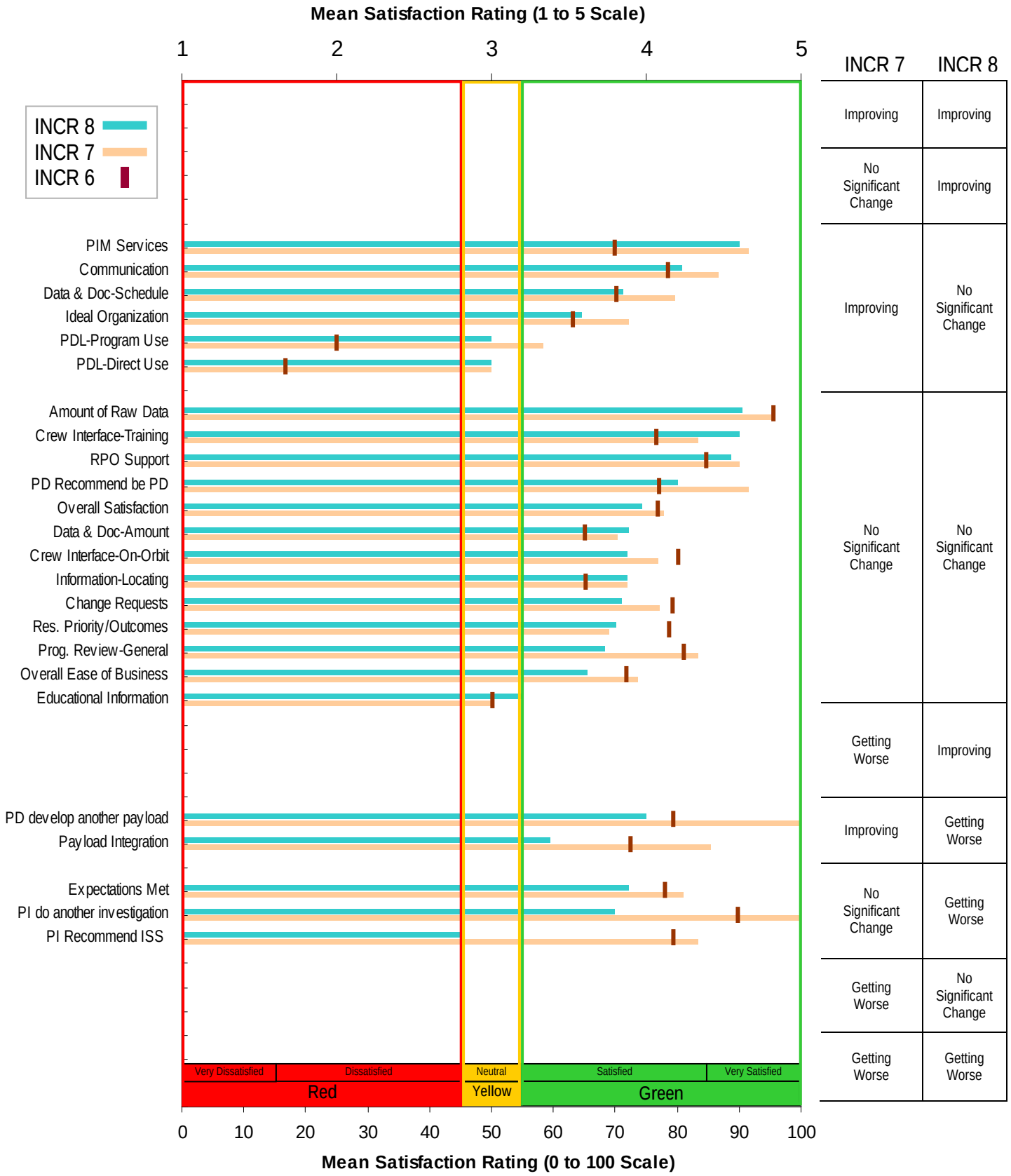
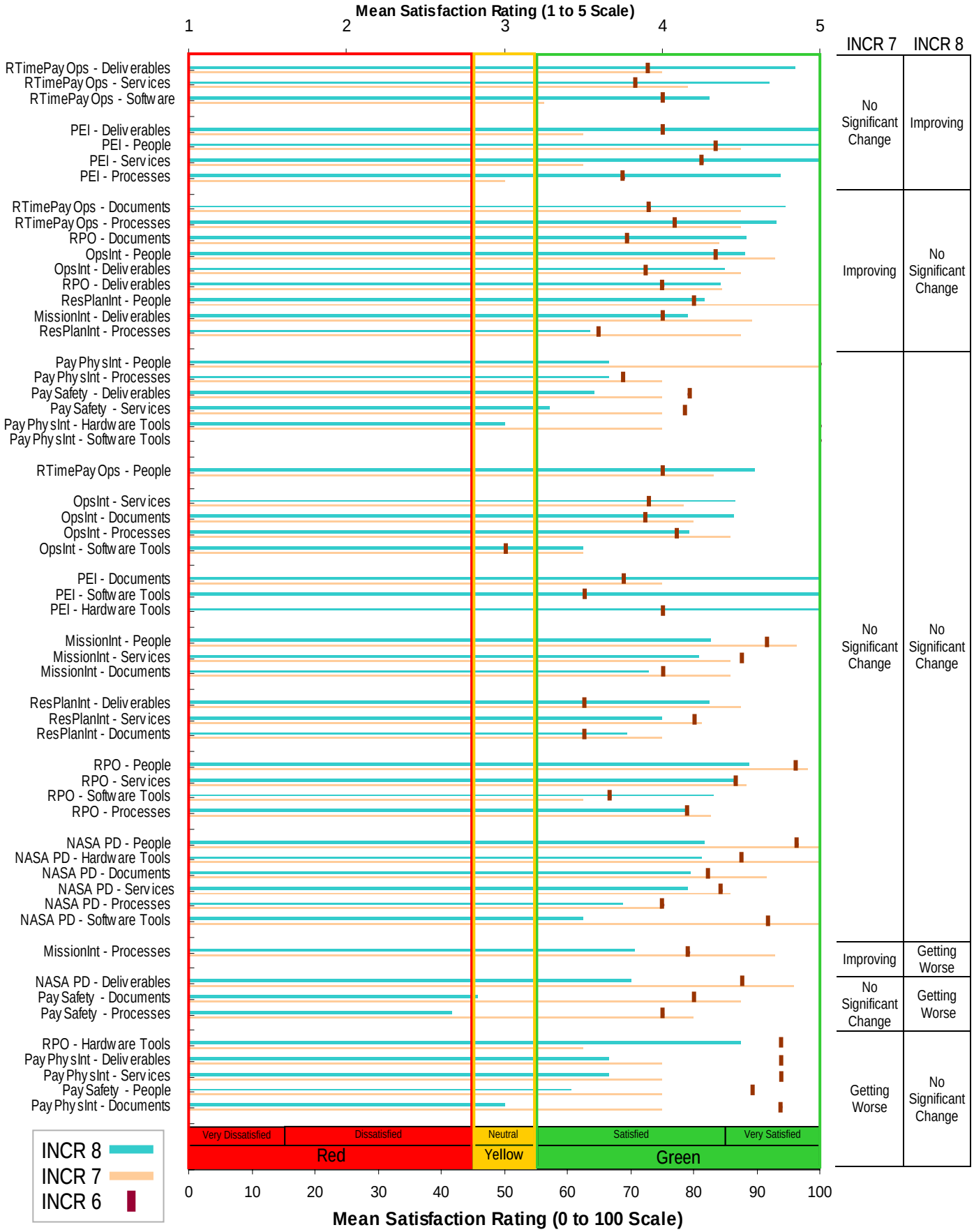


Figure 4. Mean Satisfaction Ratings (Satisfaction Level Metrics) versus Increment Comparison Metrics for Survey Part 1 – Cross Program Feedback

Figure 5. Increments 7 and 8 Mean Satisfaction Ratings (Satisfaction Level Metrics) versus Increment Comparison Metrics for Survey Part 2 – Program Management Areas



The Increment 7 and 8 Satisfaction Level scores for the OSI basis questions are plotted with the results for the other Part 1 Survey questions in Figures 2 and 4. A detailed comparison of the changes in the OSI basis question rating scores between Increment 6 and 7, and 7 and 8 is shown in Figure 6. Between Increment 6 and 7, all three OSI questions showed a numerical increase in mean score, but only the change for Question 1.1.3-Ideal Organization was statistically significant (Figures 2 and 6). The net increases in mean score for the OSI basis questions between Increment 6 and 7 result in an increase in the OSI index from 73 to 77 between these Increments (Table 5). This change is considered to be statistically significant because at least one of the basis questions (Ideal Organization) had a statistically significant increase in mean score, while the remaining questions were statistically unchanged.

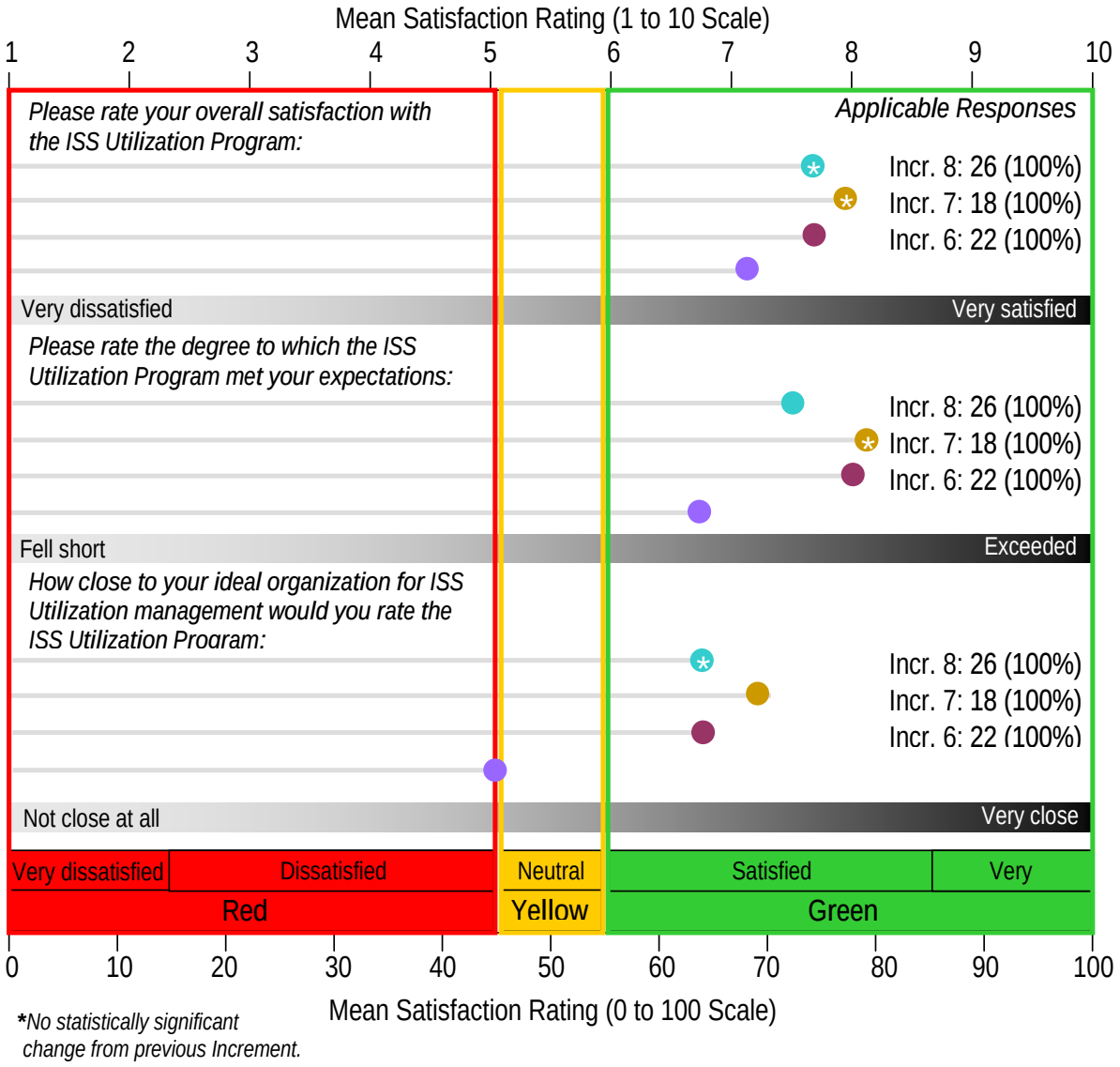


Figure 6. Mean Satisfaction Ratings with Satisfaction Level Metrics for Overall Satisfaction Index Basis Questions

Table 5. Comparison of ISS Utilization Survey Overall Satisfaction Indices (OSI) to American Customer Satisfaction Index (ACSI)

ACSI INDUSTRY RANKINGS	**Score**
Amazon.com	84
ISS Utilization Program Increment 7 OSI	**77**
Retail Industry (aggregate)	75
Wal-Mart	75
ISS Utilization Program Increment 6 OSI	**73**
ISS Utilization Program Increment 8 OSI	**70**
Federal Government (*aggregate*)	70
NASA/Glenn Research Center	67
Airlines *(aggregate)*	66
McDonald's	64
Federal Aviation Agency *(commercial pilots)*	64
Internal Revenue Service *(tax filers)*	63
ISS Utilization Program Increment 5 OSI	**60**
National Science Foundation *(grantees & applicants)*	58

Source: American Customer Satisfaction Index (ACSI) 2004 www.theacsi.org

Between Increment 7 and 8, all OSI questions showed a numerical decrease in mean score. Question 1.1.2 – Met Expectations showed the largest decrease, and was the only change that was determined to be statistically significant according to the criteria outlined in Appendix B (Figures 2 and 6). Based on the across the board decreases in basis question scores, the OSI index decreased from 77 to 70 between Increments 7 and 8. On the whole this change is considered to be statistically significant because at least one of the basis questions (Met Expectations) had a statistically significant decrease in mean score, while the remaining questions were statistically unchanged.

The OSI value obtained for Increments 7 and 8 from the OSI basis question mean scores are compared to the values for previous Increments, as well as to ACSI score for other organizations, in Table 5. For Increment 7 the OSI value of 77 places the ISS Utilization Program above benchmarks for the aggregate Federal Government and also above the aggregate score for the U.S. retail industry. Further comparison of this score to the latest comprehensive ACSI listing at www.theacsi.org reveals few organizations with scores above the 77 level (the Amazon.com ACSI is something of an outlier at the top end of the scale, with relatively few organizations in its range).

For Increment 8 the OSI value of 70 represents the first observed Increment-to-Increment decrease in this metric for the ISS Utilization Program since the ISS Utilization Survey was initiated following ISS Increment 5. A comparison of the score distributions of the OSI basis questions shows that the Increment 8 scores have a higher number of low-score outlier values (negative skew) compared to Increment 7, and these outliers are largely responsible for the lower aggregate OSI score for Increment 8. Furthermore, an analysis of the demographic makeup of the Increment 8 outliers shows that 4 out of the 5 respondents (80%) with the lowest (dissatisfied) mean values of the three basis scores are associated with new Investigations that flew for the first time on Increment 8. This is compared to the existence of only one outlier value with a mean score below 5 for Increment 7, and this response was from a continuing Investigation. The data

point to the presence of service factors and/or experiences that made individuals associated with new Investigations on Increment 8 proportionately less satisfied than individuals associated with new Investigations on Increment 7.

5.2.2 Specific Topic Questions

For the remaining 24 questions in Part 1 of the Survey that covered specific feedback topics, and that were based on inter-comparable, satisfaction-based rating scales, the following general results are apparent based on the relationships in Figures 2 and 4:

- For both Increment 7 and 8 no Part 1 question had a Satisfaction Level in the Dissatisfied or Very Dissatisfied range of the scale (Figure 4). Questions pertaining to the Payload Data Library (PDL), Educational Information, and PI Likelihood to Recommend ISS had Neutral (Yellow) Satisfaction Levels. The remaining 21 out of 24 Part 1 question scored in the Satisfied to Very Satisfied range of the scale.

- Between Increment 6 and 7 the question topics covering Direct Use and Program Use of the Payload Data Library improved significantly, moving from Dissatisfied to Neutral. These questions remaining in this category for Increment 8 (Figure 4).

- Over the Increment 7 and 8 Survey cycles the topics areas with the consistently highest levels of satisfaction were: 1) PIM Services, 2) Satisfaction with Raw Data, 3) Satisfaction with Communication with the Program, 4) RPO/RIO Support, and 5) Crew Training Support.

- Areas with consistently low levels of satisfaction over the Increment 7 and 8 Survey cycles were: 1) Program Use and Direct Use of PDL (but improved significantly relative to Increment 6), and 2) Satisfaction with Educational Information.

- None of the Part 1 topic areas showed either an Improving trend or a Getting Worse trend that continued between the Increment 7 and Increment 8 Survey cycles. For Increment 7, eight topic areas showed significant Improvement and sixteen showed No Significant Change. *However, for Increment 8 no topic area showed significant Improvement and 5 out of the 24 topic areas were Getting Worse.*

- *The Getting Worse trend observed for some of the Part 1 topic areas for Increment 8 is notable as the first occurrence of a statistically-significant negative change in satisfaction for any Part 1 topic area since the Survey was inaugurated on Increment 5.*

- Of the 8 Improving question topic areas between Increment 6 and 7, the most notable improvements were observed in: 1) Program Use and Direct Use of PDL (as noted above), 2) PIM Services, 3) Payload Integration, and 4) Likelihood of PDs to elect to develop another payload.

- Of the 5 topic areas that showed Getting Worse trends between Increments 7 and 8, the largest decreases in Satisfaction Level were observed in: 1) Payload Integration, 2) PD likelihood to develop another payload, 3) PI likelihood to do another investigation, 4) PI likelihood to recommend ISS to colleagues.

- Of the 13 total topic areas that showed significant change (either Improving or Getting Worse) over the Increment 7 and 8 Survey cycles, only three topic areas had large enough

changes in score to change their stoplight status. These were: 1) Program Use and Direct Use of PDL (Improved from Dissatisfied/Red to Neutral/Yellow) and 2) PI likelihood to Recommend ISS to Colleagues (Getting Worse from Satisfied/Green to borderline Neutral/ Yellow).

- When asked to provide feedback on the Payload Information Source and Payload Developer website information products released by the ISS Payloads Office, greater than 90% of respondents on both Increments indicated that they had either never heard of these products, or had not used them enough to have a basis for feedback.

5.3 Survey Part 2 – Increment Comparison Overview

The questions in Part 2 of the Survey focus on respondent's satisfaction with standard points of interaction they have had with selected Management Areas within the ISS Utilization Program. Because respondents generally had a lower familiarity or amount of direct interaction with some of these Management Areas, the number of applicable responses to the Part 2 questions was generally lower (very low in some cases). This resulted in greater statistically uncertainty associated with Increment-to-Increment changes in Part 2 mean scores. As can be seen in Figure 5, this is reflected in several questions that had notable numerical changes in mean score which nevertheless were classified as showing No Significant Change. These changes in mean score, although statistically insignificant, were large enough to change the satisfaction stoplight status of three topic areas: Payload Physical Integration – Hardware Tools and Documents (from Green to Yellow between Incr. 7/8), and Operations Integration – Software Tools (from Yellow to Green between Incr. 6/7). In evaluating these changes it was elected to ignore them on statistical grounds, and to regard these topic areas as maintaining (inheriting) their satisfaction status from the Increment that preceded the statistically insignificant change in mean score.

As summarized in Figures 3 and 5, the Increment 7 and 8 response data for Part 2 of the Survey exhibit the following general relationships:

- For the Increment 7 and 8 Surveys, satisfaction with Payload Safety – Process was the only Part 2 topic area with a Satisfaction Level in the Dissatisfied range of the scale. This score reflected a statistically significant decrease for this area from a Satisfied level on Increments 7 and 6, to Dissatisfied on Increment 8.

- Other than Payload Safety – Processes, a majority of 52 out of 55 (94%) of the remaining Part 2 topic areas maintained Satisfaction Levels of Satisfied or Very Satisfied for Increments 7 and 8. Of the 4 topic areas with Satisfaction Levels in the Neutral/Yellow range on either Increment 7 or 8, only Payload Safety – Documents can be considered to have attained this status in a statistically meaningful manner (see previous discussion). The remaining questions are regarded as maintaining their "inherited" Satisfaction levels, which were in the Satisfied range. A fifth topic area, Operations Integration – Software Tools, is considered to maintain an inherited Neutral/Yellow satisfaction status from Increment 6.

- No Part 2 topic areas showed an Improving or Getting Worse trend that continued between Increment 7 and Increment 8. For Increment 7, 10 out of the 55 Part 2 topic areas (18%) were Improving, 5 (9%) were Getting Worse, and 40 (73%) showed No Significant Change. For Increment 8, 7 (13%) of topic areas Improved, 4 (7%) were Getting Worse and 44 (80%) showed No Significant Change.

- *The Getting Worse trends that were observed for some Part 2 topic areas in the Increment 7 and Increment 8 results are notable as the first instances of statistically-significant negative changes in satisfaction for any Part 2 topic area since the Survey was inaugurated on Increment 5.*

- There was a general diversity in the Program Management Areas that showed Improvement for Increment 7. However, all of the Management Areas that were Improving for Increment 8 were either within Payload Engineering Integration (Services, Processes, People and Deliverables), or Real-Time Payload Operations (Services, Software and Deliverables).

- Topic areas that showed Getting Worse trends for either Increment 7 or 8 were dominated by Payload Physical Integration (Services, Document and Deliverables) and Payload Safety (Processes, Documents and People). These were two areas that had very high satisfaction levels on previous Surveys (see Figure 5).

6. Survey Part 1 Comprehensive Response Data and Verbal Comments

Comprehensive response data, descriptive statistics, increment comparison metrics and demographic trends for all questions in Part 1 of the Survey are summarized below using a datasheet format. The datasheets include the transcribed Increment 7 and 8 verbal comments for each question, with lines separating the comments received from each interviewee.

As was done in the Increment 5 and 6 report, the datasheets have been re-grouped for reporting purposes into Topic Areas that relate to particular products, services, or performance aspects of the ISS Utilization Program. These Topic Areas were not used in the organization of the questionnaire itself, and do not necessarily align with the sequential order of the questions in Part 1 of the Survey.

The following provides an explanatory key to the data sheet components:

MANAGER'S TOOL BOX: Contains a set of four at-a-glance metrics and summaries considered the most useful to ISS Payloads Office management for judging corrective action and process improvement in a particular problematic area.

1. NOTABLE FINDINGS: Summarizes aspects of Survey question quantitative results and/or verbal comments that may be of particular interest for further investigation for process improvement or corrective action.

2. OVERALL STATUS: Provides roll-up status for a question's level of *Improvement* and level of *Satisfaction*. The *Improvement* status is linked, based on the Student t test statistical criteria described above, to the Comparison Index as follows (see Figure X):

Super – Statistically significant <u>increase</u> in mean score for at least one of the Increments 7 or 8, with the other Increment having no worse than a No Significant Change in mean score.
Neutral – No statistically significant change in mean score for both Increments 7 and 8.
Mixed – Statistically significant increase in mean score for one Increment, with statistically significant decrease in mean score for the other.
Sub – Statistically significant <u>decrease</u> in mean score for at least one of the Increments 7 or 8, with the other Increment having no better than a No Significant Change in mean score.

Satisfaction is based solely on the question's Increment 8 *Satisfaction Level* according to:

Green – Satisfied or Very Satisfied (Increment 8 Scaled Mean Score > 55)
Yellow – Neutral (Increment 8 Scaled Mean Score 45 to 55)
Red – Dissatisfied or Very Dissatisfied (Increment 8 Scaled Mean Score < 45)

3. CURRENT LEVEL-OF-SATISFACTION STATUS: Each Survey question from Part 1 with a satisfaction-based rating scale (or a similar scale in which "higher is better") is assigned a *Satisfaction Level* for each Increment based on its mean rating score recalculated to a 0 to 100 scale (scaled mean score), with Very Satisfied = 100 to 85, Satisfied = 85 to 55, Neutral = 55 to 45, Dissatisfied = 45 to 15, Very Dissatisfied = 15 to 0.

4. INCREMENT COMPARISON: For each Increment, an *Increment Comparison* metric is reported for each question based on the change in its mean score relative to the previous increment. Questions are classified as *Improving* if they show a statistically significant positive change in mean score relative to the previous Increment, or as *Getting Worse* if they show a statistically significant negative change. Questions whose difference in mean score is not judged to be statistically significant are put in a *No Significant Change* category. The analysis and criteria used to determine statistical significance in these cases are described in detail in Appendix B – Statistical Methods.

Response Descriptive Statistics: Tabulates and compares the following descriptive statistics for the Increment 6, 7 and 8 responses for all questions in Survey Part 1.

No. respondents: The total number of individuals in the Survey interview group for each Increment.

Applicable responses: The total number of individuals who responded to the question with a numerical rating response (as opposed to a "Not Applicable" response, or no response).

Mean Score: The average of the numerical rating scores for each Increment.

Scaled mean score: Mean rating score recalculated on the basis of a 0 to 100 scale.

Mean score Δ: The numerical difference in mean score relative to the score for the preceeding Increment.

Standard error: Standard error of the mean of the numerical rating scores. Calculated as the standard deviation of the scores divided by the square root of the number of responses.

T-test: Percent probability that the mean score is statistically different from the mean score for the preceding Increment, based on the T-test statistic described in Appendix B – Statistical Methods.

Chi-square test: Percent probability that the frequency distribution of the scores for a given Increment is statistically different from the score distribution for the previous Increment as determined from the multinomial goodness-of-fit test described in Appendix B – Statistical Methods.

Median score: Rating score median values.

Skewness: Degree of asymmetry of the distribution of rating scores around their mean value. Positive skewness indicates a distribution with an asymmetric tail extending toward more positive values, with the median less than the mean, and higher scores over-represented in the mean. Negative skewness indicates a distribution with an asymmetric tail extending toward more negative values, with the median greater than the mean, and lower scores over-represented in the mean.

10th percentile score: Gives the rating score defining the boundary between the bottom 10% and top 90% of the score distribution. This statistic provides insight into the level of satisfaction of the least satisfied sub-set of respondents.

% Dissatisfied: Percentage of respondents scoring a 4 or less on 1-to-10 scale questions, or 2 or less on 1-to-5 scale questions.

% Satisfied: Percentage of respondents scoring a 6 or greater on 1-to-10 scale questions, or 4 or greater on 1-to-5 scale questions.

All Interviewees Response Distribution: Histograms showing relative frequency of rating scores for particular Increments as calculated as percentages of the total number of applicable responses for that Increment.

Demographic Trends from Incr. 7 and 8 "Core" Response Group: Provides a brief summary as well as plotted score frequency distributions and mean scores for different demographic *groups* of respondents defined within various demographic *categories*. The categories include the respondent's *Role* (PI or PD), *Research Integration Office* (Space Operations, Bioastronautics, Microgravity Sciences and Development, Cell Biology, Space Product Development), *Respondent's Organization* (NASA, Other U.S. Government Organization, University, Private Sector) and whether the respondent's investigation was *New* (flying for a first time on a given Increment) or *Continuing* (from a previous Increment). Data are from a "core" group of 38 respondents drawn from both Increments in order to better reveal trends by improving the statistical base. As noted in Table 2, this core group consists of: (1) PIs and PDs interviewed for Incr. 7 whose investigations did not continue into Incr. 8, (2) PIs and PDs interviewed for Incr. 8 associated with investigations conducted on both increments, and (3) PIs and PDs from investigations started on Incr. 8.

Topic Area: Overall Satisfaction – Overall Satisfaction Index
Question 1.1.1 – *Please rate your overall satisfaction with the ISS Utilization Program.*

MANAGER'S TOOL BOX

NOTABLE FINDINGS: Increment 8 score distribution has low score (dissatisfied) outliers not present in Increment 7 distribution. These are mostly from customers associated with investigations flying for the first time on Incr. 8. Satisfied respondents cite on-orbit productivity and useful interface to crew; dissatisfied respondents cite activities in Russia and lack of definition of the integration process for low-upmass payloads.

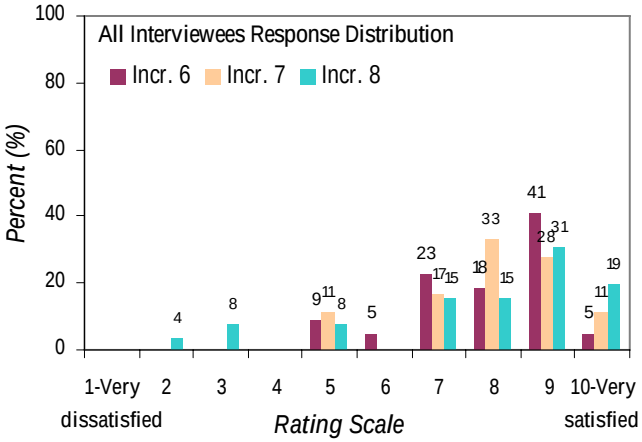
Overall Status	
IMPROVEMENT (INCR. 6 THRU 8)	*SATISFACTION (INCR. 8)*
Super	Green
Neutral	Yellow
Mixed	Red
Sub	

INCREMENT 7 SATISFACTION LEVEL: **SATISFIED**
INCREMENT 7 TO 6 COMPARISON: **NO SIGNIFICANT CHANGE**

INCREMENT 8 SATISFACTION LEVEL: **SATISFIED**
INCREMENT 8 TO 7 COMPARISON: **NO SIGNIFICANT CHANGE**

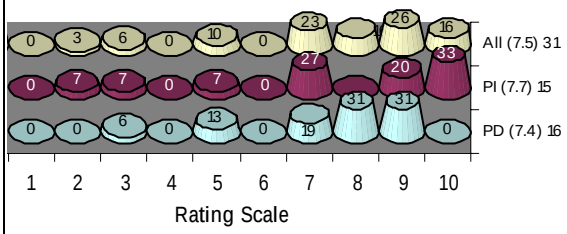
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	22 (100)	18 (100.0%)	26 (100.0%)
Mean score:	7.9	8.0	7.7
Scaled mean score:	76.8	77.8	74.4
Mean score Δ:	0.7	0.09	-0.31
Standard error:	0.29	0.33	0.45
T-test:	85.1	16.2	38.2
Chi-square test:	89.9	68.7	65.0
Median score:	8	8	8.5
Skewness:	-0.78	-0.84	-1.24
10th percentile score:	6.1	6.4	4
% dissatisfied:	0%	0%	12%
% satisfied:	86%	89%	81%

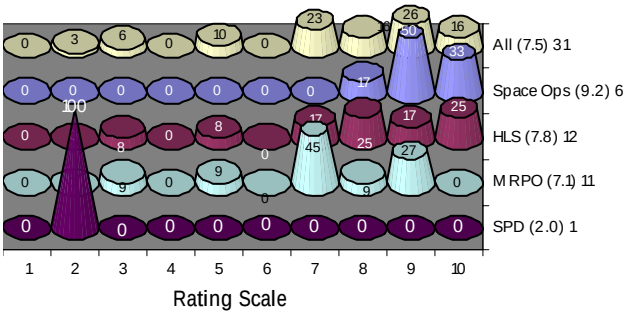


Demographic Trends (Summary): Notably lower scores for New vs. Continuing investigations and respondents at Universities as opposed to NASA; significant variation based on RIO.

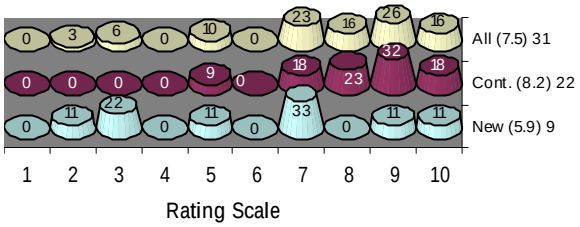
Responses based on Customer's Role



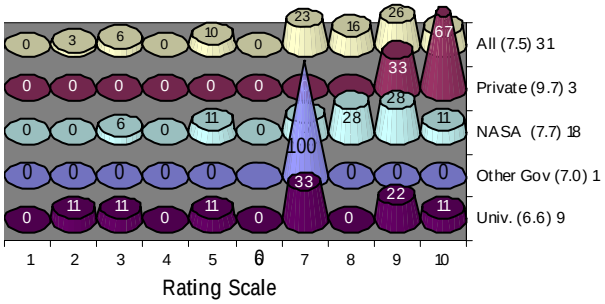
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for *Question 1.1.1 – Comments from Increments 7 & 8*

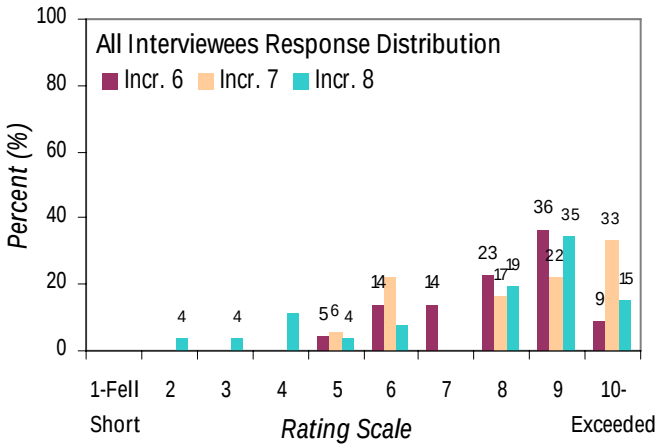
Topic Area: Overall Satisfaction – Overall Satisfaction Index
Question 1.1.2 – *Please rate the degree to which the ISS Utilization Program met your expectations*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Incr. 8 score distribution has low score (dissatisfied) outliers not present in Incr. 7. These are mostly from customers associated with investigations flying for the first time on Incr. 8. Satisfied respondents cite greater than expected on-orbit productivity and crew contact ; dissatisfied respondents cite Russian activities, redundant support contacts, lack of advocacy and priority.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: **SATISFIED**	INCREMENT 8 SATISFACTION LEVEL: **SATISFIED**
INCREMENT 7 TO 6 COMPARISON: NO **SIGNIFICANT** CHANGE	INCREMENT 8 TO 7 COMPARISON: **GETTING** WORSE

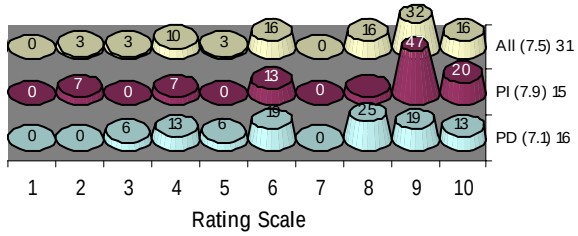
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	22 (100.0%)	18 (100.0%)	26 (100.0%)
Mean score:	8.0	8.3	7.5
Scaled mean score:	77.8	80.9	72.2
Mean score Δ:	1.29	0.28	-0.78
Standard error:	0.29	0.41	0.47
T-test:	98.4	42.3	75.3
Chi-square test:	99.7	99.4	86.5
Median score:	8	9	8.5
Skewness:	-0.60	-0.63	-0.98
10th percentile score:	6	6	4
% dissatisfied:	0%	0%	19%
% satisfied:	82%	72%	69%

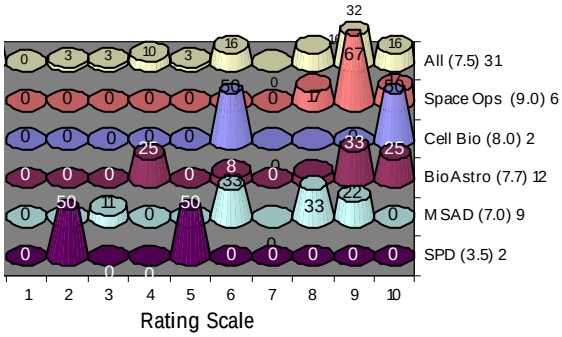


Demographic Trends (Summary): Notably lower scores for New vs. Continuing Investigations; significant variation based on RIO.

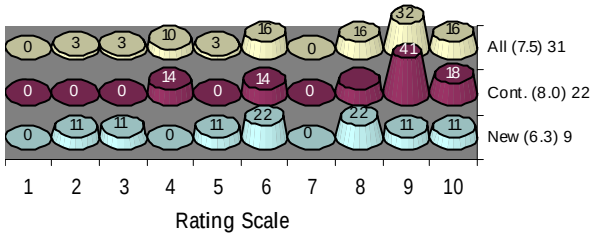
Responses based on Customer's Role



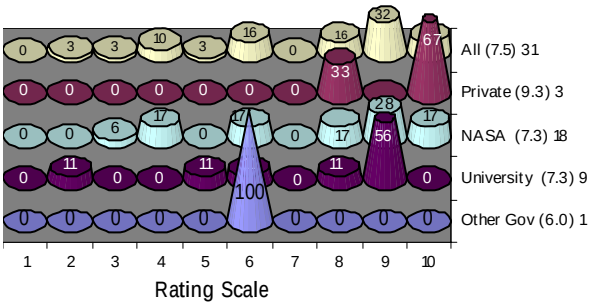
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for Question 1.1.2 – *Comments from Increments 7 & 8*

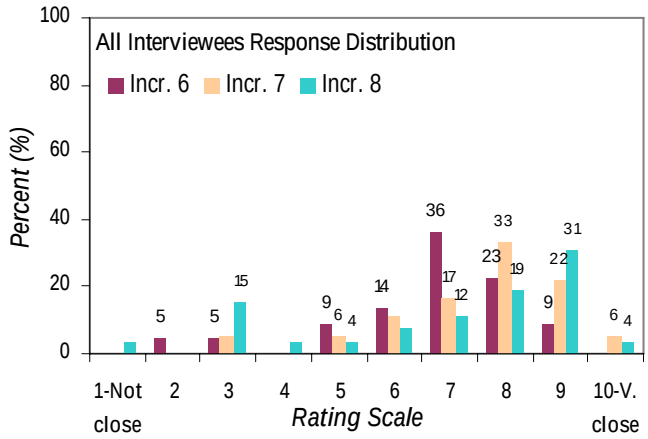
Topic Area: Overall Satisfaction – Overall Satisfaction Index
Question 1.1.3 – *How close to your ideal organization for ISS Utilization management would you rate the ISS Utilization Program?*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Incr. 8 score distribution has low score (dissatisfied) outliers not present in Incr. 7. These are mostly from customers associated with investigations flying for the first time on Incr. 8. Satisfied respondents cite PIM services; dissatisfied respondents cite difficult-to-understand org. structure with excessive layers.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: **SATISFIED**	INCREMENT 8 SATISFACTION LEVEL: **SATISFIED**
INCREMENT 7 TO 6 COMPARISON: **IMPROVING**	INCREMENT 8 TO 7 COMPARISON: **NO SIGNIFICANT CHANGE**

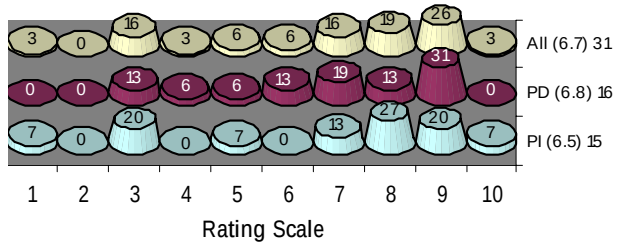
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	22 (100.0%)	18 (100.0%)	26 (100.0%)
Mean score:	6.7	7.5	6.8
Scaled mean score:	63.1	72.2	64.5
Mean score Δ:	1.46	0.82	-0.69
Standard error:	0.37	0.40	0.50
T-test:	98.7	85.9	68.3
Chi-square test:	96.4	71.6	75.3
Median score:	7	8	8
Skewness:	-1.28	-1.15	-0.86
10th percentile score:	5	5.7	3
% dissatisfied:	9%	6%	23%
% satisfied:	68%	78%	65%

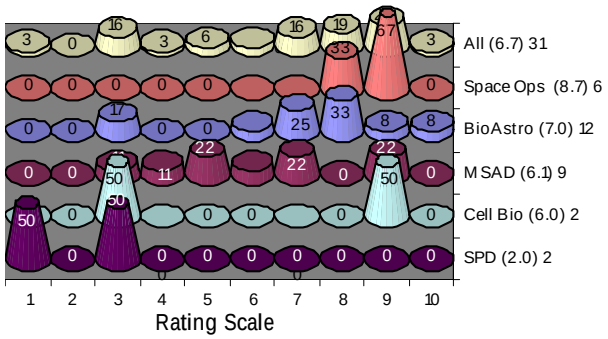


Demographic Trends (Summary): Notably lower scores for New vs. Continuing Investigations; significant variation based on RIO.

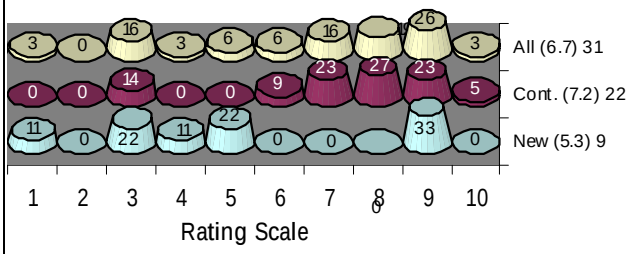
Responses based on Customer's Role



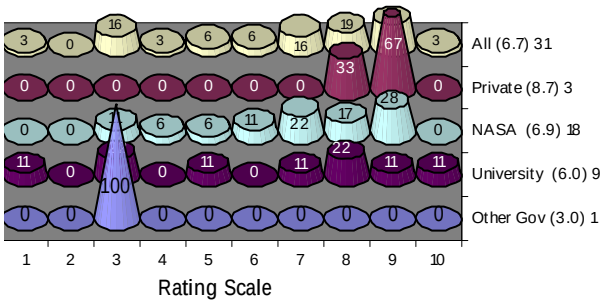
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for *Question 1.1.3 – Comments from Increments 7 & 8*

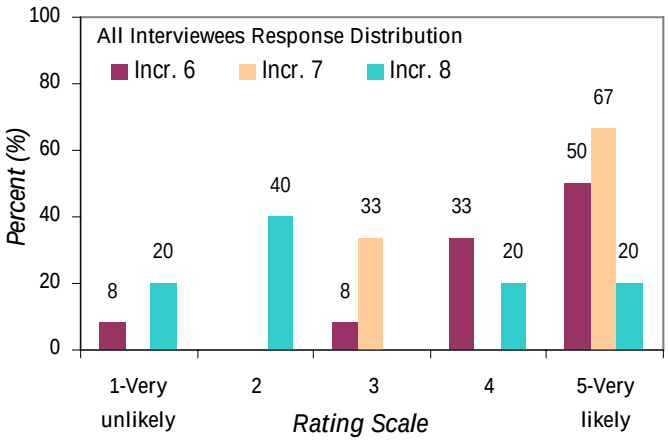
Topic Area: Overall Satisfaction - Customer Loyalty
Question 1.1.6 – *Assuming it did not change your own odds in competing for ISS research opportunities, how likely are you to recommend to a colleague that they perform research using ISS?*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Restriction of feedback collection to "new" PIs reduced overall response rate, but helped to highlight relative dissatisfaction of new PI group on Incr. 8 compared to Incr. 7. Few verbal comments from satisfied PIs; dissatisfied PIs cite "difficult" process and funding reliability.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	**Yellow**
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: **SATISFIED**	INCREMENT 8 SATISFACTION LEVEL: **NEUTRAL**
INCREMENT 7 TO 6 COMPARISON: NO **SIGNIFICANT** CHANGE	INCREMENT 8 TO 7 COMPARISON: **GETTING** WORSE

Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	12 (54.5%)	3 (16.7%)	5 (19.2%)
Mean score:	4.2	4.3	2.8
Scaled mean score:	79.2	83.3	45.0
Mean score Δ:	0.40	0.17	-1.53
Standard error:	0.34	0.67	0.73
T-test:	63.7	16.9	78.9
Chi-square test:	49.6	70.0	93.1
Median score:	4.5	5	2
Skewness:	-1.92	-1.73	0.52
10th percentile score:	3.1	3.4	1.4
% dissatisfied:	8%	0%	60%
% satisfied:	83%	67%	40%

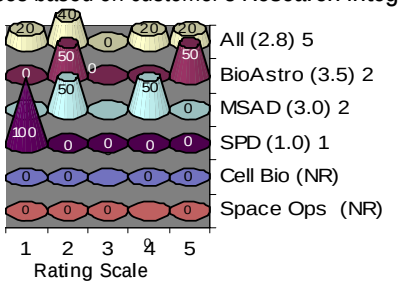


Demographic Trends (Summary): No significant differences

Responses based on Customer's Role

Not applicable
(responses limited to one demographic group)

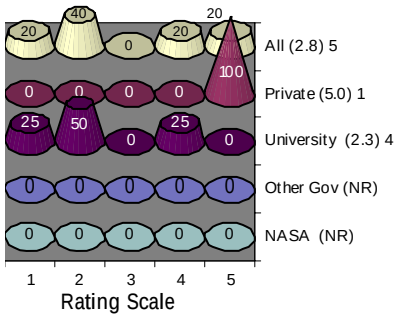
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation

Not applicable
(responses limited to one demographic group)

Responses based on customer's Organization



Click the link at right for Question 1.1.6 – *Comments from Increment 7 & 8*

Topic Area: Overall Satisfaction - Customer Loyalty
Question 1.1.7 – *Assuming it did not change your own future opportunities for ISS support work, how likely are you to recommend to a colleague that they become a payload developer for ISS?*

MANAGER'S TOOL BOX

NOTABLE FINDINGS: Restriction of feedback collection to "new" PDs reduced overall response rate, but show this group is more likely to recommend the Program than "new" PIs. Satisfied PDs cite unique research opportunities; dissatisfied PDs cite stretched resources and excess bureaucracy.

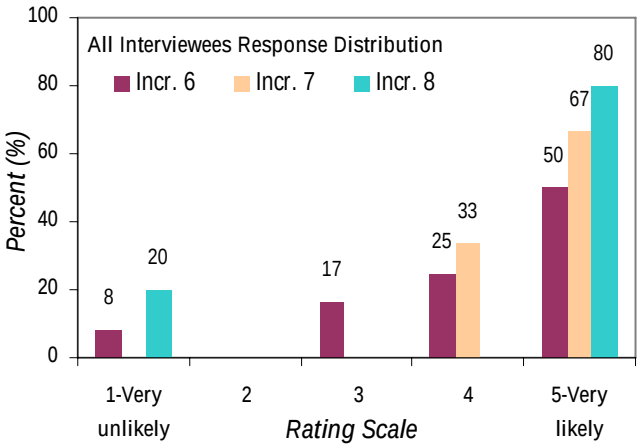
Overall Status	
IMPROVEMENT (INCR. 6 THRU 8)	*SATISFACTION (INCR. 8)*
Super	Green
Neutral	Yellow
Mixed	Red
Sub	

INCREMENT 7 SATISFACTION LEVEL: **VERY SATISFIED**
INCREMENT 7 TO 6 COMPARISON: **NO SIGNIFICANT CHANGE**

INCREMENT 8 SATISFACTION LEVEL: **SATISFIED**
INCREMENT 8 TO 7 COMPARISON: **GETTING WORSE**

Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	12 (54.5%)	3 (16.7%)	5 (19.2%)
Mean score:	4.8	4.7	4.2
Scaled mean score:	95.5	91.7	80.0
Mean score Δ:	0.40	0.58	-0.47
Standard error:	0.11	0.33	0.80
T-test:	90.2	54.9	31.5
Chi-square test:	56.9	19.9	82.0
Median score:	5	5	5
Skewness:	-2.91	-1.73	-2.24
10th percentile score:	4.1	4.2	2.6
% dissatisfied:	8%	0%	20%
% satisfied:	75%	100%	80%

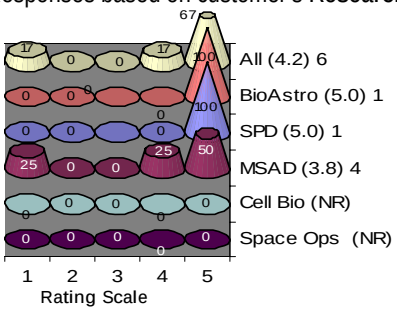


Demographic Trends (Summary): No significant differences

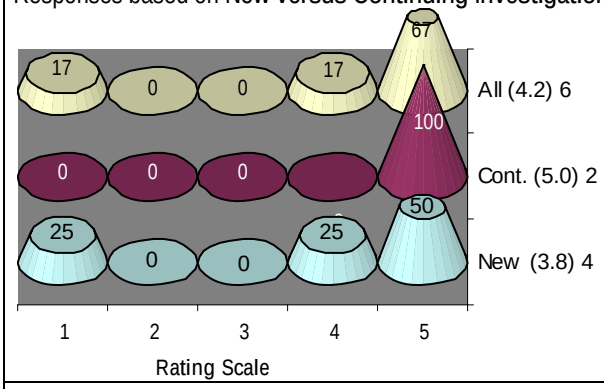
Responses based on Customer's Role

Not applicable
(responses limited to one demographic group)

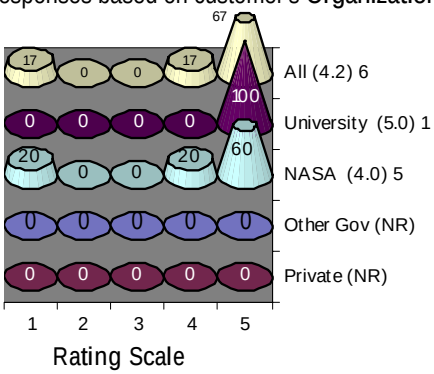
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for *Question 1.1.7 – Comments from Increments 7 & 8*

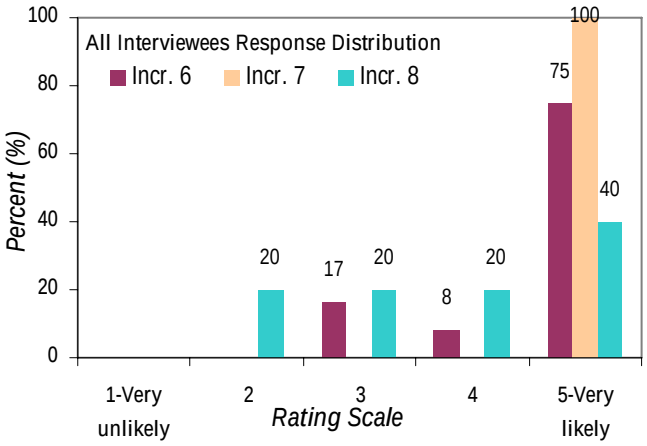
Topic Area: Overall Satisfaction - Customer Loyalty
Question 1.1.8 – *Assuming you could get research funding, how likely would you be to choose to pursue another research investigation on ISS?*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Restriction of feedback collection to "new" PIs reduced overall response rate, but helped to highlight relative dissatisfaction of new PI group on Incr. 8 compared to Incr. 7. Satisfied PIs cite research capabilities and potential; dissatisfied PIs cite redundant, excessive paperwork and funding reliability. (Program funding is out-of-scope for evaluation as part of the Survey.)	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: **VERY SATISFIED**	INCREMENT 8 SATISFACTION LEVEL: **SATISFIED**
INCREMENT 7 TO 6 COMPARISON: **NO SIGNIFICANT CHANGE**	INCREMENT 8 TO 7 COMPARISON: **GETTING WORSE**

Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	12 (54.5%)	3 (16.7%)	5 (19.2%)
Mean score:	4.6	5.0	3.8
Scaled mean score:	89.6	100.0	70.0
Mean score Δ:	-0.08	0.42	-1.20
Standard error:	0.23	0.00	0.58
T-test:	63.5	60.8	82.6
Chi-square test:	90.9	39.3	NA
Median score:	5	5	4
Skewness:	-1.64	NA	-0.54
10th percentile score:	3.1	5	2.4
% dissatisfied:	0%	0%	20%
% satisfied:	83%	100%	60%

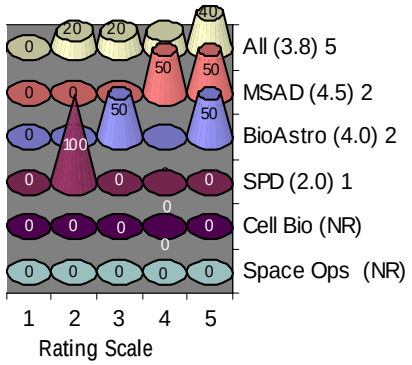


Demographic Trends (Summary): Insufficient responses to reveal demographic trends.

Responses based on customer's Role

Not applicable
(responses limited to one demographic group)

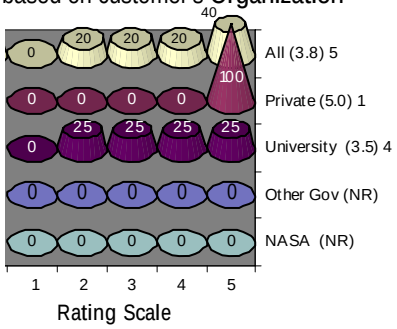
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation

Not applicable
(responses limited to one demographic group)

Responses based on customer's Organization



Click the link at right for Question 1.1.8 – *Comments from Increments 7 & 8*

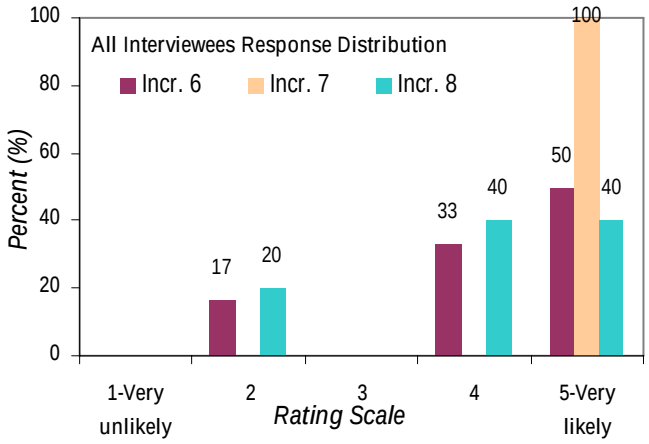
Topic Area: Overall Satisfaction - Customer Loyalty
Question 1.1.9 – *Assuming it was not your only option for work, how likely would you be to choose to develop another payload for ISS, given the opportunity?*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Restriction of feedback collection to "new" PDs reduced overall response rate, but showed Incr. 8 PDs were less likely to be repeat customers than Incr. 7 PDs. Satisfied PDs cite Program improvements; dissatisfied PDs cite long development time, availability of less-bureaucratic alternatives for space research.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: VERY SATISFIED	INCREMENT 8 SATISFACTION LEVEL: SATISFIED
INCREMENT 7 TO 6 COMPARISON: IMPROVING	INCREMENT 8 TO 7 COMPARISON: GETTING WORSE

Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	12 (54.5%)	3 (16.7%)	5 (19.2%)
Mean score:	4.2	5.0	4.0
Scaled mean score:	79.2	100.0	75.0
Mean score Δ:	0.35	0.83	-1.00
Standard error:	0.32	0.00	0.55
T-test:	51.7	77.0	78.0
Chi-square test:	100.0	77.7	NA
Median score:	4.5	5	4
Skewness:	-1.33	NA	-1.36
10th percentile score:	2.2	5	2.8
% dissatisfied:	17%	0%	20%
% satisfied:	83%	100%	80%

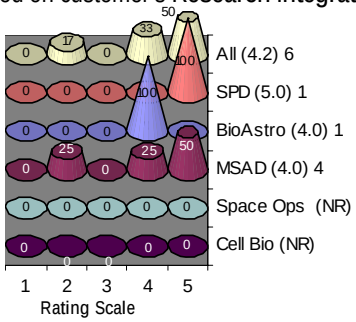


Demographic Trends (Summary): Insufficient responses to reveal demographic trends in most categories; otherwise no notable differences

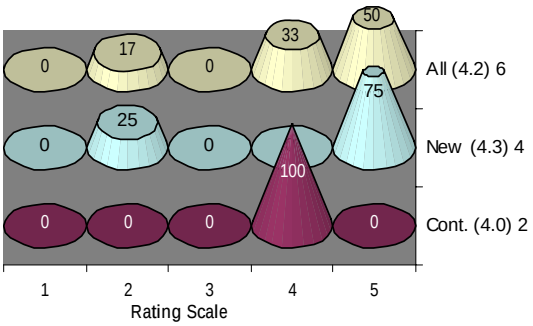
Responses based on Customer's Role

Not applicable
(responses limited to one demographic group)

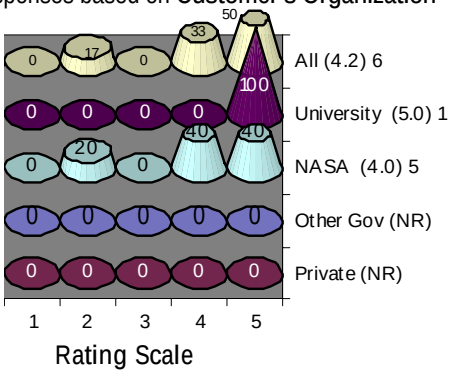
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on Customer's Organization



Click the link at right for Question 1.1.9 – *Comments from Increments 7 & 8*

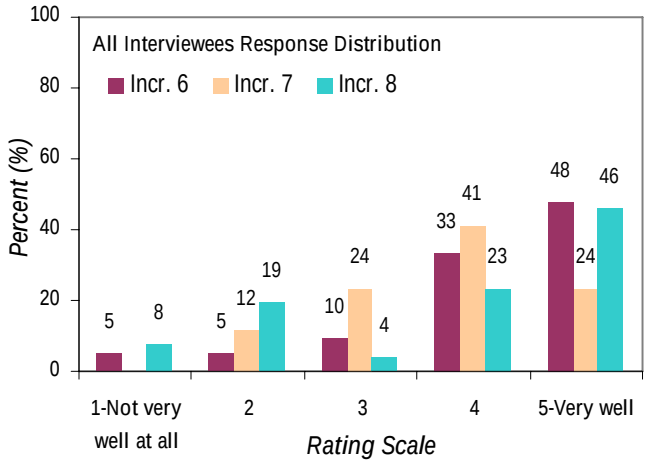
Topic Area: Overall Satisfaction – Research Priorities and Outcomes
Question 1.1.4 – *Please rate how well the ISS Program gave priority to research during the current Increment.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Little change in mean score over Incr. 6-8, but Incr. 8 score distribution shifts noticeably to a bimodal, negatively skewed (dissatisfied) distribution compared to Incr. 7. Satisfied respondents cite Program "pushing" to do as much research as possible with limited resources; dissatisfied respondents cite extreme resource problems, and groups who push for non-research priorities.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	Red
	Sub	

INCREMENT 7 SATISFACTION LEVEL: SATISFIED	INCREMENT 8 SATISFACTION LEVEL: SATISFIED
INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

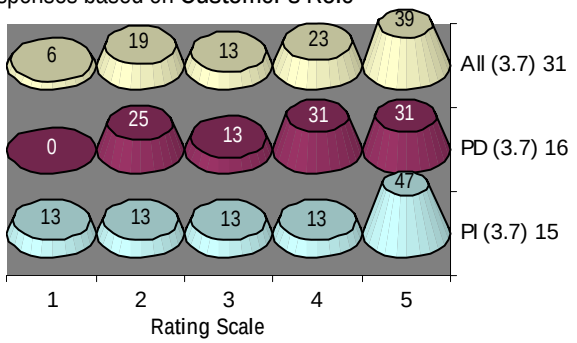
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	21 (95.5%)	17 (94.4%)	26 (100.0%)
Mean score:	4.1	3.8	3.8
Scaled mean score:	78.6	69.1	70.2
Mean score Δ:	0.26	-0.38	0.04
Standard error:	0.24	0.24	0.28
T-test:	60.3	72.3	8.7
Chi-square test:	91.8	92.3	99.6
Median score:	4	4	4
Skewness:	-1.53	-0.40	-0.83
10th percentile score:	3	2.6	2
% dissatisfied:	10%	12%	27%
% satisfied:	81%	65%	69%

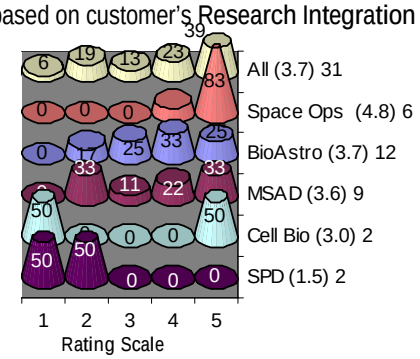


Demographic Trends (Summary): Notably lower scores for New vs. Continuing investigations and University vs. NASA customers.

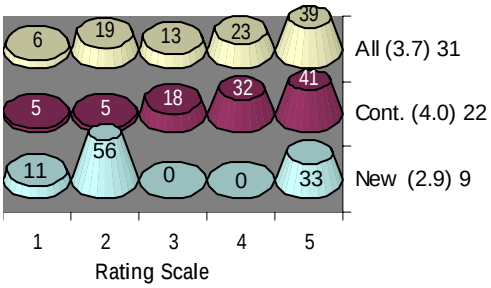
Responses based on Customer's Role



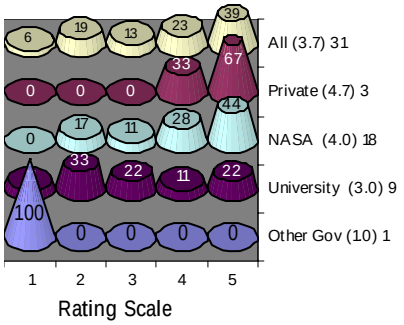
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for Question 1.1.4 – *Comments from Increments 7 & 8*

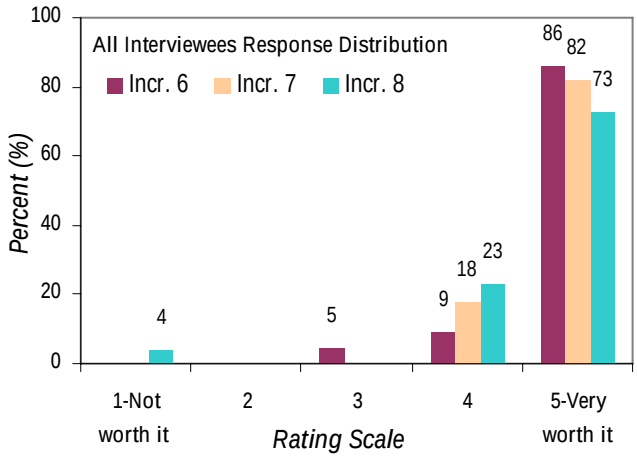
Topic Area: Overall Satisfaction – Research Priorities and Outcomes
Question 1.1.5 – *Please rate the extent to which the amount of raw data collected by your ISS Investigation during this Increment was worth your participation in the ISS Program.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: One of the most consistently highest-rated topics in the Survey. Incr. 8 shows only minor negative trend relative to Incr. 7. Respondents cite exciting, quality data as reason for their satisfaction and cases where Program was flexible and creative in introducing value-added aspects to the data collection.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	Red
	Sub	

INCREMENT 7 SATISFACTION LEVEL: VERY SATISFIED	INCREMENT 8 SATISFACTION LEVEL: VERY SATISFIED
INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

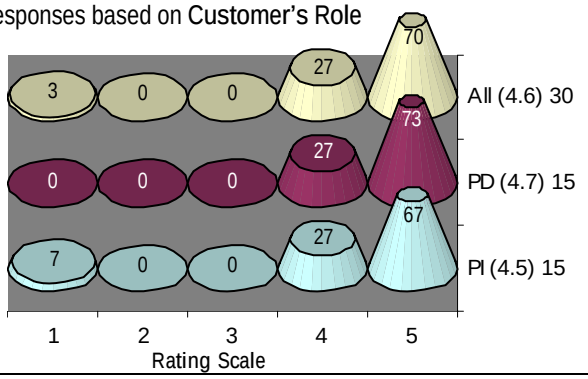
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	22 (100.0%)	17 (94.4%)	26 (100.0%)
Mean score:	4.8	4.8	4.6
Scaled mean score:	95.5	95.6	90.4
Mean score Δ:	0.40	0.01	-0.21
Standard error:	0.11	0.10	0.17
T-test:	90.2	2.9	64.8
Chi-square test:	56.9	66.3	59.9
Median score:	5	5	5
Skewness:	-2.91	-1.87	-3.33
10th percentile score:	4.1	4	4
% dissatisfied:	0%	0%	4%
% satisfied:	95%	100%	96%

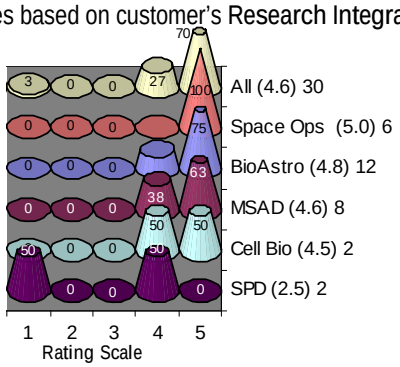


Demographic Trends (Summary): Notable lack of scoring variation indicates consensus across demographic groups.

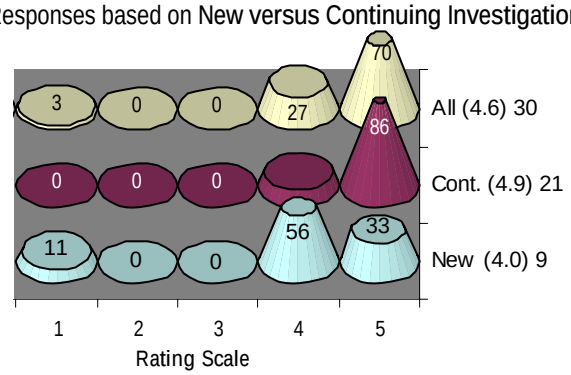
Responses based on Customer's Role



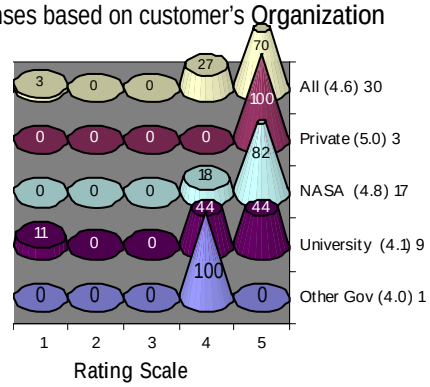
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for Question 1.1.5 – *Comments from Increments 7 & 8*

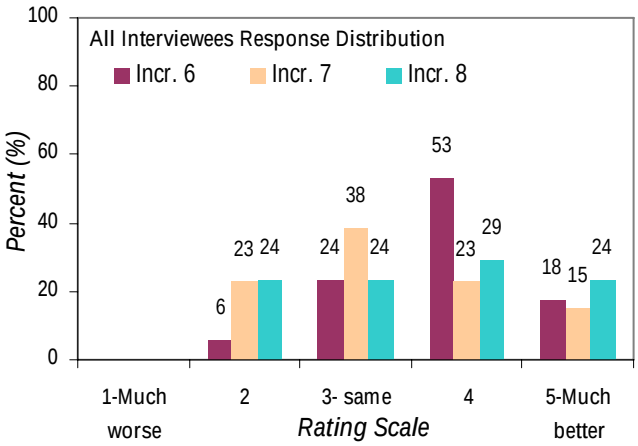
Topic Area: Overall Satisfaction – Program Improvements
Question 1.1.10 – *How would you compare your experience with the ISS Utilization program for the current increment to your experience on previous Increments?*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Score distribution show consistent majority of respondents on Incr. 6 through 8 who feel each Increment is better than the previous one. Satisfied respondents cite improvements in baseline data collection, increased familiarity with the Program; dissatisfied respondents cite decrease in advocacy/ priority for their investigation compared to previous Increment(s).	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: *NOT APPLICABLE*	INCREMENT 8 SATISFACTION LEVEL: *NOT APPLICABLE*
INCREMENT 7 TO 6 COMPARISON: GETTING WORSE	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

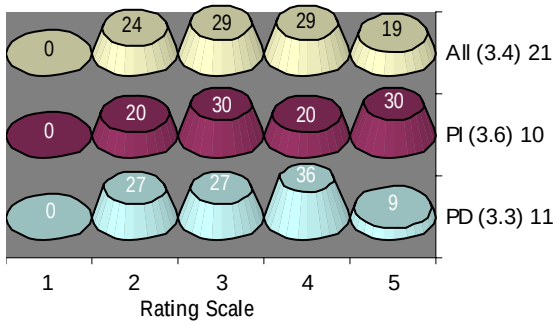
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	19	18	26
Applicable responses:	17 (89.5%)	13 (72.2%)	17 (65.4%)
Mean score:	3.8	3.3	3.5
Scaled mean score:	70.6	57.7	63.2
Mean score Δ:	-0.22	-0.52	0.22
Standard error:	0.20	0.29	0.27
T-test:	60.0	86.4	41.6
Chi-square test:	69.7	98.1	43.1
Median score:	4	3	4
Skewness:	-0.45	0.34	-0.08
10th percentile score:	3	2	2
% dissatisfied:	6%	23%	24%
% satisfied:	71%	38%	53%

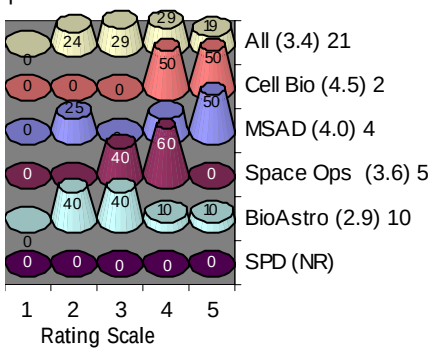


Demographic Trends (Summary): Bioastronautics customers possibly see less improvement than those from other RIOs, otherwise no notable/significant differences based on demographic groups.

Responses based on Customer's Role



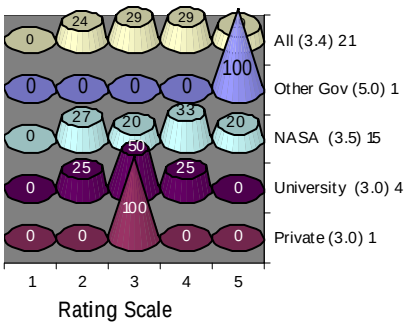
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation

Not applicable
(responses limited to one demographic group)

Responses based on customer's Organization



Click the link at right for Question 1.1.10 – *Comments from Increments 7 & 8*

Topic Area: Program Processes – Ease of Doing Business
Question 1.2.1 – *Please rate your level of satisfaction with the overall ease of doing business with the ISS Utilization Program.*

MANAGER'S TOOL BOX

NOTABLE FINDINGS: Score distribution and mean score consistent from Incr. 6 to 8, with slight increase in dissatisfied respondents in Incr. 8 vs. 7. Satisfied respondents cite good communication, help from many quarters; dissatisfied respondents cite Payload Safety procedures, inexperience in their first-points of contact, and difficulty understanding organizational system.

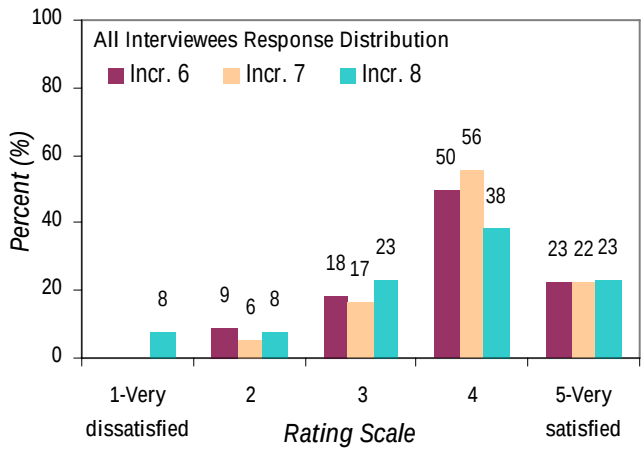
Overall Status	
IMPROVEMENT (INCR. 6 THRU 8)	*SATISFACTION (INCR. 8)*
Super	Green
Neutral	Yellow
Mixed	Red
Sub	

INCREMENT 7 SATISFACTION LEVEL: SATISFIED
INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE

INCREMENT 8 SATISFACTION LEVEL: SATISFIED
INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

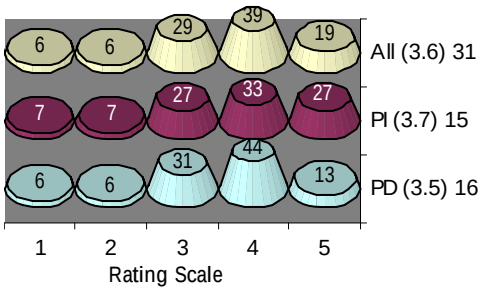
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	22 (100.0%)	18 (100.0%)	26 (100.0%)
Mean score:	3.9	3.9	3.6
Scaled mean score:	71.6	73.6	65.4
Mean score Δ:	0.59	0.08	-0.33
Standard error:	0.19	0.19	0.23
T-test:	96.7	23.3	69.4
Chi-square test:	98.8	5.6	47.4
Median score:	4	4	4
Skewness:	-0.61	-0.66	-0.79
10th percentile score:	3	3	2
% dissatisfied:	9%	6%	15%
% satisfied:	73%	78%	62%

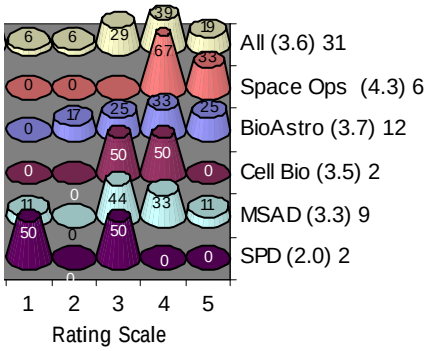


Demographic Trends (Summary): Notably lower scores for New vs. Continuing Investigations; significant variation across RIOs.

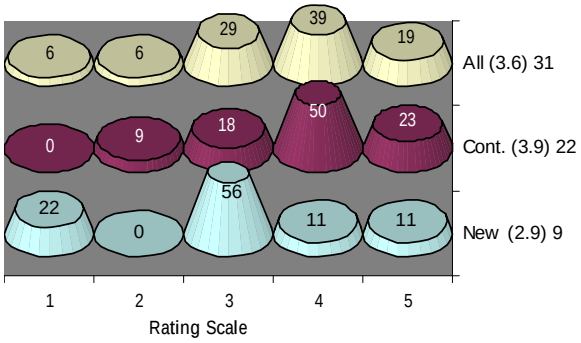
Responses based on Customer's Role



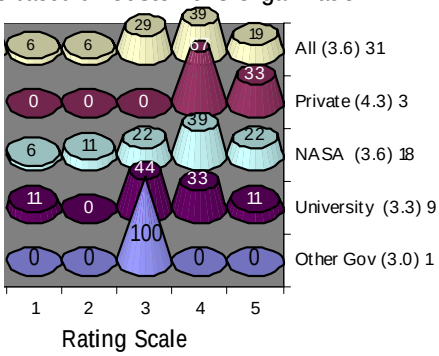
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on Customer's Organization



Click the link at right for Question 1.2.1 – *Comments from Increments 7 & 8*

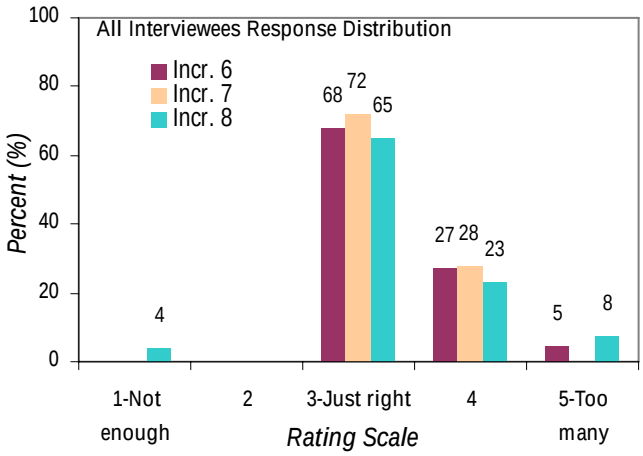
Topic Area: Program Processes – Ease of Doing Business
Question 1.2.2 – *What is your opinion of the number of personal contacts you interacted with in order to accomplish your ISS project?*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Score distribution and mean score consistent from Incr. 6 to 8. Satisfied respondents (just right) cite PIM services and Program improvements in reducing number of first points-of-contacts; dissatisfied respondents (too many contacts) cited Russian activities, lack of insulation from disorganized multiple requests for data and Payload Safety panel personnel turnover.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	Red
	Sub	

INCREMENT 7 SATISFACTION LEVEL: NOT APPLICABLE INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE	INCREMENT 8 SATISFACTION LEVEL: NOT APPLICABLE INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

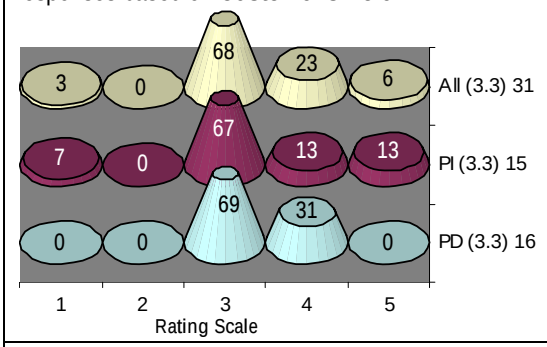
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	22 (100.0%)	18 (100.0%)	26 (100.0%)
Mean score:	3.4	3.3	3.3
Scaled mean score:	59.1	56.9	57.7
Mean score Δ:	-0.31	-0.09	0.03
Standard error:	0.12	0.11	0.15
T-test:	79.7	38.6	11.4
Chi-square test:	94.3	35.0	46.0
Median score:	3	3	3
Skewness:	1.39	1.08	-0.10
10th percentile score:	3	3	3
% dissatisfied:	0%	0%	4%
% satisfied:	32%	28%	31%

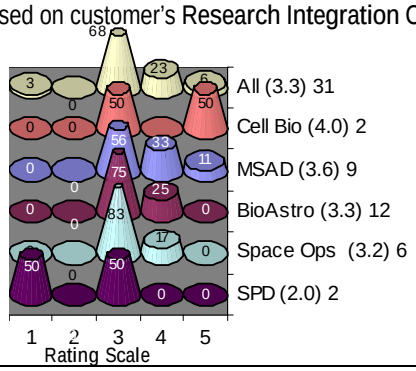


Demographic Trends (Summary): No strong / notable differences based on demographic group.

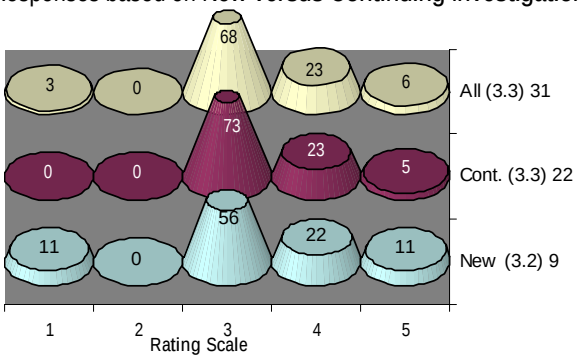
Responses based on Customer's Role



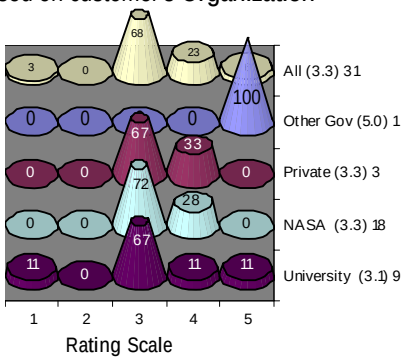
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for *Question 1.2.2 – Comments from Increments 7 & 8*

Topic Area: Program Processes – Payload Data Library
Question 1.2.3 – Please rate your level of satisfaction with your direct use of the Payload Data Library (PDL).

MANAGER'S TOOL BOX

NOTABLE FINDINGS: Low response rates reflect small proportion of respondents who utilized PDL directly during Incrs. 7 and 8. Increase in Incr. 7 mean score relative to Incr. 6 is nevertheless statistically significant and represents notable improvement in satisfaction level from Dissatisfied to Neutral between Incr. 6 and Incr. 7/8. Respondents cite PDL tool as "improving" with few specifics.

Overall Status	
IMPROVEMENT (INCR. 6 THRU 8)	*SATISFACTION (INCR. 8)*
Super	Green
Neutral	Yellow
Mixed	
Sub	Red

INCREMENT 7 SATISFACTION LEVEL: NEUTRAL
INCREMENT 7 TO 6 COMPARISON: IMPROVING

INCREMENT 8 SATISFACTION LEVEL: NEUTRAL
INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	6 (27.3%)	3 (16.7%)	1 (3.8%)
Mean score:	1.7	3.0	3.0
Scaled mean score:	16.7	50.0	50.0
Mean score Δ:	0.08	1.33	0.00
Standard error:	0.33	0.58	--
T-test:	13.8	93.2	0.0
Chi-square test:	47.8	63.2	63.2
Median score:	1.5	3	3
Skewness:	0.86	0.00	--
10th percentile score:	1	2.2	3
% dissatisfied:	83%	33%	0%
% satisfied:	0%	33%	0%

Demographic Trends (Summary): Insufficient responses to discern demographic trends.

Responses based on Customer's Role

Insufficient responses to reveal demographic trends

Responses based on customer's Research Integration Office

Insufficient responses to reveal demographic trends

Responses based on New versus Continuing Investigation

Insufficient responses to reveal demographic trends

Responses based on Customer's Organization

Insufficient responses to reveal demographic trends

Click the link at right for *Question 1.2.3 – Comments from Increments 7 & 8*

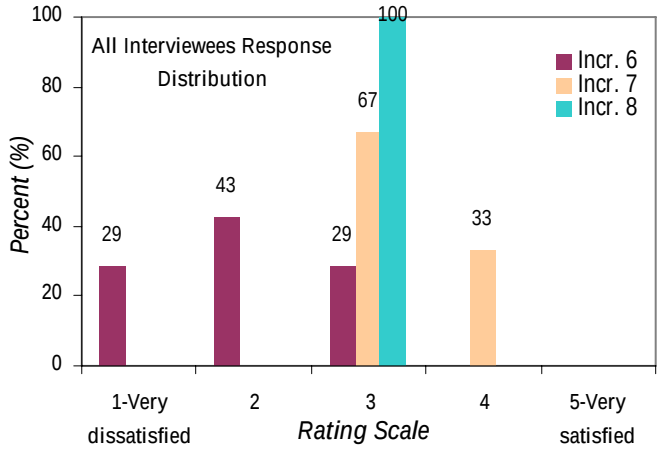
Topic Area: Program Processes – Payload Data Library
Question 1.2.4 – *Please rate your level of satisfaction with how effectively the data in the Payload Data Library (PDL) are used by the ISS Utilization Program.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Low response rates reflect small proportion of respondents with insight into how Program utilized PDL. Increase in Incr. 7 mean score relative to Incr. 6 is nevertheless statistically significant and represents notable improvement in satisfaction level from Dissatisfied to Neutral between Incr. 6 and Incr. 7/8. Respondents cite PDL tool as "improving" with few specifics.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	**Yellow**
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: SATISFIED	INCREMENT 8 SATISFACTION LEVEL: NEUTRAL
INCREMENT 7 TO 6 COMPARISON: IMPROVING	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	7 (31.8%)	3 (16.7%)	1 (3.8%)
Mean score:	2.0	3.3	3.0
Scaled mean score:	25.0	58.3	50.0
Mean score Δ:	-0.33	1.33	-0.33
Standard error:	0.31	0.33	--
T-test:	46.7	96.5	33.3
Chi-square test:	71.6	84.0	52.0
Median score:	2	3	3
Skewness:	0.00	1.73	--
10th percentile score:	1	3	3
% dissatisfied:	71%	0%	0%
% satisfied:	0%	33%	0%



Demographic Trends (Summary): Insufficient responses to discern demographic trends.

Responses based on Customer's Role	Responses based on customer's Research Integration Office
Insufficient responses to reveal demographic trends	*Insufficient responses to reveal demographic trends*
Responses based on New versus Continuing Investigation	**Responses based on customer's Organization**
Insufficient responses to reveal demographic trends	*Insufficient responses to reveal demographic trends*

Click the link at right for Question 1.2.4 – *Comments from Increments 7 & 8*

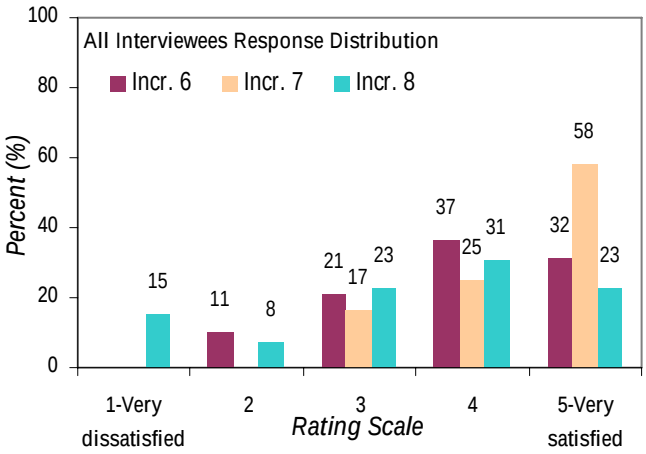
Topic Area: Program Processes – Payload Integration
Question 1.2.5 – *Please rate your level of satisfaction with the ISS end-to-end payload integration process.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Improving satisfaction between Incr. 6 and 7 was reversed between Incr. 7 and 8. Change in trend reflects presence of low score (dissatisfied) outliers in Incr. 8 score distribution not present in Incr. 7. Incr. 8 dissatisfied respondents cite lack of process definition and end-to-end Program understanding of integration for No- / Low-upmass payloads.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	Red
	Sub	

INCREMENT 7 SATISFACTION LEVEL: VERY SATISFIED	INCREMENT 8 SATISFACTION LEVEL: SATISFIED
INCREMENT 7 TO 6 COMPARISON: IMPROVING	INCREMENT 8 TO 7 COMPARISON: GETTING WORSE

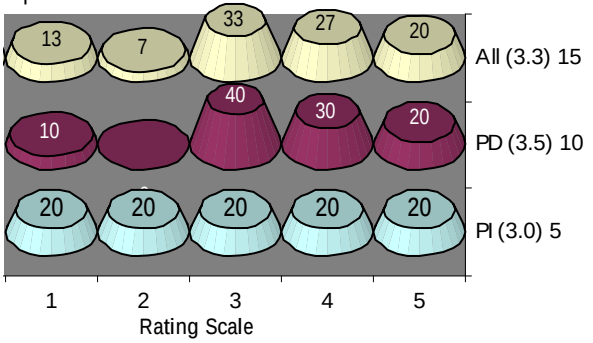
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	19 (86.4%)	12 (66.7%)	13 (50.0%)
Mean score:	3.9	4.4	3.4
Scaled mean score:	72.4	85.4	59.6
Mean score Δ:	0.26	0.52	-1.03
Standard error:	0.23	0.23	0.38
T-test:	61.0	86.4	96.6
Chi-square test:	20.7	79.2	80.4
Median score:	4	5	4
Skewness:	-0.53	-0.99	-0.60
10th percentile score:	2.8	3.1	1.2
% dissatisfied:	11%	0%	23%
% satisfied:	68%	83%	54%

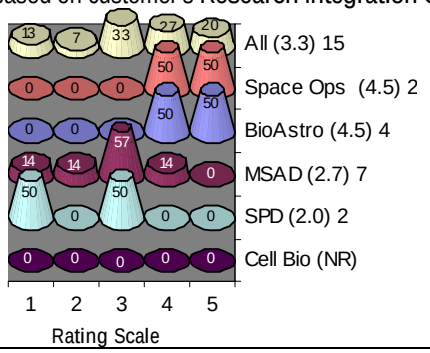


Demographic Trends (Summary): Notably lower scores for New Investigations and University respondents; MSAD and SPD dissatisfied relative to other RIOs.

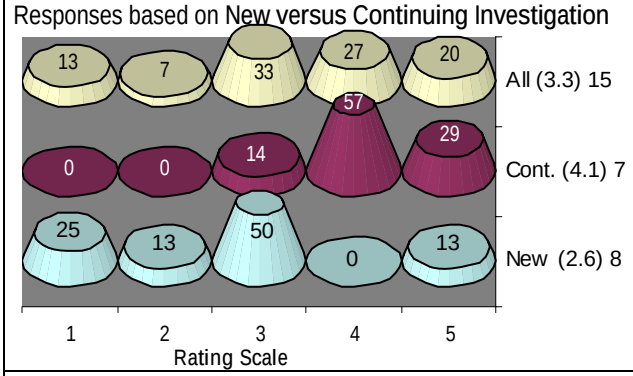
Responses based on Customer's Role



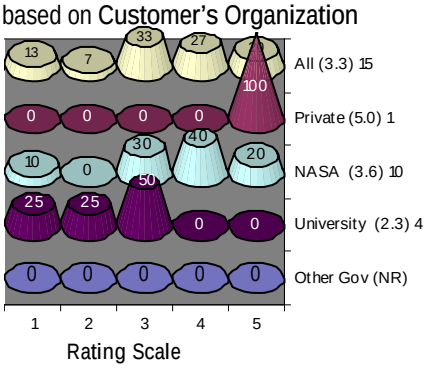
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on Customer's Organization



Click the link at right for Question 1.2.5 –*Comments from Increments 7 & 8*

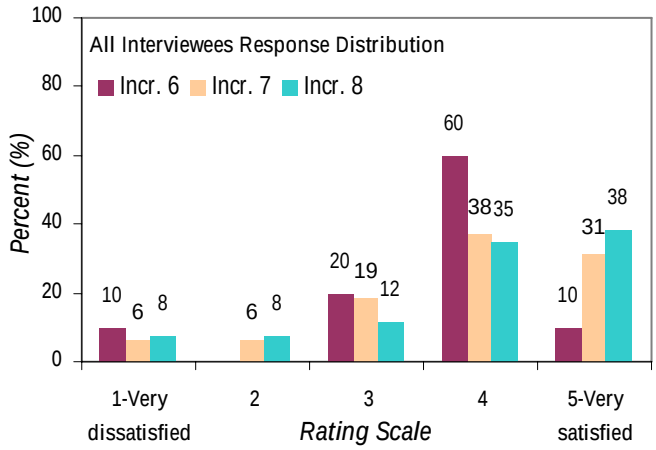
Topic Area: Program Processes – Data and Documentation
Question 1.2.6 – *Please rate your level of satisfaction with the amount of data and documentation you had to produce and deliver to meet the ISS Utilization Program's requirements.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Respondents generally satisfied with no significant change in mean score or shift in score distribution from Incr. 6 to 8. Satisfied respondents cite data and documentation as "appropriate", especially easy for continuing Investigations. Dissatisfied respondents cite requests for irrelevant data and multiple redundant data requests, some driven by "what-if" scenarios.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	Red
	Sub	

INCREMENT 7 SATISFACTION LEVEL: SATISFIED	INCREMENT 8 SATISFACTION LEVEL: SATISFIED
INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

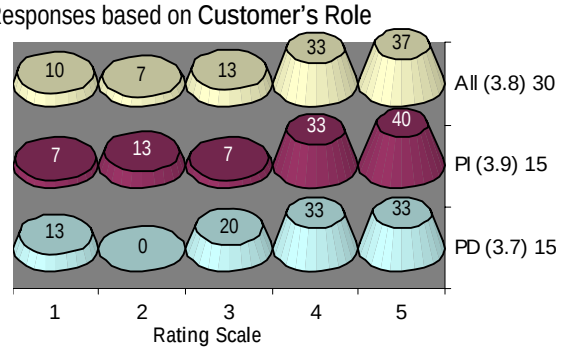
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	20 (90.9%)	16 (88.9%)	26 (100.0%)
Mean score:	3.6	3.8	3.9
Scaled mean score:	65.0	70.3	72.1
Mean score Δ:	0.42	0.21	0.07
Standard error:	0.23	0.29	0.24
T-test:	76.9	43.1	14.7
Chi-square test:	98.8	96.8	15.3
Median score:	4	4	4
Skewness:	-1.52	-1.03	-1.12
10th percentile score:	2.8	2.5	2
% dissatisfied:	10%	13%	15%
% satisfied:	70%	69%	73%

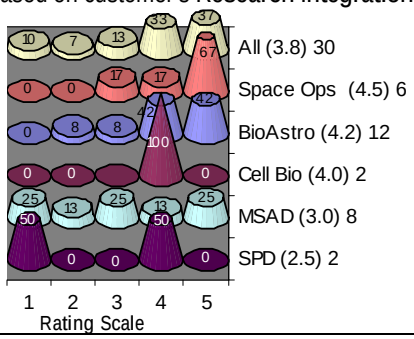


Demographic Trends (Summary): No strong demographic trends with possible exception of MSAD & SPD less satisfied compared to other RIOs.

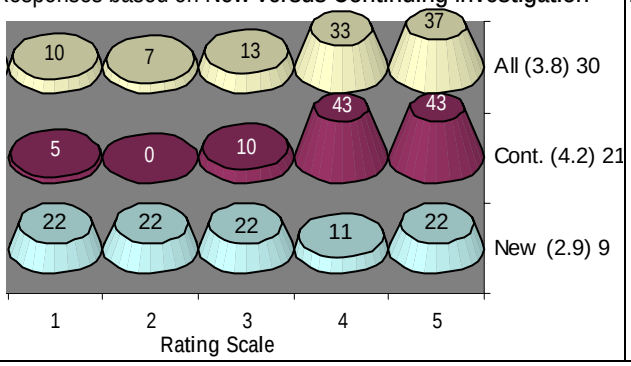
Responses based on Customer's Role



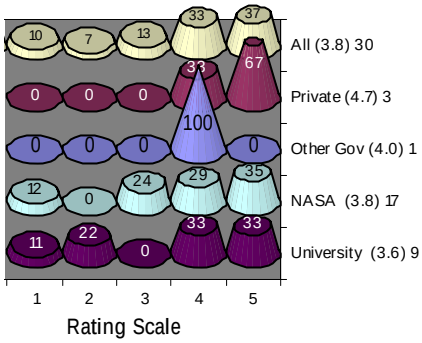
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on Customer's Organization



Click the link at right for *Question 1.2.6 – Comments from Increments 7 & 8*

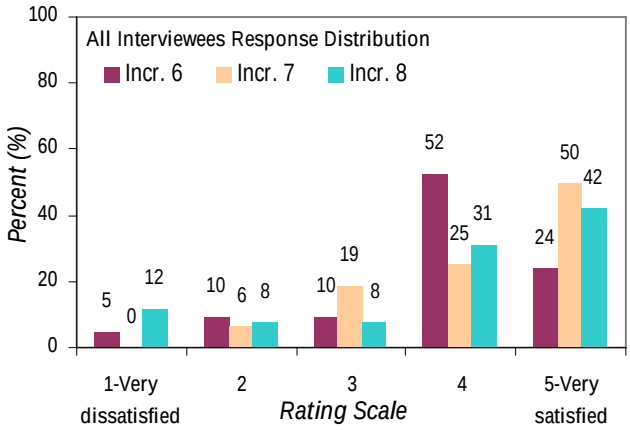
Topic Area: Program Processes – Data and Documentation
Question 1.2.7 – *Please rate your level of satisfaction with the required schedule for delivering the data and documentation you had to produce to meet ISS Utilization Program requirements.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Statistically significant increase in satisfaction between Incr. 6 and 7 was maintained (no significant change) between Incr. 7 and 8. Satisfied respondents cite schedule as "reasonable"; dissatisfied respondents cite multiple "hurry up and wait" situations or short-fuse schedules that appear with little prior notice.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: SATISFIED	INCREMENT 8 SATISFACTION LEVEL: SATISFIED
INCREMENT 7 TO 6 COMPARISON: IMPROVING	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

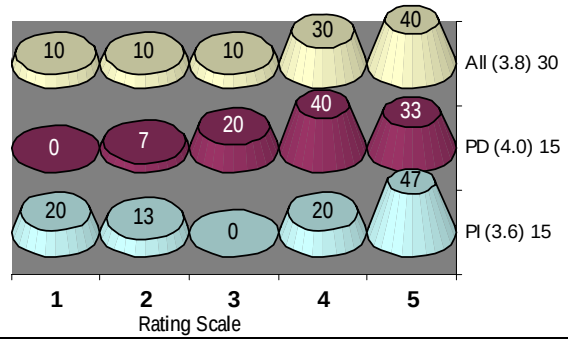
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	21 (95.5%)	16 (88.9%)	26 (100.0%)
Mean score:	3.8	4.2	3.8
Scaled mean score:	70.2	79.7	71.2
Mean score Δ:	0.18	0.38	-0.34
Standard error:	0.24	0.25	0.27
T-test:	46.4	72.0	60.7
Chi-square test:	43.5	94.5	51.3
Median score:	4	4.5	4
Skewness:	-1.17	-0.91	-1.10
10th percentile score:	2	3	1.5
% dissatisfied:	14%	6%	19%
% satisfied:	76%	75%	73%

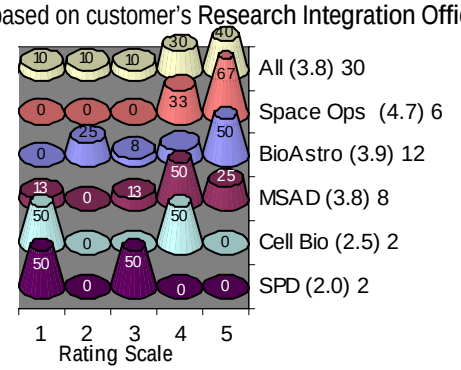


Demographic Trends (Summary): New Investigations and University personnel notably less satisfied than other groups.

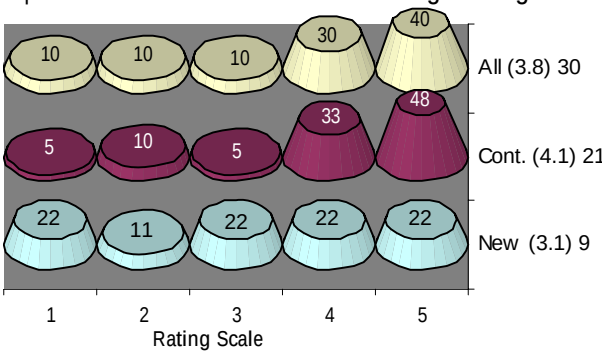
Responses based on Customer's Role



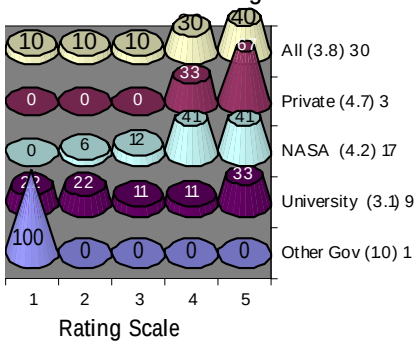
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for Question 1.2.7 – *Comments from Increments 7 & 8*

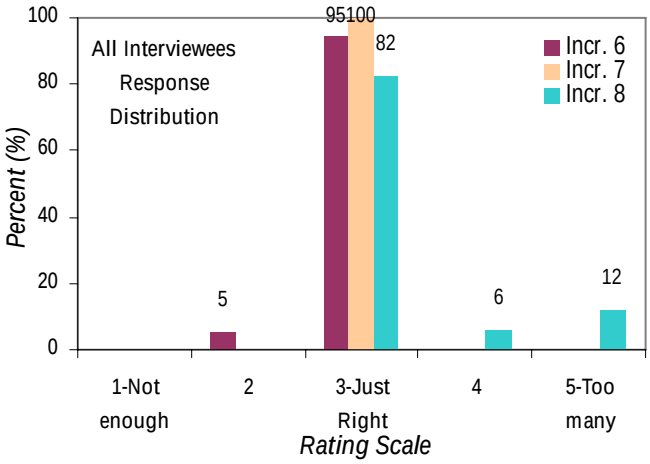
Topic Area: Program Processes – Program Review Processes
Question 1.2.8 – *What is your opinion of the number of ISS Program formal review meetings that you were required to prepare for or participate in?*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Consistent satisfaction ("just right") with this area shows slight negative trend between Incr. 7 and 8. Satisfied respondents cite number of meetings as appropriate, with a low burden for continuing Investigations in particular. Dissatisfied ("too many") Incr. 8 respondents cite short notice on number of up-coming reviews that they need to prepare data for.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: *NOT APPLICABLE*	INCREMENT 8 SATISFACTION LEVEL: *NOT APPLICABLE*
INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE	INCREMENT 8 TO 7 COMPARISON: GETTING WORSE

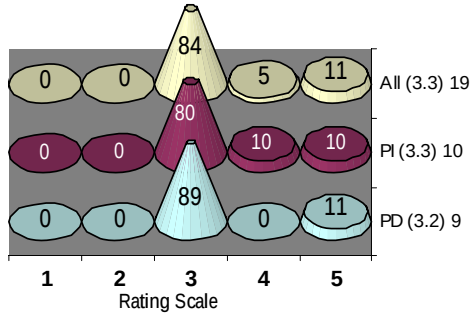
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	19 (86.4%)	9 (50.0%)	17 (65.4%)
Mean score:	2.9	3.0	3.3
Scaled mean score:	48.7	50.0	57.4
Mean score Δ:	-0.05	0.05	0.29
Standard error:	0.05	0.00	0.17
T-test:	27.5	49.8	78.5
Chi-square test:	41.3	52.0	--
Median score:	3	3	3
Skewness:	-4.36	--	2.18
10th percentile score:	3	3	3
% dissatisfied:	5%	0%	0%
% satisfied:	0%	0%	18%

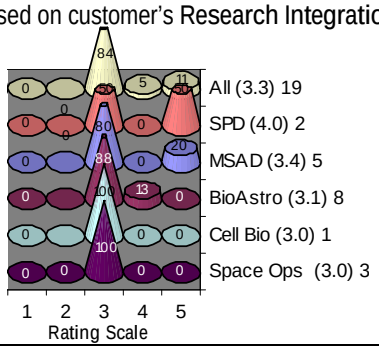


Demographic Trends (Summary): No strong / notable differences in satisfaction across demographic groups.

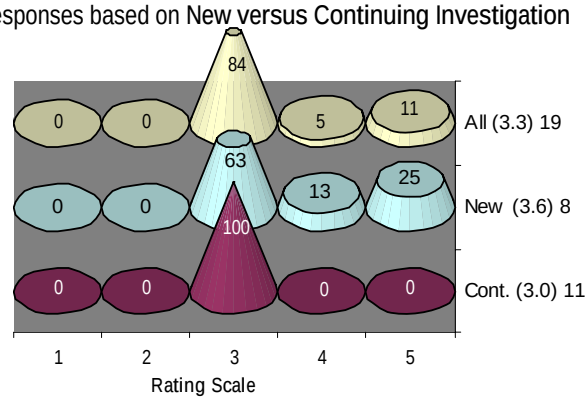
Responses based on Customer's Role



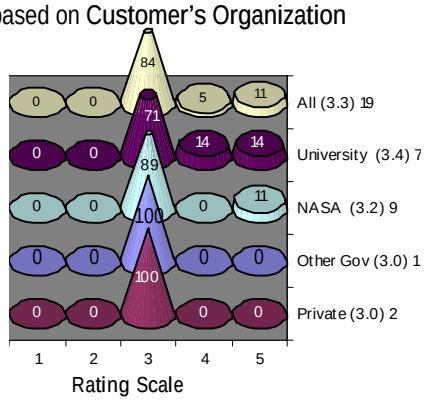
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on Customer's Organization



Click the link at right for *Question 1.2.8 – Comments from Increments 7 & 8*

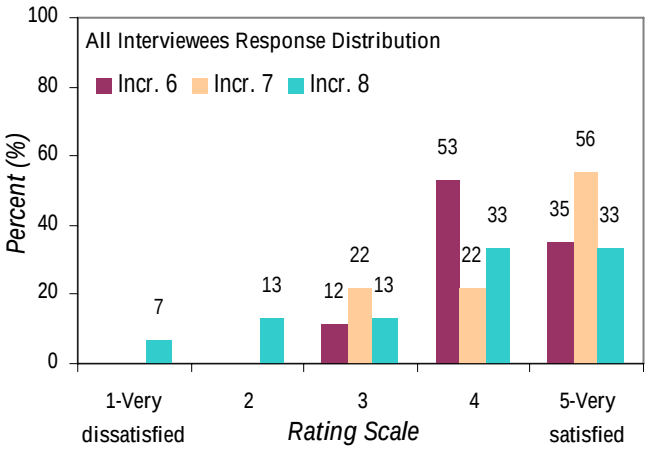
Topic Area: Program Processes – Program Review Processes
Question 1.2.9 – *Please rate your level of satisfaction with the ISS Utilization Program's formal review processes in general.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Generally satisfied responses over Incr. 6 to 8 show slight (statistically borderline) decrease between Incr. 7 and 8 due to presence of low-score dissatisfied outliers in Incr. 8 score distribution. Dissatisfied Incr. 8 respondents cite inconsistent support from junior points-of-contact in preparing data for reviews as well as review panels dealing with issues out of their scope.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	Red
	Sub	

INCREMENT 7 SATISFACTION LEVEL: SATISFIED	INCREMENT 8 SATISFACTION LEVEL: SATISFIED
INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

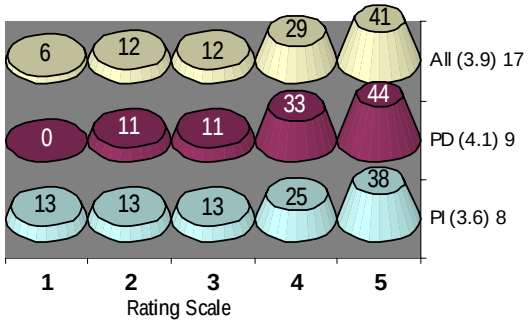
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	17 (77.3%)	9 (50.0%)	15 (57.7%)
Mean score:	4.2	4.3	3.7
Scaled mean score:	80.9	83.3	68.3
Mean score Δ:	0.60	0.10	-0.60
Standard error:	0.16	0.29	0.33
T-test:	97.7	25.0	77.2
Chi-square test:	94.5	82.5	74.1
Median score:	4	5	4
Skewness:	-0.29	-0.82	-0.84
10th percentile score:	3.6	3	2
% dissatisfied:	0%	0%	20%
% satisfied:	88%	78%	67%

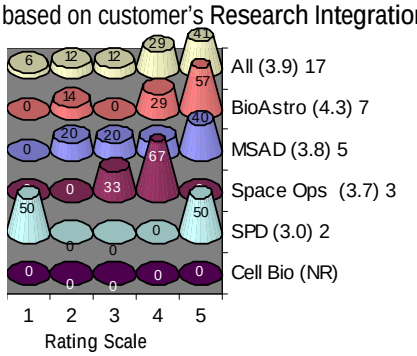


Demographic Trends (Summary): PIs possibly less satisfied than PDs; New investigations and University personnel less satisfied.

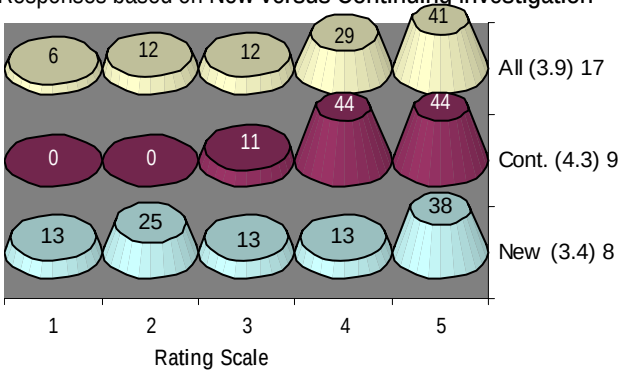
Responses based on Customer's Role



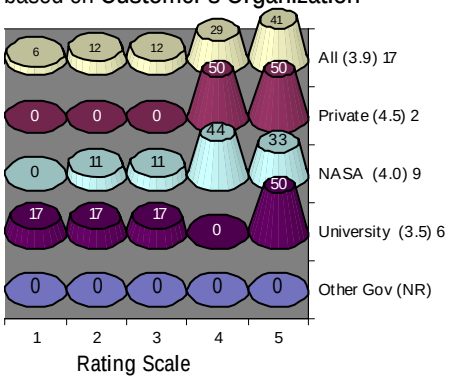
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on Customer's Organization



Click the link at right for Question 1.2.9 – *Comments from Increments 7 & 8*

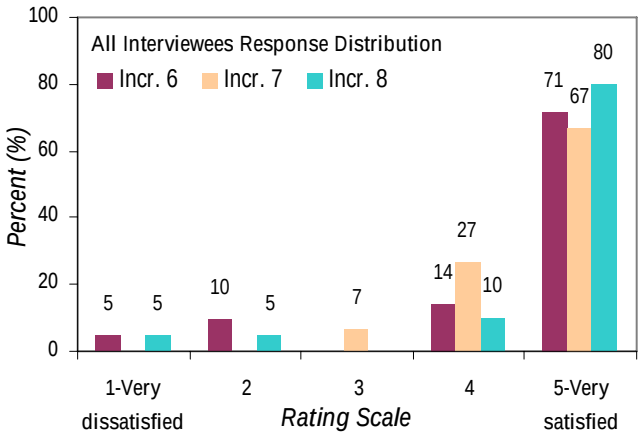
Topic Area: Customer Support Interface – NASA Research Program Office Support
Question 1.3.1 – *Please rate your level of satisfaction with the support your ISS Investigation received from your assigned NASA Research Program Office/Research Integration Office.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Consistent high level of satisfaction maintained from Incr. 6 to 8. Satisfied respondents cite RPO/RIO proactive attitude, consistent support and efforts to reduce customer burden. Dissatisfied respondents cite inconsistent advocacy depending on RPO/RIO management level, issues with inexperienced first points-of-contact and over-restrictive control of PIs access to program.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	Red
	Sub	

INCREMENT 7 SATISFACTION LEVEL: VERY SATISFIED	INCREMENT 8 SATISFACTION LEVEL: VERY SATISFIED
INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

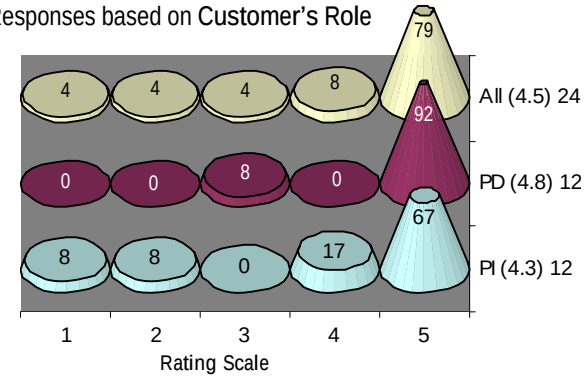
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	21 (95.5%)	15 (83.3%)	20 (76.9%)
Mean score:	4.4	4.6	4.6
Scaled mean score:	84.5	90.0	88.8
Mean score Δ:	-0.10	0.22	-0.05
Standard error:	0.26	0.16	0.25
T-test:	24.8	47.5	12.4
Chi-square test:	6.5	71.6	86.1
Median score:	5	5	5
Skewness:	-1.98	-1.41	-2.65
10th percentile score:	2	4	3.8
% dissatisfied:	14%	0%	10%
% satisfied:	86%	93%	90%

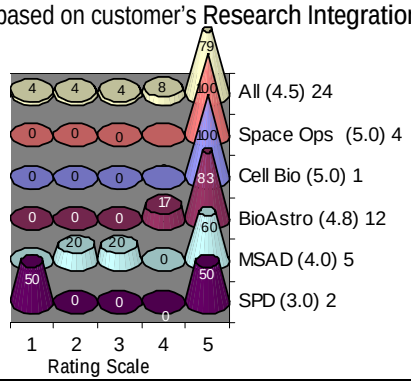


Demographic Trends (Summary): New investigations and University personnel relatively less satisfied than other groups.

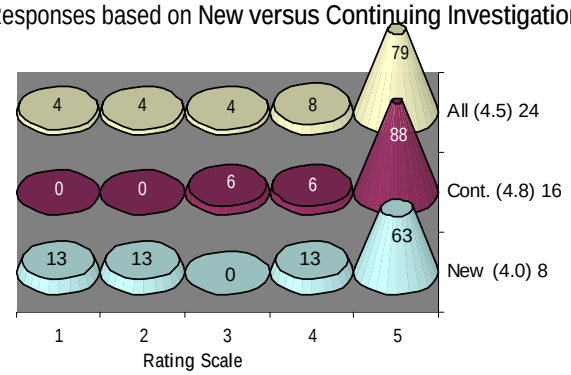
Responses based on Customer's Role



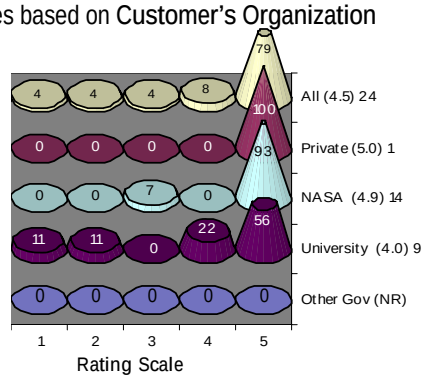
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on Customer's Organization



Click the link at right for *Question 1.3.1 – Comments from Increments 7 & 8*

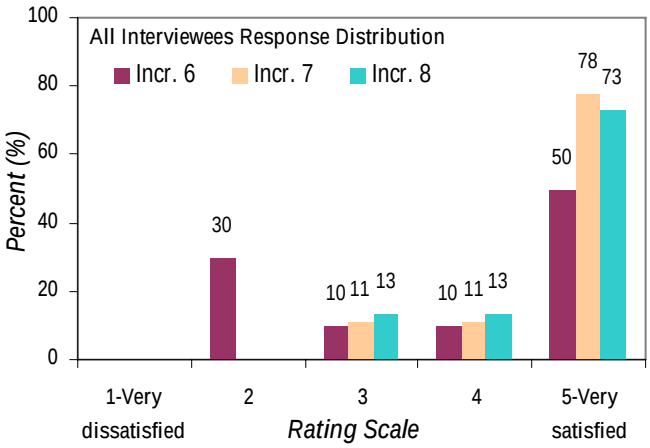
Topic Area: Customer Support Interface – PIM Services
Question 1.3.2 – *Please rate your level of satisfaction with the services provided by the Payload Integration Manager (PIM) assigned to your Investigation.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Notable improving in satisfaction between Incr. 6 and 7, with high level of satisfaction maintained into Incr. 8. Improvement reflected in mean score correlates with loss or absence of dissatisfied subset of respondents between Incr. 6 and 7. Verbal comments consistently positive with superlatives used in many cases.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: VERY SATISFIED	INCREMENT 8 SATISFACTION LEVEL: VERY SATISFIED
INCREMENT 7 TO 6 COMPARISON: IMPROVING	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

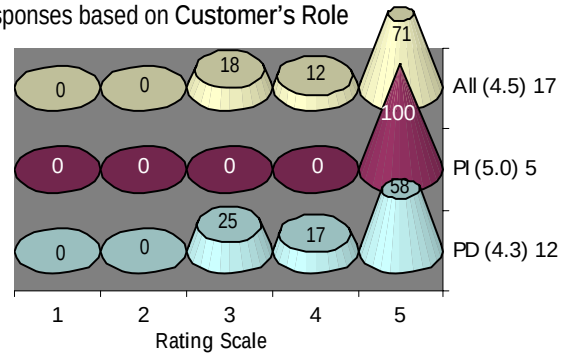
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	10 (45.5%)	9 (50.0%)	15 (57.7%)
Mean score:	3.8	4.7	4.6
Scaled mean score:	70.0	91.7	90.0
Mean score Δ:	0.30	0.87	-0.07
Standard error:	0.44	0.24	0.19
T-test:	33.4	88.7	17.0
Chi-square test:	85.0	75.0	8.2
Median score:	4.5	5	5
Skewness:	-0.48	-2.12	-1.63
10th percentile score:	2	3.8	3.4
% dissatisfied:	30%	0%	0%
% satisfied:	60%	89%	87%

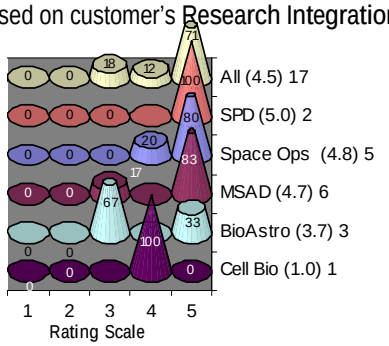


Demographic Trends (Summary): "Atypical" demographic trend has NASA Bioastronautics personnel and Continuing investigations relatively less satisfied than other groups.

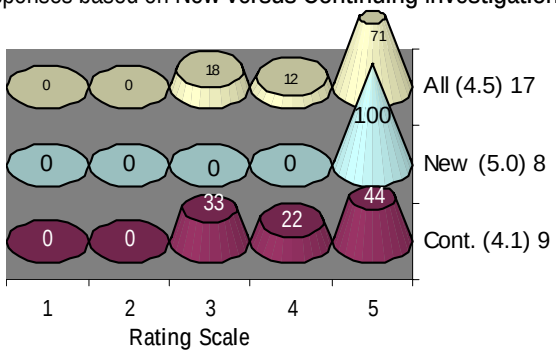
Responses based on Customer's Role



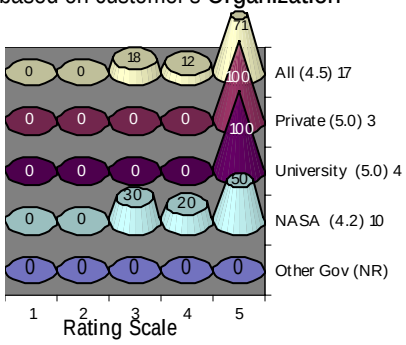
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for *Question 1.3.2 – Comments from Increments 7 & 8*

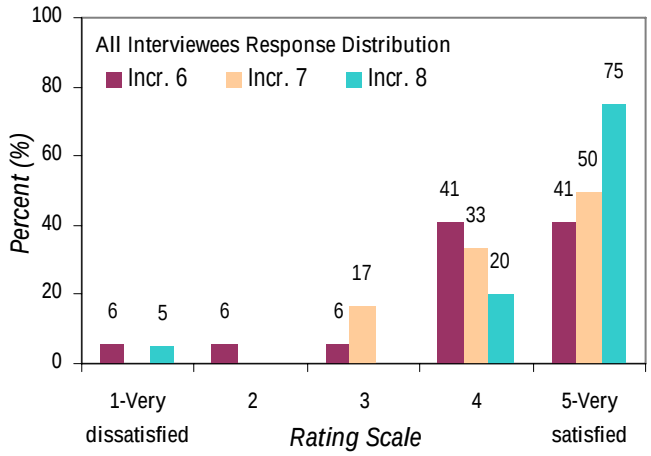
Topic Area: Customer Support Interface – Crew Interface: Training and On-Orbit
Question 1.3.4 – *Please rate your level of satisfaction with the support the ISS Utilization Program provided to your investigation in the area of Crew Training.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Consistent increment-to-increment satisfaction based on mean score with slight increment-to-increment shifts in score distribution that incorporate dissatisfied outliers for Incr. 6 and 8. Verbal comments generally positive, citing good support.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	Red
	Sub	

INCREMENT 7 SATISFACTION LEVEL: SATISFIED	INCREMENT 8 SATISFACTION LEVEL: VERY SATISFIED
INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

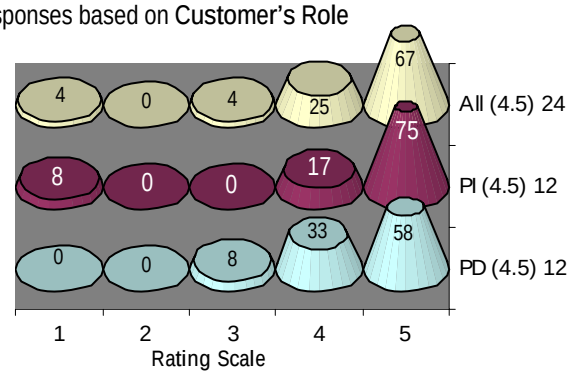
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	17 (77.3%)	12 (66.7%)	20 (76.9%)
Mean score:	4.1	4.3	4.6
Scaled mean score:	76.5	83.3	90.0
Mean score Δ:	0.30	0.27	0.27
Standard error:	0.28	0.22	0.21
T-test:	56.0	52.2	58.5
Chi-square test:	45.3	61.9	96.8
Median score:	4	4.5	5
Skewness:	-1.55	-0.72	-3.27
10th percentile score:	2.6	3.1	4
% dissatisfied:	12%	0%	5%
% satisfied:	82%	83%	95%

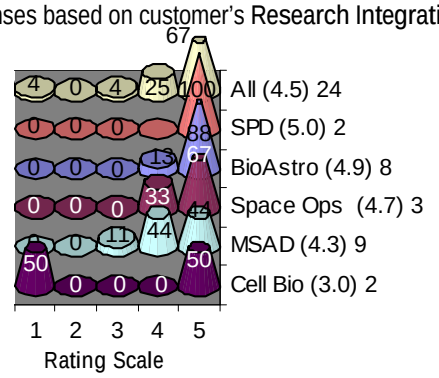


Demographic Trends (Summary): No strong / notable differences in satisfaction based on demographic group.

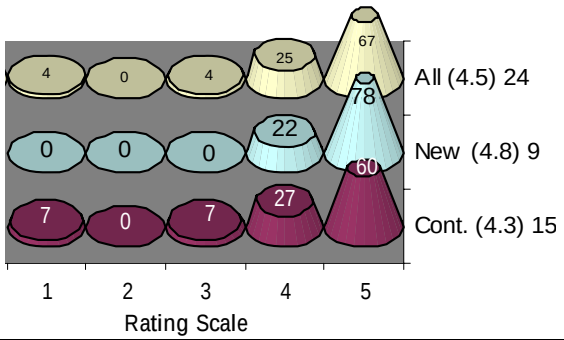
Responses based on Customer's Role



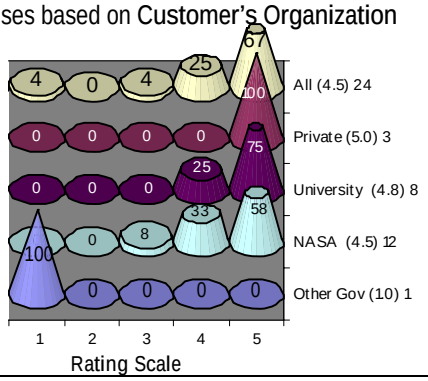
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on Customer's Organization



Click the link at right for Question 1.3.4 – *Comments from Increments 7 & 8*

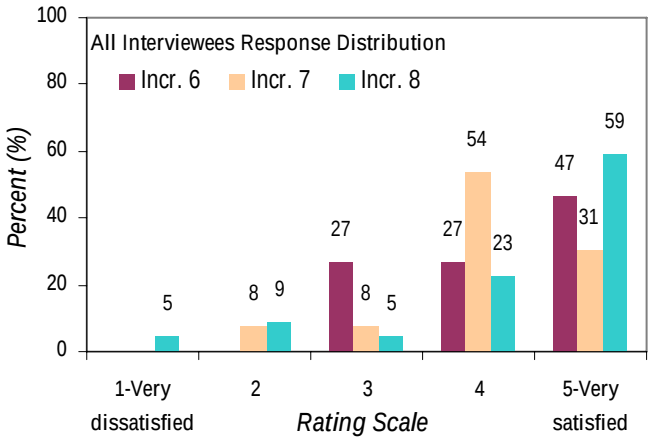
Topic Area: Customer Support Interface – Crew Interface: Training and On-Orbit
Question 1.3.9 – *Please rate your level of satisfaction with your Investigation's interface to the crew on-orbit.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Consistently high level of satisfaction from Incr. 6 to 8 with no significant change in mean score. Verbal comments indicate this area is a stand-out satisfaction driver. Satisfied respondents cite increasing efforts of Program to facilitate direct interaction with the crew; dissatisfied respondents cite firewalls in their crew interface and lack of consistent relay of information.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	Red
	Sub	

INCREMENT 7 SATISFACTION LEVEL: SATISFIED	INCREMENT 8 SATISFACTION LEVEL: SATISFIED
INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

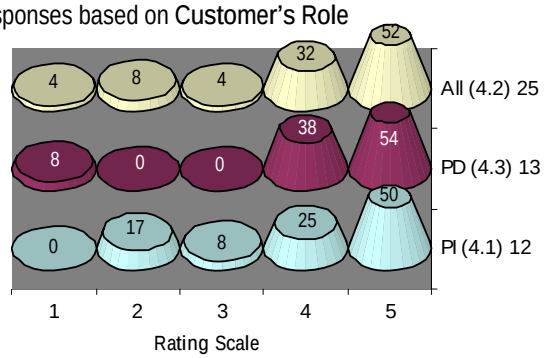
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	15 (68.2%)	13 (72.2%)	22 (84.6%)
Mean score:	4.2	4.1	4.2
Scaled mean score:	80.0	76.9	80.7
Mean score Δ:	0.52	-0.12	0.15
Standard error:	0.22	0.24	0.25
T-test:	84.5	29.1	30.6
Chi-square test:	98.0	95.2	98.2
Median score:	4	4	5
Skewness:	-0.43	-1.09	-1.59
10th percentile score:	3	3.2	2.1
% dissatisfied:	0%	8%	14%
% satisfied:	73%	85%	82%

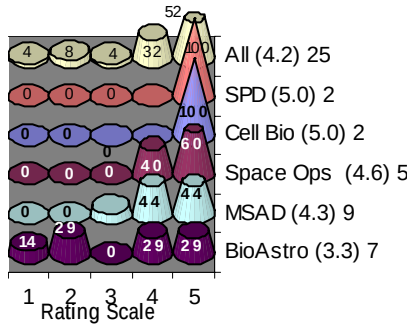


Demographic Trends (Summary): Bioastronautics personnel notably less satisfied than from other RIOs; otherwise no strong demographic trends across other categories.

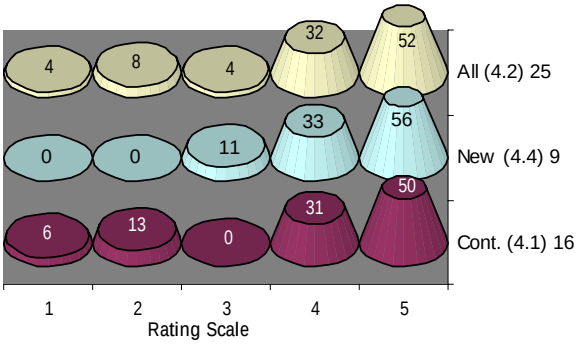
Responses based on Customer's Role



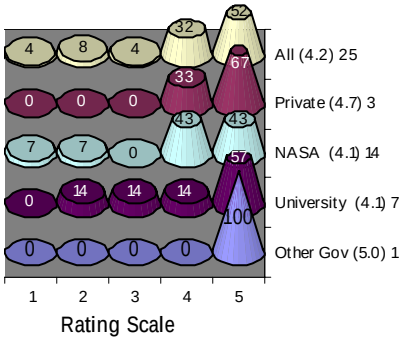
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for *Question 1.3.9 – Comments from Increments 7 & 8*

Topic Area: Customer Support Interface – Change Requests
Question 1.3.5 – *If at any time during your Investigation's development, integration and operation your requirements of the ISS changed, please rate your level of satisfaction with how the ISS Utilization Program responded to your change request.*

MANAGER'S TOOL BOX

NOTABLE FINDINGS: Generally satisfied responses show statistically borderline decreasing trend in mean score from Incr. 6 to 8. Satisfied respondents indicate change process was efficient and well supported; dissatisfied respondents cite inconsistent application of rules determining when formal changes need to be submitted for operational changes, and multiple changes from junior POCs.

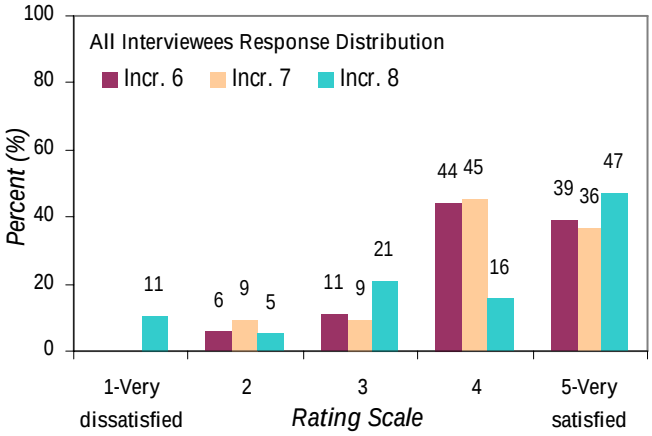
Overall Status	
IMPROVEMENT (INCR. 6 THRU 8)	*SATISFACTION (INCR. 8)*
Super	Green
Neutral	Yellow
Mixed	Red
Sub	

INCREMENT 7 SATISFACTION LEVEL: SATISFIED
INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE

INCREMENT 8 SATISFACTION LEVEL: SATISFIED
INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

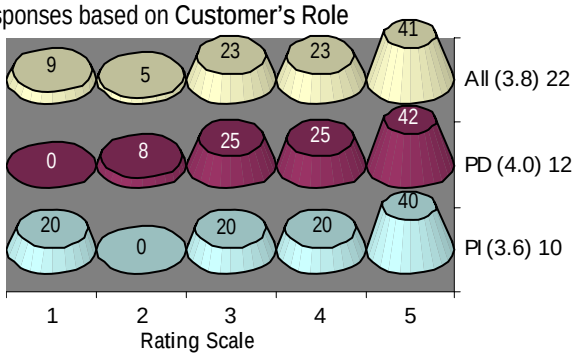
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	18 (81.8%)	11 (61.1%)	19 (73.1%)
Mean score:	4.2	4.1	3.8
Scaled mean score:	79.2	77.3	71.1
Mean score Δ:	0.43	-0.08	-0.25
Standard error:	0.20	0.28	0.32
T-test:	79.3	17.4	39.8
Chi-square test:	83.5	4.2	94.5
Median score:	4	4	4
Skewness:	-0.98	-1.08	-0.95
10th percentile score:	3	3	1.8
% dissatisfied:	6%	9%	16%
% satisfied:	83%	82%	63%

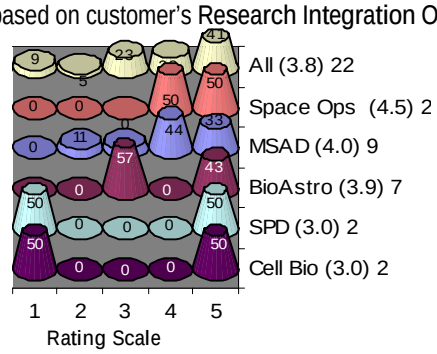


Demographic Trends (Summary): PIs possibly less satisfied than PDs; otherwise no strong demographic differences.

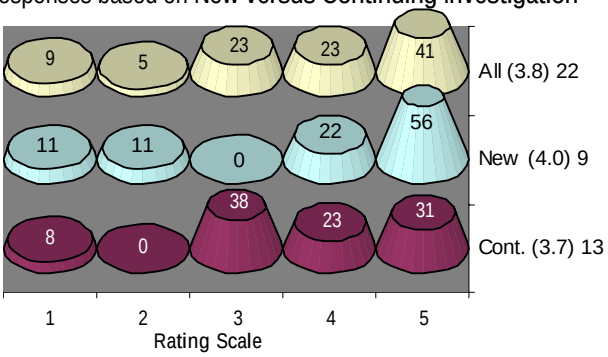
Responses based on Customer's Role



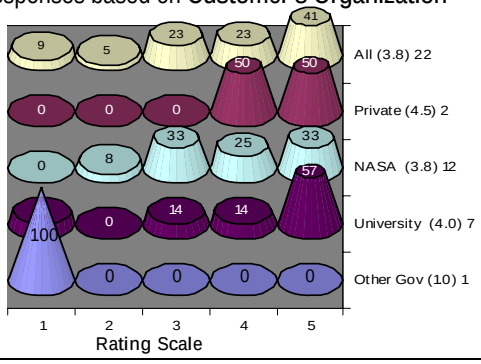
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on Customer's Organization



Click the link at right for Question 1.3.5 – *Comments from Increments 7 & 8*

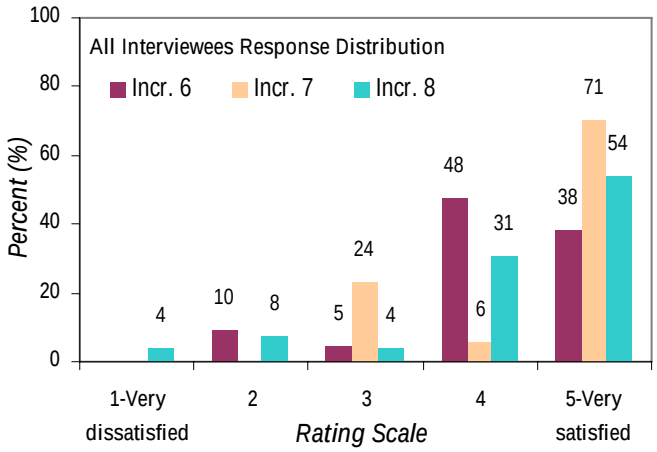
Topic Area: Customer Support Interface – Communication with Support Personnel
Question 1.3.6 – Please rate the level of your satisfaction with the communication flow between you and the personnel in the ISS Program.

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Notable mean score improvement from satisfied to very satisfied between Incr. 6 and 7 is reflected in verbal comments that cite improved "flattening" of the communication routes using PIM services and other approaches. Dissatisfied respondents cite need for better communication of Program organization and poor flow up/down of information relayed from POCs.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: VERY SATISFIED	INCREMENT 8 SATISFACTION LEVEL: SATISFIED
INCREMENT 7 TO 6 COMPARISON: IMPROVING	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

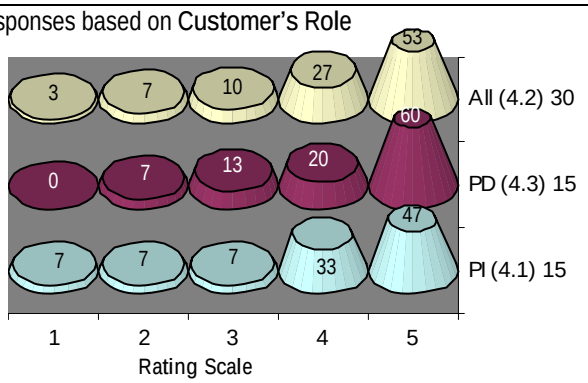
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	21 (95.5%)	17 (94.4%)	26 (100.0%)
Mean score:	4.1	4.5	4.2
Scaled mean score:	78.6	86.8	80.8
Mean score Δ:	0.14	0.33	-0.24
Standard error:	0.20	0.21	0.22
T-test:	43.2	73.1	54.4
Chi-square test:	67.3	100.0	100.0
Median score:	4	5	5
Skewness:	-1.18	-1.17	-1.65
10th percentile score:	3	3	2.5
% dissatisfied:	10%	0%	12%
% satisfied:	86%	76%	85%

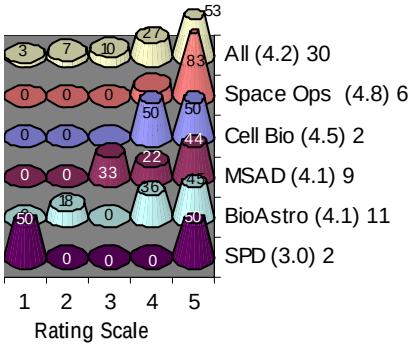


Demographic Trends (Summary): No notable / strong demographic differences or trends.

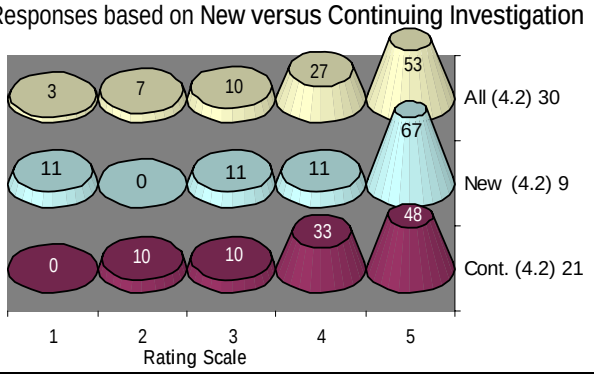
Responses based on Customer's Role



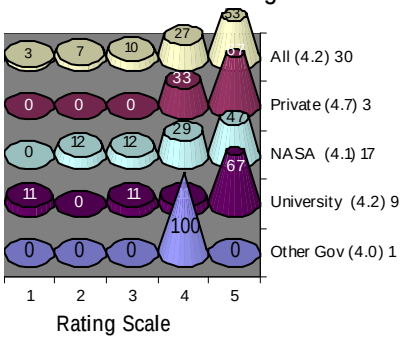
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for *Question 1.3.6 – Comments from Increments 7 & 8*

Topic Area: Customer Support Interface – Activities in Russia
Question 1.3.13 – *If your investigation had significant payload integration/data collection activities in Russia, please rate your level of satisfaction with the support the Program provided for these activities.*

MANAGER'S TOOL BOX

NOTABLE FINDINGS: Very satisfied rating for Increment 8. Respondents cite "above and beyond" efforts from support personnel to accomplish integration and data collection in Russia.

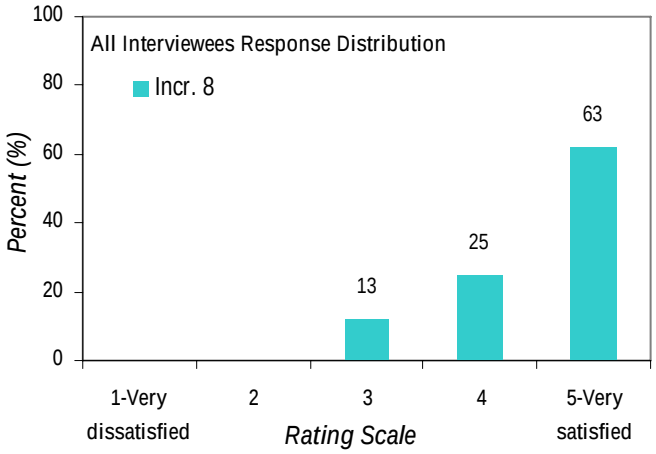
Overall Status	
IMPROVEMENT (INCR. 6 THRU 8)	*SATISFACTION (INCR. 8)*
Super	Green
Neutral	Yellow
Mixed	Red
Sub	

INCREMENT 7 SATISFACTION LEVEL: NOT APPLICABLE
INCREMENT 7 TO 6 COMPARISON: NOT APPLICABLE

INCREMENT 8 SATISFACTION LEVEL: VERY SATISFIED
INCREMENT 8 TO 7 COMPARISON: NOT APPLICABLE

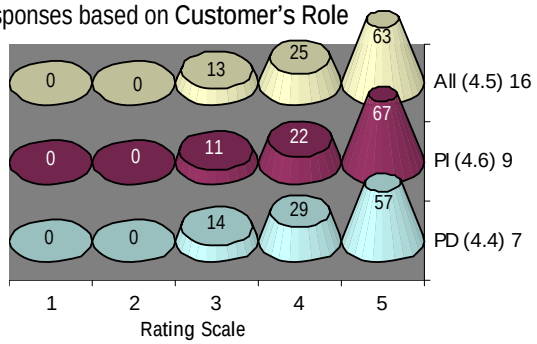
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	NA	NA	26
Applicable responses:	NA	NA	16 (61.5%)
Mean score:	NA	NA	4.5
Scaled mean score:	NA	NA	87.5
Mean score Δ:	NA	NA	--
Standard error:	NA	NA	0.18
T-test:	NA	NA	--
Chi-square test:	NA	NA	--
Median score:	NA	NA	5
Skewness:	NA	NA	-1.17
10th percentile score:	NA	NA	3.5
% dissatisfied:	NA	NA	0%
% satisfied:	NA	NA	88%

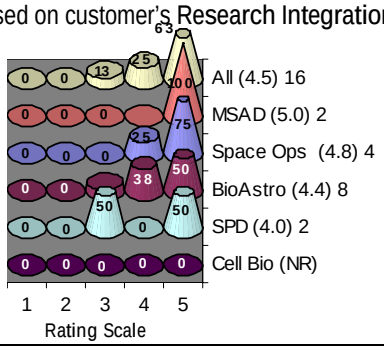


Demographic Trends (Summary): No notable / strong demographic differences.

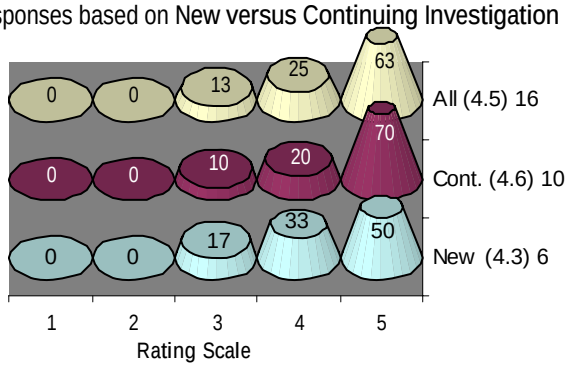
Responses based on Customer's Role



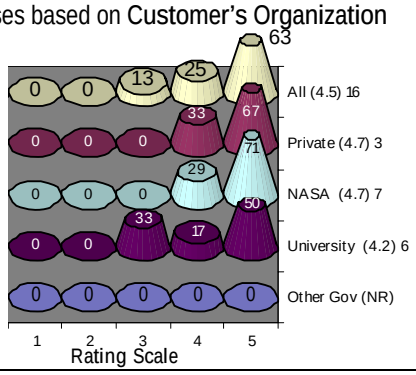
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on Customer's Organization



Click the link at right for Question 1.3.13 – *Comments from Increment 8*

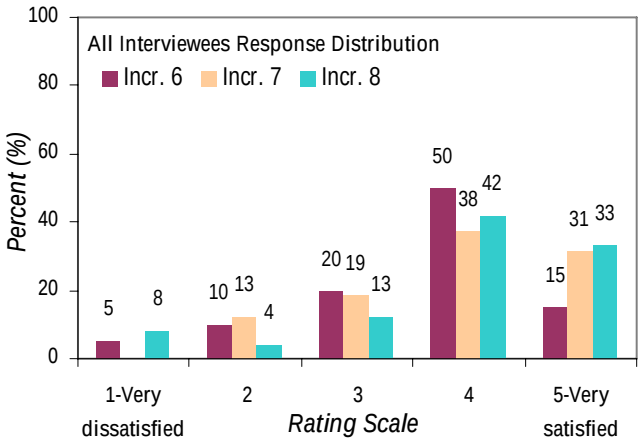
Topic Area: Customer Support Interface – Information Sources
Question 1.3.7 – *Please rate your level of satisfaction with the ease of locating necessary information.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Consistent level of satisfaction shows no significant changes in mean score or score distribution from Incr. 6 to 8. Satisfied respondents cite importance of support from single point of contact such as PIMs and other direct support individuals in providing information. Dissatisfied respondents cite poor website organization, access to forms, inconsistent answers from different POCs.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	Red
	Sub	

INCREMENT 7 SATISFACTION LEVEL: SATISFIED	INCREMENT 8 SATISFACTION LEVEL: SATISFIED
INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

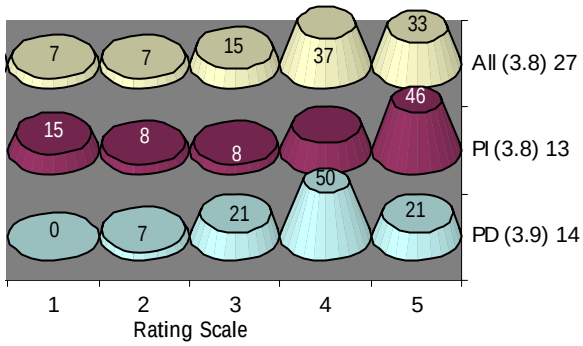
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	20 (90.9%)	16 (88.9%)	24 (92.3%)
Mean score:	3.6	3.9	3.9
Scaled mean score:	65.0	71.9	71.9
Mean score Δ:	0.15	0.28	0.00
Standard error:	0.23	0.26	0.24
T-test:	34.9	56.5	0.0
Chi-square test:	55.2	62.4	42.3
Median score:	4	4	4
Skewness:	-0.91	-0.57	-1.26
10th percentile score:	2	2.5	2.3
% dissatisfied:	15%	13%	13%
% satisfied:	65%	69%	75%

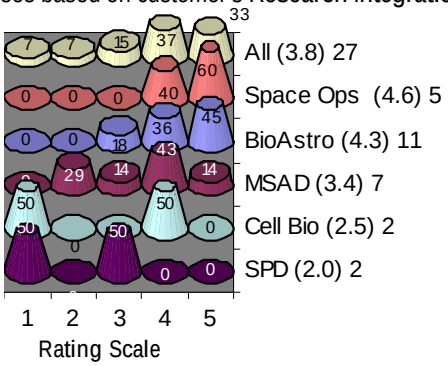


Demographic Trends (Summary): Variation across RIOs; otherwise no pronounced demographic differences.

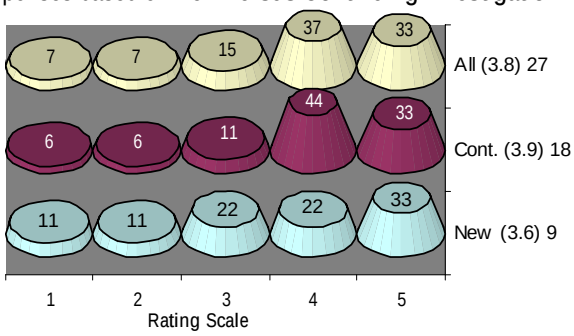
Responses based on Customer's Role



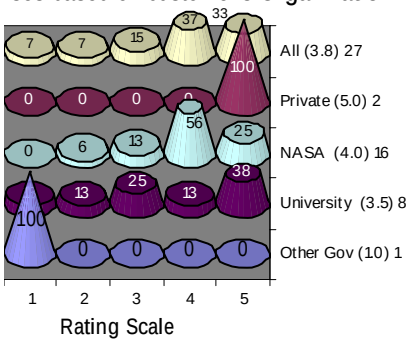
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for *Question 1.3.7 – Comments from Increments 7 & 8*

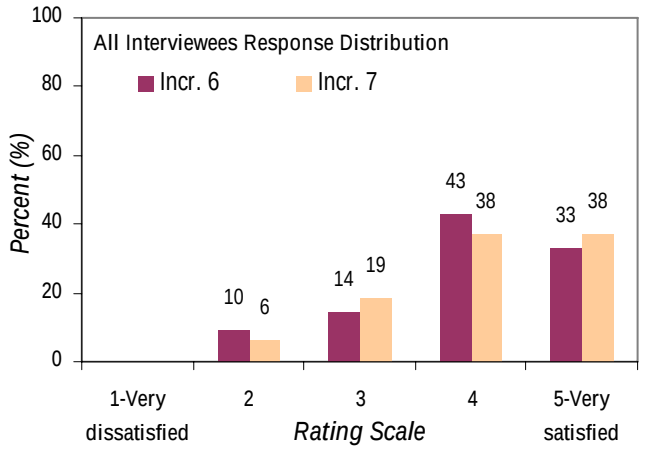
Topic Area: Customer Support Interface – Information Sources
Question 1.3.8 – *Please rate your level of satisfaction with the ease of accessing necessary information once it is located.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Consistent level of satisfaction for Increments 5 through 7. Question was discontinued from use in the Increment 8 Survey.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: SATISFIED INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE	INCREMENT 8 SATISFACTION LEVEL: NOT APPLICABLE INCREMENT 8 TO 7 COMPARISON: NOT APPLICABLE

Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	--
Applicable responses:	21 (95.5%)	16 (88.9%)	--
Mean score:	4.0	4.1	--
Scaled mean score:	75.0	76.6	--
Mean score Δ:	0.00	0.06	--
Standard error:	0.21	0.23	--
T-test:	0.0	15.8	--
Chi-square test:	53.6	10.2	--
Median score:	4	4	--
Skewness:	-0.78	-0.71	--
10th percentile score:	3	3	--
% dissatisfied:	10%	6%	--
% satisfied:	76%	75%	--



Demographic Trends (Summary): Insufficient responses to reveal demographic trends

Responses based on Customer's Role *Not applicable* *(responses limited to one demographic group)*	Responses based on customer's Research Integration Office *Insufficient responses to reveal demographic trends*
Responses based on New versus Continuing Investigation *Insufficient responses to reveal demographic trends*	Responses based on Customer's Organization *Not applicable* *(responses limited to one demographic group)*

Click the link at right for Question 1.3.8 – *Comments from Increments 7 & 8*

Topic Area: Customer Support Interface – Information Sources
Question 1.3.10 – *Please rate your level of satisfaction with any educational/orientational information you received from the ISS Utilization Program at the outset of your ISS Project.*

MANAGER'S TOOL BOX

NOTABLE FINDINGS: Consistent mid-scale (neutral) level of satisfaction over Incr. 6 to 8 is one of the lower satisfaction levels of all Survey topic areas. Few respondents indicate they used or received educational information when they started their Investigations and were unaware of the Program's efforts in this area.

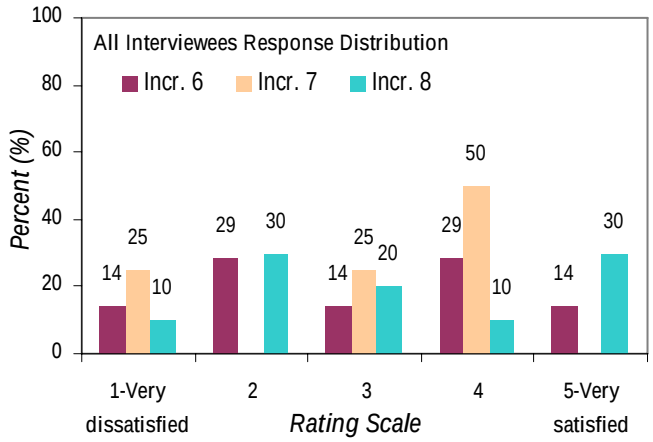
Overall Status	
IMPROVEMENT (INCR. 6 THRU 8)	*SATISFACTION (INCR. 8)*
Super	Green
Neutral	Yellow
Mixed	
Sub	Red

INCREMENT 7 SATISFACTION LEVEL: NEUTRAL
INCREMENT 7 TO 6 COMPARISON: NO SIGNIFICANT CHANGE

INCREMENT 8 SATISFACTION LEVEL: NEUTRAL
INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

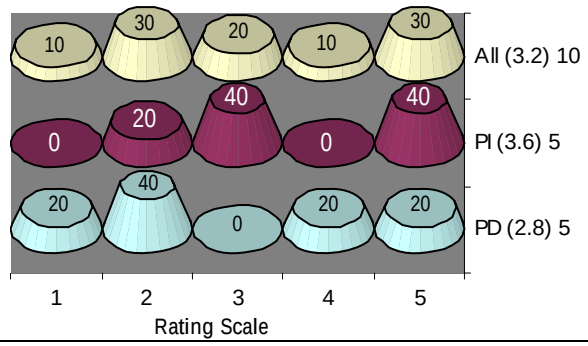
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	14 (63.6%)	4 (22.2%)	10 (38.5%)
Mean score:	3.0	3.0	3.2
Scaled mean score:	50.0	50.0	55.0
Mean score Δ:	0.10	0.00	0.20
Standard error:	0.36	0.71	0.47
T-test:	19.7	0.0	17.9
Chi-square test:	89.5	44.2	87.8
Median score:	3	3.5	3
Skewness:	0.00	-1.41	0.09
10th percentile score:	1.3	1.6	1.9
% dissatisfied:	43%	25%	40%
% satisfied:	43%	50%	40%

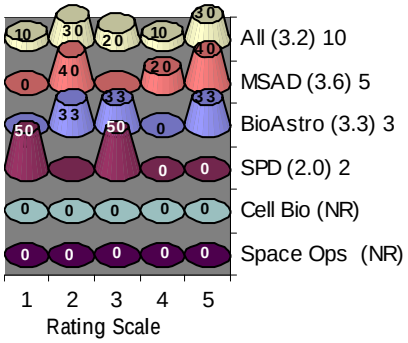


Demographic Trends (Summary): University personnel notably less satisfied (dissatisfied) relative to respondents from NASA.

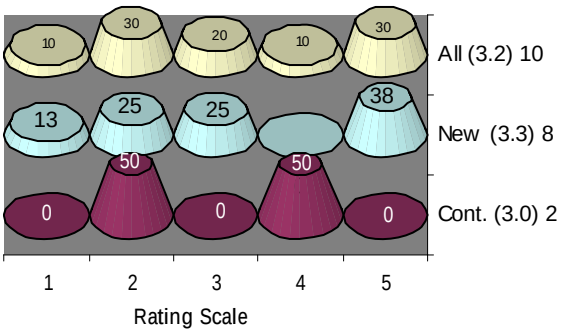
Responses based on Customer's Role



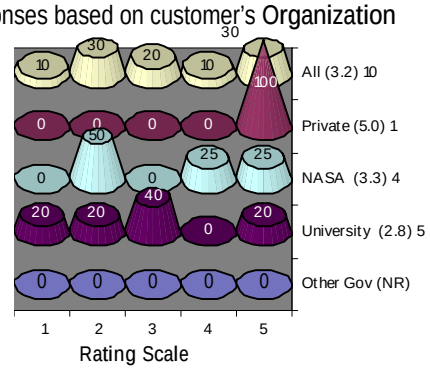
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for Question 1.3.10 – *Comments from Increments 7 & 8*

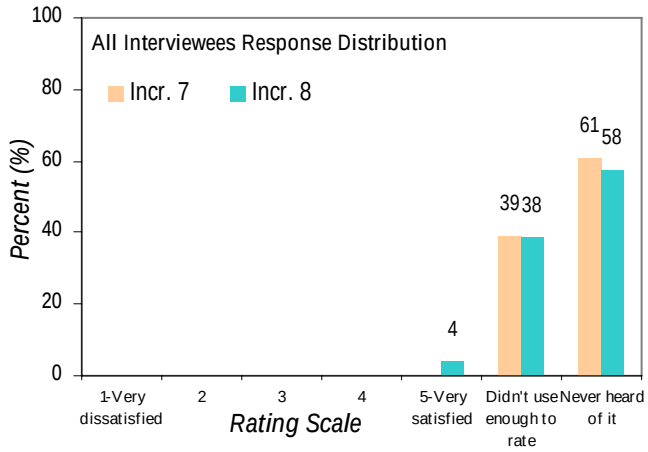
Topic Area: Customer Support Interface – Information Sources
Question 1.3.11 – *Please rate your level of your satisfaction with the Payload Information Source CD and its companion website as an informative and useful resource.*

MANAGER'S TOOL BOX	Overall Status	
	IMPROVEMENT (INCR. 6 THRU 8)	*SATISFACTION (INCR. 8)*
NOTABLE FINDINGS: Only one respondent over the Incr. 7 to 8 survey cycles was familiar enough with this product to provide a rating. Most respondents had either not heard of the Payload Information Source or hadn't used it enough to have a basis for providing feedback.	Super	Green
	Neutral	Yellow
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: NOT APPLICABLE	INCREMENT 8 SATISFACTION LEVEL: NOT APPLICABLE
INCREMENT 7 TO 6 COMPARISON: NOT APPLICABLE	INCREMENT 8 TO 7 COMPARISON: NOT APPLICABLE

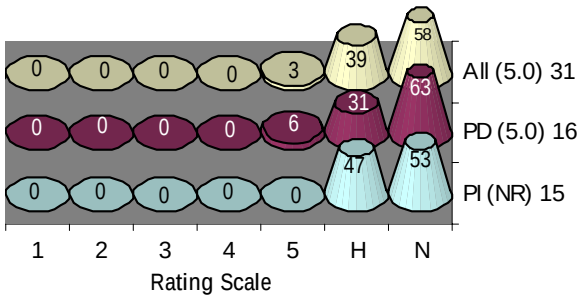
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	NA	18	26
Applicable responses:	NA	18 (100.0%)	26 (100.0%)
Mean score:	NA	--	5.0
Scaled mean score:	NA	--	100.0
Mean score Δ:	NA	--	--
Standard error:	NA	--	--
T-test:	NA	--	--
Chi-square test:	NA	--	--
Median score:	NA	--	5
Skewness:	NA	--	--
10th percentile score:	NA	--	5
% dissatisfied:	NA	--	0%
% satisfied:	NA	--	4%

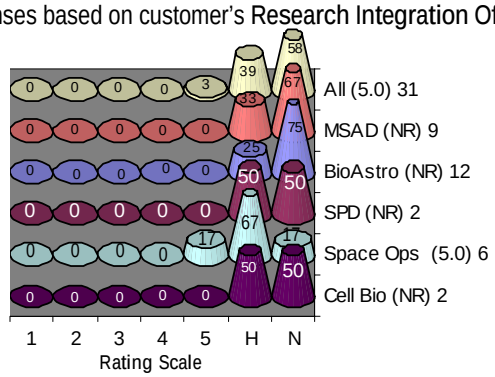


Demographic Trends (Summary): Strong demographic consistency (no differences across groups).

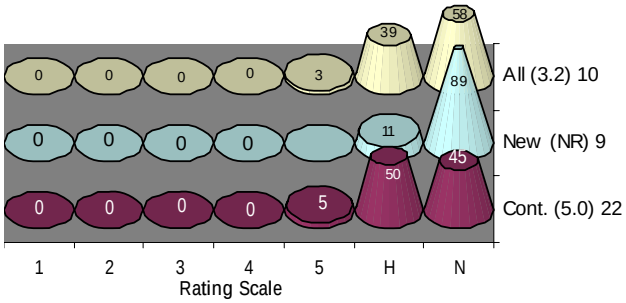
Responses based on Customer's Role
H = Heard of, didn't use enough to rate, N = Never heard of it



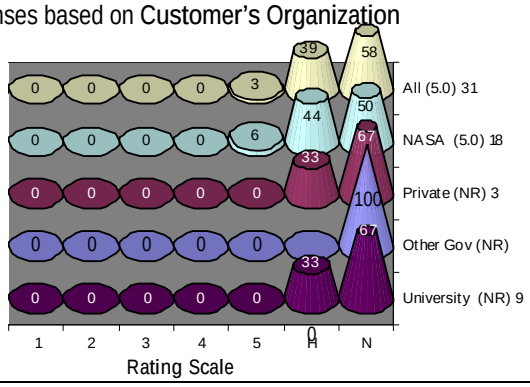
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on Customer's Organization



Click the link at right for Question 1.3.11 – *Comments from Increments 7 & 8*

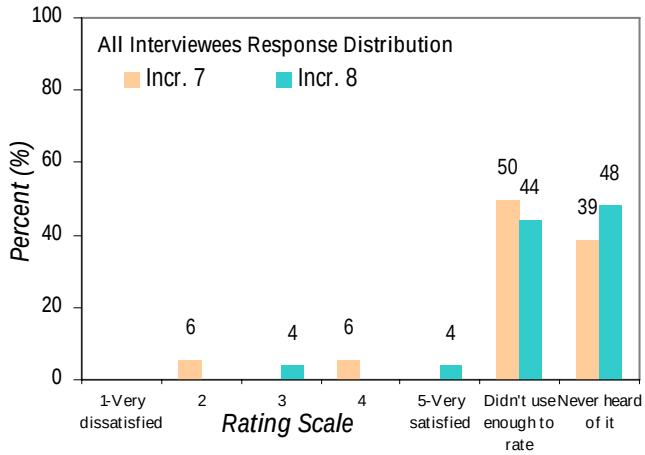
Topic Area: Customer Support Interface – Information Sources
Question 1.3.12 – *Please rate your level of your satisfaction with the Payload Developer Web Portal as an informative and useful web-based resource.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Only 4 respondents over the Incr. 7 to 8 survey cycles were familiar enough with this product to provide a rating. Most respondents had either not heard of the Payload Developer Web Portal or hadn't used it enough to have a basis for providing feedback.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	Red
	Sub	

INCREMENT 7 SATISFACTION LEVEL: NEUTRAL	INCREMENT 8 SATISFACTION LEVEL: SATISFIED
INCREMENT 7 TO 6 COMPARISON: NOT APPLICABLE	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

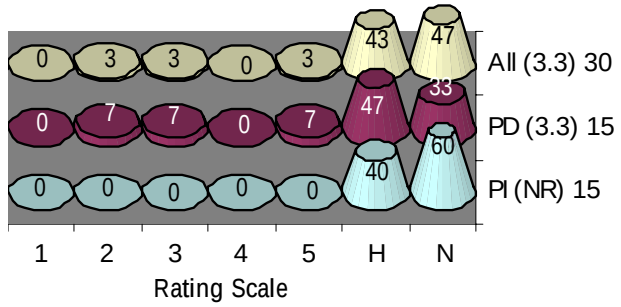
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	NA	18	26
Applicable responses:	NA	18 (100.0%)	25 (96.2%)
Mean score:	NA	3.0	4.0
Scaled mean score:	NA	50.0	75.0
Mean score Δ:	NA	--	1.00
Standard error:	NA	0.33	0.28
T-test:	NA	--	--
Chi-square test:	NA	--	--
Median score:	NA	3	4
Skewness:	NA	--	--
10th percentile score:	NA	2.2	3.2
% dissatisfied:	NA	6%	0%
% satisfied:	NA	6%	4%

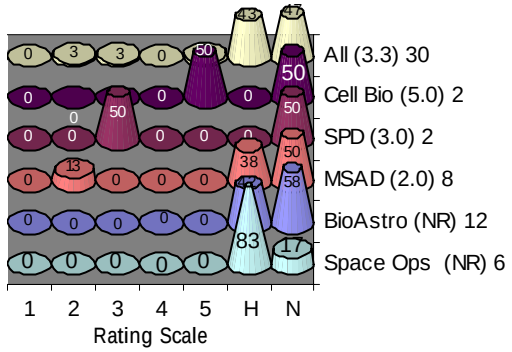


Demographic Trends (Summary): PDs slightly more familiar than PIs, otherwise no pronounced demographic trends.

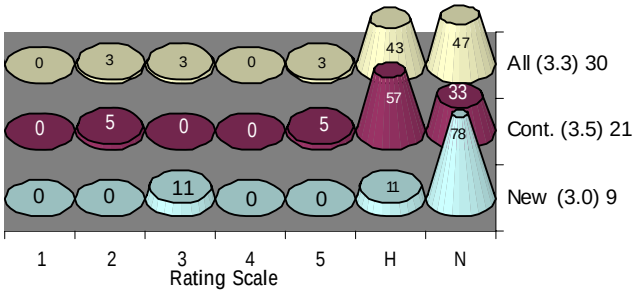
Responses based on Customer's Role
H = Heard of, didn't use enough to rate, N = Never heard of if



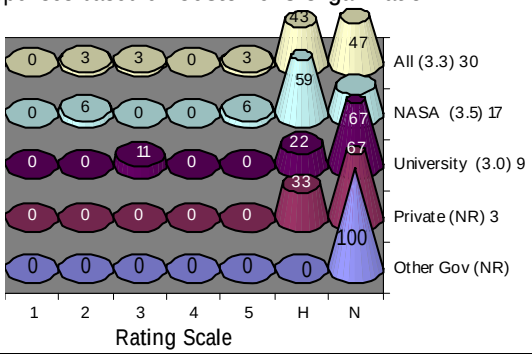
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on Customer's Organization



Click the link at right for *Question 1.3.12 – Comments from Increments 7 & 8*

7. Survey Part 2 Specific Management / Functional Areas - Verbal Comments

A detailed review of the response data for Part 2 of the Survey indicated that the majority of the key data relationships and findings for this part of the Survey are captured in Figures 3 and 4 above. For this reason, and other considerations associated with the weaker statistical base for the Part 2 scores, it was elected not to use the same detailed level of reporting for the Part 2 data as was used for Part 1. The remaining key results from the Part 2 questions in the form of the respondent verbal comments are provided below via hyperlinks to them in Appendix D.

Section 2.1 – NASA Payload Development

Please rate your level of satisfaction with the various services and support provided by your NASA Payload Development Team

Click the link at right for Section 2.1 - *Comments from Increments 7 & 8*

Section 2.2 – NASA Research Program Office (RPO) Project Management

Please rate your level of satisfaction with the various services and support provided by your NASA Research Program Office.

Click the link at right for Section 2.2 - *Comments from Increments 7 & 8*

Section 2.3 – Research Planning and Integration

Please rate your level of satisfaction with the various services and support provided by Research Planning and Integration

Click the link at right for Section 2.3 - *Comments from Increments 7 & 8*

Section 2.4 – Mission Integration

Please rate your level of satisfaction with the various services and support provided by Mission Integration

Click the link at right for Section 2.4 - *Comments from Increments 7 & 8*

Section 2.5 – Payload Engineering Integration

Please rate your level of satisfaction with the various services and support provided by Mission Integration

Click the link at right for Section 2.5 - *Comments from Increments 7 & 8*

Section 2.6 – Operations Integration

Please rate your level of satisfaction with the various services and support provided by Operations Integration

Click the link at right for Section 2.6 - *Comments from Increments 7 & 8*

Section 2.7 – Real-Time Payload Operations

Please rate your level of satisfaction with the various services and support provided by Real-

Time Payload Operations

Click the link at right for Section 2.7 - *Comments from Increments 7 & 8*

Section 2.8 – Payload Safety

Please rate your level of satisfaction with the various services and support provided by the Payload Safety Management Area.

Click the link at right for Section 2.8 - *Comments from Increments 7 & 8*

Section 2.9 – Payload Physical Integration

Please rate your level of satisfaction with the various services and support provided

Click the link at right for Section 2.9 - *Comments from Increments 7 & 8*

8. Columbia Mishap

Please rate the extent to which your investigation was directly affected by the Columbia mishap.

MANAGER'S TOOL BOX

NOTABLE FINDINGS: Majority of Incr. 7 and 8 respondents were highly affected by the Columbia Mishap but their verbal comments indicate the effect was both negative and positive. Negative effects stem from reduction in resources, crew time and ability to return samples; positive effects relate to increased priority for investigations that require little or no upmass or crew time.

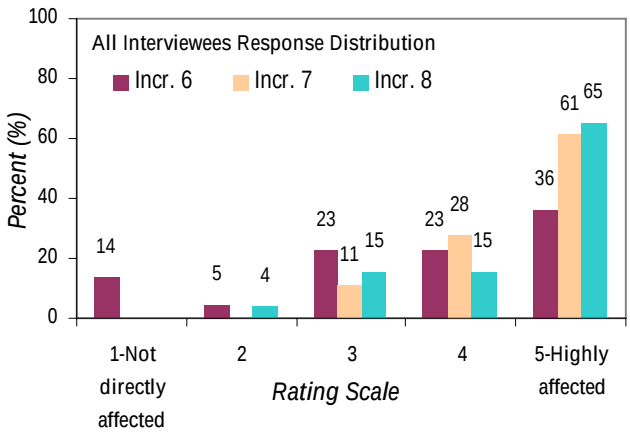
Overall Status	
IMPROVEMENT (INCR. 6 THRU 8)	*SATISFACTION (INCR. 8)*
Super	Green
Neutral	Yellow
Mixed	
Sub	Red

INCREMENT 7 SATISFACTION LEVEL: *NOT APPLICABLE*
INCREMENT 7 TO 6 COMPARISON: *NOT APPLICABLE*

INCREMENT 8 SATISFACTION LEVEL: *NOT APPLICABLE*
INCREMENT 8 TO 7 COMPARISON: *NOT APPLICABLE*

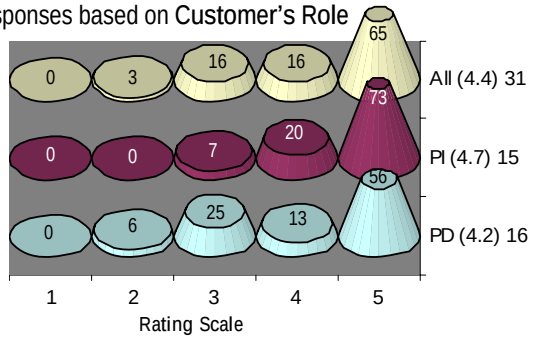
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	22 (100.0%)	18 (100.0%)	26 (100.0%)
Mean score:	3.6	4.5	4.4
Scaled mean score:	65.9	87.5	85.6
Mean score Δ:	--	0.86	-0.08
Standard error:	0.30	0.17	0.18
T-test:	--	100.0	23.6
Chi-square test:	--	89.2	62.1
Median score:	4	5	5
Skewness:	-0.77	-1.12	-1.35
10th percentile score:	1.1	3.7	3
% dissatisfied:	19%	0%	4%
% satisfied:	59%	89%	81%

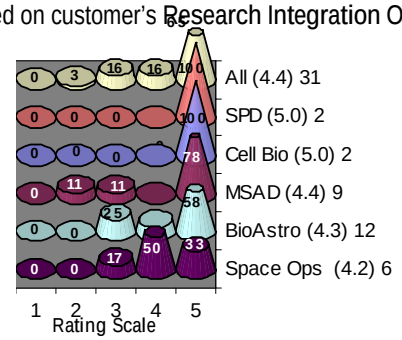


Demographic Trends (Summary): No notable / strong differences across demographic groups; New investigations possibly less affected compared to Continuing investigations.

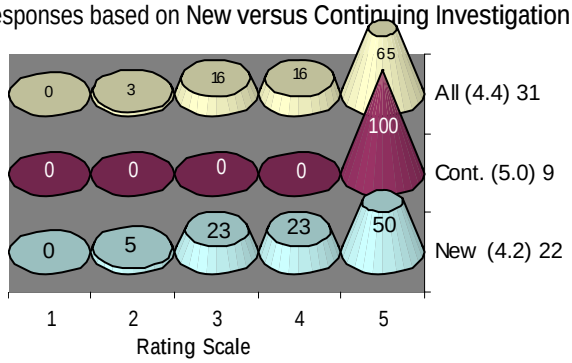
Responses based on Customer's Role



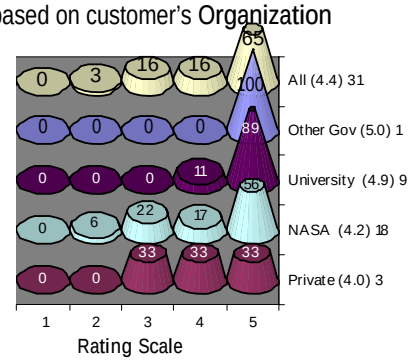
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Click the link at right for [Question CM – *Comments from Increments 7 & 8*]

9. Open-Ended Feedback

9.1 Satisfaction Factors

The Increment 7 and 8 Surveys collected focused, thematically-directed verbal feedback using the same open-ended response questions employed for the Increment 6 Survey. The first of these questions asked respondents to provided verbal responses to the question: *What three aspects of the ISS Utilization Program would have the highest impact on your overall satisfaction if they were improved?* The goal of this question was to use open-ended verbal feedback as a tool to identify the service and product areas that are the most significant drivers to overall customer satisfaction within the ISS Utilization Program. The aspects identified by the respondents, referred to here as Satisfaction Factors, are tabulated below with their supporting comments.

After initial editing for clarification, the transcribed Increment 7 and 8 Satisfaction Factor verbal feedback was subjected to a Pareto-type analysis that classified the Factors into more general topic areas and then counted the number of Factors within each area. A total of 17 general topic areas were arrived at and are used as the basis for the Pareto frequency diagram shown in Figure 7. In order to provided a consistent basis of comparison, the Increment 6 Satisfaction Factors analyzed under slightly different Pareto categories in the Increment 6 Final Report, were re-cast according to the Increment 7 and 8 categories and are shown for comparison in Figure 7.

Although in general the shifts in satisfaction drivers from Increment to Increment are complex, with no easily-identified patterns, some notable features of the results include: 1) from Increment 6 to 8, the frequency of citation of PIM Services and Support as a satisfaction driver decreases (i.e., satisfaction with this area is improving), 2) the customer's interface to the on-orbit crew is consistently cited as a satisfaction driver, and 3) the categories of Program Processes, Real-Time Payload Ops, and Customer Knowledge of Processes increase in importance as a satisfaction drivers from Increment 6 to Increment 8.

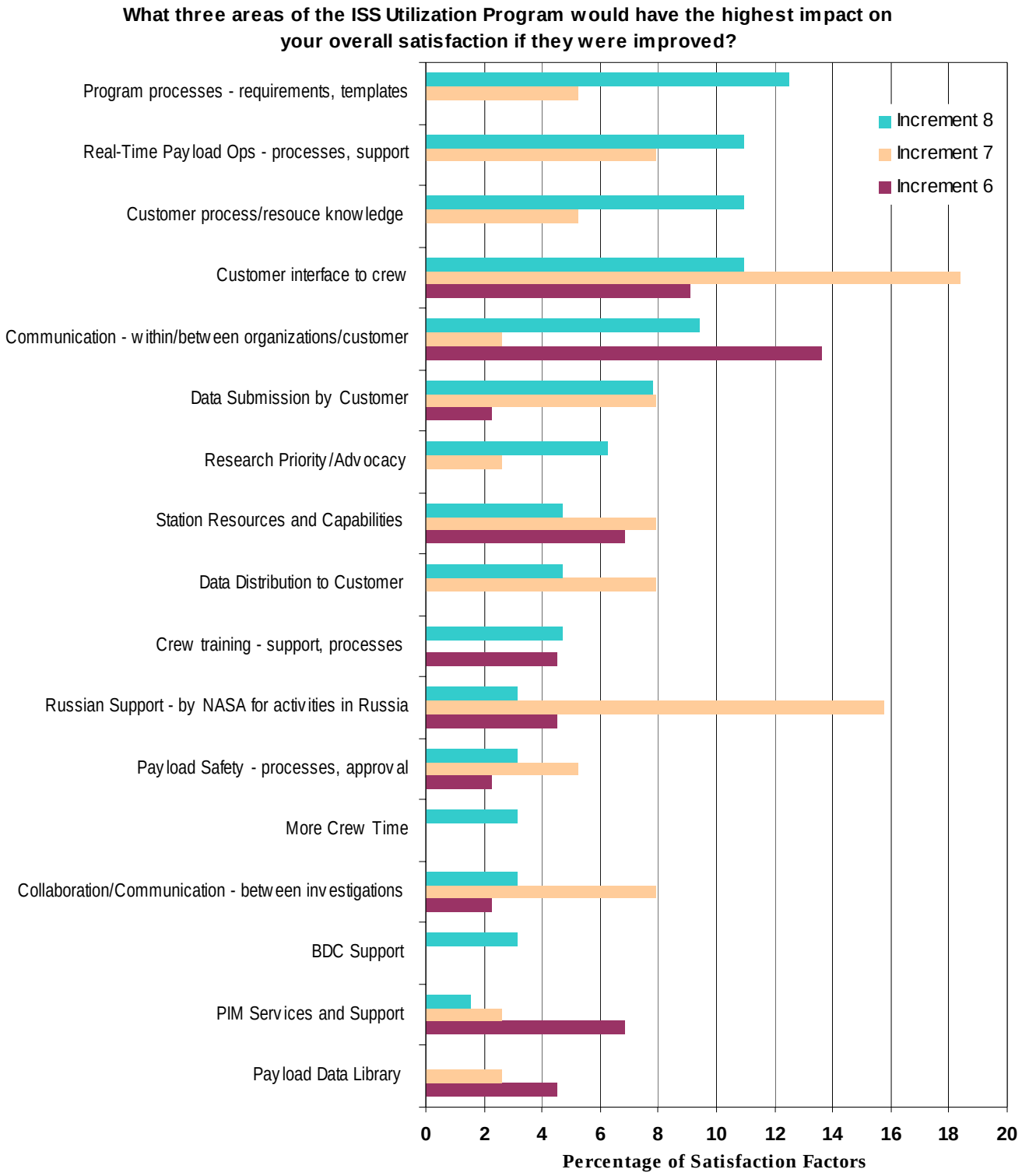


Figure 7. Open-Ended Feedback – Satisfaction Factor Pareto Analysis Categories

9.1.1 Satisfaction Factors and Associated Comments from Increment 7

Satisfaction Factor #1	Comments
More user Friendly PDL	{respondent} – PDL - Just make it user-friendlier.
Logistics in Russia	{respondent} – The biggest challenge that we face is working the logistics in Russia. Any extra support we can get to approve things in Russia is always going to be a plus.
Better access to electronic data tools (iURC, PDL etc.)	{respondent} – Better access to the network tools. A consistent interface for iURC, PDL, NPD and all those.
Video link to support payload Ops	{respondent} – Having a video link during flight sessions to check the proper execution of the flight sessions.
Coordination/integration between US and Russia programs.	{respondent}– I don't know what you could necessarily improve. I would think that better coordination with the Russian. Better integration between the Russian and US programs. When you go through the Russians [for the measurement] is seems to me that you lose a lot of control over the measurements and the control is very poor. My experiment is winding down, so for me and others who are affected by Russian landings and whatnot, better integration with the Russians and more easy communication would be beneficial.
No suggestions, experience very positive	{respondent} – Our experience in this Increment was so positive. We were not expecting to get what we got. There were aspects in the past that we may have commented on, but it seems that some of the processes have been streamlined or optimized and aspects such as flexibility and accommodation and things like that were truly phenomenal.
Upmass on Soyuz and Progress	{respondent} The things that I'm thinking of I don't think the ISS program had control over them like upmass on the Soyuz.{interviewer} – Did you say more upmass on the Soyuz? {respondent} Yeah. {interviewer} – that's fine. That's all right. If that's something you came up with, that's perfectly legal to put that done so I would suggest we put it down. {respondent}– Ok. And then along with that, well I guess just upmass on the Russian vehicle so we don't have to list them separately, the Soyuz and the Progress separately. {interviewer} – ok more upmass on the Russian vehicles. That's a helpful comment.
Video link to support payload Ops	{respondent} – To give more value and to have the highest impact certainly is the possibility to have a video link, not only the device loop during the practical execution.
More continuous real-time data downlink	{respondent} – Continuous downlink. Real time downlink, you know what I mean, right?
Discuss scientific/educational merit issues at appropriate stages/forums	{respondent} – I think I mentioned one. I think our first one would be that we'd like to identify the correct point in the process that if there are questions about the education value when would be the correct audience to discuss that. Maybe even a thought of if that is necessary, if that's something that needs to be done. It's not that we mind doing that. We just don't want to be so far down the road in the process with the payload and with our external PI that we do that so we'd like to do that upfront if that's necessary and if it's not necessary we're good with that as well. {interviewer} – {interviewer}, how would we summarize this? Earlier identification of

	priorities? {interviewer} and I have to summarize this in something reasonably succinct. {respondent}– And I know and you know I'm not a succinct person. I apologize.{interviewer} – Early prioritization. {respondent} And just one more comment about that. Actually we're not sure that's an appropriate role for the ISS Utilization Program. In our world we would think that we would not come to you if we did not have something that had education merit. That's our bottom line dot. I guess what we've seen is there have been a lot of questions from people within the program that we've had to answer. We don't necessarily feel like we have to do that, but if there are going to be questions, then we'd rather go ahead and get that out of the way right at the beginning if that makes sense. I mean we think we are the education experts so to speak and we have made these decisions that this has education value. I guess what I want to convey is that we don't necessarily view that as a role that the ISS Utilization Program would have to do, but it's come up in the past. {interviewer} – We could get into a much longer discussion about peer review concepts and how they are implemented and that kind of thing. Can you think of anything else?
Customer communication with crew and payload ops cadre	{respondent} – Improve communication both with the crew on orbit and with the station staff on ground that we work with. I think that has improved and has been improving so we are satisfied but that would be the main, in our payload, that would be the main thing.
Paperwork reduction for customer	{respondent} – Paperwork reduction for customer.
Interaction between Russian crew/mgmt and US crew/mgmt to give scientists data they need	{respondent} – It's the problems we're having with reporting of diet and exercise. Our experiment has a large impact; diet and exercise have a large impact on our data. We have a complete exercise log book from the US crew and in some cases the Russian crew member will give us such information, but that's only happened once. All we're told is that they do the Russian protocol but we don't know what the Russian protocol is. This is something I think I made a comment on before is the interaction between the Russian crew and the American crew or maybe it's Russian management and US management from the point you are really cooperating to give the scientists the data they need. I think it's still a problem.{interviewer} – That's a great comment. Very useful and very relevant to things the payloads office is working on right now.{respondent} – That's my main comment and that applies not to exercise reporting but the dietary reporting which will have an impact on our experiments.
Provide crew with a system emulating a lab notebook	{respondent 1} – The one biggest thing is the lab notebook. We think that the biggest impact that we could have on the ISS research program and to utilize it is to figure out how the scientific effort of the astronaut is elevated to that of a collaborator with a lab notebook. We think that the development of science took place through this tool called the Lab Notebook where the investigator has to look at the data, look at what they've done and think about their hypothesis and come up with a plan for the next experiment and it's intellectual time that is not yet scheduled for the astronauts. The astronauts are extremely heavily scheduled and the only way we've come up with doing it is by having a crew conversation. Just asking these people the questions is not sufficient because they need to, it has to be drawn out of them so it's a mixture of the crew conferences and the lab notebook. {respondent 3} – The second is a way to get information back to the crew.

	Science is a loop, you know once we get the data we analyze it and we learn something and we have to be able to communicate this back to the crew who's doing the experiments.{respondent 1} – So that they're involved as scientists.
Consistency of safety process	(See part 3) {respondent} – We have some thoughts here. As we were going through the development, the first hurdle we really hit was going through the safety process. *[Name]* and *[Name]* not only supported *[our investigation]* but they supported the development of *[another investigation]* which started at the same time and was going through the development process at the same time that *[our investigation]* was and we had the same safety engineer that supported both projects as well. The thing that we found is that it was very dependent on who on the PSRP side was your payload engineer, as to what the requirements were and how they were able to work actually getting your package reviewed in a timely manner and resolving issues that came up. So it was very dependent on whom you had and again, like I said, we were told it would be a 2 week review time and 6 weeks later we finally got our packages signed. So if they are truly trying to streamline that process and I don't mean shortcut any review, but if they are trying to do fast track, then It's like they all need to be on the same page.Right, there wasn't a consistency in how that was applied and actually our sort of buy end that yes, we are going to try to expedite these because this is hardware that's already on orbit and had been approved through a safety process. We ran into, since we were going to PSRP some of our hardware had been through the station safety panel so it was a different organization that had reviewed that equipment originally so you had some folks that said, "well, we haven't seen it here" and that kind of thing. So it certainly made things a little more difficult to get through that.
Real-time data and information on station pointing/flight attitude	{respondent} – To *{my investigation}*. Can I infer that? To our specific payload.{interviewer} – Right. Or it can be more general. With all the spectrum of things out there that the payloads office could go out and work on and try to improve, which of those things which if they got better would cause you to give a higher rating when asked about your overall satisfaction? {respondent} – More real time knowledge on attitude. Because we would have to dig several times. There would be a date and a time, like the LIS puts it in their daily summary on when the attitude is going to change like from X POP to LVLH but sometimes there were changes to those and also when burns occurred (I sort of lumped those two together), so I guess more of a real time knowledge on what is affecting the placement of the orbiter, I mean the ISS.
Support for all areas related to interacting with Russia	{respondent} – The only thing and I don't know exactly how to list it, but I would say the Russia aspect of things, having to go through customs and having to go through other layers of support for getting the hardware or in this case getting samples out of Russia. There is a lot of room for improvement in that area. That's the reason you guys aren't interviewing me about *[the other investigation I supported]* is because we couldn't get it done; we couldn't meet the PI's requirements and still can't meet the PI's requirements and are having to modify the PI's requirements so that we can look at processing his experiment again given that we expect we're going to be over in Russia forever. We're having to make his experiment fit the system because the system doesn't fit his experiment, so that's just kind of

	an….{interviewer} – No, it's very useful. Let me weigh in on this question. I do want to tell you something and that is this issue about Russia that you just mentioned. That also appeared the last time we did the survey for Increment 6 and that may have included comments from you and *[PI's name]* , isn't he *[other investigation name]*? So he talked about that and other people did. You know the payloads office doesn't just sit on these survey results; it's very important and it has a very set process for initiating corrective actions that flow out of the survey, and there are now in the queue a set of corrective actions that the payload's office is working directly associated with this issue. So I wanted you to know that.{respondent} – I appreciate that and at the same time in fairness to you guys, I realize that it's one thing if I say, "hey I had trouble with my PIM, I never heard from my PIM or this document that you guys made me fill out is crap". It's a totally different matter if I tell you that Russian customs held up my samples and ruined some blood samples because they wouldn't let them out of the country or something like that and they went bad, but I mean some things you guys have a direct link to and I can say, "this is no good, you guys should fix this" and some of them it's very, very tangential here, your interaction. I mean I appreciate that the program is working to address these things. {interviewer} – Nevertheless the payloads office intends to work on what it can work on in this area.{respondent} – I appreciate that.{interviewer} – I want you to know that.
Ops cadre and flight director consistency - particularly during handovers	No comments.
Satisfaction Factor #2	**Comments**
Taylor and adapt integration requirements to fit payload characteristics	{respondent} – Tailoring integration requirements. That would determine your workload right up front – rather than trying to reach an agreement on data that is not necessarily required.
No response	No input/comment
Streamline/flatten CR and ECR review process	{respondent} – Flattening of review process for CRs, ECRs etc. Right, now it has to go up to the President, before it gets back down to us. That is what it seems like. ECRs are crew procedure driven, as opposed to CRs, and a lot of times as the ECRs are being developed, when the formal ECRs come out and I get it through my chain and I mention it to Helen about an ECR to be reviewed and she will say she has already seen it and her comments are in. And that is the way it should work. That is the way I think it really should work. We should be doing more at a lower level, and these things should not be routed up through the higher altitudes, to put it simply. How much value is added by routing a CR through upper management? We should be more value-added there.
Improve adherence to set up and other procedures by crew	{respondent} – Sometimes the crewmember was not setting up best type of payload according to the procedures. So the crewmembers deviated from the crew procedures. This is something that could have an impact on the scientific results.
More opportunities/forums for information exchange	{respondent} – More opportunities to meet with other NASA investigators to find out what they were doing. It would be interesting if there were more active interest on the part of JSC in getting/learning more about the science

with other PIs	they are supporting. An example: when the paper we published came out – it was the first paper to look in real detail at 3-dimensional bone loss and it used some bio-mechanical estimate that had never been used before. It had some major findings with respect to ultrasound, and honestly the JSC guy wasn't even sure it merited a press release. I don't think there were that many publications coming out of the Program. This was a fairly major one, and the lack of interest I found a little baffling. It received a lot of interest at my University, which is kind of interesting because there is a real snob effect within IH that anything that isn't National Institute of Health gets sort of down played. And they don't take NASA science seriously enough because they don't fully understand that it is peer-reviewed just as rigorously as IH, if not more rigorously. I was surprised that my own University seemed to take this publication in the best bone journal a lot more seriously than JSC did.
No response	No response/no comment
No response	No response/no comment
More immediate crew feedback following experiment execution	{respondent} – Another point is that we receive feedback from the test subject after the re-entry. I think it the experiment would have a very high impact if it is possible to have a feedback just after the experiment execution. I understand that this is not so easy but for physiology experiments this is quite important not only to have the data in bits but also to have the personal appraisal of the test subject on the experiment execution so possibility to have feedback from the astronaut not only after re-entry but also after experiment execution in orbit. After the re-entry then we had the list of questions prepared and sent to the astronaut after his re-entry, but I think it is extremely important to have also his feedback just after the execution of the experiment. Not only feedback after re-entry but also just after the execution of the experiment.
More science time for direct interaction with crew	{respondent} – More science time and direct interaction with the crew. It was a safety thing. For instance, once the experiment is in there and running he can't put his hands in there to do anything because there's something in there over 50°C. ({interviewer}talked over him) For him to get at this more than 50°C thing, would require a considerable effort on his part. He couldn't go in there and turn a little real stat knob to change the light density. {interviewer} – I understand. So he has to cool the run down before he can stick in his hand.{respondent} – Yeah, he couldn't put a knob in there or he couldn't tap the sample. And it's inconceivable but I suppose in the universal grand scheme of things, not impossible, but it's inconceivable that he could come in contact with anything above 50°C.{interviewer} – I'm going to make a change. We're going to put 2 and 3 together. And then for 3 we'll put safety constraints on operations.{respondent} – I don't know if you can put that on there, because I can appreciate and understand the safety aspects, and I think that that if everybody saw what he was going to do then nobody would have a problem with it, but that doesn't happen. {interviewer} – Ok, I'm still going to recommend we keep that or safety impacts on science or something like that.{respondent} – Well, that's going to get blown off because of the safety conscientiousness of this whole thing. I'm just getting myself in trouble.{interviewer} – No one gets in trouble. First of all, they don't know it's you and second of all, we've been doing this for 3 cycles now and no one gets in trouble. {respondent} – It would be nice

	if some comments or some rational thinking could get into the process. For instance, on Increment 8 with Mike Foale, we had the circuit breaker go off and if that happens at home, what do we do?{interviewer} – We reset it. Yeah, but they had to do a fault tree to find out why the circuit breaker failed.{respondent} – Which is probably ok, but then Mike Foale says, "I push it in", and then he laughs because he knows he can't.{interviewer} – I see. Well, their feeling is the breaker went off for a reason. What's the reason?{respondent} – Yes, I know. But I think this was some time after they had gone through the whole fault tree analysis and stuff like that.
Availability of straight forward timeline/template for deliverables	{respondent} – I think one thing that would help me as I begin the process is I came in just a little bit after the start of the Increment 7 *[investigation name]* process and one of the things that our PIM has done is I'm always looking for the timeline. I'm always interested in when you're going to need the next document from me, when do I need to have this ready because I'm working with external people who are not very attuned to your needs and although I think it's good, I think for me being able to convey to them deadlines would help me do a better job in meeting the needs of the program office if there is a very simple document. Some of the forms I don't share with them because I don't think they would understand nor would it give them the value that they need to have, but I guess that's one thing that would help me be a better customer for you is that if I could tell them I need this by this date and we've got to have this done. We struggled a bit with our PIs in helping them feel the importance of your deadlines, so anything you could do that would give me that information to share with them and make them timelier in their responses would be helpful. {interviewer} – Well one thing that comes to my mind is that I believe that the large operating payload integration template which is a program document was scrubbed and updated not too long ago and was re-released in a new version and *{name}* would know about that. That would be something *that name* would probably be working to but it might be a document that you would be interested in looking at. {respondent} - That would be great because we try to give them a big picture of the process and explain to them you know, if you don't meet this deadline these dominoes are starting to fall here and however we did that, I don't think we did well it enough so we would look for the next time to be more proactive to establish right up front this is the process, these are the drop dead dates for things.
Time allotted for training	{respondent} – The second would really be increase or somehow improvement in time allotted for crew training. We know that crew time is at a premium and it's very precious and they are always overbooked for what they need to do, but I believe maybe one thing would be to access it and look at the entire spectrum of things they do and sort of give time to training more priority.{interviewer} – What about the training on the ground or on orbit training? Are there different trade offs there for you, I mean could you accomplish what you need by having on orbit training?{respondent 1} – On orbit training is a tool that we are exploring and working on but more importantly, on orbit training is only effective after they have had, in my view, good ground training. The reason is because on orbit training is more supplemental rather than a primary tool.{interviewer} – So when you train them you're training them with the imaging equipment, the cameras, but also what to look for.{respondent} – Right. What to look

	for, what's the significance and what to do when things change or when things are not going according to the plan. For example, we told you to photograph a mountain but there's a big dust storm a few seconds from now so forget the mountain and we are going to go with the dust storm and that sort of thing. That is an on-going thing that has a bigger ramification than just a small payload like *[our investigation]*.
Information on roles and responsibilities of points of contact	{respondent} – Especially if this was my first increment it would have been helpful to have some kind of a field guide or something to explain these different job rules in the program and who should I turn to for what and what are the different organizations. It was very hard to figure all of that out. That's a little big vague.
More opportunities/forums for information exchange with other PIs	{respondent 1} – We think that there should be weekly telecons. This idea that *{name}* brought up. We support that there should be a review of the scientific research activities with a telecon with the crew and all of the PIs once a week, a weekly lab meeting. Just a comment – {respondent 2} found on the web just a comment that somebody else had a problem with bubbles on their experiment and we had never communicated with the other PI.
Available crewtime	{respondent} – The other thing that we felt would really have a big impact is available crew time. Since there is such limited crew time I think that the other thing we've run into is the prioritization of how that's worked. *[Our investigation]* was picked among several proposed investigations for a no mass up during this time and it was the highest priority item that the investigation picked, yet when it came down to what crew time was available we didn't always get the priority in terms of even against our own MRPO investigation because there were so many other factors that played into that and it's not always clear how that's weighted so I think some improvement in that area would certainly have an impact.
Fix US Lab Window	{respondent} – The US lab window conditions would help *{our investigation}* even if it were just the scratched panes because we don't have to remove the scratched pane, but it's in pretty bad shape. And whether it's psychological or real, right now we can't use it anyway but if we could open the window there's a drawback. The astronauts seem not to want to use that because of all the scratches and whatnot. So, I guess the overall condition of that window. {interviewer} – *{name}*, you said something that maybe I've missed in my travels over the last few weeks. The window shutter due to the U tube, the window has been closed?{respondent} – That's right. There is an arrangement where they allow the crew member, if Mike Finke wants to right now he can open the window for 90 minutes a day. They are allowed to do that and I know they're doing the pressure checks often. I don't know what the schedule is on those, but I know this week they had some in place. {respondent} – Ok, so that really impacted Increment 8 for you obviously and when we talk to you about Increment 8 that will be something that will be coming into play then.Yes. Actually it impacted 7 as well, not the pressure part, but just how it's been beaten up over time. The crewmembers tend to not want to use it because it's scratched up as they look out.
No response	No response/no comment
Satisfaction Factor #3	**Comments**
PIM Services consistency	{respondent} – I was fortunate and had an excellent PIM. But some PIMs do their job better than others. PIM training needs to be more standardized and they need to be certified like a flight controller. They need to learn about

	all the resources they have available to help the payloads go through the integration process.
No response	No response / no comment
More consistency between flight directors and PODs for payload ops.	(This portion of tape lost due to equipment malfunction) {respondent} – Consistency I'm looking for concerns when PODS, flight directors change, there was a drastic change between Increment 6 and increment 7.
No response	No response / no comment
No response	No response/no comment
No response	No response/no comment
- Relationships between investigators, a meeting before and after to exchange info (=More opportunities/forums for information exchange with other PIs)	{respondent} – Another point is if I had to think for the highest impact could be what kind of relationships between the various experiments executed during the same increment. What I mean is, we made an experiment in human physiology on motor control and muscle fatigue. It could be extremely interesting to have a workshop before or after the increment with the investigators in order to gain respective science and possible potential cooperation. For example when we make our experiment, it could be extremely interesting to have information on the blood pressure, for example, which certainly was important and maybe some other experiment needs. I mean the possibility to have a meeting before for example could be very interesting because the scientists could eventually decide to exchange between themselves the respective experience and possibly also data. This would certainly give a strong contribution not only to the success of the single experiment but to the success of the program, of the scientific program on the utilization.{interviewer} – Your comment is a relevant one because this is a question that has come up before about having an investigator workshop and *{name}*, I know, has looked at this so this is helpful. We will be looking at this comment again, so thanks a lot.
No response	
Reduce safety constraints on experiment operations	{respondent} – For instance, once the experiment is in there and running, he can't put his hands in there to do anything. He couldn't go in and turn a little wheel or tap the sample. It's inconceivable but I guess not impossible. It would be nice if some safety could get into the process.
No response	{respondent} – I think that's it.
Confirmation that crew receives messages sent to them by Investigation team	{respondent} – Some kind of clear confirmation if we're trying to contact the crew about whether or not that occurred. Like I said, we say something like make sure they know that if they have any questions they can contact us and then if they don't contact us we don't know if that's because they didn't have any questions or because they never got the message.
	{respondent} – Of course, we'd like to get back to landings in the US. I mean just because there's all the logistical. Well, first of all, when we land in the US we get the biopsies on our zero regardless of where we land. The only problem with Russia is that we've still got logistics in getting that sample back but the other testing that we do is delayed in Russia where it isn't when it's landed in the US so we're getting not as good a data from the point of view of the other tests we do because they're delayed. I'm not saying the data is not good data, it would just be better if it were at the time point that it was supposed to be on. I think the reason for that problem is logistics. The flights for example, MRIs we do. We had to go somewhere into Moscow where we had intended to do it right there. So we considered

	doing the MRI on R+ 1 and we may be doing it at a 5 or 6 which is, of course, a little more problematic. That's a logistical thing that rates to facilities and I don't think anybody can do anything about it until we get back to the US landings. Those 2 things are the biggest impacts. I don't think there's anything else.
Dedicated crew debriefing time for PI	{respondent 1} – The other thing I think that's high on our list of impact. This is a pipe dream but I think that astronauts should rotate through the ground lab both before and after their increment. They're very busy but it seems to me that if you want to get this research done, that the astronauts should be involved in the science development before they fly, maybe 2 years before they fly or something like that, and it's surprising that it's harder to discuss something with the astronaut after he's back on the ground than it is when he's on Station. There should be some dedicated PI crew debriefing time. Since there isn't enough time for the crew conference we ant, it would be very helpful to have even a 15 minute debriefing telecon with the astronauts as soon as possible when they're done so that we can really find out what they did up there and incorporate it into the next procedure in a timely fashion {respondent 2} – I don't know if this is the place for this or not now. We talked before about the procedures and having wet runs and dry runs, but another part of the procedure is that we're trying, we may have fixed but we won't know until there's a complete run through again that we did not get the number of images that we expected because different people interpret the procedures differently. {interviewer} – We've got a question about that coming up so why don't we hold it for that. {respondent 2} – Now let me ask you about this then. I understand when there is an LOS or when there's no audio, I forgot what you call it when you lose the audio. They can record the video but there's no audio recorded and so what happens if we lose communication and they can record the video for us and we can get that later; there's no way to record any audio so that's sort of a problem because we can see what the crew member is doing but there's no way for him to record any audio. We were told there is nothing up there for them to do that.
Improve up front customer understanding of critical path/template	{respondent} – The other thing was understanding the critical path. Being sort of a trailblazer through this, had we known ahead of time it would have certainly been helpful to understand all the wickets we needed to go through. {interviewer} – I'm going to make a suggestion to {interviewer} on one thing. The first one I might rephrase that to be consistency in following safety process.
Improve customer knowledge of ISS vehicle timing and position	{respondent} – For us during this time for Increment 7 timeframe, there wasn't really any time slipping issues. It didn't matter if the crewmember stayed longer or stayed shorter and then we turned over to new people so occurrence of Soyuz's or Progress' didn't really matter for us. Sometimes that's an impact but not this time. {interviewer} – You don't have to come up with 3. {respondent} – I can't think of. I guess one other would be knowing timing and position of the ISS a little bit better, well actually quite a bit better. Knowing its position to a higher degree would be the 3rd if we really wanted to improve some things as far as our timing of requests and getting more accurate.

9.1.2 Satisfaction Factors and Associated Comments from Increment 8

Satisfaction Factor #1	Comments
Increasing the baseline data collection.	{respondent} – I think this is quite important in order to verify and to make comparison on ground and during flight. The data we got is really interesting for both Increment 7 and Increment 8. Most of this data correlates. We have one point that could be better clarified if we had more baseline data collection so this is the reason why I'm saying that probably more baseline data collection could be helpful in order to have an impact.
Reduce redundant data submissions / one entry reaches all users.	{respondent} – I only have one comment. The rest is all very acceptable. My comment is the data cross-feed. It is improving. It's still in process. I don't know that you can totally satisfy that to the 100%.{interviewer} – In the comments box, we need to explain carefully what you mean by cross-feed. I know what you mean. {respondent} – One entry meets all the end users.{interviewer} – One data entry reaches all end users. Thank you. You're sure you don't have a 2 or 3 on this? {respondent} – The whole process is so much better than it was way back in I2. With me being a reoccurring payload unfortunately the program has made my job so easy rolling forward that I don't have to do as much work as an initial PD or for the initial integration effort. Once you're onboard and if you stay onboard, it's just minimal work. {interviewer} – Of course that depends on your investigation to some degree. {respondent} – I agree. It varies. In my case I'm very simple.
Amount of customer direct interaction with the crew.	{respondent} – I mean it was good when we had it and it would be better if we had it all of the time.
Amount that customer's direct POCs know about investigation science.	{respondent} – POCs need to be more knowledgeable of processes in scientific area.
Customer knowledge of timelines and templates.	{respondent} – I think and I'll try to look at this from 8 is that I think what would help me and I know these are available is timelines. Looking ahead, planning ahead, small office on our end what we really need is advanced notice. And although our PIM and CODE M provide that to us, I think we're interested in more information from the beginning of when things are due and I think these are extenuating circumstances with Russian flights and stuff like that but that's very helpful for us if we see a big picture from the whole end-to-end process so to speak from the time we get stuff to safety review and things like that. That just gives us a good visual and that may be simply because we don't do this often enough and it keeps us smart if you will. So timelines for us are really good. That was such a good increment for us.
Logistical support/facility access for Russian BDC	{respondent} – There are some things that I don't know if the program can help but there are always logistic issues out in Russia with collecting post-flight data. One of the issues we always have is access to the post-flight data collection, the BDC building, building number 3 out there. The issue is if you know in advance that you're going to be in there, you can tell them and they'll write a letter and it goes up thru their chain of command to approve it, but sometimes you need to get in there because you need to fix something or you have something you didn't plan for and it's very hard to get in that building on off-hours. So in terms of making

	things, this may be an attractable problem because you're dealing with the Star City folks and their rules and that sort of thing, but I'm not sure I'm the only one who has this issue and I'm not sure it's fixable. But it does make things complicated sometimes. Access to our test room can be somewhat problematic if it's unplanned. {interviewer} – Ok, so what I would put for number one for this would be – Unplanned access to post-flight data collection facilities in Russia. {respondent} – Right. Can be challenging. Because you know you're going into a building that's largely controlled by their military and their first response to you is no because their commanding officer hasn't approved it. It's less flexible and I realize we're guests there and that's fine. That's why I don't make a big deal out of it, but it does impact. I guess the bottom line is if we're going to be considering, and there is talk about having Soyuz as being the sole return to the long duration crews, we're going to have to deal with some of these problems over the long term and that could mean building a new BDC facility for the experiments that we have prime access to. {interviewer} – Can you think of a second or third thing?{respondent} – Well, that's the biggest thing. The rooms that we're using in Russia are some adhoc rooms that they have provided for us and we're really thankful for them, but they aren't the best circumstances in terms of ventilation and that sort of thing, but I'm not going to put that as an issue. I think we're going to have to deal with that in the future, as I said, if we're going to be doing this permanently we're going to have to build some kind of additional wing or additional building to support our BDC activities. I would say the access issue is one that is most important on my mind right now.
Management of end-to-end process for Russian integration.	{respondent 1} – I'll take the fist one. If we're going to fly on Russian vehicles they really need to pave the way for it. And if they're going to ask us to prepare payloads for Russian vehicles, then it would be nice if they actually secured the upmass before we go through all of the pain and trouble of doing the paperwork and loading the hardware and then reloading the hardware and changing the paperwork time and time and time again because there's no upmass. {interviewer} – Understood.{respondent 2} – I agree with {respondent 1}
Communication and feedback with/from the crew on orbit.	{respondent} – Feedback from the crew on orbit, especially during the events like the hurricanes we are seeing now. For example, I know this is not related to the current expedition, but if we have good communication we get good data and good observation.{interviewer} – Can you think of a second item? {respondent} – Not really. I think we have most of the things in place being a long-standing payload. That's the really crucial part that determines the success of our payload is crew communication.
Customer overview education on processes and templates.	{respondent} – I think we were relying on our previous experience to know how to interface with the program. If this had been our first increment it probably would have been difficult so some kind of orientation as to whom the different, what the different roles are and things like that would probably be helpful for new people. I'm just lucky that I knew it. We had a new employee come and she was lucky that I could explain it to her, but it would have been hard for her to have to learn it on her own.
Safety review efficiency / burden on customer.	{respondent} – The only one was the process of safety review. That was just extremely cumbersome. Again, most of the work was done by the

	team at Marshall that had to be constantly revising documents. It wasn't clear to me that this needed to be so complicated just to inject honey and water. That was the only gripe I had.
Communication between NASA internal orgs. and between NASA and Russian orgs.	{respondent} – Probably the things we touched on earlier. Communication among organizations within JSC and outside if that is the Russians.{interviewer} – Ok, so I'm going to say communication among organizations, including JSC and Russian organizations.
Science advocacy	{respondent} – We felt that at the higher levels in the program we didn't have that. We had to justify everything we wanted to do as opposed to having an advocate try to help us get that done. We spent a lot of time in meetings talking about why it was important and basically going back through and re-explaining our investigation over to these people so that they would try to help us get what we needed. {interviewer} – It's my understanding that one of the main science advocates is the Lead Increment Scientist, which would be *{name}*. {respondent} – That's correct and that's whom we're talking about. That's one of the people.{interviewer} – Ok. This is why we're doing this. I have to know. You feel that this is somehow connected to the support you got from *{name}*. {respondent} – And *{name}* was also part of that. {interviewer} - Ok, so maybe they were not as much of a science advocate as you would have liked. {respondent} – Right.
Upmass availability.	{respondent} – Well, of course the big limiting factor for us was upmass but that's not really a fair comment in the current circumstances.{interviewer} – I would say that's an entirely fair comment because this is open to anything and whether it's yes, we all know where the program is at the moment but if that's a factor, then it's a factor. {respondent} – All right then my number one factor is increased availability of upmass.
Customer opportunities to communicate with crew.	{respondent} – See previous comments. Everything, as you've heard me ramble on, has worked very well. interviewer} – You had mentioned something about scheduling. Is there something you would like to comment on scheduling here? {respondent} – I think the crew has more time to engage in science even with the current constraints than the scheduling people; it appears to me that the crew has more time to do science than the scheduling people seem to think. There are certain times of high tempo activity in preparation for an ETA or before and after a cargo shipment that are very busy for the crew, but there are other periods when they have more time and would like to be more meaningfully engaged in science. {interviewer} – And if you could sum up in just a couple of words what aspect in that realm. {respondent} – Ask, and here's another thing. They never consider asking the crew what they want to do. For example in that situation that I described where they had deleted his electronic journal and he wanted it restored. I said, "Ask Michael what he wants to do", and "well, we can't do that". And I said, "What, you don't ask the ultimate user what they want out of it"? Well, "No, we don't want to bother them". And the assumption was that they know best for the crew when in fact my research has shown that people in isolation and confinement greatly appreciate being consulted about issues that affect them. And for example, another issue was they wanted to time line. They

	wanted to remove journals from instead of three 15 minute commitments each week to putting it on the task list for a couple of weeks in order to give interactions time to have their questionnaires or something else. And I said, "Well, why don't you ask Michael if he wants it tasked listed because he was very adamant in the ICB that he wanted it actually assigned to a time. Then he actually was given the time, he could bank that time he didn't have to do it at that specific moment that it was scheduled, but he could bank that time and use it and then complete the task at his leisure later, but at least he had been given the time to do it. And, it's a reminder. If it's on the task list, and this is what NASA doesn't understand, when it's on the task list they don't consider it important and that came out in the debriefing with Michael that he said if it's on the task list it must mean that NASA doesn't think highly enough of it to schedule it. Has that come out before in your experience? Has anyone ever said that? {interviewer} – In so many words, yes, I've heard similar comments in past increments. {respondent} – So the schedulers' have an entirely different interpretation of what's going on than what is really going on.
Consistency/coordination of program funding.	{respondent} – Again, I'm going to have to bring up the disjointed funding of the program. That's one that impacts a PI a lot. I've said enough about that.
Consistency/standardization of Safety/PSRP review criteria and processes.	{respondent 1} – Again, we have lots of data points based on who your point of contact is, who you get assigned; it's different every time; the flavor of the comments that you receive; the scrutiny that certain pieces get; it's too subjective right now; we had another no up mass payload that was going at the same time we were; they were zipping through the process with their POC he was very cooperative and helped them get everything done; our POC we had a change of personnel that was one problem and then the next thing we had to go through the learning curve all over again with the new guy after we're already in the process and then the new guy was not commenting to the same kinds of things that the other no up mass payload kind of comments were getting; it was more editorial not a whole lot of value added and they were getting on an expedited review process and he fought it; the other payload and the payload that I wad working were under the same priority guidelines, urgency, everything and one POC took it and ran with it and tried to do it and the other one fought it every step of the way. {respondent 2} – As an example our POC when we went from one increment to the other, we had to do a revised safety data package; the other project did a letter. {respondent 1} – right, so why did one team have to do a letter and the other team had to revise their entire package? In the review process and I've got more details about this later on, but the review process the way it was done calls additional iterations in the informal part of it; so anyway, they ought to standardize within their group that all of their guys do things the same way.
Amount of crew time available for research.	{respondent} – Possibility to have more crew time available for experiments with payloads because you know crew time is a crucial resource.
Customer overview education on processes and templates.	{respondent} – I can only think of one off the top of my head is what Kathy commented on about knowing the schedule and the order of activities and the dates and everything of which everything needs to be

	accomplished.
Better/more efficient dissemination of data to PI team.	{respondent 1} – The biggest thing for us was if delivery of data was 24/7, that would be great. We want some more people to maintain the dissemination of data from the station. {interviewer} – So what I'm going to put for #1 is "better or more efficient dissemination of data from station". {respondent 1} – But specifically, we're willing to work 24/7 and we think we should be supported 24/7. The station is working 24/7, COM is working 24/7. We think the people that disseminate the data to the PIs should be; we don't think the procedure is over until we've analyzed the data. It doesn't end and everybody goes to get a drink when the astronaut ends his time period. {interviewer} – I understand your comments. I just have to try to encapsulate this in a single phrase. So that would be you would want a 24/7 interface with the program?{respondent 1} – Typically we've got lots of 24/7 support. The only area that's deficient is the particular route by which the downlink from station gets to the PI up the chain, which is not a simple one, and this may be different in each case. That electronic stream should be simplified and facilitated. There's no particular reason it can't move at the speed of light. Instead, it can take up to 4 days. {interviewer} – Ok, so we're going to put "continuous data downlink". {respondent 2} – In addition to that, there's a problem with JSC and here there's the firewall issue. Someone has to put it on a CD or DVD and then leave the campus and then go over to Wiley and put it on the FTP server. It's a multi-step process. {respondent 2} – Each person you go to will tell you how they're doing it as quickly as they can do it, but no one with enough scope and imagination has been able to integrate this entire process.{interviewer} – So perhaps the downlink is ok but it's the final dissemination and the manner in which that's handled. Would that be a good way to look at it? {respondent 1} – That's my understanding but to the PI it's getting the data. {interviewer} – Ok, so for #1 I'll put "better data flow to PI team after downlink".
PI training at the beginning of the program.	{respondent} – I don't fault anybody with that because even the NASA people it was their first time with Space Station so they didn't know. I would say what would be helpful to future PIs would really be a good PI training session on how to work at NASA and they may already be doing that. {interviewer} – Yes to various degrees, but it may still be an area that needs work. Based on what people have told us in this survey it's still an area that appears to need work.
Communication between POIC cadre and RPO personnel during real-time ops	No comments.
Interface to crew on orbit.	{respondent 1} – First would be the interface to crew on orbit. {interviewer} – Wait a minute, you gave that question a 5.{respondent 1} – We sure did, but we said the highest impact of overall satisfaction, we want to keep that going. But we sort of talked about it. Well, you know it went good in Increment 8. {interviewer} – No, you answered precisely the way you're supposed to. We're trying to understand what correlates with what in terms of your overall satisfaction. You've just told me that the thing that correlates very strongly is interface to crew on orbit. So, for example, if we gave you an even better interface then you overall

	satisfaction rating would go up to a 10. {respondent 1} – Yes. {respondent 2} – In Increments 5, 6 and 7 we really didn't have much crew interaction but Increment 8 was great and it would go up to a 10 if it was. {respondent 1} – Yes, absolutely because although we got to talk to the crew a lot more than expected, there were still times where we felt like we needed to talk directly to the crew and not through the POIC to the crew, but we just did not have that flexibility to say "hey, we need to talk to the crew today on this one".
Direct interaction with the crew.	{respondent} – Crew on orbit payload conference or conferences where issues could be discussed directly rather than being second-guessed by those forwarding them on. Again, this goes back to that lens issue. And actually Mike Fincke requested a conference with us and it went real well.
Closer coordination with mission time liners as investigation protocols develop in real time.	{respondent 1} – Areas I think across all payload developers. These I think are probably more general comments based on the flights we've had and so forth. I think something that is very valuable when we're trying to accommodate the PI as best we can in terms of best science return we can get for the PI, for NASA that's so critical, I think that if we can try to perhaps see ways, I know you're working and you're challenged with various factors it's the crew time, it's all the payload experiments. I think optimizing these investigations. It's very crucial in terms of getting the most return and sometimes I think that maybe if we worked more closely with the time liners in the program in terms of really understanding those critical steps within the investigation to get that good science return, maybe there's a way of improving and in optimizing. {interviewer} – Ok, let me see if I can paraphrase this. I would say "Closer coordination with mission time liners on investigation development or protocols". {respondent} – Actually maybe in terms of the integrated. I think that's good so they can really go off and say maybe their ways of optimizing things how we time line them. For instance, let me give you an example for the FDI. In order to proceed and do some of these investigations, we would have to set the camera up every time and then take it down. If we could have found a way to set the camera up and keep it under that configuration we would have saved a tremendous amount of time instead of having reconfigure each time. And I'm just thinking when you look at the big picture and we're looking at our goals for a given increment from the scientific standpoint, maybe there's a way we can do even better. It's just kind of a general comment. And that's where we really need to work as a team because the time liner people really know what those different investigations are, different timelines and can work with a given investigation and it's kind of an interface probably instead of just submitting maybe our requirements and not the time that's required. A little bit more interactive there. I'm just trying to find things that maybe would be helpful.
Amount of time required for end-to-end implementation.	{respondent} – Over all speed. It seemed like everything just took a long time. Again, I'm *{at an early career stage}* and this is my first time and I don't have a lot of experience working with these things but it just seemed that little things you wanted to change that smart people agreed were not going to have a huge impact necessarily on anything it just seemed as though there were many steps in getting everything done. Sometimes it was good but more often than not it just seemed like it was just a huge

	bureaucratic barrier in getting things done.{interviewer} – Ok, for this one I'm going to put "Overall time for implementation". {respondent} – Yeah, that sounds like a good way to say it.
Real-time operations support	No comment
Satisfaction Factor #2	**Comments**
More opportunities for information exchange with PIs from similar experiments.	{respondent} – I think the possibility to have a real overview and maybe exchange of ideas with similar human physiology experiments that are conducted in the same increment if any. I don't say a wash-up but to increment the network between the various experimenters because actually I recognize that each experiment is on its own. He is conducting his experiment, he is happy and that's all. So I think that the entire utilization program could benefit if somebody is promoting this a little bit more. Because it is clear that the scientists are (unclear), but you know every scientist wants to be the number one and sometimes avoid any type of relation with others. {interviewer} – Yes, I know because there's always the perceived possibility that you can cooperate but there's also competition somehow involved maybe and that's always the human problem, competition versus cooperation but that's a useful comment. We have heard that from other investigators and I know that *{name}* here in the office has looked at that and hopefully they will look it a little more about trying to support or implement that.
No response provided	*No response/no comments provided*
More continuous data downlink.	{respondent} – Is it fair to say it would be nicer if we had more continuous KU and S band coverage? {interviewer} – Sure. {respondent} – I think that's an important one that doesn't reflect on anybody. Let's make this #2. {interviewer} – We can keep it as 3. Let's keep #2 the way it was. Alright it you want to make it 2, it's 2. Do you want to delete 2? {respondent} – I would say that. That's an important thing because if we miss something and we send a command then we can lose half an hour and get nothing. {interviewer} – Ok, did you want to keep that comment about working outside of OCRs or do you just want to delete that? For example, did you want to put that as #3? {respondent} – I'd like to leave something like that in 3. {interviewer} – Ok, so #3 is going to say, a little more flexibility to work outside of OCRs.
Feedback from management concerning approval/progress of requested changes	{respondent} – Feedback from management and approval meetings of requested changes and outcomes. Communication was unidirectional; it went one way and didn't come back.
Opportunity/availability of face-to-face crew training.	{respondent} – I think crew training is important for us. Although we're simple and small and don't take up a lot of time, I think crew members feel that because it's education, feel a real compelling need to do it well and that sometimes our procedures although are adequate that it's that compelling need to do it well that can only be addressed in a face-to-face. It's difficult to do that with OBT. So I think anytime we can get that face-to-face training time it improves what we do.
No response provided	*No response/no comments provided*
Increased priority of science.	{respondent 2} – Because it had an impact on the work that I did because we would get in our inputs in there as far as operational requirements and then we'd have to change it or copy it over to the next increment because

	that one didn't work. That was cumbersome but separate and some different comments, going back to an earlier question about support of science on station, again I think that the people who are there to oversee all of the science – the people at Marshall and that is their purpose – I think they do a great job, but if there was some way to improve the overall viewpoint and priority of science in general on the station, I think that would make a huge difference. It almost appears to be given kind of a secondary or backseat to just maintenance or something else. I'm not even sure what it is. I don't know what takes priority on the space station, but it certainly doesn't seem to be science. I think it's a really high level where that needs to change, not necessarily on the lower level where the people are doing the work. I think those people have a priority assignment. {respondent 1} – Yes, I agree with that. It seems to be somewhere above them that the problem happens. {respondent 2} – Right, so that's a distinction. I want to make sure that that gets conveyed.
More time for training with the crew.	{respondent} – The only other thing and I think I've mentioned this to you in the past in other surveys if you want to mention it again is if we would get some more time for training with the crew. That would always be helpful to better performance. {interviewer} – We'll put that in for the second one. We did ask you a question about that earlier about your satisfaction that you got for crew training. {respondent} – We are very satisfied. {interviewer} – What you did was put a NA for that question.{respondent} – For this particular expedition. I'm talking about in general. {interviewer} – Ok, that's fine. I just wanted to try to coordinate those two questions. {respondent} – You know from expedition to expedition it varies, but I'm talking about in general if the ISS Utilization Program wants to improve something this would be one area.{interviewer} – Alright, that's helpful.
Accommodation of customer scheduling for crew debriefs.	{respondent} – I don't know if anything can be done about this or not. But it was very difficult for us to plan for the debrief of the crew, in the first debrief, to plan our schedules and get plane tickets and things like that ahead of time because their schedule kept changing. I don't know if anything can be done about that especially since we have, the PI and I are both clinicians so we had to rearrange patients and things like that. At one point I was going to go and the schedule changed and he was going to go and it was pretty disruptive. {interviewer} – It was more than one time that schedules hopped around? {respondent} – I think so. And also it was just unclear for a long time so we were unsure what to tell patients. We have psychiatric patients so we don't want, you know we meet with them on a weekly basis, so we need to tell them ahead of time if we're going to be gone. {interviewer} – I totally understand. My wife is an occupational therapist so I know where you're coming from. That's good feedback. Thank you. Anything else? {respondent} – No.
No response provided	*No response/no comment*
Overall support for research.	{respondent} – Put into action that what we say is important about Station.
Communication with supporting personnel.	{respondent} – Something to improve would be communication and again it was the same people we were having problems with.
Faster availability of baseline data to	{respondent} – …I'm not complaining about flight data, I'm talking about base line data. {interviewer} – So basically you wanted to get to a

investigator	crew member sooner than you were able to? {respondent} – No, we wanted to get to the crew member's data that had already been collected. {interviewer} – Oh, so one thing there is that you had trouble getting to base line data. That was pre-flight data? {respondent} – Yes. It hasn't all flowed as quickly as it should have done. {interviewer} – That was base line data collected in Russia? {respondent} – Houston. {interviewer} – Oh, in Houston. {respondent} – It's not a big deal.
Better scheduling of crew time	{respondent} – I think the crew has more time to engage in science even under the current constraints than the scheduling people. It appears to me that the crew has more time to do more science than the scheduling people seem to think. There's certain times of high temp activity before and after a cargo shipment that are very busy for the crew, but there are other periods when they have more time and would like to have more time. They never consider asking the crew in what they want to do. Another issue was they wanted to remove *{our investigation}* instead of 3 15 minutes each week to put it on the task list for a couple weeks. I asked why they didn't ask Michael if he wanted it task listed. This is what NASA doesn't understand. When it's on the task list they don't consider it important. The schedulers have an entirely different interpretation of what's going on.
Faster turnaround from NASA for data required from no-upmass investigations.	{respondent} – I guess that's ok if we're business as usual in that where you're looking at a couple of years towards integration. Again, I was time compressed. We offered up and said we can fly early and we were taken up on that because of the upload constraints and NASA did not respond in kind, so where I had to produce documents on an almost daily basis, NASA stuck to its standard 4 to 6 week turnaround so that was very frustrating. That may not be for somebody who has the luxury of flying in a year or two.
Streamlined process definition for no up mass payloads	No comments
Availability/accessibility of information on Station Support Equipment.	{respondent} – It would be useful to have more knowledge about Station support equipment available. I remember that while preparing the setup for our payload we would need some support equipment and then it was not so easy to know what was onboard the ISS so this knowledge may help during the project development.
Better guidelines for crew conversations.	{respondent 1} – I think there should be a cultural decision about language the PIs can use with astronauts should be revisited. A new look at what is and isn't acceptable language in communicating with astronauts. And that's not just my communication, it's COM communication. In our conferences they are unfettered. They're beautiful. There's some censorship that goes on while we're planning for it, but those are unacceptable. We can understand how to get around that. But when there's a simple point that needs to be made like the famous example is and it's better than it used to be, because my friend *{name}* plugged something in the wrong way and the PI on the ground saw the monitor was plugged in the wrong way but they wouldn't let him tell him it was plugged in the wrong way. I understand things are better but there are cultural psychological sensitivities that I think are more cultural than real problems and getting a real psychologist on board to investigate what is and what

	isn't important and appropriate would help all of us. Then we would have guidelines from someone we would trust and we wouldn't be wondering where this is coming from. {interviewer} – Well, actually there is a study of that type somewhat related called interactions that's being done by a team at the VA hospital in San Francisco. It might be relevant. I'm trying to remember. *{PI name}* is the PI on that.
Collaboration opportunities with JSC scientists.	{respondent} – I think the program could be improved by more scientific collaboration between the university PIs and the NASA people. I think it was sort of frowned on to have JSC people as co-authors and things of that nature. I think either having, not just having JSC as so much as a service provider site, but also to be able to involve some of the scientists as members of the collaboration. I think that might be utilized in the future. Some of these guys, especially the young people who are working at Lockheed Martin might be going on later on to PhD programs and things of that nature and would benefit from a closer role in the actual science. {interviewer} – As a scientist myself, I hear what you're saying is that you could sort of mentor them to some degree {respondent} – I've been in a situation where some collaborators have kind of used me as a data cow and I was always thinking it was nice that at least I was able to derive some funding from it, but it would have been nice to be able to grow scientifically as a result of that collaboration. So those are two things.
Education/knowledge of POIC cadre on investigation objectives prior to increment.	No comments
Time available for crew training.	No comments
Fix the lab window.	{respondent} – It would give the crew more options for windows to image out of. {interviewer} – I've lost track of the status of the window. What is the status of the window? {respondent} – Right now they have not evacuated it so there's still cabin air where it's supposed to be a vacuum so it's continually closed so that light doesn't get in there and cause critters to grow and really ruin the surfaces there. And also they had a cable sent up and they have a box to put over that loop where the pressure was leaked out of but just the other day when I was standing there, Dean explained that there's some safety issue that the Russians keep bringing up that they don't want to use that particular cable or whatever the tube that was sent up to try to fix it, so it's just sitting to see if they can get through the Russian safety guys. So it's on standby and it's still closed. {interviewer} – That's what I heard too.
Reduce process time and increase efficiency.	{respondent 3} – I think in terms of efficiency. Whenever we can reduce the time, make the processes quicker and efficient for all of the payload developers, that's great. And I think that we've come a long way since the very first Station flights and so I would encourage that. We've seen so much more efficiency at the payload developer level.{respondent 2} – Right. An example being the PODF processes.{interviewer} – Right so in particular you're seeing the efficiency as coming in operational aspects that are important to you. {respondent 1} – Yes, absolutely and that has made a big difference and it saves a lot of costs to NASA, a lot of money. We don't have as many data entries now and it populates everything so

	when we can cut back in terms of updates and making changes and we only have to do it with one data entry, that saves so much time. Those are examples of things that really are helpful because then we can focus on other things more and it makes our life a lot simpler and a lot more cost effective.
More ability to be flexible relative to established processes.	{respondent} – I don't know how to say this one so you'll have to help me summarize this. My feeling is a lot of people seem to be motivated only by looking out for their performance reviews, which is not the right way to say it, but people were sort of conservative. They didn't want to do anything that might, it was like it was obvious that things to me that would be cool if we could do certain things maybe a little differently and try some new stuff or whatever and everybody seemed to be very concerned sort of protecting their rear. I don't know exactly how to say that but there was sort of like it's not just the speed of implementation but this huge mass of inertia. Well, we didn't do it this way last time so we're not going to try anything new. These are the procedures. That's kind of it. It seemed as though there was sort of a slavish devotion to what had been done before and what was the procedure on paper. I mean it's not like these people are dumb, they just didn't feel like trying anything new. There was just an extreme conservatism for most aspects of what was going on and it seemed like people didn't want to rock the boat or get in trouble and if that mean that ok we sacrificed some scientific goals, well so be it at least we're not getting into trouble.{interviewer} – I'm going to paraphrase this as follows, "Flexibility and initiative in implementation". That's how I see it. You felt the people weren't flexible enough and they didn't take enough initiative in implementing things. Is that f air? {respondent} – Yeah, that's fair. You know doing what was done before; I guess that's inflexibility. Yeah, that's fair.
Data submittal requirements process.	{respondent} – In a general sense, I'm going to start off saying the payload development process. I guess where I'm trying to go with this, Roy, is the data submittal requirements process. {interviewer} – Ok, Data submittal requirements process.
Satisfaction Factor #3	**Comments**
Post-mission information exchange between investigation teams.	{respondent} – The follow-up. It's extremely interesting what you are doing actually this interview with the PI but I think there should be added a discussion between the various scientists on the specific research. {interviewer} – Yes, you're saying that PIs should discuss specific results with the program. {respondent} – Let me give you an example if it helps. Just as an example, one of our protocols consists of exerting a maximum voluntary contraction with the hand. There are comments in old literature that says that making this type of exercise perhaps into stabilizing the blood pressure in long term. So if given the same increment some other scientists were measuring blood pressure, this could be interesting to correlate the data they got and the data we got, but if nobody knows what exactly the other one is doing that's funny. The data is there but they're not correlated and that's a lot of science at the end. {interviewer} – I understand exactly what you're talking about and as I mentioned the payloads office has looked at this. Maybe they have not looked at it closely enough. I'm going to ask Ed, my colleague, to just make a note or put an asterisk that this is a key piece of input and I will try to discuss this

	a little bit more with management more about this particular issue. It seems very common sense that this would be done but it's surprising that it's not. At least it's not being done to your satisfaction.
No response provided	*No response/no comment*
Flexibility to work outside of OCRs.	{interviewer} – Ok, so #3 is going to say, a little more flexibility to work outside of OCRs. {respondent} – Yeah that sounds pretty good. For instance in terms of comments for #3. We might say something that we're looking at coverage down the road a little bit and we know we've got plenty of time to turn the thing off and get it all shut down, but we'd like to run it for another hour or so because we still have some tape left and we want to see this, but if we don't shut it down or write an OCR right away, even though we didn't do that I don't think, we got to cut short the science which keeping it going really has no impact on anybody.
Make science the driver	{respondent} – Make science the driver
No response provided	No response/no comment
No response provided	No response/no comment
Reduce redundant data submissions / one entry reaches all users	{respondent 1} – I have a third one. Redundant and repeated data entry. It would be nice if we could submit information one time only instead of the same information over and over and over again. That doesn't make any sense. {interviewer} – This is an area that the payloads office is working very hard to improve. {respondent} – I'm very glad to hear that. {interviewer} – They're working very hard to improve it. It's possible that the improvements haven't bubbled up to your neighborhood yet and that's too bad. So you are still finding issues with redundant data entry.{respondent 1} – Oh, definitely. {interviewer} – I'm certain in the future you'll see improvements on that.{respondent 1} – Good, glad to hear that.
No response provided	*No response/no comment*
No response provided	*No response/no comment*
No response provided	*No response/no comment*
Coordination of crew and PI/PD scheduling.	{respondent} – I don't know if there's much really that can be done about that, but I guess crew scheduling can be very taxing, so I guess if there's a way that could be better planned. Because we put in our requirements long before we do research, yet it doesn't seem to ever really stick.
No response provided	*No response/no comment*
Streamlining the process of data sharing	{respondent} – Streamlining the process of data sharing would be a positive thing. {interviewer} – I have to ask you to elaborate a little about what you mean by data sharing. {respondent} – If we want access to something that is not directly collected by our experiment but may have been collected by Med-Ops, something as simple as post-flight body weight, we have to go thru a fairly elaborate process at least it's time consuming, whether it's elaborate or not I don't know, to actually share that data so that is something I think could be streamlined. I understand there are confidentiality issues, but some of these things are really borderline confidential.
No response provided	No response/no comment
Organizational inter-communication	{respondent} – I think there's somewhat of a siloism or a disconnect between some of the program offices and so it would often happen where something was done over here and the other management team would know absolutely nothing about it, so we had to often re-educate people

	about where we were in timelines, in program changes and things like that and that was pretty frustrating. It didn't seem like a big family all working together down there. It seemed like Hatfield and McCoy type stuff that we had to talk to these people and then we had to talk to these people and go back to the other people to make sure that everybody was comfortable.
More crew time opportunity	No additional comment
Overview of the procedures and documentation for PDs starting up	{respondent} – It would be useful for payload developers that are beginners with the ISS program to give them an overview of the procedures and documentation they should provide because the SSP documents are very huge and sometimes for a small payloads as ours is, it's not so easy to understand what is the number and the consistency of the documents that we had to give. So maybe at the beginning it could be useful to give an overview so that everybody can understand which is the rate of the labor of detail needed for the requirements for the payload. That's my comment.
No response provided	*No response provided*
Better flexibility to incorporate new information in evolving situations	{respondent 3} – 3 – One more comment. There appears to be a reluctance to quickly incorporate new information that can improve the ongoing studies and although the incorporation of new information quickly may involve creating new documents and having different committees review it quickly and it's sometimes a bit of a headache to coordinate it, it's sometimes critical that the new information has to get included into the program and that we just can't continue repeating something knowing there is a piece of information that can change how we're going to interpret it. The bubbles were a classic example of that.{interviewer} – I understand what you're saying. For #3 – "Better incorporation of new information in evolving situations". {respondent 1} – I was going to say and you brought it up that there's something going on by other people. Having this idea of a PI maybe quadrennial or something, PI conferences so that we know what each other is working on. This idea that the bubbles are a problem. The lab says we're not surprised you have that problem but there isn't enough PI. I guess that's being held under the Brooklyn Bridge thing. In the Brooklyn Bridge conference we're going to have more PIs, maybe that's to handle that.{interviewer} – Right, but I understand that comment. I will share that I have heard that from other PIs. We are going to promote that as an issue to management to make them aware of that because we've heard that from other people that better cross communication between people is essential and there are not enough mechanisms for that.
Better feedback mechanism on the science, better review.	{respondent} – Maybe a <u>better feedback mechanism on the science</u> would be nice. Operationally I'm pretty happy with things, the communications, problems where you have a zillion different parallel channels of communication that seemed to be, at least from my point of view, that seemed to be solves, but I think it would improve satisfaction if they were sort of closer scientific feedback and you. Because I feel like people have seen my paper and all that, and it's nice you wrote a paper but I never really had any response from JSC why it was interesting or not interesting. {interviewer} – I seem to remember you mentioned this last time as well and did you have any contact with *{name}*, the space station research

	manager because I seem to remember he had mentioned about your paper to me. We were talking about research output and productivity. It was either *{name}* or *name}*. Have you talked to either of them? {respondent} – I've not talked with either of them about it. I might have asked *{name}* at some point a question about how do I phrase this or tabulate this or that to protect confidentiality, but apart from that I don't think I had any interaction with them. But I'm glad it seems like they did read it and take notes on the paper.
Better customer understanding of LIS role.	{respondent} – I need a clearer understanding of the LIS' role in supporting the program and supporting the science. I often felt that, and I don't know if this belongs here or somewhere else, but I felt that often the LIS acted contrary to what was best for the experiment and often did that without talking to us and I'm trying to figure out a way to word it.{interviewer} – That's fine. For 3 we'll put better user understanding of LIS role. How's that? {respondent} – My comments were that often science requirements were challenged and my opinion is that science requirements should not be challenged at the integration level, they should just be implemented and I did not appreciate science requirements being challenged. Science requirements are something that the RPOs and the RIOs establish and it's ISS' job just to implement them, not question them, at least at the LIS level.
Delivery schedule for documentation and data.	{respondent 2} – I think we rated it pretty high for Increment 8. That's kind of harking back to our experience leading up to launch so I don't know how applicable that one is. But pre-launch there was a lot of data and documentation that was required. We were all learning and we were kind of overwhelmed there for a little bit. Increment 8 though itself, we didn't have a lot of data and documentation for Increment 8, so I guess we're having a little bit of difficulty with answering these questions. We're trying to focus on Increment 8 but we can't help but (interviewer talked over interviewee).
No response provided	No response/no comment
Alternate mechanisms/processes to increase science productivity.	{respondent 1} – I think 2 and I think this Saturday science that's been incorporated in terms of allowing more science if the crew wishes to do that is very valuable. {respondent 2} – 2 – Any kind of alternate venue that would allow for an increase in science return, even though it's at the crew discretion, could prove very useful and could maximize the output from the science side. {interviewer} – So what I would call this is "Alternate venues and mechanisms for science productivity".{respondent 1} – Absolutely and that's a way to free some on orbit time up or it's a great opportunity. I think it's a really good idea.
Decrease redundant paperwork/deliverables requests.	{respondent} – I don't know if I've covered this before because it did lead to as a consequence of it taking a long time, but the paperwork was really like it just seemed that everything needed lots and lots of. Well, I guess this is the same thing as maybe redundancy is what we called it before. I don't mind being asked to provide a figure every now and then, but it's like if I'm being told to go home in the middle and send up and updated thing in a different file format, that really got on my nerves. So you can call that redundancy. I guess I sort of feel like…..Well, maybe I should put it this and this I don't know how you want to summarize but on a personal level it was a very strange experience for me because on the

	one hand *{the PI}* gave me the latitude, as a student, to basically do his job in a sense, scientifically, right? I was making the decisions, I made the samples, I trained the astronauts, I wrote the protocol. It was a great experience for me in that sense. At some level he was delegating to me the authority to make decisions on how things should be run scientifically. You know, he certainly has that ability as the official PI; he can designate someone in his steed to basically take his position, correct? ({interviewer} – That's correct) So in that sense, I'm the customer. On the other hand I'm *…{at a different level of experience than many ISS customers}….{and I felt that this fact inappropriately became a factor in interactions with some of my NASA support personnel. This included being requested to do tasks that I believe would be normally out of scope for a PI}.*{interviewer} – What we'll do is, some of those comments I'm going to reallocate to a later part of the questionnaire. I can do that. Once everything goes into the computer, I won't say I move things around, but the way we evaluate the verbal comments we categorize and classify them and I'm going to classify this as relating largely to your payload development support. For #3 I'm just going to put "Excess paperwork or redundant requests". {respondent} – Yeah, we can just focus on that issue. That's certainly something that was definitely an issue. It's like you know we have this science summary to send out and send this other graph or whatever. Well I sent one last week and it's 90% the same. Fine, you want me to change it I'll change it but it's more like I know this isn't making a huge difference. Scientifically ok, you know, oh it would just make us feel better if we had more data to show. Well, look I'm glad but on the other hand it's not changing any of the conclusions here. So, definitely the redundancy was something that was pretty annoying. And that I just sort of feel like it was some kind of bureaucratic requirement that didn't really didn't help us get any more science done. I don't think it necessarily made things even all that clear for the recipients because it wasn't a big change.
PIM support	{respondent} – I have a comment for PIM support. I want to say that subsequent to the completion of I8 our RPO, HLS and the PIM organizations have gotten together and discussed changes in PIM support that will hopefully improve the process. I'm trying to remember who the PIM manager over there and if you told me I'd recognize it, but they came over and talked to us about some changes that they wanted to make with an eye toward improving things, I guess, or making; I guess it all comes out to improving things, doing a better job of being PIM and so I think there's some process improvements that are already in place that are going to bear fruit. {interviewer} – That is possibly or likely the result of feedback that we have gotten on previous surveys. The I6 final report on the survey included recommendations and issues regarding that and I think that that probably flows down out of that.

9.2 Program Strengths and Weaknesses

Both the Increment 7 and Increment 8 Surveys asked respondents to answer the questions: *(1) What are the major strengths of the ISS Program? and (2) What are the major weaknesses of the ISS Program?* The more general term of ISS Program was used specifically to expand the

question scope beyond the ISS Utilization Program, but interviewees were reminded not to neglect the ISS Utilization Program as a subset of the entire Program in considering their answers. The transcribed verbal responses to these questions are listed below.

9.2.1 Program Major Strengths – Comments from Increment 7

{respondent} – People are good and once you are manifested they will bend over backwards to take care of you. Excellent people anywhere you go, even if they don't have the best tools, they are ready and willing to make the activity happen so that you have the best chance for success.

{respondent} – The ability and desire to be flexible to get our experiment done. Our experiment is a very complex experiment, and I was impressed by the desire of the program to support us quite well in terms of doing this and supporting logistics in shipping this equipment out and working with the Russians, because we need fairly large rooms for our experiments and that was all negotiated for us. I've been impressed by the desire of the program to get the science done and work with us to make that happen. It would have been easy to put the science off until the Shuttle flew again.

{respondent} – The people working the ISS program. When you look at the program as a whole, you can shoot holes all over it. But when you start talking to people, they understand what we are trying to do with the ISS Program, and work really hard to get the project through and even more of a payload focus in the program. It is the people trying to make this thing work.

{respondent} – The strength of the program is that it is built on some considerable experience with Shuttle research and the MER. There was some tradition there, even though some of the processes were new. I've always felt that even though there a lot of people in the loop, there was good communication in the program. I've felt that there was always, throughout my little piece of NASA that I deal with, I can get on the phone with folks at HQ and JSC and get the information that I need. I really like that. It's nice having that personal level of contact.

{respondent} – Flexibility and the willingness of the particular individuals to go above and beyond the call of duty and the great importance that quality of science was given are certainly huge plusses that we were very satisfied with. Changes were addressed and implemented expeditiously. It is the kind of thing that the scientists and the PI's are interested in and many times one cannot control changes with may be due to hardware, off nominal situations or legitimate changes to some of the procedures based on the early science data that is acquired. In all of the above, our changes request were accommodated and time-lined in such a way that we had such a great participation from everyone, ranging from the photo & TV group, the computer support group at Marshall which installed an IVOD capability in the PI office at NIH in Bethesda, MD, to the way the LIS and the whole cadre worked with us. I received exceptional support. Schedulers were very accommodating and PODF worked very well. All of that really positively contributed to the rapid implementation of important science-related changes and we applaud the way those things were dealt with. The only caveat is that this Increment 7 with a reduced crew and a different context and set of payloads and we don't know whether this kind of support is even possible under other circumstances when the schedule is different. But it certainly was something that happened in this Increment that we were very happy about.

{respondent} – Basically, I think the Utilization Program does a great job in encompassing so many different types of research activities on station and you know, giving ample opportunity to everybody when feasible without showing too much favoritism to this type of research or that type of research.{interviewer} – That's an interesting comment, thanks for that. I don't know if everyone would agree with you. {respondent} – Maybe it's because we're getting our fair share.

{respondent} – The fact that it is possible to perform long term missions. We performed the same preliminary experiment of muscular atrophy on the taxi flight during 10 day missions and now we have the possibility to have a long term mission. What is possible to study during the long term mission is much more related to the problems of old people on the ground; both osteoporosis and muscular atrophy and motor control. With the advantage that for the astronauts when he comes back, he recovers. It takes

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some time before recovering completely but he recovers. So his process of degradation in terms of muscular skeletal problems or motor control problems, so the performance degradation is as a vegetable process so it can be really studied and it can be studied dementia, the cellular dementia, behavior dementia and to study also how he recovers after that. So it is extremely important. We are now applying some of the results of *{our investigation}* to clinical treatment. So I am really in favor of the long time missions because they are very useful in terms of clinical application.

{respondent} – The major strength is providing a micro gravity environment to conduct experiments relevant to NASA's programs. A long term micro gravity environment.

{respondent} – I think from my standpoint that I view the instances on research as probably the major strength. As an educator, my association with the ISS program and, of course, the payload people have perhaps given me insight into the importance of research that I hope that as an educator and working for NASA education that I have then been able to convey to the broader group who work with students and are looking at products for students. I think when I came to this office although I thought of science onboard station as important, I think that the whole ISS program personnel, the group that I work with, have really done such an excellent job in conveying to me on a very low level certainly of what's going on on Station that it's made me better in what I do because I think now that I realize how valuable this is and how important it is in the whole overview of the ISS program, that I probably push that more with NASA education.

{respondent} – I think the strengths basically are that the lead increment scientist, the PIM are very open and very sensitive to PIs and their needs and their desire to get good science out of their payloads so that means I found that as one of the major strengths of the entire program.

{respondent} – Like I said before, I'm impressed with how multiple competing pressures are taken into account and dealt with and the science actually gets done. It's a real monumental task and a very complex one. I also appreciate that I'm being shielded from having to know about a lot of the things that go on. A lot of the interfaces with these other groups that I don't even know about that are being done on our behalf in order to make our study happen. I appreciate that.

{respondent} – A major strength from the point of view of our experiment is studying the effects of prolonged space flight on skeletal muscle. Without it we couldn't do it. It provides a platform for studying and alternately solving the problems associated with muscle deterioration from microgravity.{interviewer} – But in terms of an organization, the support doing this kind of research. What do you think the organization strengths are in terms of processes, how things are set up to use space station and in particular if you can think about, we're trying to focus on Increment 7 specifically. Some water has flown under the bridge. You've been flying o 3 straight increments, if you give any thought to that.{respondent} – I could say that my study has been very well supported and other than these logistic problems I talked about we haven't had a problem. I think the management has been very good. I think the major strength has been, the people from my perspective from a management perspective, is the people they have interacting with me know what they're talking about and seem to interact well with the Russian personnel over there. I can imagine that could be a disaster if that wasn't the case. So management wide, I think that's a strength that they have good people with experience handling this experiment in Russia. That they send them over there and they're there, we're not just going over there and we have to deal with them. That would be a problem.

{respondent 1} – Clearly the major strength is to have this unprecedented long stretch of time in microgravity and the realization that this is our last chance. In other words, it's such a boon to have the astronauts so close and yet in microgravity because in future missions that take astronauts farther away from us are only going to diminish the degree of KU coverage and IVOD coverage that we get. It's only going to get worse. It's not going to get better and we learn how important it is during, just like during a space walk you're going to have continuous communications with the person that's running the engineering operation is going to have continuous conversation with the astronaut. We learned how extremely valuable it is to have PI / crew conversations for that very reason and it would be great if it could be extended to during the operations in some future date. The strength of Station is that it's going

to let us figure out how to enable scientists to do science with increasing independence and when I say to do science, I don't mean to run a PIs procedure. I mean to solve their everyday problems using the scientific method that the training and the level of science awareness in the NASA community and culture has increased tremendously during Increment 7 and continues to increase with all of the real time research that is finally being done day in and day out at NASA and to me that's the biggest strength for the entire NASA program is to get science and the scientific method integrated into problem solving for flight.{interviewer} – Ok. What about again, the process side of things? You were talking about the capabilities of the vehicle itself. Do you have any thoughts? {respondent 1} – Well those voices of the COM officers are unbelievable. The real time operations I think we were all extremely impressed with the level of professionalism and the way that they manage things and the way they manage time way exceeded my expectations. {interviewer} – Interesting piece of feedback. Thank you.

{respondent} – We were discussing on major strengths that the real time ops execution has gone very, very well. They've got a good process and experience level and things are going smoothly and that's a major strength.

{interviewer} – Could you hold forth for a minute about what you think the major strengths of the program in general are and then more specifically what we call the ISS Utilization Program as a subset of that.{respondent} – To me the ISS program it's strength is hang in there despite all of the negotiation and operational challenges. Being persistent. Operational, political challenges. I see that as a real strength that they just keep on plugging on. As far as the utilization program, some strengths I've seen for Increment 7, it's more than just for Increment 7, but for Increment 7 the interest in pushing payload time and payload interest, representing the payloads well within the ISS program and letting their voice be heard. It doesn't mean it can be acted upon but at least they're being heard. And, of course, all of the positive people. You've got a good group of folks that keep trying to get the system to work a little bit better.

{respondent} – I think, I'm not real sure how to phrase this. I think the program does a good job of trying to accommodate as much science as it can given the inherent limitations of the space station as it is currently built and staffed. That's about all I can say on that. And on 3.2.2 I'm going to tell you that you don't have a lot.

9.2.2 Program Major Weaknesses – Comments from Increment 7

{respondent} – Some of the tools that we are dependent on. The integration process is a necessary evil, not a weakness, it is a requirement, there is nothing wrong with it – it is just something that you have to do.

{respondent} – The process and number of people you need to work with to get anything done. This is a problem throughout NASA. The amount of paperwork it takes to get things done. On Increment 7, we wanted to fly our in-flight experiment in service module and we interacting with our Russian colleges to do that, and people are working this issue, but we are finding that we are the first experiment to be sort of completely devoted to being set-up in the service module and there are a lot of logistic issues associated in doing something like that and we are trying to overcome that. The logistics of doing a US experiment in the service module on the Russian side is really a process that we need to facilitate because it will come repeatedly down the road.

{respondent} – Bureaucracy. The amount of paperwork that we have to do to keep the program afloat. My concern is how the program is going to readjust when we start flying shuttle again, and there are a

finite number of shuttle flights left. I would like to see the Program come out with a plan for Payloads and still providing a viable way to do research. Right now, I am feeling that they are starting to settle for a lot of things. And not just the Program, but the users as well. We have spent a lot of time to get the ISS up there and we seem to be losing focus on what really good science on ISS would be. It is still a unique for micro-gravity research and we should not be losing that point.

{respondent} – The programs depend very strongly on the Russians and I think that's the weak link. There is a very tenuous bridge over to Russia and anybody who wants to do a study over there, really has to deal with a big loss of control. If Russia is to be an asset, then I think that has to be changed.

{respondent} – Well, the only weakness that I can think of is that it seemed as though it took the Columbia accident to happen before the program developed a solid contingency plan for something like this, you know something like the accident.

{respondent} – I think that if we look from the other side of the table, the major weakness is we have to be sure that the PI conceives his experiment with enough flexibility then from the other side this means that the problem obliges the PI to prepare the practical execution and experiment with enough flexibility which is not always with a good attitude from the principal investigator. When the principal investigator is principal, he wants to do his things.

{respondent} – I think the weaknesses were brought up in the concerns I had up on top and that we talked about earlier, lack of science time, poor interactions, delayed interactions, schedule changes, down link times. It's all complicated now by the shuttle being grounded too. I don't think you can count that as a weakness, but a lot of these are a consequence of the shuttle fleet being grounded.

{respondent} – Weaknesses, from my standpoint, I think like anything else it's a complicated organization that as a new person it takes a bit of time to kind of understand the flows and the management system. I think that perhaps, you know, if there's any weakness that it's for a new person coming in, it's how does this all work and how does this all flow, not that I need that a lot from where I sit, but occasionally it's good to sort of see how everything is carefully put together and how the pieces of the puzzle fit. But all in all I will tell you our experience has been very, very positive and as I say all in all, I think the remarkable thing is what I feel from the program office and from the ISS Utilization Program is that there's a real value on what we do as far as education and that you view the ISS as an excellent platform to do education and one of the things I should mention is that during Increment 7, we had a limited amount of time and it was the working with Code M and the lead increment scientist that we were given a bit more time to do some additional education activities that utilized only onboard resources and I think that was a remarkable and very important message. We were able to get much more education footage video. Operations took place because there was a recognition that there might be available crew time and education would be a worthy use for that time and that came not so much from us going to the people, but the people coming to us and so I think that is certainly something that I would want to convey that that has been a valuable resource for us and certainly something that came from you guys.

{respondent} – I don't have any observations on weaknesses relative to crew observation, but I have a general – it's not really a weakness – general comment and that is that I would like to see more emphasis on science output from payload and recognition within management that that's very important so they can encourage the staff to continue to provide the support they are providing.

{respondent} – In terms of major weaknesses, I guess I still don't see why it really has to be so complicated. I would prefer it to be less complicated but I don't know all of the factors that are driving the level of complication that it has.

{respondent} – The major weakness I already described I think is the lack of integration of the US and Russian management teams from the point of how it affects science. From the point of view of when we want to get some information about the Russian crew, it seems like it's not available. It ought to be. And when you're dealing with just 2 crew members, you know, a Russian and a US, that's pretty important. And no way to fix the equipment up there, that's just a weakness because of the problem with the shuttle.

{respondent 1} – Can we list the fact that we only have 2 crew members as a weakness? {interviewer} –

That's perfectly legal. {respondent 1} – You really have to get upload and download. We really have to get shuttle integrated with ISS research again and I think it's a big mistake to short change and to devalue just how important it is to work out all of the bugs about getting science, getting astronauts to be scientists and to use the scientific method by curtailing the number of years of ISS and it's amount of upload and download. I think it's a huge mistake to terminate after building when we have so much to learn about doing research in space. Second, I would say and I've said it before but I have to reiterate it you can't do science without a lab notebook and all that that means culturally. So the culture of a lab notebook. {interviewer} – Yes, as a scientist myself I'll have to admit not that I've worked in space science, but it's an interesting thought that you would be doing science without a lab notebook. It would be strange.{respondent 3} – And to follow up on that and reiterate what *{name}* touched upon. It seems to be difficult to integrate new knowledge in a timely manner. When we find something and it changes how we view the world and we want to propagate information to subsequent procedures and new ways of doing things it takes a considerable amount of effort and time in going through a great deal of process.{respondent 1} – There's too much inertia. We're not talking about the small things between processes, we're talking about how long it took for the concept of the discovery of the bubbles to really permeate the organization.

{respondent} – On the other hand, we wouldn't necessarily say it's a weakness, but it's an area, the ops development, pre-ops development, probably still needs some tweaking there to get that to go a little more smoothly. For me I think the major weakness is limited resources as far as being able to be time lined and have your experiment completed in a timely manner really is something that is unfortunate.

{respondent} – By appearances, it seems like the ISS program gets walked over in political manner in some negotiations. That's what it appears. Again, I'm not in the inside scoop of all that but that's how it appears and for the ISS utilization program weaknesses, still need to work on some of the initial process flow for payloads to gain an understanding of what they need to do. {interviewer} – A template.{respondent} – Yes, a template. I see that as a weakness there. I'm not sure it will ever be simple, but somehow simpler.

{respondent} – I would say the major weakness of the ISS program is that there are not crewmen up there to do any significant science. When this experiment came through the system the researcher was looking at at least 3 and hopefully at some point 6 possible subjects that were going to be up there for 4 months so maybe as many as 18 subjects a year and now we're looking at 4. So it's very hard to get the researcher's science completed in a timely manner because the pipeline, you know the supply of subjects is so much less than what we thought it was going to be. And under the current conditions that we've got, another major weakness of the ISS program is that there's no upmass capability and I'm now trying to focus on just one experiment and for this one experiment we don't care about upmass capability so maybe that's not a comment that I should make at this time.

9.2.3 Program Major Strengths – Comments from Increment 8

{respondent} – The major strengths of the program are, of course, the duration of the increment. This means that the crew member has normally learned very well the protocol and this protocol has the possibility to be repeated along the six month period many times so this is a great opportunity, especially for a physiology experiment.

{respondent} – The major strength of the ISS program is they get things done. If it needs to be done, it will get done. This is in the research light. People will bend over backwards to help make it happen.{interviewer} – I can push back on that comment and say the issue is prioritization sometimes. In deciding what we are going to do and people get on the losing end of prioritization. {respondent} – That's something everybody sees every day. Either you don't have a big enough bank book or you can't do what you want anytime you want, you have to live within the system. And the system I think is very

fair in that context. Anything else on strengths? {respondent} – The people, people, people are great. They are the program.

{respondent} – Providing a microgravity platform. Long term, microgravity platform for experimentation.

{respondent} – PIMS are superb. Everything at JSC was great. Crew training was great. Handover people were skilled and knowledgeable. They were wonderful.

{respondent} – I think based on our experiences that there is a high level of adaptability. I mean I think what we saw was that very quickly we were in different circumstances and the program reacted quite well to having us do things a little bit differently than we had planned and helped us do that. I'm not sure that we would have all thought that we could have turned this around as quickly and continue doing education without the help of a lot of folks who were able to think outside the box a little bit and get this done and get things done for us.

{respondent} – One thing is that we have quite an extensive post-flight data collection schedule. You know we collect data on R + 1, 2, 4 and then 7 and then we collect it out here at 24 approximately. It's a pretty intense post-flight schedule and we've had a lot of support in terms of doing it not only from the program but from the crew members themselves because post-flight is a difficult area when they're readapting but they've come to every session and done everything, particularly on 8, so I'm impressed by that. I didn't expect it, but still it's nice to see. We've had really good support on that front.

{respondent 1} – I think their major strengths are a lot of the people they have working for them.{respondent 2} – Experienced people. {respondent 1} – But sometimes that's also a weakness too. Well, certain people. {respondent 2} – So the strength that comes in the people that have years and years of experience maybe going back to the Spacelab days, they had to switch gears a little bit to support Station, but it seemed like that experience wasn't carried over and it's helpful. {respondent 1} – Well and they're the ones that are able to think outside the box so to speak. They can look at something and determine what really needs to be done to get the payload out there and flown and they're not stuck thinking about these little details that really don't mean anything. {respondent 2} – The other strength I can think of is I think the real-time operations process is pretty well nailed down. I mean it seems to work for me but I'm a pretty flexible person too and I like the way that operates that you can get things done quickly if you really need to.{interviewer} – Really?{respondent 2} – Now you have to know who to talk to and how to talk to them, but it's possible. It is possible. Sometimes you can get an OCR that kind of gets stuck in the process, but if you make a few phone calls and you stay in touch with these people, you know you can push it through pretty quickly.

{respondent} – I can't really think of any major weaknesses or anything like that other than the fact that a couple of questions ago we talked about in other payloads, improved communications with the crew on orbit is always a plus and that I would say has been improving so that's a major strength of the program.

{respondent} – I think the organization is strong in being able to integrate such a complicated set of tasks and to funnel that all down to 2 crew members who have to do so many things and to still satisfy so many different requirements, especially with the ever-changing situations and being very structured and yet being very flexible.

{respondent} – It provides an opportunity to do experiments you can't do any other way. A major strength is that the highly structured nature was a very interesting and valuable experience because normally as an academic we don't work on projects that are as complex and you're not trying to integrate into something as detailed, and therefore what sometimes can seem like an arbitrary rule when you understand in the context of trying to plan this enormous schedule on a multi-billion dollar project, I actually learned a lot about management and was impressed by management techniques and structure. Like I never knew what a GANT chart was. As a typical investigator I have to deal with only a few number of people and I'm usually in charge of it so this was valuable to see how you managed such a structure. {interviewer} – So you developed a certain appreciation for this? {respondent} – Absolutely and I enjoyed that and it was a different experience.

{respondent} – The main strength of the ISS program is the long duration flights and what science can

come out of all of that, that gives us a lot more than just the short Shuttle flights ever gave us. As far as the personnel that help make it happen. {interviewer} – the organization that helped make it happen.{respondent} – I guess it's strength I was hoping would have been that it can be a louder megaphone for us when we run into trouble. Unfortunately it didn't turn out to full fruition. But there was a lot of talk. It made it to the crew office and it made it to a lot of different people. To help as an advocate.{interviewer} – Ok, to some extent a strength is that it has great potential for advocacy. Maybe not always meeting that potential.

{respondent} – I think once you've gotten over the hurdle of actually getting your hardware ready and getting the procedures ready and everything and you're at the stage we are now with we're just trying to fly and get our end up, I think the program does a pretty good job of pushing and continuing the work once it's been started. You know there's a big huge activation energy at the very beginning but that seems to level off a little bit into something a little more reasonable afterwards.

{respondent} – I'd say very strong engineering support. I'd say crew member interest in life sciences experiments. I'd say program commitment to life science, and I mean that in the most global NASA sense. So those are 3 that I think I'd go with.

{respondent} – The major strengths of this program are the dedication of people, the PIM and *{name}*, *{name}*, *{name}* and *{name}* and their counterparts at Lockheed, *{name}*. I mean the people are truly committed to the projects and they are the primary strengths of the program. They watch out for the science, they are looking out for my interests. They do a fine job of it. The extraordinary personalities of many of the crew members, unbelievable. People who gravitate toward this sort of special duty tend to be extraordinary people anyway, but I have been very impressed with every astronaut that I've met with their dedication, their intelligence, their thirst for information and sincere commitment to the science.

{respondent} – I think the major strengths of the ISS Program are the dedicated and knowledgeable individuals in the integration or operational realm. So once you've finally gotten down to business, ok we need to train crew. So everybody involved with that was great. Ok, we need you to – let me speak about software since I went over that momentarily. We had a very robust educational CD ROM that we created of experiment unique software. I had to do a little bit of behind the back trick on this so NASA wanted to call this a crew training CD ROM. Well then I have to conform to all of these NASA educational standards where between you and me, are 1950s. So to conform to their timeline and their ridiculous requirements completely took any educational value of this program out of scope. So we called this experiment Unique Software and avoided all of those constraints. To do that I had to have a number of your very good personnel evaluate whether or not this was compatible with the information system on Station and that it wouldn't lock anything up or use resources that weren't appropriate. The guys that did that timeline were fantastic, very innovative, very forward thinking individuals. I can't say enough good about them. The folks in the TFC where we did all of the on-orbit activities were phenomenal. They worked schedules like you wouldn't believe. The astronaut support team was fantastic, the Mission Control guys were great, the crew surgeons who helped us out. Everybody on the operational side, this would have been a 10 out of 10 if I could have avoided anything else and just dealt with those individuals.

{respondent} – I've had two experiences with PIMs now; the first experience I had was very little value added. I thought this was a great example of how it should have been done. The concept of the PIM when it was executed was excellent and it was a great thing; I have also been in a position where it was executed with very little value added and basically it just created more work than it saved; I thought it was a great strength; after I saw it work right I was like ok well I understand now and if it worked like this every time it's a great thing. I thought the training guys streamlined and tailored to fit the size of our activities very well; the people that did the OBT and defined what was appropriate for this type of activities; the procedure development which was actually our own team, they did a good job of streamlining and trying to get things together.

{respondent} – Based on the experience that we had, I would say that the major strength is that there are many people with broad experience for technical aspects in several fields so this is helpful during the

development because it's important to have some cooperation from people that have a full knowledge of the technical matter, so that's what we got during the development. And I think ?{interviewer} – Great. Any other comments about the strengths of the program?{respondent} – No, I think it was the one that I mostly appreciated.

{respondent} – I like how everybody is enthusiastic about getting everything correct and working. Everybody is enthusiastic about integrating all of the aspects but also – I'm trying to explain this and it's hard. Well, everybody knows what their role is and everybody likes to get things to work so they have to be enthusiastic in order to meld with the other roles and that goes from all of the different branches and levels of the project.{interviewer} – Anything else? You had some pretty high ratings throughout the survey if you want to take a moment to reflect if there's anything else you would like to elaborate on.

{respondent 1} – The greatest strength, as always, has been the availability of continuous microgravity. It's major strength is that to the extent that it does provide crew time to run experiments in microgravity. {interviewer} – Ok, so that's good. You talked about its strength in terms of the capability. Now if you look at the part of the program that we've mainly been talking about today, which is the so-called ISS Utilization Program, i.e. the Space Station Payloads Office, the POIC, your payload developer, everything that supported you to get FDI done, if you look on that what's the greatest strength of that organization? {respondent 1} – The whole organization for the real time ops is stellar. The checks and balances are in place to try to optimize the utilization of crew time to make it more efficient I'm a little more ambivalent about. Because on the one hand, if you go in that direction there should be even more of it to make sure that everything that the astronaut is going to actually do has been checked out safe and there's no more human error anywhere. On the other hand, the ability of an astronaut and the PI through all of these teams to grapple with the incontestable problem that's at the root of the science is very hard to get to that point. You get to do so little at each point in time and it takes so much work to do each point that I guess we would say we're very sensitive to anyplace that there isn't support. That the support is needed given the monumental challenge of doing science in space.{interviewer} – I see your answer as bleeding between strengths and weaknesses, maybe even more toward the weaknesses side. Let's go into that weakness side a little more. {respondent 3} – I had another combination strength/weakness. A major strength is the concentration and expertise that does exist in the program.

{respondent} – I think overall they've done a pretty good job of organizing it. I think that the expectations were made clear and I got a lot of help. There was a lot of beau racy but I got a lot of help in going through it so there were no glaring omissions. I think the space program in general and the life sciences part that I've had contact with. The caliber of the people is very high, smart and really motivated and helpful and they take a lot of pride in the program so it makes it as one strength that it has been a pleasure to work with these folks. I mean the folks that I dealt with were great.

{respondent 2} – One strength would be and this is selling point that has been built for space station, but having more time on orbit. On Spacelab with some of the problems we've had both on *{a previous investigation}* and *{our present investigation}* , that would have been the end of our investigation. We would have had to come down in the Spacelab days, but with the space program a major strength is that we can put the hardware in a safe state and take a month to figure out how to fix it if we need to. We can spend a couple of days learning what to do to fix it or we can spend up to a month coming up with a solution to fix it and getting the hardware back operational to get good science.{interviewer} – Ok, so that's sort of the capabilities of the station as a platform. What about the organization that supported you flowing all the way to the payloads office, again out to the POIC and so forth. What do you think the strengths of the organization are from that side? {respondent 1} – I would say the communication and interaction with the different teams, with the people. That was good, because that is important to be able to get things done, to be able to talk to people and we all understand each other and we could get together and we could make things happen quickly and that was the case. Everybody was working. {respondent 2} – As payload developers we've had different viewpoints depending on how little sleep we get during on orbit ops, but the overall feeling is that people want us to succeed and are willing to do what it takes to help and at the same time there's an appropriate level of oversight to make sure that if there is a problem

that it's not a real problem that will hurt the crew or other station components. I really think the people want us to be successful and they're willing to help, like (respondent 1) said.

{respondent} – The major strengths of the program are really the positive people that work the issues regardless of the hurdles. It's people like you and Dean and the management in OZ, the Marshall people. They all have very positive attitudes that they're going to make this work and do the best they can. They're very professional and there's all kinds of hurdles so they just keep working on and working the issues.

{respondent1} – I definitely feel that communication is a strength. I think it's improved.{respondent 2} – It's improved. I think that their commitment to the evolution and improvement of processes has been very helpful at every level whether it's the decrease in paperwork or the decrease in time for review or things like that or something else. I think that ability to change for the better has been one of the biggest strengths and, of course, the individuals that are involved have been very helpful.{respondent 1} – I think that being a strength now was a weakness to the program previously because as a payload developer we went to many forums. We were one of the first payload developers and we worked very hard at trying to make suggestions on what would improve some of these processes that we were working to, in terms of PDL and PODF and so forth and the response we'd gotten from the program was slow. It's happened but I think when these suggestions, and it's always like that when you start up a new program anyway, but I think that those inputs should be taken into consideration and try to work them. Whenever you have a payload developer saying this is cumbersome for us or is there a way of making this less redundant, you should take that information and try to incorporate it as quickly as possible. It's more efficient and cost effective.

{respondent} – Well, stuff did get done eventually. I mean all of these tasks are split up among other people. We got our science and we got good data. That should not be ignored or forgotten and so even in the midst of all of these problems that could be improved, it still got done. It's this thing floating above the Earth that basically allows me to do ? benchtop science in an experiment and that's just incredible. I guess another thing is none of these comments have really dealt much with the astronauts and at some level the interface with them has been fantastic. Mike Foale sent down a lot of comments and took a bunch of extra pictures and had two crew conferences. I mean that interface wasn't addressed by any of the specific questions. I mean that guy on a scale of 1 to 5, I'd give him a 10. When we finally got to the level of dealing with the astronauts and the organizational structure makes most of that transparent ultimately. That was just really cool. He got excited and we had some great chats and good data so I shouldn't lose sight of that. So in that sense the structure of a lot of people and the big delegation of responsibility, the upside is that most of the details are transparent, most of them. So that's good.

{respondent} – This is kind of hard. I think the maturity of the program is a strength in that the program probably is lately getting a better handle on what it can and cannot do relative to research. I can't really think of anything else right now.

9.2.4 Program Major Weaknesses – Comments from Increment 8

{respondent} – I think first of all, the level of detail that has to be prepared for the experiment itself and for the payload which obliges the PI to take always step by step and I think this is positive, but this is a point in which the normal PI is not prepared. You know I have the double edge so it is normal for me to think in terms of procedure and experimental apparatus' and so on, but normally just for a scientist it's more difficult to concentrate on the operation.{interviewer} – Yes, I understand. It's a different world between a ground based laboratory and then having it done in space. Something that not all scientists are prepared to deal with.

{respondent} – How we deal with the Russians. That seems to be a very contentious relationship. It's kind of frustrating and I'll consider myself an end user and as an end user to have the program in between us and the facilities and why we can't just use them causes a bunch of head scratching. You know once

you cross the hatch, it's a different world and it shouldn't be.

{respondent} – I think that's not a fair question given the situation after Columbia. {interviewer} – Ok, an organization is an organization. It has a certain structure. It's been setup in certain ways. Some of that is independent of Columbia. So what do you think are the major weaknesses of the ISS utilization organization are? How things are organized to support you as a PI? {respondent} - I think I'm reasonably well supported. I would say a major weakness of the ISS Program and it may not be predicated on Bush's exploration initiative, but apparently they're not viewed by somebody as a scientific program, or it's not worth doing science up there or this is a bad word or something here. I don't know. I mean they cut all of our programs for stuff.

{respondent} – See previous comments.

{respondent} – I would tell you that I think from our standpoint, at least for *{our investigation}* , that we have seen a continual steady process of improvement as far as the point of contact and information sharing. I think the survey itself is one of those things that you feel a real desire on the part of the program to make things better for the payload developers and the PIs.

{respondent} – Again, since we got everything on Increment 8 in regards to data, I don't see any major weaknesses, at least at this point.

{respondent 2 } – Just as there are people in the program that are considered strengths, there are also maybe individuals that are considered weaknesses, but I think in general the weakness is that there is such a high turnover rate, it seems from the outside anyway. There are like a few core positions that tend to be the same people over and over and that's great. But there also seems to be a large turnover in some of the support positions.{interviewer} – Ok, can you think of an example?{respondent 2} – For example, our PIM. We had a great PIM, everything was going well, we were really happy with her, we were getting to know her well, then suddenly she moved on to something different and another PIM was thrown at us but that didn't work out, he had to go away temporarily so we got somebody else in the meantime. That wasn't permanent and then we got another permanent PIM.{respondent 1} – And then we got one of the others back. It's a mess.{interviewer} – All right. I hear you. This is a focal point for the payloads office about PIM turnover. They're aware of it. It's being worked.{respondent 2} – And something similar with PARC For the longest time I had a really great contact person, Susan Davis. We knew each other well, she knew our processes and operations and our hardware really well. She got promoted so I'm really glad for her. It wasn't a turnover, she got promoted, but since then we were assigned two different PARCs depending on what hardware it was.{interviewer} – I'm sorry, you used an acronym that I'm not clear on.{respondent 1} – I'm not sure what PA{interviewer} stands for but they are basically our point of contact for inputs to the iURC system.{interviewer} – Ok, that's fine. Your POC for iURC. I know what that is now.{respondent 2} – But I've noticed recently there's a little bit of shifting going on there too, so it's frustrating. You get to know somebody, you're working with them, they understand your hardware, your needs and then they're gone and you get somebody new and you have to start over. That's frustrating. Not very efficient.

{respondent} – I would say NA. We have ironed out a lot of things so I would say on this particular expedition there isn't anything I can say.

{respondent} – A weakness that goes with that is that it makes it very complicated so it's hard for an outsider to know where to start in dealing with it.{interviewer} – That's been a running theme from outsiders is how difficult it is to walk into something so gigantic and complex and mesh in and acclimate. It does take a lot of time and patience so you're not alone.{respondent} – Yeah, I can imagine. I work at the VA and I did my dissertation in the Soviet Union so big bureaucracy and all tend to have these things.

{respondent} – It's highly bureaucratic.{interviewer} – Would you say that in regard to the program itself or the utilization program in specific?{respondent} – It's just utilization. That's my only experience It seemed there were a lot of forms to be completed and I say that sometimes it wasn't always clear to me that all of them were necessary, although you know like Franz Joseph the Mozart in the movie Amadeus, you know he said there's too many notes. He says which ones would you like me to remove? I'm not always sure exactly which ones are unnecessary. I don't have enough experience to see how you would;

I’m not enough of a manager to know a better way to manage it. That was just a perception.

{respondent} – Relationship with our international partners. Commitments to decisions that were made at even high levels falling through. That’s going back to BDC.

{respondent} – We talked about them.

{respondent} – Interaction between experimental teams and the operational side of the house. Difficulty with Russian data collection. The difficulties created by Russian involvement.

{respondent} – I am so pleased with the way it’s going, there’s no major weakness that I can think of. Even this survey isn’t that bad.

{respondent} – I think I’ve touched on most of those. One of them relates to redundancy of requirements, excessive NASA timelines. I guess turnaround time was prolonged in many things, in even the most simple of things. The multiple miscommunicating or communicating silos of the various teams. You know what’s really tough is that as an outsider, and I guess I’m not a complete outsider. I’ve worked with NASA for 8 or 10 years, it’s still hard for me to know who’s job is what so when you have a specific task, who’s supposed to do this so you; my experiment team was pretty good at ultimately figuring out no this is the responsibility of this person or this office. I don’t know how you figure that out without an awful lot of information from insiders.

{respondent} – Inability to prioritize across the program; the lack of the no up mass payload process definition.

{respondent} – Maybe for weaknesses I could say that the ISS Program is a big fort for small payloads because as I told you a few minutes ago, sometimes it’s not so easy to understand which of the several requirements are applicable or not to the payload, but it is only at the beginning. Because once you understand what is the iteration you have to follow, the team can support you for a smooth development.{interviewer} – Ok, but I understand your comment and I’m just going to repeat it for the tape and that is, “at the beginning, at the outset of a payload, the structure of the requirements can be confusing because it’s not easy to understand which ones are applicable and which ones are not applicable. {respondent} – Yes, I understand that the ISS Program is related to every kind of a payload starting from the MPLM and ending with *{investigation name}* but of course you can understand that the MPLM module has different requirements from *{investigation name}* but the development documents and applicable documents are the same so maybe it’s confusing at the beginning, especially the first time it is approached. I’m sure that if a developer can have the opportunity to develop another payload for the ISS this development would be smoother.

{respondent} – We already touched on the one we thought was the major weakness and that was the{interviewer} – the process flow and schedule.{respondent} – The process and scheduling and everything. The flowchart would help tremendously probably. I mean there may be one, we just may not have had access to it or something, I don’t know.

{respondent 3} –The weakness is that it sometimes took us awhile before we could identify that person, but once they were identified, then we could go back to them for lots of help.

{respondent} – I would say the weakness is the exploitation of the science part and the ability to generate new ideas and to get PIs working. I know people are trying to do that, groups like the NSBRI. It’s not easy to get going but that’s sort of the deficiency right now. The science is being done but it’s almost as if no one’s listening. I don’t know how to explain it.{interviewer} – I know. {respondent} – Some of the major weaknesses that I ran into in Increment 6 aren’t really there anymore. That’s probably maybe like a crisis plan that anticipates future crisis and what form they might possibly take and then how would you adjust the science as a result of that. That doesn’t mean having a specific plan for adjusting science, for that particular instance, as much as making sure that there are at least channels of communications to avoid this whole problem of parallel channels of communication. I honestly can’t think of anything else.

{respondent 2} – I know Station is going to get better. Even though we’re getting more KU band downlinked than we expected we still do go through large periods of video outages, COM outages. It’s made our planning a little bit more difficult so that’s a technical weakness right now and we know that Station’s going to mature where they’re going to be able to provide more KU band for video, more AOS

periods, more coverage. {interviewer} – Especially for video, right?{respondent 1} – For us, it's primarily video but I guess to convert to go along with that commanding. We'll sometimes put our experiment on hold until we can get another KU band or we'll program the hardware to translate at a very slow rate and just basically wait out the LOS on occasion. For *{name}* a lot of the science he wants to do is very real-time video based where he can see what's going on. So a weakness right now would be the AOS coverage for K band is not as great as it will be in the future.{respondent 1} – Also trying to get the video down. We used the BTR and just trying to get the docs down after a run would take forever because of the COM coverage so I'm just adding to what (2) said.{interviewer} – Again, thinking about the organizational aspect of things, the payloads office, POIC, are there any weaknesses to the organization that you would like to draw attention to?{respondent 2} – I don't know if this applies necessarily for Increment 8, but the payload's office has been improving their process and we're aware that the payloads office has a desire to try to reduce the requirements on investigations. I know in the past a lot of times we, *{our investigation}* felt like we were treated more like a larger facility class payload than a sub-rack, but that process has been improving too. Like the requirements on a sub-rack, the acknowledgement that sub-rack payload teams may only have like ten people at the core working on them and they go in a facility. I guess that's been improving though and I know MSG itself is working on their ICD with Station in regard to verification submittals and deliveries trying to reduce some of the verification delivery requirements that investigations have to provide if the investigation doesn't have a direct interface with Station.{interviewer} – I hear you. I used to work microgravity requirements and I understand all about that.{respondent 2} – I don't know if that would be a weakness. It's been getting better. The amount of requirements and verification put on investigations. That's always a hard one. There are a lot of things to do to make sure things work which you want. Grounding and bonding has been an interesting one. I think MSG has been working that too. There's a lot of grounding and bonding requirements that looking at them could be really design goals and if an investigation meets their electromagnetic interference test. A lot of the grounding and bonding requirements are really design goals to help you meet your EMI test. {respondent 2} – We noticed during Increment 5, Peggy Whitson was very good about setting up the camera in the module and we could watch her set up hardware in the facility and sometimes we would notice that maybe, you know she did a great job most of the time, every now and then a piece of hardware was turned 180° from how it was supposed to be installed. What I'm driving to is I think the astronauts have gotten away from using that camera during setup. Am I correct (1)?{respondent 1} – Well I think it is a crew preference for them to set the camera up. I don't think that's something that they have to do. This is a crew preference so that was something that Peggy did for us which was a good thing, but some of the other crew they did not, so I really don't think that's something that we could.{respondent 2} – So maybe that's not a weakness for 3.2.2. {interviewer} – Ok.{respondent 2} – The observation is when the crew does exercise their preference to put the camera up and we can see them set up the hardware, we can get a real-time feel for if everything is proceeding smoothly or if we need to get PayCom to go up and say, "hey by the way you may want to check that cable connection again". But maybe we could leave that off of 3.2.2.{interviewer} – Ok, that's fine.

{respondent} – I still think that the fact that there are really are two ISS programs instead of one. You've got a US one and a Russian one. Now that has nothing to do with Earth Obs, but that's my overall ISS program thought and I see that as a weakness even though we work together constantly it's just a them versus us type thing and it just doesn't seem that we've ever been able to quite get it coordinated or get the Russians to coordinate with us.

{respondent 2} – Some aspects of what we describe as strengths still remain as weaknesses to some degree. In particular, the communication issue in the sense that sometimes the on orbit activities do not necessarily match with the terrestrial activities in relation to holidays and other things going on. In our particular experience we had our busiest time was around the time of the end of the year holidays here on earth and I think if communication would have been better, we wouldn't have run into a particular incident in which we had not received communication about other entities that we expected to be around but were not. We had on orbit operations and the PI was very anxious to obtain his data and we were

unable to have the data processed.{respondent 1} – In terms of quick turnaround so there was a delay and the PI, I think, was disappointed.{respondent 2} – So we need to improve that aspect of communication so that things like that won't happen again when there are on orbit activities regardless of the schedule here on earth.{respondent 1} – I think it's important that we ensure that every aspect of the infrastructure is in place over holidays so that when these activities take place that, and in this particular case one of the labs was closed, so we did not get the information to the PI when we should have. It had to do with processing some video. And we need to probably, we're taking the blame a little bit too. We should have probably double checked with those folks to ensure that the lab was going to be open and they could process our downlink video.{respondent 2} – Again what made things a little bit harder at this time, was that we were able to get a lot of crew time over a short period of time so we were wanting to learn from the results of each of the activities to be able to apply it to the next activity in a much more constrained schedule and at the same time it was the period around the holidays so that made it a little tougher as well. But there's a lesson learned from that.

{respondent} – The bad part of everything being delegated to a lot of people is they tend to fight with each other so I ended up getting caught in the cross fire between some political and fighting between *{organizations at different NASA centers}* which was not very much fun at all. Basically, *{name}*, the LIS, was able to get a lot of stuff to happen that I guess was more or less inconceivable with getting time and getting access to the crew and talking to them and allowing me to send up documents and I was told by *{my Payload Development team}* that many times they had never been on an investigation where something actually worked this way. But after a certain a point when it became clear, I think that in particular *{name}*, I don't know exactly what her job title is ({interviewer} – Project Manger/Payload Developer). I think *{the Payload Developer had concerns that organization structure and roles and responsibilities were not being followed}* But basically I was not really aware of all of this structure coming in, ….. this being my first time. All I know is that there were a whole lot of people that I was getting email from that had a whole lot of acronyms afterwards of which I understood very few. So, basically I would send them emails saying this is what we found, they is why I'm excited about it, etc. and I basically just interacted with the people that wrote back. That was just a very natural human thing and the person who wrote back the most was *{name}* who also happened to be the LIS. But she told me that she likes the fact that *{my position is different from most ISS investigators}* and I'm not really trying to strategize or look out for some kind of positional development. All I know is the data is cool, I'm excited about it, I just want to get more data, I just want to do my science, I'm having a good time and not much is coming through in my emails. I'm not writing all of these things super carefully to see if somebody is going to be looking over my shoulder and I'm saying something that's going to get me intro trouble later or whatever, because mostly it's just about the data. So, she also haven gotten a PhD from MIT also is a scientist so we do end of talking about the science a lot more. So, I didn't really talk to her as if I'm trying to manipulate my way around *{name}* to get all of these extra things done. It's just there's somebody who is interested in what's going on and we're having a good time, whatever. I think this caused the *{Payload Development team to have concerns that organization structure and roles and responsibilities were not being followed}* As far as I'm concerned, I'm not violating my own procedure. I'm the customer here and I believe I should be able to talk to whom I want. So at that point they were, and I don't know if this is a weakness of the program or just a characteristic of my experience.{interviewer} – What you're saying is entirely relevant to the question.- {respondent} – So that was extremely unpleasant *{to have different, sometimes contentious, views on organizational procedures than the PD}* Another thing and maybe this speaks also is that there seemed to be a bureaucratic approach to getting the science done because the *{our investigation}* had several PIs and at certain points *{name}* said to me, "well you got your science done. You need to get the other people they're stuff done too". Whereas, in science it really doesn't work that way and we're certainly pretty good friends all among the PIs here and it seemed as though there was sort of a set of paper goals for science which we had to make up because we didn't know what we were going to find. That's the way science goes, right? So we found some more interesting stuff and instead of really pursuing what. I think

it would have been more sensible to sit everybody done and figure out for the whole experiment what's the best way to go scientifically, not that's there's conflicts but who's stuff can wait, who's stuff should go as opposed to having a bureaucrat make that decision who doesn't understand any of the science and being told we're not going to look at any of your samples the next 6 months because you already got what you wanted which is not true. So, that approach might usefully be fed in somewhere else. That's another thing. They make you define these science goals but if you know what you're going to find it's not very good science to begin with. {interviewer} – So, you're saying a certain amount of flexibility and adaptability in planning as related to your science.- {respondent} – And a lot of NASA's greatest success is with science on orbit, not necessarily with the Space Station, is because you see some promising results, you follow it up, you change directions, you adapt and then you get something really cool that you didn't know you could look for. And if you sort of squash that you're not going to get anything that's all that significant because the whole point of going to space is it's an environment that we can't simulate on the ground. If we could simulate it on the ground and get close to what we wanted, then why bother with all of this. So in that sense, yeah we started seeing stuff that we hadn't expected to see and all of a sudden I was being told that I got my goals done which certainly wasn't even true because our goals were not goals of scientific learning. The goal was ok we need X many photographs at certain times and at some level that's not a goal. You don't publish a paper based on we got these photographs of such and such. The goal is a new understanding and a new idea or understanding what you're seeing and it seemed like some of that was getting squashed because it conflicted with bureaucratic, sort of ok check you got your photos at X times and that's it as opposed to if we have a couple more photos we can learn so much more and how can we work this in a sort of overall sensible manner, and so I think *{name}* at that point sort of came in and started thinking about this because it's obviously her job to do this and then the *{center-to-center issues with authority and chain of command resulted}* So that whole thing as far as the interface with the ISS program was definitely, definitely no fun for me.{interviewer} – Everything you've said is appropriate.{respondent} – I don't mean to be just sitting here harping about other people.{interviewer} – We know how to handle this type of feedback. It's going to be looked at carefully. We evaluate it in terms of very real and specific things and summarize it in terms of key things and we'll look at your comments very carefully. Don't worry.{respondent} – Yes, but I just want to make sure that *{any issues will be handled appropriately}* {interviewer} – No, you won't.{respondent} – Ok.

{respondent} – I'm looking at weaknesses and it's going to sort of sound like what I've said about strengths I'm also going to say about weaknesses. And that's that it's very hard with the fact that we're now launching and landing in Russia and we don't know exactly when Shuttle is going to start flying again and exactly what level of support to Station it's going to be given. It's very hard to reliably plan. In a specific sense, we would go up there thinking we've got X amount of Progress space and then we find out that that Progress is not going to launch and it's real hard to figure out what you can do. Also a major weakness of the program right now is that we essentially have no upmass capability. With a 2 man crew we have not nearly as much science capability as we should have on that space station.

9.3 Lessons Learned

Continuing the approach used in the Increment 5 Survey, the Increment 6 Survey asked interviewees to comment on their Lessons Learned, which were defined as either: (1) application of successful methods to deal with problems, (2) mishaps that occurred for which the causes were determined later, or (3) the identification of a process or design that could reduce or eliminate the possibility of a problem or failure. The as-received Lessons Learned comments are transcribed below.

9.3.1 Lessons Learned – Comments from Increment 7

{respondent} – PDL rightfully is being looked at and scrutinized. Make sure the PIMs get an adequate

level of training to guide folks through the PDL process and would make life so much easier, especially with the international partners coming on board. If you cannot get things into PDL and IURC you are not going to be able to operate. I think IURC is a very simple straight-forward process and it works well. Explaining the IURC process where you stake your claim to the resources required and you do that through the Code M Discipline Manager. You have to know the process to get your resources required to operate, getting manifested inside and out, if you do not you do not fly or continue to fly.

{respondent} – Particularly regarding operations in Russia we learned through experience that the power situation is problematic. For it to work you need to have a single power converter along with a power conditioner along with a UPS system to even out any of the power drops that occur. That is the only way it works reliably. Those three things are worth there weight in gold, and without them you are sunk. Our setup is multiple computers, 6 camera motion analysis systems, an i-motion capture system and we have various other systems out there and it is a problem not having a continuous power supply. A handbook should be put together on how to set up an experiment out there including what you actually need. We had to send out fans for our equipment rooms that we work in to keep the equipment cool.

{respondent} – Applicable to ISS too as a result of Columbia and re-focus of the Agency. Have as much flexibility in your hardware as possible. Some of the things that have occurred at WSTF – when we originally flew the *{payload subsystem}*. That system is not an {unintelligible} system, it really requires to have our ITU. There is no local hard disk on the RTS so it can boot up by itself. It actually has to go out, talk to the ITU, and uses a disk from the ITU to access its data and act as a local hard disk, but really it is a network hard disk. Because of the way it is set up we have a single point failure that when our ITU is down our ITS is not collecting acceleration data anymore. What we did with the TSATS that we will be flying, and we will actually be replacing the RTS system in MSG with this – the system can actually boot up by itself and it will start collecting data and it sends data out on the Ethernet. If the ITU goes down, we could actually have an express rack, laptop, a crew PTS laptop or even the MSG Laptop or any other way of sending a command to it to have it send the data to a different IP address – it actually allows someone else to connect to one of its ports – and grab that acceleration data. We could even have that TSATS, if we could get the approval from Station to send it directly to the Payload MDL. So when we get the TSATS up there it will give us another means to send the data down, without relying on a single point control unit. We still see the control unit as the central point to send commands, but if we get into a point where we are running critical science data on a facility like SIR, they could grab that acceleration data with their own data acquisition system, without having to send it to the express rack through a control unit. This is something that we need to look at, and that includes have standard ports on facilities, so you can plug in different types of sensors that are more generic, which would also allow us to move sensors around, not just talking acceleration sensors but any type of sensor.

{respondent} – Maybe some of this info could be included in the CD that was mentioned before. From the beginning of the development get a clear understanding of the scenario and various stages of the project. Especially with all the different areas that must be covered. Interview terminated at this point do to telephone difficulties.

{respondent} – My advice to any future PI is not just think of the immediate requirements of their program but the structure of their program in terms of data sharing plans and other requirements, as to what they will maximally need. Look at ancillary areas as well, and cast a broad net, so you can avoid having to resubmit paperwork down the road.

Comments move to “Strengths” per interviewer’s remarks for transcriptionist.

{respondent} – One must be flexible. Just learn to expect that things don’t always go as planned.

{respondent} – I think from the PI point of view I think that the first lesson learned is that the principal investigator must be prepared to change his schedule, be flexible to accept constraints coming during the increment so from a PI point of view the way he conceives the experiment is always to be flexible because if it is too tight to a set schedule, then maybe. What I mean is, just to give you an example, we had foreseen to perform the protocols one each, one protocol every month. This was not possible and we had to perform the protocol as pre-planned by your people and it was possible because the scientific

result of our experiment was not so much related to a fixed schedule so what I mean is any experiment of physiology to be conducted on the ISS has to be considered with enough flexibility in terms of a schedule shift so this is the first lesson that I learned. And this I'm also saying to my colleagues in Italy which are preparing experiments for the ISS, especially the human physiology, I'm trying to teach them that they should try to avoid giving too many constraints in terms of a specific time of execution on the experiment.

{respondent} – It's the same stuff. Pay attention to your KU and S band schedules and be able to plan your experiments around them since you're trying to do live stuff. Things are expedited when you have direct communication. Again, this is an Increment 8 thing.{interviewer} - You can throw it in.{respondent} – I think experiments are expedited when you have direct contact with the crew. Keep your SAMS unit on. Make sure everything gets stored in the right spot. Try to avoid OCRs.

{respondent} – Prior to Increment 7, process for our payload, for our procedures, had been housed at JSC and with this payload we moved that to Marshall based on recommendations from the PIM. What I had found in the past was that there were some gaps that perhaps were not definitely corrected by putting everything at Marshall that I think made us better in that our operations probably were improved. We're in photo TV and for whatever reason that had been kept at JSC even though most everything, I think, had moved to Marshall and so our procedures were in one format and by making the change to Marshall we became standard. We adjusted to another standard which I think all in all probably benefited crew members and perhaps resulted in better on orbit operations. We should have done that earlier, I'll be honest with you. I don't know why the previous people did not want to do that in the office and that is a level of support that we had not had in the past because, you know, when folks at Marshall when the OBT people are talking to the iURC people and everybody is there, it gave us a continuity in our process that we had not experienced in the past and so that is probably the best lesson that we gained is from Increment 7.

{respondent} – One lesson learned basically was that improved communication with the crew during real time operations is very helpful for a payload like *{ours}*.{interviewer} – That's good. You see that kind of comment will help as other earth obs payloads hopefully get flying once the WORF gets up there and so forth.{interviewer} – In fact, actually it's not a bad theme if you think about the other Earth obs people that might be flying in WORF in time to come. What kind of advice would you give them?{respondent} – The opportunity for interactive discussion with the crew about upcoming Earth obs the target they are going to observe and photograph is very important for clarifying the scientific intent and therefore the science returns are much higher. That happened during Increment 7 and we were delighted that the crew asked some questions and clarifications. I.e., you sent us this operational flight note and we didn't understand it. So I think the lesson learned was every crew communication really made us feel better and at the same time our scientific output went up.

{respondent} – I don't think I have anything very specific. I guess it would just be something general. Again, I think the fact that there's a great team of people out there but it's confusing to know who does what but once you learn that then it can be very productive. That's pretty much what I said before.{interviewer} – But we could say – make sure you learn roles and responsibilities as soon as possible.{respondent} – I think it would be worth adding something about the Russian side of things. {interviewer} – We haven't talked that much about the Russian side of things. If you want to throw some things on that in here, we wouldn't mind. It's an important issue that the payloads office and NASA management is looking at so if you have anything to say about it you can say it now.{respondent} – Again it's kind of vague but I think that the Russian's operation or whatever we want to call this whole group of people that the Russian side has a very different work style than the American side has and in my experience they are both effective, but it can be difficult when you need to negotiate working with both at the same time in order to get the data. It can be confusing. I think it's important to be flexible. The sort of NASA way of having everything planned out ahead of time as to who's going to do exactly what, that could be very good but then if something comes up that prevents that from happening, it's not necessarily a problem as the Russian side is very good at adapting to changing situations in my

experience. I think the fact that these two groups have different styles and are working together could be frustrating for both and that frustration could make it difficult. I think that's something that could be reduced if the two sides could be accommodating to the different styles rather than trying to expect the other side to have the same styles they have.{interviewer} – e.g., the attitude "Why can't they be like us"?{respondent} – I think that's a common question. Why can't they just do what they said they are going to do?{interviewer} – Yes. The attitude "because our way is so obviously better".{respondent} – I think that's how it works too except when you have two classic styles. That can be a mess.

{respondent} – Having a translator available to help with shipping items back to the US. I think my science manager would be better able to answer that question because I think she learned some things but as far as handling the interaction would be support over there. It went pretty smooth this time around. I think there might have been some other things they did that I don't know about, but I know this official handling and the fact that we already had our lab over there made it easier. The first time we were sort of looking around for a place to set up our equipment as opposed to having it already there.

{respondent 3} – I think learning about the bubbles is critical for all cellular experiments using TCMs.{respondent 2} – Does this first part include procedural issues?{interviewer} – Yes and in particular if you had an issue where you had a problem and you found a way to fix the problem or get around the problem and that knowledge of that you think would be helpful for the program to know about.{respondent 2} – When we make changes to procedures and use the OCR to do so, a lot of the time or most of the time it's because we've learned something and to need to adjust the procedure and it's not because there is a mistake in the procedure and I think there's a problem that it's looked at by NASA as there's something wrong or somebody has made a mistake and the OCR needs to be looked at or there needs to be a different category or maybe like a scientific OCR or something like that because people have made comments to me that people are going to get into trouble or there is some sort of issue or it's looked at as a bad thing when you make a change to a procedure, and I guess we're the only ones who make changes to procedures all of the time. It just needs to either be looked at differently or understood that there's nothing wrong with changing the procedures that we're changing it for a good reason that otherwise it's not going to work right or there's a reason behind it and in fact we have to give the reasons why we're changing it.{respondent 1} – I think the biggest lesson that we learned as Paul said was the bubbles, but I think the biggest lesson that I learned was the importance of having and engaging the intellectual processes of the astronauts. I guess I've said that before. But I really want to emphasize it in this summary because we're recruiting these astronauts with PhDs now, they have the background and they need intellectual time to be scheduled for them.{interviewer} – Let me insert a comment – I think that that's a great piece of feedback. Thank you very much.

{respondent} – Struggling a little bit with this because we kind of know what's coming down the road from our organization and I think some of these. There aren't anymore no mass up payloads proposed and funding probably has something to do with that and the refocusing to the exploration of a lot of the pure research. Although I know *{the PI}* I know is proposing to follow on to *{his present investigation}* because it directly relates to in space fabrication and repair is for product lines that is being worked, but I don't know of anything new. We're just sort of struggling.{interviewer} – You've given it your best shot and I would say if you can't come up with anything, that's fine. All we ask is that you consider it.{respondent} – I could say have a positive attitude and know that you may get redirected in the middle of it and you just go with the flow. That's my best advice.

{respondent} – I would say don't be shy at inputting changes to the payload and don't be shy at asking questions of crew members but work with the real time operations team on getting the right questions up.{interviewer} – Did you have any anomalies on orbit or anything with ops or finding targets where you learned something about how to find a target properly?{respondent} – No. I guess for *{our investigation}* if anything for Increment 7, send annotated images up to point out exactly where the site is that you want. That's definitely a real positive thing. We had used that earlier but we really started using that more with Ed's requested site. He had a longer list of sites that he wanted and so we would help him find it that way. We'd annotate the image and send it up. So, if you're looking for something on earth use

annotated images instead of just using a paper type 2D map. Sometimes the maps aren't that clear. I think that would be about it.

{respondent} – I can't really think of any. {interviewer} – Ok. I always think of this question to some extent as if you got a different job and your replacement was coming in on the project and you were training your replacement for a couple of days, what advice would you give to your replacement payload developer for chromosome about dealing with the program?{respondent} – You know my interaction with the program was minimal and really pretty smooth.

9.3.2 Lessons Learned – Comments from Increment 8

{respondent} – In general, technically speaking I don't see anything particular. I think one point could be, especially for physiology, to have more baseline data collection and also more scientific runs of the same protocol during the increment.

{respondent} – Dealing with the Russians is probably getting better.{interviewer} – Any advice on that topic. Say that you went off to do another project and you had a replacement come in, what advice would you give to your replacement about that issue, about dealing with the Russians?{respondent} – You've got to start that process as early as you think you may need it. The US side of the equation doesn't, it's a very nebulous process. I don't know how to get it to work other than I have to request that we get permission to work on the Russian side and that's out of my hands. I don't understand what's going on. I'm probably one of the few payloads that can flip from the US to the Russian side and it's not a defined process.

{respondent} – I think it's important to have a good relationship with the crew and I think you need to have more direct interaction with the crew. I think you need to keep them informed about what you have done, what you're results are and how they're helping you with that. I've been doing that with this soldering stuff and again, this is probably more applicable to the next time you talk to me, but I wrote a one page thing with a couple of pictures in it explaining the soldering experiment and what's been going on down here based on what Mike Fincke has been doing up there to send to Mike Fincke, so I cant' send it to Mike Fincke, right?{interviewer} – You mean you can't send it to Mike Fincke in the sense that it has go thru?{respondent} – I've got to send it to LIS and so the next day I asked LIS if they sent my message to Mike Fincke and they say, that was a great message but we've got to figure out the best way to get it up to him. I guess they're not going to do it by FedEX, UPS, DHL or the US Postal office. I don't think you have too many options, but you know.{interviewer} – Yes, I understand.{respondent} – And then when they do send it to him I don't have idea what they sent him.{interviewer} – I understand. What you're saying is your interaction with the crew, except when it's direct, the interaction is possibly highly filtered and not apparent to you.{respondent} – Not apparent and it seems to take some time and I don't get an accurate transcript or a copy of what has been sent. I can understand some of this. I could have inadvertently put something in there that was probably not appropriate. I don't think I did. In fact, I'm sure I didn't, but I can understand why they might want to look at this.

{respondent} – I say you need to get more experienced and sophisticated points of contact for the investigator and you need to share information with the investigator, particularly the simple timeline steps and feedback from those steps.

{respondent} – I honestly can't think of any positive or negative that would be worth even speaking of.

{respondent} – I think the biggest issue we've already discussed was the UPS. That's the biggest problem that we did encounter and subsequently solve.{interviewer} – So what we could say is "Learned the importance of having uninterruptible power supply units in the post-flight data collection.{respondent} – Right and another thing that we have done now is you really need to go, and it might seem obvious but I think I want to make a point of it. You need to go early for setup, especially in Russia because everything can take 3 or 4 times longer than you think because you don't have the FedEx. What we normally do is that we have two people come about 10 days before I arrive and start doing the

setup and then I would bring anything – hand carry anything – that they decided that we needed in hardware and that seemed to be a very good way to do it. Giving you a lot of pre-setup time is quite important. I think the program needs to accommodate for that particularly for complex experiments like our's. We need, not significant, but we need some time beforehand to really set up and it's not just set up time but it's turnaround time. If you've forgotten a piece of hardware or a piece of hardware is broken, you need time to get it here and then have someone hand carry it there so that can add some significant time, so you need initial foresight to have initial time there for setup but also set up some sort of a fade arrival of folks doing BDC so someone can hand carry something if possible. And also have contingency for other people to hand carry who are heading out to Russia perhaps the last few days before the landing.

{respondent 1} – One lesson I learned from the real-time operations was to utilize the option of video downlink more, take more advantage of that. We couldn't have foreseen ahead of time how useful that was going to be so I think that's a valuable resource that more payload developers should take advantage of and be allowed to take advantage of.{respondent 1} – I started to say now, because we classified *{our investigation}* as a small payload, we couldn't even request that. {respondent 2} – It was something the crew offered and did completely on his own. We discussed it during crew training. He asked if it would be helpful. We said we anticipated that it would be but we couldn't give him specifics but it was something that he chose to do and he found the time to do. And I think that should be something that should be made more available to PIs and not so difficult to get. It's almost like if you ask for it you're going to get turned down to do your whole science experiment because you're asking for too much. {interviewer} – Anything else on Lessons Learned?{respondent 2} – Make your own stowage boxes.{respondent 1} – Definitely.{interviewer} – That's fair.{respondent 1} – And make your own stowage container.{respondent 2} – There just seemed to be some places where there is a double standard as said before where you're almost caught between a rock and a hard place. If you let JSC do it, it makes certain things easier, but you have to deal with them and sometimes that's not so easy. Sometimes it's fine so I guess there are places where there are double standards and you kind of have to be careful with what you choose.{respondent 1} – So be careful what you ask for.

{respondent} – NA

{respondent} – As I mentioned before, I would advise people to talk an experienced colleague about how to interface with the program if there isn't some kind of orientation for them. The second thing that may only be specific to us but we were trying to get repeated questionnaires. Well, you understand having the effort you had to go through to get people like me to answer your questionnaire. But we're trying to get people to do questionnaires on a weekly basis for multiple increments. I'm referring to the ground subjects. That has not gone very well. I think it would have gone much better if we could have paid the subjects, but we weren't allowed to since they are civil servants. I don't know what the solution to that is. Everyone on the ISS team, on our team, made a big effort to boost participation as much as possible, but not very much was possible I guess. So, I guess I would, if anybody was thinking of designing a study that way I would encourage them to think again or to come up with other measures to boost participation.{interviewer} – In your opinion, have you come up with any clever ways to boost participation without running into the barriers that you did?{respondent} – We found that having personal contact with people was really helpful so we went to Marshall and Johnson and went around and met our subjects and thanked them and tried to give them little tokens of our appreciation like patches and small things that are allowable to do and that helped some. I think it was just overly ambitious maybe to ask so many people to fill out so many questionnaires so many times. In our future studies we've designed it differently. That's the one hitch that there's been in I8; otherwise, everything has been fantastic.

{respondent} – The first thing is that NASA is a different organization. In terms of normal scientific investigation, there is a tremendous amount of administrative overhead that's not science but probably a majority of it is necessary. It's trying to do an experiment in a very special environment under very special conditions and so it's a different kind of research that you have to be committed to and be willing to invest a lot of personal time and professional time if you want to do it and I don't see much way

around that simple fact. The only way to deal with it is to just deal with good people and be flexible and willing to, you know you're not going to change the system from within, you've got to just go along with it and do as best you can.

{respondent} – Nothing is coming quickly to mind. I guess number one is plan very far in advance and be ready to be changing at last second. Meaning, we only had 3 baseline data collections but they have to be timed to a certain time frame and with crew schedules the way they are, they tend to be very fluctuating and so just have lots of backup people that can help you because the people you probably plan on driving them and assisting them and understanding the science won't be there that particular day. They will probably be on holiday. Just be prepared for anything and everything which I know is so specific but that's what we ran into. I'm sure a lot of people run into that.

{respondent} – For expedition 8, the major weakness we felt was lack of science advocacy and the communications flaws.{respondent} – From my perspective I think the lessons learned here is that we have to, as a PI team, very closely monitor what decisions and inputs are being made about our experiment at the level above the ESS without our knowledge and so what action we're going to be taking is more closely track what is being done with the inputs from the ESS because our communication with our ESS two ways has been excellent. However, when it gets above that, you know the ESS will provide some information back to the next layer or two up in a chain and what comes back is a misunderstanding or a mis-communication when this has been very clear from ESS's so I think we will be a little more participatory in some of the things that are going up because we do not feel that that is adequately handled at that level above.{interviewer} – but here's an important point because you do feel that – I've got to be careful because you do mention *{name}* and you mention *{name}*. Let me ask about your payload developer who was *{name}*. Do you feel that *{name}* maybe could have also done a better job in that to some degree?{respondent} – That's correct.{interviewer} – Because usually what happens is the payload developer is supposed to try to insulate the PI from these hassles as much as possible and that's often what does actually happen, but we've got a big of an anomaly with you folks here.{respondent} – Especially when we've had previous experience that was not the same as this.

{respondent} – I would say we have learned that we need to be ready to respond to requests immediately. That we need to keep on top of data communication data protocol changes. That we need to maintain a constant and continued interaction with our experiment team at JSC. That we need to establish a personal rapport with the crew member. So those things I think would be helpful.

{respondent} – The engineer who is assigned by NASA, what's the title again? Systems Support Engineer? Or is that the Lockheed person?{interviewer} – You mean the Increment Payload Engineer?{respondent} – The person who has several experiments assigned to her, mine one of them, to shepherd it through.{interviewer} – Yes, it's basically the Payload Integration Manager.{respondent} – The PIMs use of weekly teleconferences during the development phase was extremely helpful. It was a great management tool.{interviewer} – That to me sounds like it might be more categorized as a strength of the program.{respondent} – Oh, I see. For lessons learned then I would say I would like to have a mechanism for more fluidly contacting the on orbit subject, the crew. There should be a mechanism in place for contacting the crew.{interviewer} – And would you say you found that successful route that you would want to pass on to someone and say, "well, we had that adverse or that experience that was challenging but we".{respondent} – But now if I say that they're going to close that loop and then there won't be that backdoor possibility and then they completely isolate the crew.

{respondent} – I also function in an NSBRI smart medical team and there's a whole volume of investigators that would love to have a flight experiment and so I think I've learned from their mistakes, as well and perhaps they from mine. One thing is I think you need an inside knowledgeable individual to be directly affiliated with your proposal for expectation management. Let me give you an example, one of the guys in the NSBRI would like to have 80 hours of crew training time. Now that's a fatal flaw, obviously. How in the hell do you figure that out that that's just stupid to even think about. You need some people that are more integrated to the program. That's not in any of the brochures, maybe it is sort of peripherally, but it's not. The ability to fly new hardware versus trying to modify existing hardware.

Again, I think somebody closer to the ground at NASA is very important. I think having a local investigative partner so perhaps at Baylor or at NSBRI or I have some folks at Wyle who serve as co-PIs on my team. That's huge when you have to go to all of these meetings and they can function as that. So if you're an investigator in Detroit or in New England and you have to come down for all of these meetings, that's a big constraint.{interviewer} – What you're sort of saying and we've heard this before is that it's really difficult to manage if you're a total outsider coming totally into the program with no connection.{respondent} – I would say near impossible at least for a flight proposal. Maybe if you want to fly a clam and then take a picture of it when it comes back you could do it, but if you have any complicated program at all I really think, I don't know how you would inform these people. I think there's just so many layers of understanding that are required that unless you have somebody who's somewhat operational savvy, it would be mind boggling. Let's talk a little bit about redundancy and requirements and paperwork. I know you guys are crushing on that, and G-d bless you. There's more work to be done on that. I don't know how all of the various, you know the safety offices and the payloads integration and all of those guys talk and sometimes it seems like they don't, and so I think making sure that you have a lined objective is good. I don't think that the Code U speaks directly; I don't know if they know where JSC is so it doesn't seem like there is a lot of communication that way.

{respondent 1} – I looked at it as if I was trying to advise somebody that was coming behind me. The first thing I would tell them is not to count on any shortcuts no matter how simple your payload; that would be from a scheduled risk perspective we should have been much more conservative and we should have identified to headquarters that we didn't think it was very high risk and it couldn't be pulled off in the timeframe they were asking.{respondent 2} – We've said it several times but I think the lesson is if we're going to step away from normal processes we need to develop a process up front so that everybody understands it.{respondent 1} – We suffered from the guinea pig thing big time; I know we've made recommendations since then that they've taken; we asked to do away with the readiness review they made up and just go back to the COFR; it was less intense to do it that way.{respondent 2} – But that in itself is awkward in that we weren't flying anything.{respondent 1} – But still we don't have a tailored process but the fact that they tailored one; I guess that's the thing if you're going to define one either take some time and really streamline but just making up an alternate path that still has as much work involved; that was something that the people on the sides that were trying to make up the process didn't seem to get; that the processes they were making up were not saving anything.

{respondent} – I would say that for our experience one lesson learned is that it's real important that the crew is involved at the beginning of the payload development since we got very good suggestions from him concerning the receipt up of the experiment onboard and the way to use our payload. So if the crew was included in the payload, I think it is a very good approach.{interviewer} – Excellent comment. You said you got good suggestions from him? Which crew member was that that gave you?{respondent} – During Increment 7 it was Ed Lu. During Increment 8 it was Mike Foale.{interviewer} – So what you're saying is that the astronauts on-orbit on Station gave you good suggestions about how to improve things?{respondent} – Yes, because at the beginning you know that while they are on the Station sometimes they cannot do the exercises as they would because there is something missing or because they have some other requirements due to work that they have to do during the day, so it was good to hear from him some modification to the setup performed by him during the execution. I remember that one time he was not able to find out where to attach our instrument so he proposed to use another device and he gave us good hints based, of course, on his experience. One other comment would be related to the importance of the Payload Integration Manager that can drive the Payload Developer through the process if he understands the payload requirements and fortunately it was our case. Because if the PIM knows exactly what the payload is and what the payload needs, it can help the developer to find a way to reduce time resources.

{respondent} – I'm going to go through my lessons learned. Some of these are more like experiment basis learned and some of them are overall knowledge.{interviewer} – That's great{respondent} – Most of them are for operations though. In order to get information on the downlink file number and size and

all of that off our files, it took us a while to figure out the downlink process. Like I was saying before, just so we wanted to verify that all of the pictures he took actually did get downloaded and were available to us. In order to do that, in the beginning, we were like, “well of course this will match” because we were getting information from DIMS who was loading it on so we’d have the same information because we’d see the same thing. But we were informed that the information comes from TCO, I’m not sure what that stands for off the top of my head. But they were the ones that actually get the downlink information from the OCA so we figured out that we had to call Phantom on the Phantom loop or on the phone in order to get that information and they would contact TCO for that information for us. It just took us a while to get that figured out because everybody. I don’t know, it was just confusing at first until we got it figured out. At the beginning, like I said there was an anomaly which is what they called it. One of our samples dried out and kind of leaked out into the chamber and we didn’t really specifically tell them at that tine that it was an anomaly. It was just like that sample dried up or whatever. We didn’t say, “hey, you know we should tell you more about what might have happened”, so they were all (tape ended). We thought they’d imply it by the situation or like our discussions about it. The next one.{interviewer} – That’s it for lessons learned? {respondent} – No, we have a list of 8. Some of them are like procedural so they’re not really applicable to this. {interviewer} – Sure, carry on. Anything you want to share is quite valid. {respondent} – We used the Kodak digital camera up there and they take PCM CIA cards to store their data. I guess before operations even started , we were told that we would have 2 or 3 cards set aside just for *{our investigation’s)* images at the time until we got everything archived. But I guess on orbit they have some sort of PCM TA card rotation so as soon as they fill up one card they’ll put it at the back of a stack of cards and leave it there until the card in rotation – I don’t know how many cards they have in rotation, maybe 10 or so. We wanted them to save that information until we told them that we had finished archiving it but there was no guarantee as to whether how long it would be stored if they put it back in that rotation, so we worked something out with them to say we’ll tell you when we have it archived and if you just set it aside for. I think it was 4 days was our limit. We’d take up to 4 days to download because it also took a while for the image to become available so we worked that out with them. We also thought that it would probably be a good idea if we wanted the PCM CIA cards saved instead of using the ones available on orbit, that we could probably put it as part of our payload like send them up with our experiment so they’d be designated specifically to us. So if in the future anybody has issues with saving data, then that would be a good one for people to know. Here’s another one. It’s not in our procedures but we’re like let’s get some video of this experiment being run whether it’s 10 minutes or 20 minutes of it being set up and everything, so in order to do that we either knew we had to write an OCR to specify the amount of time and whether or not it should be recorded and sent back during loss of KU and stuff like that. So basically it’s a lesson learned but it’s rather minor, I guess. Another one was, like I said, we used the camera for all of our data acquisition and some of us weren’t as familiar with the camera as others so if a question would have come down fro the crew on exactly how do I adjust a certain setting or something like that, we could have probably had the camera available during the set up just so we could go through it. I mean we had the manual and everything but it would probably just have been helpful to have the camera with us at the TSC too. I think only one instance came up but we were able to get our camera expert in there to answer the question. {interviewer} – But you provided the camera to the crew? {respondent} – No, the camera is actually an ISS camera. {interviewer} – And yet if they? {respondent} – They should have had training on it, but just in case. They have training on a lot of things and the camera is just one of them so just in case they had like a brief question on one of our specified settings. You know what I mean? {interviewer} – Ok. {respondent} – That’s it really. That’s what we had on lessons learned that is applicable to this.

{respondent 3} – One lesson learned is that it’s very difficult to write procedures containing loops where you have to go back and repeat and have that information transmitted when you don’t have an opportunity to talk directly with an individual.{interviewer} – Are you not working with procedure folks at Marshall when you’re doing this? Is that occurring or not?{respondent 3} – When we’re writing it with JSC, then when we think we’ve finalized it then goes to Marshall, they will make comments and

then we'll all agree on it, but in fact when it's on station and the astronaut is going through and doing it, sometimes we did not anticipate the alternative interpretations which were just as valid, but we just didn't see it.{interviewer} – Right, so when you were doing your procedures, weren't those procedures used in crew training because a lot of times those issues will come up during crew training.{respondent 2/3} – No, they were not.{interviewer}/{interviewer}– Ok, so maybe part of the lessons learned would be to, and again I'm not an OPS person so forgive me, would be to use actual semi-finalized procedures in the crew training. Is that something that can happen? {respondent 3} – That's it.{interviewer} – Yes, it used to be that you would have dry run-throughs with the crew and the crew would make comments and a lot of times those comments would make things easier for the crew member to carry out your investigation.{interviewer} – Ok. We've captured that one. Do you have any others on lessons learned? {respondent 3} – Yes, that it's critical to have conversation with the crew when it comes to solving problems associated with procedures or for learning about new information because they are a vital part of the team. They're there and they're doing it and they see things that we don't have access to. {interviewer} – Right, they're your bench tech and they're seeing it through their eyes and you have no way to see it right now. {respondent 3} – And getting a written report is not sufficient, but having that ability to query the individual both at the time when it's happening. For example, in a crew conference relatively soon after the discovery of this new information or when the crew returns and to have a conference with them, for example, as (2) had at JSC is absolutely important. Sometimes you really just need to sit down with someone and they can show you with their hands what they did or they can draw you a little picture of what they saw that you just can't capture in a written document. {respondent 2} – Yes, we actually learned something in the meeting we had with the crew member in July that we did not know and we would not have known otherwise. He suggested that we actually have a conference with the crew member before he starts the experiment as well.

{interviewer} – I remember on the Lessons Learned theme in the past you mentioned about that it's important to try to anticipate what all the types of data you would ever want to get, so I can type that in but if you could think of any other lessons learned in particular from Increment 8, if you can.{respondent} – I can't think of any specific lessons on Increment 8.{interviewer} – That's fair, I understand. Given your level of activity that might not have just come out about it. I'm just going to type a note.{respondent} – Do these have to be specific to Increment 8?{interviewer} – I would say, no they don't.{respondent} – It's just coming back, better scientific feedback and collaboration between the PIs and the space centers as opposed to the space centers purely being like a service organization. Better PI training upfront. That's about it.

{respondent 2} – We mentioned this Lesson Learned that as a *{investigation name}* team we learned that if we have an anomaly on orbit after we get the hardware to a safe state that it's better for us to get our team to go caucus in a conference room and unfortunately poor (1) sometimes gets left on console having to tell everybody that calls her that we're caucusing and we'll get back in half an hour which they don't always appreciate, but a lesson learned is that by going to a conference room we can put our thinking caps on and solve the problem without a lot of interruptions and then we can answer the questions when we actually have answers to provide. We're still debating and thinking.{respondent 1} – I had been thinking for Increment 8 there was not anything that was really standing out to me for Increment 8.

{respondent} – We really didn't learn anything new for Increment 8. It went along and things were on track and Mike was snapping away so we really didn't learn anything new.

{respondent 1} – The MIR flight and now we have several ISS flights under our belt so I think one major strength. What we've observed through the ISS increments is that I think people work more closely together, there's better communication and that is very, very essential in terms of optimizing our time, being efficient and being able to get really good science return. {interviewer} – I'm afraid I'm going to have to interrupt you here to clarify. We may have had a slight misunderstanding about this page. There are 3 separate questions on this page. The first one is about lessons learned and then strengths and weaknesses. It sounded to me like you were speaking to the major strengths. {respondent 1} – Well, I

think it's a lesson learned too because I think in the past what has happened. For instance, if we put in in real time a change, I think that it would seem from the ISS community that we didn't have our act together or that we should have, in terms of once we set the requirements that that's what they are. There has to be an understanding that when you're conducting cell based research or you're doing fluid experiments or whatever, you may have some observations during the actual experiments that will lead you to request a change and the reason why we're requesting this change whether it can be granted or not, is so that we can get the best science return possible. And I think that is very valuable and I think the community understands that better, that there's a better understanding of that. Having a little bit of flexibility within the processes and the system in order for us to get the best science return is extremely critical. Of course you can't deal with payload developers making all of these changes all of the time. You can't accommodate that, but if there are valid criteria and a good strong reason scientifically why these changes should be made, I think it's very valuable. And I do think that people understand that better, so I would put that under lessons learned. And we realize that we're dealing with tight schedules and we want to optimize everything and get as much science done. However, I do think you have those situations where you can have very valuable insight on orbit and that's a little bit of what it's all about. NASA has wanted us to conduct research on orbit like in a laboratory and so these observations are important and if they can possibly be accommodated, I think that that's very valuable. I think that enhanced communication working closely with the different teams and working together also is a lesson learned because I think in the long run everyone understands the objectives and what we need to do and I think that optimizes our efficiency for a lot of individuals working on the team.

{respondent} – It seems like things are split up. I think a lot of it, for various political reasons that has nothing to do with the ISS and everything to do with the history of NASA, is that there are all of these different centers, Cleveland, Alabama, Johnson and they don't always get along too well. That might be a little strong, but turf battle might also be a little strong too, but there's some kind of territoriality on different functions. That's not going to change, but that definitely does make it a little bit more difficult to get things done at times. {interviewer} – What about the incident you had with loading the samples in Cleveland.{respondent} – Our samples are not so easy to come by and I spent quite a bit of time engineering very precise samples and when they got to *{the Payload Developer}*, well you know we loaded them, there are air bubbles and we can't use this because the air bubble is too big. It just seemed as though, I don't want to say they were incompetent, but on the other hand how hard is it? We're dealing with hundreds of billions of dollars of money here. How hard is it to take a vial with 25% more than the volume of your final chamber and load it without spilling it or losing it? That was pretty annoying. {interviewer} – Do you feel you should have been *{at the Payload Development site}* while they were working?{respondent} – Well, I did go actually to see what they were doing with the loading and watch the process and learn how they did it. I guess there are just lots of little things. When they finally sealed up the samples they didn't do this in a dust-free enclosure, so there's dust trapped in between panes of glass effectively so that when we take these photographs of our samples it's just sitting on the surface there. And it's like, well you know we can't rid of dust.{interviewer} – They couldn't have done it on a ? or flow bench?{respondent} – These are not micron size pieces of dust. These are like millimeter size pieces of dust. The thing that I don't really like is that at least *{at the Payload Developer site}* like well you know that's just the way it is, live with it. Can't do anything about it now. I realize that if you're in a position of now it's in space and we can't do anything about it. But it just sort of seemed like some of these things would be obvious or logical if somebody is just thinking about it carefully. There are all of these requirements they have and then they just don't take care of some of the stuff that I think is just obvious. Like, we don't want any dust in there. I don't see how hard that is. It's not like it has to be a clean room, but if you can see these things and they're like pieces of fuzz and they're a millimeter across. I mean you can take precautions to get rid of dust like that. How hard is it to seal up a sample vial? It's like the vials weren't designed right or whatever. There were always these excuses. If something doesn't work, there's always somebody else to blame. It's not like alright, we blew it, that's it. I spent weeks making these samples and characterizing them and then they just loaded it and we can't use it because the

bubble is too big and there's not enough sample to fill it. That's just kind of ridiculous, right? Just sort of the approach there. {interviewer} – I got it.

{interviewer} – You mentioned that you submitted your formal lessons learned as part of the what's called the Increment Lessons Learned. I think that's what you were referring to earlier when we were talking?{respondent} – Yes. I'm kind of looking at those to see how I can try to capture some of all of those in this.{interviewer} – I would say you're not necessarily required to and that's because you've already submitted those. I'm going to put in a comment – Increment Lessons Learned already submitted. Actually I'd rather have you come up with some new ones or some more sort of top level comments, less detailed maybe, but more top level flowing out of what you've already submitted. I kind of look at this question to some extent as to what advice would you give if you were going on to do a different job and you had to train your replacement. What lessons learned advice would you give to that replacement in trying to explain the job? What advice would you give to your replacement and that sort of thing? {respondent} - I would say to maintain a high level of communication with the payload development and support team within the RPO. Expect to have most of your interactions with the program at the RPWG and PMIT level and attend those meetings and stay on top of what's going on with the RPWG and PMIT. Try to develop a good working relationship with the PIM early and work to keep the communications flow both ways good with your PIM and also try to establish a good relationship with the POD support and the POIWG early and make sure that they're familiar with

9.4 General Comments

Part 3 of the Survey contained a final comments section to allow interviewees to mention any issue or topic that they would like to cover that they did not offer earlier in the Survey. The transcriptions of these comments are provided below.

9.4.1 General Comments from Increment 7

{respondent} – Reiterated that the major strength is the people.

{respondent} – Nothing else

{respondent} – No.

{respondent} – No based on experience in increment 7.

{respondent} – I think that's it.

{respondent} – It has been a really exciting and very good experience with all the people involved from our scientific side, but also with your guys. It was really a pleasure working with your people. From a scientific point of view the data and the scientific value are actually under evaluation. What I can say is that we got some very important information, some important confirmation, something new, pretty new which was never published before and they appear to be scientifically consistent and so we are very, very pleased with this experience and we are planning faster utilization because {our investigation} is still on board and it will remain on board until somebody takes it down. I think it will not be done before the next astronauts go to station.{interviewer} – Let me make a comment about that. This survey feedback process that we're doing here is designed to be done after every increment because we are trying to look for trends over time in our customers', you're our customer, and we're interested to know how your satisfaction with program is changing over time, and so this will mean that, we're going to give you some time over the next few weeks, but somewhere during the summer we would be calling back to ask you about your opinions about Increment 8 and how things went on that increment because it's important for us to get trend. So just understand that I will be contacting you again fairly soon in July to schedule an interview sometime in the summer and I think in late July maybe. {interviewer} – It will be primarily a lot of the same questions but the survey will be shortened because you will now become a repeat customer.{interviewer} – So it will take, we hope, less of your time to do it.{respondent} – Ok. It has been my pleasure. I will be more than glad to answer again.

{respondent} – I don't think so. I think most of our experience on Increment 7 was very positive and very productive.

{respondent} – I have a comment about the questionnaire itself. I think it was very user friendly and we're actually in the market for figuring out what our future questionnaires should be like and I like t his interface.

{respondent} – I don't think we've been positive enough about our experience because you've brought up all of our little irritations, but what you heard was the fact that your organization was so good that you got the three of us completely involved, you know, three people with a lot of things on our plates. And because of the good work of your organization got very, very involved in all of NASA science and I see that as a real credit to your entire organization. We didn't get turned off by anything. I mean we were irritated but it was always felt that there was someone who wanted to hear how to make it better and that was how our irritations were received in that spirit.

{respondent} – Nothing else.

9.4.2 General Comments from Increment 8

{respondent} – The only other thing I was thinking about is with the reoccurring payloads and I don't know how many there are. There's a few of us. Everybody seems to work by increment epics. Is there any way we can do this like twice a year? {interviewer} – Do what? {respondent} – Everything. I realize paperwork has to roll forward for CoFR process and all that and it's all geared to the increment epics. For payloads that have no changes, no nothing, it seems like we do paperwork every 4 or 5 months just because. It would be nice if there were no changes that we just recertified yearly or bi-yearly or every 6 months rather than worrying about a NASA imposed epic such as the increment date.

{respondent} – NA

{respondent} – You could bring up the communication problems.{interviewer} – Wish you had more and better com.{respondent} – The S and KU band stuff.

{respondent} – No, I think we've probably covered it all. I think we just always want to say for *{our investigation}* that we're especially grateful that the program provides us with the resources and the opportunity to do education on orbit and we recognize that that takes a lot of time and resources.

{interviewer} – Any other strengths or weaknesses?{respondent} – No, I think this was an excellent increment and each increment has gotten easier for us. I don't know if that's us getting used to you all or you all adapting to or both, but it seems to be getting better. {interviewer} – It's probably a combination of elements and quite honestly we'd like to think that the payloads office is taking a serious interest in making process improvements with their corrective actions large in part to the feedback that people like you are giving through these interviews and surveys and seeing where some of the problems lie and the good things that are being strengthened. So we want you to know that you do have a voice and it's a strong voice in helping those things shape up. {respondent} – Great. Well, it seems like it's working.

{respondent} – This survey process I've never done, I like it.{interviewer} – You know what, we're actually going to rate it on the next page. But if there's anything else you want to tell us.{respondent} – Just overall, I was very impressed with the number of people who in spite of some frustrations and things were just really committed to doing space research and had even in the face of a lot of. They had to deal with a lot of annoying paperwork and things and at 3 in the morning were still enthusiastic and a real pleasure to work with personally and that's what made it the most fun.

{respondent} – Pretty much the things that come to mind are the same things that I mentioned time and time again is the fact that it could be a better advocate when it's not really following through. Maybe it's through other organizations but for whatever reason it's not quite working. It just seems like a monster a lot of times and it seems like no one is really there when it comes down to stopping the buck, they're really there to make it happen.

{respondent} – Nothing else.

{respondent} – I think we managed the questions to evoke all of the things we wanted to tell you.

{respondent} – No, I think I've said everything.

{interviewer} – We're going to put a note that you were pleased and satisfied with how your payload software engineers performed for you. {respondent} – A good team.

{respondent} – Only two sentences. The first one is that I received a very broad spirit of cooperation from every person involved in the *{our investigation}* team and I'm proud of that. The second one is was that it was difficult to manage the hardware shipment in and out of Russia because we are still on the way for the training model that has been used by the crew member in May and they are still on the way. It's not yet in the USA due to customs. It's not so easy to manage this kind of shipment. That's solely a pity.

{respondent} – For the last one *{respondent name}* has written some things. Each role of the Cadre has its own expertise. Being the PD we are faced with understanding and relating to every aspect of each of these roles which can sometimes be overwhelming. It is helpful when the Cadre is sensitive to our shortcomings and tries to teach us who does what, who is responsible for what, etc. It is comforting when these folks help us through the details that we don't know as well as they do. For the most part the Cadre has been extremely helpful and wonderful to work with.

{respondent 1} – I think there's a major weakness. Each astronaut should have a major project that he's going to try to accomplish and that astronaut should spend a year in the PI's laboratory before they go up to Station to be completely immersed in one problem that becomes their major focus. Less is more.{respondent 3} – And if I can add to that, there's a tendency among some quarters to view the astronaut as nothing more than a trained automaton whose role is to push buttons up on Station and we take the opposite view that the crew is a vital component of the team. They are our colleagues and collaborators at the bench which happens to be orbiting the Earth and that view is very different from that of a mindless, or an automaton who's just executing a series of instructions. But that together with 1's comments about having the familiarity and being immersed in the problem definitely leads to the sense of cleavality and collaboration and partnership and we think that's vital to doing science.{respondent 1} – I think the astronaut must have on their schedule when they return to visit the laboratory and it wasn't until the second conference. It's kind of saying that we have more time with the astronaut when he's on Station than when he's on the ground. Afterwards, especially, they really should spend some time. If there's really an investment and an interest I these projects as part of the job, then part of the job should be to go to the PI laboratory and there should be a whole day spent immersing themselves in the problems that came up. No matter how many crew conferences we had and how important it was to discuss all of this stuff, it wasn't until we were back down and at the end of this hour together that we find out there's two different kinds of bubbles. Until you milk it, observations like this only come out in discussion and if the astronaut doesn't understand how important it is, he doesn't pull it up from his memory until he's been immersed in it in conversation for a whole hour. It's kind of like a lawyer doing a deposition or something like that. They keep on asking you questions so that you finally remember what really happened.{interviewer} – I understand. {respondent 3} – And along those lines we realized that the time on Station is exceedingly coordinated, but we requested before that there be some time allowed for the astronaut to think about the project. So if we send them information about what we've found they can give us feedback on the analysis saying, "wait a second, that's not exactly what I saw", and that requires time lining that sort of activity which is not an activity that is directly related to doing something per se, but it's a vital activity when you're doing science. {interviewer} – Ok, those are great comments and we understand exactly what's behind them. Let me just say, on a personal note, that it's just a shame that the resources are so restricted at the moment that that kind of ideal relationship isn't really possible right now. It's interesting to think about whether that would be possible in a 6, well we'll probably never be a 6 crew environment, more like 4 crew, whether a 4 crew environment would permit that.

{respondent 1} – Well, I don't have anything else.

{respondent} – I just put down thanks for your persistence. It's not an easy job because of the hurdles and the interfaces with different groups.

{respondent 1} – Well, John and I didn't personally use the PDL. The Wyle folks, I believe, had some input. I'm not sure. We launched everything on Progress and the necessary input was

provided.{interviewer} – Ok, it sounds to me like as far as you two go you probably wouldn't have strong basis for giving us any direct feedback on PDL.{respondent 1} – What I can tell you is that the Wyle folks have told us that, you know, we've been working Station payloads for a while and they said there had been a lot of good changes that have been made. {interviewer} – Ok, I'm going to ask {interviewer}'s opinion for this. Should we do a yes or no for these guys? {interviewer} – No.{interviewer} – Just toggle No on your screen and we'll skip asking you about it.{respondent 1} – However, I think you deserve credit for it because one difficulty we had early on with PDL is that we had to, when we made changes or we provided information, a lot of time we had to provide that same information in different areas of PDL.{interviewer} – I understand.{respondent 1} – So I think now those changes that have been made facilitate tremendously and require less time in terms of us providing our input and there's less redundancy.{interviewer} – When you say, we provided our input, are you talking first of all you personally or J (2) and in Increment 8 because these are the elements we want to focus on in this particular interview.{respondent 1} – We're talking directly for the Wyle folks that support our areas.{interviewer} – Is there anything that you would like to tell Payloads Office management or POIC management that you don't think was covered in the course of this interview?{respondent 1} – No, I guess there were just a few additional comments we wanted to do, but then we covered that, I think, in some of the ratings. We thought that that HOSC ops worked very well with us during the crew conferences and the crew POD PayCom did everything they could to accommodate us and the PI. The LIS folks supported us tremendously so I think all in all it was a successful increment.

{respondent} – No additional comments.

{respondent} – Yes. The only thing that I've got left and I certainly am not meaning this as a slam against the crew in general because we've had pretty good crew support for most of our activities and everything, but sometimes it seems to me that certain of the crew may be more the aspect of their duties of building the Station and participating in that aspect of it and maybe don't see the science aspect as strongly as we would like. I mean to me the only reason for them to be up there in the first place is because we're trying to do microgravity science up there. If we're not doing science we don't need a space station to begin with and sometimes I think that gets overlooked to a certain extent.

10. Survey Part 4 – Satisfaction with the ISS Utilization Survey Interview and Survey

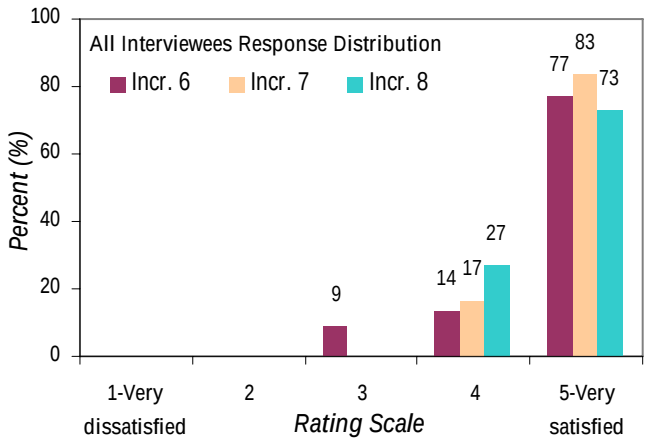
Question 4.1 – *Please rate your level of satisfaction with how the ISS Utilization Survey interview was conducted.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Respondents very satisfied with interview process from Incr. 6 through 8. Verbal comments consistently cite importance and usefulness of interview format for clarifying Survey structure, questions as well as the responses provided by interviewees.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: VERY SATISFIED	INCREMENT 8 SATISFACTION LEVEL: VERY SATISFIED
INCREMENT 7 TO 6 COMPARISON: IMPROVING	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

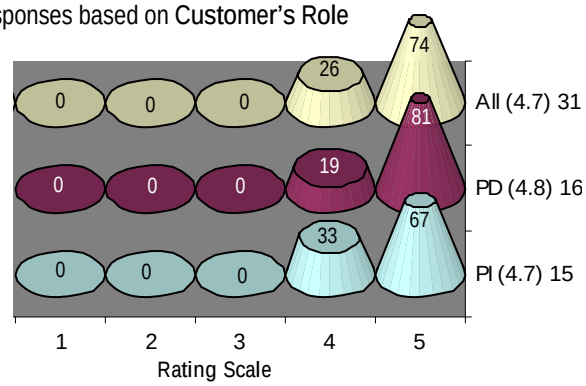
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	22 (100.0%)	18 (100.0%)	26 (100.0%)
Mean score:	4.7	4.8	4.7
Scaled mean score:	92.0	95.8	93.3
Mean score Δ:	-0.08	0.15	-0.10
Standard error:	0.14	0.09	0.09
T-test:	38.9	90.1	56.3
Chi-square test:	22.9	60.2	83.9
Median score:	5	5	5
Skewness:	-1.92	-1.96	-1.11
10th percentile score:	4	4	4
% dissatisfied:	0%	0%	0%
% satisfied:	91%	100%	100%

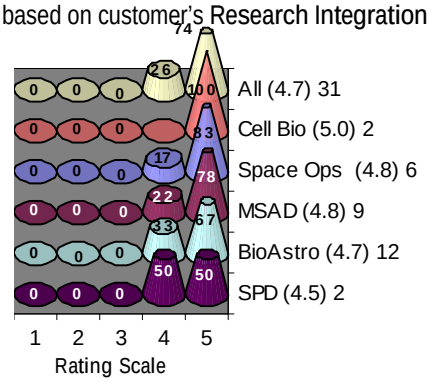


Demographic Trends (Summary): No notable / strong differences across demographic groups.

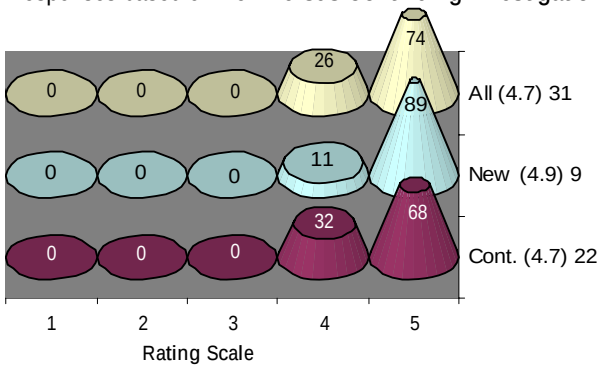
Responses based on Customer's Role



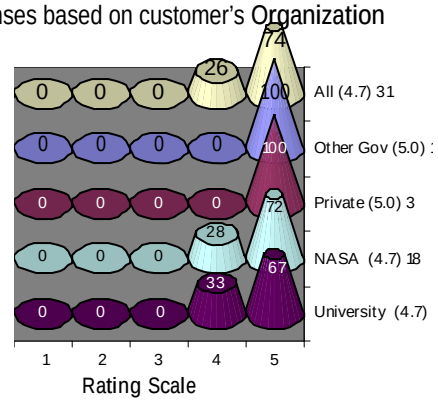
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Questions 4.1 Comments from Increment 7

– Interview is very easy. Conducted extremely well.

– I like the interactive survey. It is very hard to do this by yourself. I find the interview process quite beneficial.

– I think the interviews are good, but a little too long. I see some redundancy in the questions.

– Well conducted. Increment wasn't very eventful for me, so I'm not sure that I'm providing very useful feedback. I have no problem spending the time to do this. I'm happy to do it over my lunch hour, that's great.

– It is very comprehensive and because it covers all topics depending on the interviewee, I'm sure you get at least some type of feedback for each of the aspects that are involved. And the fact that you encourage participation of more than one individual gives you a better picture.

– A 5. You made it shorter.

– The way it has been conducted rates 5.

– I think this interview was good. I would give it a 4.

– I'm very satisfied. I really appreciate you making the phone call and not making me do this by myself because there are often times I think I know what you're talking about and having that personal interaction is really good for me because I think you keep me on track and make my answers more appropriate and certainly honest because you help me understand what we're talking about.

– I would rate both 5. Actually I want to make a comment – first of all I want to appreciate our patience because I have been difficult to get hold of due to my unfortunate travels and schedule, but I think the interview process has been streamlined and I'm happy about. I think the interview has been very good, I gave it a 5. I'm very satisfied with the kind of questions you're asking and very pointed and what I like about it is the telephone interaction and not just filling out a factious survey. This way you are explaining to me and responding to some of the questions that I need more insight on why this question is being asked. So that's a very, very helpful approach in my view.

– A 5 for both.

– I didn't have any problem with it. I'm satisfied, a 5.

– 1 - You guys were fabulous, a 5. I still can't figure out which of the components you're in.
{interviewer} – We work for the space station payloads office. That's code OZ at the Johnson Space Center.
1 – You were very good. You were very receptive.

– We'll put a 5 in. We're satisfied with the way the interview was conducted.

– Very satisfied. You did good Roy. Very clear, straight forward, clarified the questions.

– I was very satisfied with how the interview was conducted.

Questions 4.1 Comments from Increment 8

– Rating is 5.

– I wasn't looking forward to it because it's so repetitive. It went well. Let's say 4.

– I'd give it a 4. Actually I should probably give it a 2 because like last time I made a lot of comments and I never saw how my comments were interrupted or what you typed in these little boxes.
{interviewer} – I can tell you.
- Why don't you type that in the box there and say the PI or the GI is concerned that he never gets any feedback on what's typed in these little boxes.
- {interviewer} – Let me clarify that for you and that's a reasonable comment based on how we were running things last increment. We have gone to full transcription of the tapes.
- I have seen things get taken out of context here and sometimes it's not so good.
- {interviewer} – Well, I'll tell you what. As I said, we have gone to full transcription of the interview tapes so we now have essentially a professional transcriptionist listen to the tapes and they get fully

transcribed, every word.
- Well, you should have told me that up front.
- {interviewer} – Yeah, I supposed I should have. Sorry. And one other thing about those, I want to remind you, is that they are still maintained identity blind. Which is to say the transcriptions are passed to NASA mangers, but we take great care to basically delete all information in there that could be attributed to your identity.
- So any reference or mention to the word *{our investigation}* in all of this?
- {interviewer} – Yes, it's taken out. As a matter of fact, I do that myself. I go thru the transcripts and I take out references to the payload name and it just say payload name or whatever. Now realistically obviously there's going to be things that you can't do it, but to the extent that it's possible we try to make it identity blind. And this is because we are putting more emphasis on the verbal comments.
- I mean who else had anything repaired up there?
- {interviewer} – Well, a few other people. Now if you want, once your tape is transcribed I can send you the transcript. Would you like that?
- That's ok.
- {interviewer} – Alright.
- Ok, so we put a 4 in this one?
- Yes, I let you put a 4. If you want to give it a 2, I'll give it a 2.
- No, just so what I said gets transcribed.

{interviewer} – And it will.

– Rating a 4.

– I'm very satisfied. I love the way you guys do this. I mean I do a lot of surveys for different things but you really do this extremely well. I think we're glad to have the opportunity to do it. I think it's painless and you folks on the other end make it very easy for us, so very satisfied, 5, for 4.1 and 4.2.

– Rating is a 5. It seems to have gone a lot more – you've streamlined it quite a bit by having those initial questions to drop out the ones we don't need. I think it's gone a lot faster for me anyway. It seems to be a lot smoother.

– 2 – Rating is a 5. (S – 1) did have a comment earlier that she was wondering why you can't just be more careful with how you word the questions so that we can do this on line without having to do the interview.

{interviewer} – I would say that again, having done this for 2 years, that given the amount of give and take and clarification that I have had to do with this survey which was very carefully developed and the wording of the questions was significantly reviewed, with input even with consultants, given the amount of clarification I've had to do I think it would be really tricky to write something in written English such that just about anybody would understand it. One of the issues we have is this survey and the questionnaire are going at a number of different audiences. It's supposed to cover both PIs who in many cases are very isolated and insulated from the program and also Payload Developers like yourselves who are very knowledgeable about the program. So, it's trying to be a one size fits all questionnaire for a group that's somewhat diverse and that's a hard thing to do.

2 – I think it's time consuming to do the interview process but I think you're right. I think it's necessary because even today in going through this with you there were some things that even S (1) and I read differently and you needed to explain.

– Rating is a 5, satisfied.

– I guess I would say a 4 because I'm still confused about what the terminology means and whether I'm answering correctly or not. The right people when you ask me a question. But that would be a lot more work or you to find out who the people are for each of the interviewees.

– I'm very satisfied with this process.

– Rating is a 5.

– My biggest comment is that I think it would be helpful for the PI to be able to look at this, fill it out and then be interviewed by you as opposed to doing this real time because, you know in a lot of times

I'm sitting there from 4 feet across the room trying to read a small font and figure out what's going on and I don't have in my mind a thing of "ok this is what they're going to be trying to get through the whole flow". I think if one could look at the stuff ahead of time it might be helpful.
{interviewer} – Very god comment. Usually we try to do that.
- A 4.

– I was very satisfied with it, a 5.

– A 5. You did great. A 5 for sure.

– I don't know if it's value added to send the actual survey out beforehand because I tried to work through it. I got mad and frustrated because I couldn't understand what many of the questions were actually asking. Again, it was hard for me to put a face on what are you trying to rate on this question. Now that you've walked me through it verbally, I completely understand that so I would have given you a 1 on this survey had I just had to fill it out myself without you guys taking me through it. Now that we've talked about it, I think it's a good survey and I'm very satisfied with this process, but I had to overcome all of that initial angst about it. I don't know what you want to do. Maybe smarter people than me have a better flow at it, but that was a problem.
{interviewer} – The issue for us when we did the process was we were required to come up with a one size fits all questionnaire that works for outsiders like yourself that are not that knowledgeable and deep insiders who know every acronym and the solution was the interview.
- Well, without the interview this thing stinks. With the interview, I think it's very good.

– 5.

– I would say very satisfied, a 5.

– 5.

– 3 – I'm very satisfied with the conduct of the interview.
1 / 2- Yes, very good.
{interviewer} – Ok, so I'm going to give us a 5.

– I'll give it a 4.

– 1 - Very satisfied, a 5. You explained everything so well and you brought clarity to everything.
2 – We'll see what (1) thinks but we've been on orbit for about 2 years and we've spent about 3 years developing the hardware so a couple hours of our time is not bad.
1 – I really didn't think it was bad because it's pretty important stuff.
{interviewer} – There are varying opinions about this. People get so many surveys done nowadays because it's the thing to do in all organizations and people are overloaded. I don't like having to be just another survey but it's not just another survey because it goes to very high levels at NASA.
2 – My impression on the survey, maybe like pep surveys and different organization things we get here, this is really product, operational, hardware, space flight oriented.

– I'm very satisfied. You were very efficient and it was easy and flowed right along. A 5.

– 1 – Well I certainly think you have a very detailed survey.
2 – And we certainly have the opportunity to avoid any type of comment that we could possibly have about any of the entities involved so we're very satisfied in that regard.
1 – Is your plan to do this with payload developers after each increment?
{interviewer} – Yes, this has actually been going on since Increment 5.
2 – The only comment and I think I voiced this comment the last time is that when you do the same interview to the PI, the PI often times may not be able to differentiate between the specific increments and secondly, I don't know to what degree you focus this interview on different themes, but much of what is contained in here, at least for our particular type of investigations, is beyond the realm of the PI's knowledge and experience.
{interviewer} – That's right and that is always a tricky thing to navigate in this interview. So the number rating you would give would be a 5?
1 – Yes and I think in terms of when you do it with the same payload developer over different increments there may be ways of even getting through this quicker in terms of you might say, do you

really have any changes in these areas? Because we can probably optimize that and I could say well we had some problems in this area where we did before or we have improvements in these areas, so I don't know if that's something that could be helpful. {interviewer} – We considered that. We had a lot of debate about showing you the previous responses from the previous increment and simply saying "did you have any changes"? But there's an argument to some extent against that because anytime you suggest a response to someone, that response has a psychological effect of driving their opinion.
– A 5. You've been great and very helpful.
– I would give us a 4 on the first question. It's never a lot of fun to have to sit down for an hour and a half and go thru all of these questions. It probably would have been easier on me if I had been a little bit better prepared. Just the nature of the beast is that it's going to take a little while so I wasn't really dissatisfied with that.

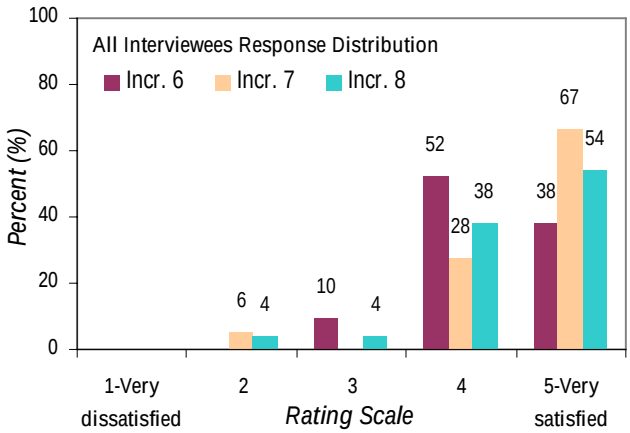
Question 4.2 – *Please rate your level of satisfaction with the design and content of the ISS Utilization Survey questionnaire.*

MANAGER'S TOOL BOX	Overall Status	
NOTABLE FINDINGS: Respondents very satisfied with questionnaire from Incr. 6 through 8. Verbal comments cite appreciation of efforts to streamline questionnaire for repeat respondents with reduced length of interview.	*IMPROVEMENT (INCR. 6 THRU 8)*	*SATISFACTION (INCR. 8)*
	Super	Green
	Neutral	Yellow
	Mixed	
	Sub	Red

INCREMENT 7 SATISFACTION LEVEL: VERY SATISFIED	INCREMENT 8 SATISFACTION LEVEL: VERY SATISFIED
INCREMENT 7 TO 6 COMPARISON: IMPROVING	INCREMENT 8 TO 7 COMPARISON: NO SIGNIFICANT CHANGE

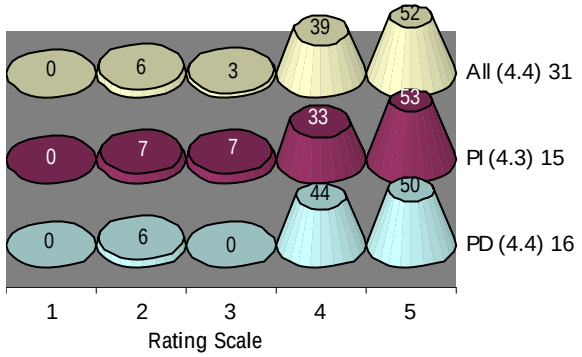
Response Descriptive Statistics

	Incr. 6	Incr. 7	Incr. 8
No. respondents:	22	18	26
Applicable responses:	21 (95.5%)	18 (100.0%)	26 (100.0%)
Mean score:	4.3	4.6	4.4
Scaled mean score:	82.1	88.9	85.6
Mean score Δ:	0.07	0.27	-0.13
Standard error:	0.14	0.18	0.15
T-test:	28.0	81.0	42.3
Chi-square test:	76.2	97.8	60.3
Median score:	4	5	5
Skewness:	-0.33	-2.27	-1.51
10th percentile score:	4	4	4
% dissatisfied:	0%	6%	4%
% satisfied:	90%	94%	92%

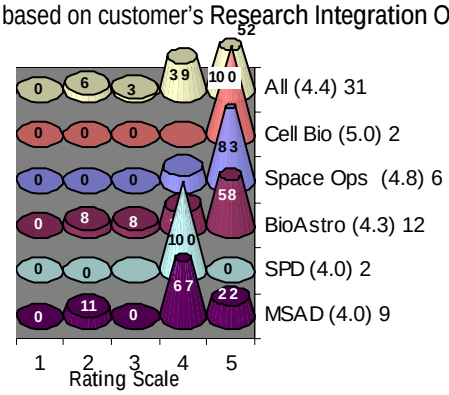


Demographic Trends (Summary): No significant differences across demographic groups.

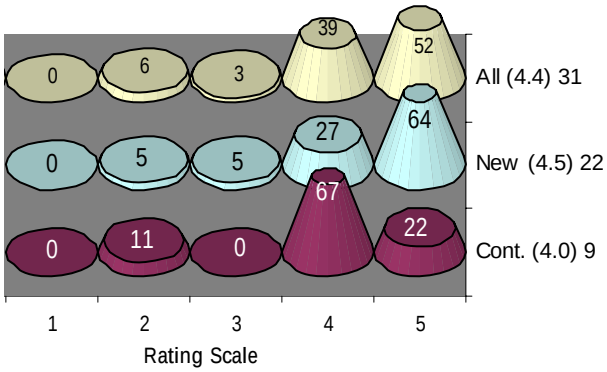
Responses based on Customer's Role



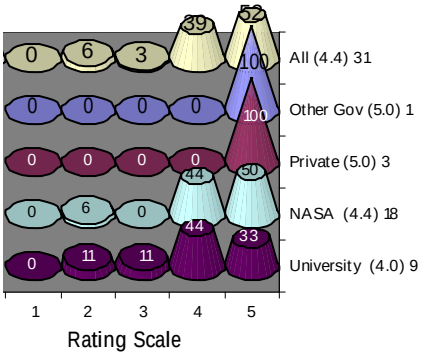
Responses based on customer's Research Integration Office



Responses based on New versus Continuing Investigation



Responses based on customer's Organization



Question 4.2 Comments from Increment 7

– Works fine.

– Still think this could be more stream-lined and centered on particular areas. Or payload based interviews.

{ - I think the design and content of the questionnaire is actually very good and it would really capture the needs of somebody who is doing a real on-board payload. I think it is a little bit over-kill for me. I think you did a good job on the questionnaire and I think it's going to give you some useful, quantitative data.

– Historically as well as now, you have involved of the Principle Investigator as a respondent to these types of questions and depending on the program and the particular experiments, some investigators may not have background or direct interactions to answer a very few of the questions.

– We can give that a 5 and no comments.

– The content and the design of the questionnaire are very good. A 4.

{ - I think you get a reasonable amount of valuable information without being too specific in your questions and making the survey too long. Like we discussed in some of the earlier questions, I mean it was, the question was broad enough that it incorporated good, bad and indifferent. I would say a 4 also noting that I think this questionnaire is designed well enough that you get a good amount of information in a reasonable amount of time.

– Very satisfied with the design and content. I thought it was better this year that it was last year. I think you took out some of the things that were not necessary and it went a little faster this year.

– I think the questionnaire getting streamlined so that payloads like us who are repeat payloads don't have to go through a lot of other questions that are not relevant to us. That's a big improvement by the way.

{interviewer} – I'm going to put a comment here about the design and content of the questionnaire that you did say you found the questionnaire very user friendly.
- I appreciate the opportunity to give you verbal answers as well as giving you numbers that you can then average across different people.

– I think it's a good one, a 5. It seems to get at the issues, which is important.

– 1 – I'm not an expert in this, it's fine. I don't have any changes. A 5. It took 2 hours instead of one, but like you said that's our talking. We are engaged in trying to make it better and so are you.
{interviewer} – I will tell you that you folks had a lot to say but you had some very valuable feedback that's all recorded. It's going to be processed, analyzed and it's going to go in an anonymous fashion directly to management. This is going to be reviewed, analyzed and they're very interested to hear this feedback in order to improve things.
1 – Great.

– Your explanation certainly added a lot. I think (tape cut out) read through them earlier. Last week I knew to have some contacts for what specifically. I think in some cases I know you're trying to get some standardization in the different categories but sometimes you lose a little bit with that in terms of, I don't know. I think your clarification was very important to the questionnaire.
- {interviewer} – So you gave a 5 and a 5?
- I'll probably put a 4 on the questionnaire. There may be a little room for improvement.

– It's both specific and you left it open ended for comments so satisfied with that as well. It's not even too long. I like the cutting out parts and going on so it didn't seem too long.

– I would say a 4+ on level of satisfaction with the content of the questionnaire. It was more streamlined this time.

Question 4.2 Comments from Increment 8
– Rating is 5.
– The questionnaire is straight forward. A 4.
– Well you seem to make some effort at cutting off stuff that we don't need to talk about so I guess that's pretty good. I'll give that a 4 also.
– Rating a 4.
– Rating is a 5. {interviewer} – One of the issues that we're getting into now and particularly for me as sort of leading the contractor side of this effort is that we are interviewing a lot of people repeatedly because there's a number of continuing investigations and so it's a little difficult to keep the process fresh every time for people and also to some extent that people feel like they've given the feedback before why are we coming back a second time to ask them again. But the problem is that each increment is unique and has its own unique aspects. I guess what I'm trying to ask is that you in particular don't feel a burden with having to do this after each increment? - No and I agree with you completely. Our experiences during Increment 7 were very different than our experiences during Increment 8. And we view this as a great opportunity to be able to share any concerns that we have. It takes about an hour. I think from our standpoint that if you want, you hope that things are done differently, it's a minimal investment in time and energy to do this from our standpoint. We welcome the opportunity actually to do it. - {interviewer} – So you think it's a minimal investment? - I think you sent us the form ahead of time to look at. I love the fact that if I have a question, you know, sometimes you do surveys and it's so sterile in that nobody will help you figure out should I answer this, how should I answer this. You guys give us that feedback. - {interviewer} – That's fine. I don't know if everybody agrees with you and the problem nowadays is that every organization in the universe is doing surveys. People are completely inundated with them and for me it's difficult to be part of that pool because everyone is grabbing for everyone's time all of the time and it's hard. But I appreciate your comments. - I agree with you. I think sometimes though the value for us is when we do these we have to stop and look at how we do things so not only when I take this do I judge and provide feedback on how you've done the Increment 8 operation, it also gives me time to sit back and think to myself where did we fall short in EPOPD. What could we have done better during Increment 8. So in our world at least do we not only hope that you improve, I think this gives us a time to reflect on how we can improve too.
– Rating is a 5.
– 2 – I would say a 4 and the reason why is because I thought there were a couple of places where things were combined and they shouldn't have been combined because as you saw we had to compromise and give a compromised rating which I don't think serves you very well either. {interviewer} – All right, clarify one more thing for me about *{your investigation}* because I wasn't aware that it was flying. What investigation was *{your investigation hardware}* supporting for Increment 8? 2 – It was called *{investigation name}* and it was a Japanese science experiment sponsored experiment using Russian hardware that flew up on a Progress. {interviewer} – Ok, a Japanese experiment in Russian hardware. It really is the International Space Station now, isn't it? 2 – Exactly. I thought it was great. I loved it. It was fun being part of that. *{name}* was the one that put all of that together. {interviewer} – Ok, GCF and the first word there is? 2 – Granada. So probably the hardware originated in Spain, I think at a university. The Russians must have supported it or paid for it or something so it truly is an international experiment. {interviewer} – But then it was put into the *{your investigation hardware}* 2 – It was put inside *{our investigation hardware}* for temperature control. So this is a *{your*

investigation hardware} unit that was launched way back on 9A. It's been up there almost 2 years. Actually Increment 8 was the second time that GCF used *{your investigation hardware}*. That was its second run.
{interviewer} – Do you recall who the Principal Investigator would have been on GCF?
2 – That was what used to be called, or maybe now they're called JAXA.
{interviewer} – Yes, but I need a persons name.
2 – I'd have to go look it up. I forget her name.
{interviewer} – That's fine. I can get it from *{name}*
2 – Yeah, he'll know. And actually I'm not sure that she would be considered the primary point of contact. She was just my operations point of contact. But *{name}* would definitely know.

– The questionnaire is quite good. As a matter of fact, I'm pleased that you're customizing the questionnaire for payloads like us that don't have to go through a lot of integration questions. My only issue was finding a good day to do it because I was called on to do a couple other things. I think that 30-35 minutes is reasonable.

– Rating is a 5. It's so easy to use. I've never done a survey before where it was on-line and on the phone so that unusual. But it seems to work.
{interviewer} – Yes. Part of that is because it is extensive and complex and some of those terms are unusual. We try to guide you along as best we can.
- I'm sure you get it a lot more validated this way with more qualitative things you wouldn't have gotten.

– Very satisfied with the design. If you just had people filling out and typing things in you wouldn't get very much information. It's not always clear exactly what's meant and you can talk faster than you can type.

– Maybe it's just because of the pre-post experiment but there seems like there's a lot of repetition within the survey, but that's the design really. I guess the length of it. It's kind of hard to carve out this much time in a day. It just so happens that I'm not going to all of my meetings at NASA since I can't get around so that worked out pretty well, but it's a pretty big time commitment to do this. But if it's used well, I'm all for it. If it's really utilized.
{interviewer} – Ok and it really is utilized. It's a very important focus on the Payloads Office. After each cycle a major analysis and report is produced which I'm responsible for producing, and that report. Of course, lots of reports are being generated in the program. I mean it's no big thing just to generate another report, but it is looked at very carefully by Payloads office management, it goes to headquarters and it is part of our matrix. Part of this feedback goes into central program metrics that Mr. Gerstenmaier sees, for example, so this is not going into some black hole, I can assure you.
- I'm definitely glad to hear that because that would definitely be a waste of your time and mine.
- {interviewer} – So what number would you give on the questionnaire?
- On the design and content?
- {interviewer} – yes.

I guess I'll give it a 4. Just because of the length and repetitively for this particular experiment.

– I think some of the, from a PI's perspective, I think some of these questions seems very redundant. I understand that from different levels you're getting different information and I don't know if you want to have your questionnaires a little more focused for PI teams versus heads, versus you know, the implementers. You might be able to make it a little more concise that way but I understand that you're trying to use one questionnaire for a lot of different people so you're going to get a lot of different views. If there's any way to clarify the groups a little better, you know, we're spending a lot of the interview time saying "which people are those you're talking about"? From a PI level and we even work here at NASA, we don't necessarily know who all of these people are that you're asking us to evaluate. So I think it would be even more difficult for PIs outside who have no feel at all for the program structure who each group would be and I don't know if there's any easy way to personalize it a little bit more or maybe have a cheat sheet at the beginning or in your email that would say, "when it

refers to this RPWG or whatever, this is who we are talking about and when it refers to this, it's these people.
{interviewer} – We skipped over a lot of that stuff and I don't know if it was *{interviewee names}* comment about "we really should have had time to look things over in advance". But I think there's adequate explanation on the questionnaire itself if you sit down and you read some of the text that's there.

- I know we were skipping it but I still think even if I read that text I wouldn't necessarily know which people it was referring to, so you might want to have for a PI team, here's your cheat sheet – when we're talking about these people we're referring to your PED, when we're talking about these people we're referring to know.
- For any given increment you know who those people are. It's like this was your staff and these are the people and you may know that, ok for example I interact with *{name}* and I know exactly how this stuff went but I wouldn't necessarily know what his position is. You know if you're asking for increment 8, it's like this is the staff that you as the PI should have interacted with and what their positions are. And then you can go into the questionnaire and that way people are more attuned to, "ok, yeah I can remember. This guy really busted butt, he did great and blah, blah, blah", you can tie it to the interactions you actually had,
- {interviewer} – Yes, I've considered that and you guys get a gold star for the best feedback on the questionnaire that I've had in a while. But you still need to give the questionnaire a rating.
- A 4.

– There were some errors of Increment 7 and Increment 8 in there that perhaps could have been corrected, but I give it a 4 in general. My comment would be that I perhaps would have probably done this more efficiently if I had filled it out in advance. I've given that a 4.

– I think it was well designed actually. Way to go SAIC.
{interviewer} – Well actually it was a lot of people, it wasn't just SAIC. We integrated a lot of the RPOs and folks around the program to help design it.
- Very good.

– Give it a 2 for the questionnaire for an outsider with not understanding everything. I gave you a 5 on 4.1 and it seems disjointed to give a 5 on that one and then a 2 or a 1 on the second one, but you've got my comments.

– 4. I don't like that I can't print it.

– Very satisfied, a 5.

– I'll say a 4. Just because I know I'm rather new to this but some of the ratings especially in that one section where whether or not I felt it was applicable. That section I'm just not sure about. Those were rather vague. It would have helped if they had examples like even one of the documents. Just so I would know what kind of answers or focus that they wanted.
{interviewer} – That's good feedback. We will see if we can add something to that for future increments and we do do this each increment so if you fly in future increments.
- We just finished a run of an operation on this increment, increment 9 so we'll probably be doing it for 9 as well.

– 3 – Also a 5.

– 2 – (1) is flashing a 5. I was really debating on a 4 because I guess there are always levels for improvement.
{interviewer} – Again, it's not legal for me to suggest an answer so the two of you think about it.
2 – It's pretty good. Can we give like 4.5?
{interviewer} – No, you can't.
2 – It's pretty good.
1 – I thought so.
2 – I guess we could say a 5 and the basis for the 5 is I don't think I could have done any better. You guys have done great asking these levels of questions and getting feedback. It's always tough to ask for

feedback because the feedback process is inherently trying to. Rarely do you bring up a lot of the good things. People bring up the negatives but you've got a good balance in the good and the bad and overall our experience is very positive.
{interviewer} – Great. I was glad to get your feedback because *{the PD}* is generally very busy and so I haven't always been able to get her to complete the interview so I was happy to talk to you folks today.

– A 5.

– 2 – I think we'd give it a 5, again because it's so thorough and comprehensive. It really leaves almost no room for missing anything.
{interviewer} – But the time issue for you folks. Is that a big factor? You'd probably like to see it be shorter? I mean everyone would like to see it take less time.
1 – You know an investigation on orbit is such a commitment and we spend so much effort preparing for the flight and getting the hardware up and working with the PI, I mean I wouldn't be concerned about that.

– I'll give it a 4. Here's what I'm going to say. I don't like the fact that you put the general questions first because then, as a taker of the survey, you're always questioning should I answer it now or should wait for the more specific questions later, so I think you should put the general questions at the end. So that's why I'll give it a 4.
{interviewer} – That's an interesting thought. I'll have to think about that. Unfortunately, it seems to be standard and survey practice to put the general questions up front.
- That may be the case. This is one of the few surveys I've actually spent some time thinking about as opposed to I just have to fill this out and fill in the bubbles and leave after 2 minutes. One of the comments I had was should I answer this now or should I answer this later. I don't know if there's a way to have an opening screen that describes what will be answered where, but then again you're on the phone and you answered that, so at some level that doesn't matter so much. But I definitely feel you should put the general questions after the specific ones.
{interviewer} – Ok, that's something I'll have to think about.

– Rating is a 5. I think the design and content of the questionnaire is it's really a pretty thorough questionnaire. On the one hand it would be nice to be able to say yeah I was real happy or I was not happy and here's why I wasn't happy, but the design of the questionnaire kind of draws out maybe some of the things you wouldn't think of otherwise to say, so a 4 on 1 and a 5 on 2.

Appendix A – ISS Utilization Survey Increments 7 & 8 Questionnaire

A condensed listing of the questions in the main Parts 1 to 4 of the ISS Utilization Survey for Increments 7 and 8 that follow the Customer Information page is provided below.

Part 1. Cross-Program Feedback

Section 1.1 – Overall Satisfaction

1.1.1 Please rate your overall satisfaction with the ISS Utilization Program (1-10, Very Dissatisfied/Very Satisfied/ N/A).

1.1.2 Please rate the degree to which the ISS Utilization Program met your expectations (1-10, Fell Short/Exceeded/ N/A).

1.1.3 How close to your ideal organization for ISS Utilization management would you rate the ISS Utilization Program? (1-10, Not close at all/Very close/ N/A)

1.1.4 Please rate how well the ISS Program gave priority to research during the current Increment (1-5, Not very well at all/Very well/ N/A).

1.1.5 Please rate the extent to which the amount of raw data collected by your ISS Investigation during this Increment was worth your participation in the ISS Program (1-5, Not worth it all/Very worth it/ N/A).

1.1.6 Assuming it did not change your own odds in competing for ISS research opportunities, how likely are you to recommend to a colleague that they perform research using ISS? (1-5, Very unlikely/Very likely/ N/A)

1.1.7 Assuming it did not change your own future opportunities for ISS support work, how likely are you to recommend to a colleague that they become a payload developer for ISS? (1-5, Very unlikely/Very likely/ N/A)

1.1.8 Assuming you could get research funding, how likely would you be to choose to pursue another research investigation on ISS? (1-5, Very unlikely/Very likely/ N/A)

1.1.9 Assuming it was not your only option for work, how likely would you be to choose to develop another payload for ISS, given the opportunity? (1-5, Very unlikely/Very likely/ N/A)

1.1.10 How would you compare your experience with the ISS Utilization program for the current increment to your experience on previous Increments? (1-5, 1-Much worse/3-About the same/5-Much better/ N/A).

Section 1.2 – Satisfaction with Program Processes

1.2.1 Please rate your level of satisfaction with the overall ease of doing business with the ISS Utilization Program (1-5, Very dissatisfied/Very satisfied/ N/A).

1.2.2 What is your opinion of the number of personal contacts you interacted with in order to accomplish your ISS project? (1-5, 1-Not enough/3-Just right/5-Too many/ N/A)

1.2.3 Please rate your level of satisfaction with your direct use of the Payload Data Library (PDL) (1-5, Very dissatisfied/Very satisfied/ N/A).

1.2.4 Please rate your level of satisfaction with how effectively the data in the Payload Data Library (PDL) are used by the ISS Utilization Program (1-5, Very dissatisfied/Very satisfied/ N/A).

1.2.5 Please rate your level of satisfaction with the ISS end-to-end payload integration process (1-5, Very dissatisfied/Very satisfied/ N/A).

1.2.6 Please rate your level of satisfaction with the amount of data and documentation you had to produce and deliver to meet the ISS Utilization Program's requirements (1-5, Very dissatisfied/Very satisfied/ N/A).

1.2.7 Please rate your level of satisfaction with the required schedule for delivering the data and documentation you had to produce to meet ISS Utilization Program requirements (1-5, Very dissatisfied/Very satisfied/ N/A).

1.2.8 What is your opinion of the number of ISS Program formal review meetings that you were required to prepare for or participate in? (1-5, 1-Not enough/3-Just right/5-Too many/ N/A)

1.2.9 Please rate your level of satisfaction with the ISS Utilization Program's formal review processes in general (1-5, Very dissatisfied/Very satisfied/ N/A).

Section 1.3 – Satisfaction with your Customer Support Interface

1.3.1 Please rate your level of satisfaction with the support your ISS Investigation received from your assigned NASA Research Program Office / Research Integration Office (1-5, Very dissatisfied/Very satisfied/ N/A).

1.3.2 Please rate your level of satisfaction with the services provided by the Payload Integration Manager (PIM) assigned to your Investigation (1-5, Very dissatisfied/Very satisfied/ N/A).

1.3.4 Please rate your level of satisfaction with the support the ISS Utilization Program provided to your investigation in the area of Crew Training (1-5, Very dissatisfied/Very satisfied/ N/A).

1.3.5 If at any time during your Investigation's development, integration and operation your requirements of the ISS changed, please rate your level of satisfaction with how the ISS Utilization Program responded to your change request (1-5, Very dissatisfied/Very satisfied/ N/A).

1.3.6 Please rate the level of your satisfaction with the communication flow between you and the personnel in the ISS Program (1-5, Very dissatisfied/Very satisfied/N/A).

1.3.7 Please rate your level of satisfaction with the ease of locating necessary information (1-5, Very dissatisfied/Very satisfied/ N/A).

1.3.8 Please rate your level of satisfaction with the ease of accessing necessary information once it is located (1-5, Very dissatisfied/Very satisfied/ N/A). **[Increment 7 only, discontinued for Increment 8]**

1.3.9 Please rate your level of satisfaction with your Investigation's interface to the crew on-orbit (1-5, Very dissatisfied/Very satisfied/ N/A).

1.3.10 Please rate your level of satisfaction with any educational/orientational information you received from the ISS Utilization Program at the outset of your ISS Project (1-5, Very dissatisfied/Very satisfied/ N/A).

1.3.11 Please rate your level of satisfaction with the Payload Information Source CD and its companion website as informative and useful resources (1-5, Very dissatisfied/Very satisfied/ N/A). **[New for Increment 7/8]**

1.3.12 Please rate your level of satisfaction with the Payload Developer Web Portal as an informative and useful web-based resource. (1-5, Very dissatisfied/Very satisfied/ N/A). **[New for Increment 7/8]**.

1.3.13 If your investigation had significant payload integration/data collection activities in Russia, please rate your level of satisfaction with the support the Program provided for these activities. (1-5, Very dissatisfied/Very satisfied/ N/A). **[New for Increment 8]**.

Section 1.4 – Satisfaction Factors

1.4.1 What three aspects of the ISS Utilization Program would have the highest impact on your overall satisfaction if they were improved?

Satisfaction Factor 1 – (Open-ended, verbal response w/comments)
Satisfaction Factor 2 – (Open-ended, verbal response w/comments)
Satisfaction Factor 3 – (Open-ended, verbal response w/comments)

Part 2. Feedback on Specific Management / Functional Areas

2.1 Please rate your level of satisfaction with the various services and support provided by your **NASA Payload Development Team**

2.2 Please rate your level of satisfaction with the various services and support provided by your **NASA Research Program Office / Research Integration Office.**

2.3 Please rate your level of satisfaction with the various services and support provided by **Research Planning and Integration.**

2.4 Please rate your level of satisfaction with the various services and support provided by **Mission Integration.**

2.5 Please rate your level of satisfaction with the various services and support provided by **Payload Engineering Integration.**

2.6 Please rate your level of satisfaction with the various services and support provided by the **Operations Integration** management area.

2.7 Please rate your level of satisfaction with the various services and support provided by **Real-Time Payload Operations.**

2.8 Please rate your level of satisfaction with the various services and support provided by the **Payload Safety** management area.

Services (1-5, Very Dissatisfied/Very Satisfied/N/A)
Processes (1-5, Very Dissatisfied/Very Satisfied/N/A)
People (1-5, Very Dissatisfied/Very Satisfied/N/A)
Hardware Tools (1-5, Very Dissatisfied/Very Satisfied/N/A)
Software Tools (1-5, Very Dissatisfied/Very Satisfied/N/A)
Documents (1-5, Very Dissatisfied/Very Satisfied/N/A)
Deliverables (1-5, Very Dissatisfied/Very Satisfied/N/A)

2.9 Please rate your level of satisfaction with the various services and support provided by **Payload Physical Integration**.

Columbia Mishap

CM - Please rate the extent to which your Investigation was directly affected by the Columbia mishap (1-5, Not directly affected/Highly affected/N/A).

Part 3. Open-Ended Feedback

Section 3.1 – Lessons Learned

3.1 Based on your ISS experience, what lessons, either positive or negative, have you learned that could help future users of the ISS? (Open-ended, verbal response)

Section 3.2 – Program Strengths and Weaknesses and General Comments

3.2.1 What are the major strengths of the ISS Program? (Open-ended, verbal response)

3.2.2 What are the major weaknesses of the ISS Program? (Open-ended, verbal response)

3.2.3 Is there anything else you would like to tell us? (Open-ended, verbal response)

Part 4. Satisfaction with the ISSUS Interview and Survey Questionnaire

4.1 Please rate your level of satisfaction with how the ISSUS interview was conducted (1-5, Very Dissatisfied/Very Satisfied/N/A).

4.2 Please rate your level of satisfaction with the design and content of the ISSUS questionnaire (1-5, Very Dissatisfied/Very Satisfied/N/A).

Appendix B – Statistical Methods

For the questions in the ISS Utilization Survey that solicited responses based on numerical rating scales, the overall data analysis strategy had two main goals: (1) selection of a single statistical parameter that would form the principal basis for describing the data and making comparisons of the Increments 5 and 6 response results for each question, and (2) development of methods for testing the statistical significance of variations in this parameter as well as the response data as a whole. For each question, the response data take the basic form of a distributed frequency of rating scores, and with data of this type there is typically no single "best" statistical parameter that can roll up all features of the distribution. A particular challenge for many of the Survey questions was the tendency of their score distributions to be based on relatively small *n* (sample size) with asymmetric (skewed) shapes that are not easily parameterized by a single measure of center. These features present challenges in applying standard statistical tests to assess the significance of Increment-to-Increment variations in the data, because many of these tests assume that the data are normally distributed.

Upon review and analysis, it was elected to use question mean scores as the principal comparison statistic for the response data. Compared to other descriptive statistics such as the median, the mean is a more sensitive indicator that takes all values in the distribution into account, and it is a commonly recognized basis for a variety of statistical methods. The tendency of the mean to be inordinately affected by extreme or outlier values in asymmetric data distribution is, however, a factor that had to be managed given the sometimes skewed (typically negatively skewed) nature of the Survey question response distributions. This issue, and the other statistical challenges presented by the Survey response data were addressed by following a flexible approach that cross-compared the results of more than one statistical test to look for variations in the data. The two principal statistical tests used in this approach are described as follows:

- *T-test*: For the Survey questions with satisfaction-based rating scales (see Section 4 above), the statistical significance of the difference in mean score between Increment 5 and Increment 6 was assessed using the statistic:

$$T = \frac{\bar{x}_{Incr.6} - \bar{x}_{Incr.5}}{\sqrt{\left\{\left[(n-1)S^2_{Incr.6} + (m-1)S^2_{Incr.5}\right]/(n+m-2)\right\}(1/n + 1/m)}}$$

  where $\bar{x}$ denotes the sample mean, corresponding in this case to the question mean rating score for a given increment, S is the sample variance (score variance), n is the Increment 6 sample size, and m is the Increment 5 sample size. If the total set of response scores obtained for each question during each of the Increment surveys are considered to be random samples of a corresponding larger population, each with population mean μ, then the Increment 5 and Increment 6 Surveys can be considered to have sampled populations with identical measures of center if $\mu_{Incr.6} = \mu_{Incr.5.}$ If this is *true* the values of T will follow a Student *t* distribution with $r = n + m - 2$ degrees of freedom. For the value of T calculated for a given question the corresponding significance level $\alpha/2$ obtained from the two-tailed Student *t* distribution can then be taken as the probability that the hypothesis $\mu_{Incr.6} = \mu_{Incr.5}$ is true, i.e. the Increment 5 and 6 respondent populations would yield the same mean score if they were all surveyed. In the present case, the alternative parameter 1- $\alpha/2$ was used as a measure of the probability that the alternative hypothesis $\mu_{Incr.6} \neq \mu_{Incr.5}$ is true and the Increment 5 and Increment 6

respondent populations are different with respect to their mean scores. The parameter 1- $\alpha/2$ is the value reported under the heading "T test" in the descriptive statistics section of the datasheets for the Survey Part 1 questions in Section 6.0 above. In practice it was elected to use 1- $\alpha/2 \geq 0.80$ (80% significance level) as a key criteria for determining whether a question should be classified as showing a statistically significant change in mean score between Increment 5 and 6. This criteria was supplemented with information from the multinomial goodness-of-fit test described below for those questions where 1- $\alpha/2$ was close to the 80% critical value.

- *Multinomial goodness-of-fit test (chi-square test).* Although the T-test statistic has some flexibility with regard to the distribution shape of the data being tested, it is generally based on the assumption that the two data sets being compared are each normally distributed and have similar variances. If these assumptions are violated, but not too badly, the T-test is satisfactory but the significance levels are only approximate. Because as noted above a number of the Survey score distributions deviate from normally, it was considered prudent to support decisions on statistical significance with an additional statistical test that required fewer assumptions regarding the form of the data. The additional test applied in this case was a multinomial goodness-of-fit test, which tests the statistical difference of the overall shapes of the score distributions, with no assumptions required concerning whether they are normal or not. The goodness-of-fit test is based on the statistic:

$$\chi^2 = \sum_{i=1}^{5,10} \frac{\left(O_i^{Incr.6} - E_i^{Incr.6}\right)^2}{E_i^{Incr.6}}$$

where for a particular Survey question $O_i^{Incr.6}$ represents the observed frequency count of a particular rating score *i* (1 to10 or 1 to 5) obtained in the Increment 6 survey, and $E_i^{Incr.6}$ represents the "expected" frequency count for that score value for Increment 6 that is predicted from the Increment 5 response data according to:

$$E_i^{Incr.6} = \left(O_i^{Incr.5} / m_{ap}\right) n_{ap}$$

where $O_i^{Incr.5}$ is the frequency count for the rating score *i* obtained on Increment 5, m_{ap} is the total number of applicable responses to the question obtained on Increment 5, and n_{ap} is the total number of applicable responses to the question obtained on Increment 6. The term in parenthesis, which represents the relative frequency of the score value *i* obtained in the Increment 5 survey, can be regarded as the probability estimate that the score value will be selected by any of the Increment 6 respondents *if the Increment 5 and 6 interview groups were identical.* The extent to which the actual frequency of this score value differs from the predicted is a measure of the statistical difference of the Increment 5 and Increment 6 interview groups in terms of their predisposition to select a score value of *i*. The sum of the differences as measured by χ^2, which is a measure of the overall deviation of the actual Increment 6 score distribution from the statistically expected one based on Increment 5, has a chi-square statistical distribution. From the value of χ^2 calculated for a given question the corresponding significance level α obtained from the chi-square distribution can then be taken as the probability that the Increment 5 and 6 interview groups were the same with respect to

their predisposition to select score values. As was done for the T-test, the alternative parameter 1- α was used as a measure of the probability that the alternative hypothesis is true and the Increment 5 and Increment 6 interview groups were on the whole different in their decision-making regarding score selection. The parameter 1- α is the value reported under the heading "chi-square test" in the descriptive statistics section of the datasheets for the Survey Part 1 questions in Section 6.0 above. In practice the critical value of χ^2 corresponding to a value 1-α ≥ 0.80 (80% significance level) was taken as the criteria for deciding that the Increment 6 score distribution for a question was statistically different than that for Increment 5.

Although the T-test was the primary statistic used to assess the degree of statistical difference in question responses, both the T-test and chi-square statistics were used in combination when the T-test results were borderline and/or suspected of being inaccurate. In these cases questions with T-test values near the borderline 80% significance level were classified as showing statistically significant change (either Improving or Getting Worse) if they had chi-square values significantly above the 80% significance level. Conversely, questions with borderline T-tests would generally be put in the No Significant Change category if they had chi-square values significantly below the 80% significance level. Question for which both statistics were around 80% significance level were generally classified as showing No Significant Change unless a review of their overall score distribution and other descriptive statistics supported a different classification.

Appendix C – Verbal Comments

Please note, the verbal comments appear in numerical order, i.e., according to how each question appears in the Survey questionnaire.

Topic Area: Overall Satisfaction – Overall Satisfaction Index
Question 1.1.1 – *Please rate your overall satisfaction with the ISS Utilization Program.*

Question 1.1.1 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– It seemed so much more organized. I didn't have to answer the same question multiple times. *{name}* did a really good job. It really started showing.

– We are in a unique situation doing data collection out in Russia. It is not always the best of circumstances, but of course, that is not the Program's fault. We do the best we can the power situation and all those types of things that we have to deal with out there and the logistics. It is not a Program it is just a situation we have to deal with post-Columbia. There is talk of the Soyuz being the sole return vehicle for the ISS crews, and I guess there are reasons for that. If we are going to do that, I think we need to be really careful about having adequate BDC facilities out in Star City, because right now…we're borrowing…and it is difficult. I am not blaming the Russians or the Program; we are all doing the best we can. The point is if we go to a permanent situation, we need a facility where we have good clean power to our test rooms, and also that we have access to. Sometimes we have difficulty getting access to our rooms because we are in Star City, which is a military installation and we are guests. Those are the kinds of things that we are doing the best we can with what we have but if we go to a permanent type scenario we need either to build a BDC wing on Bldg. 3 out there or build a separate facility that we can control, both the access and power.

– No comment.

– No comment.

– Some things did not come out exactly as I wanted them. We got the crew back later than we wanted, but it wasn't clear that we could help that. One area of improvement that I've noticed is that I felt that I'm going on parallel tracks with multiple people and that wasn't the case this time. This time I basically dealt with *{name}* and *{name}* pretty much got everything through. Once in a while *{name}* would pop in, but the process was quite streamlined I thought, for issues related to this increment.

– We believe that some of the individuals helped us out above and beyond what our expectations were and the ability they demonstrated was also superior to what we anticipated. We thought the support was extraordinary. We could not have expected it to turn out as well as it did.

– I'm going to give it an 8. The only thing on increment that we were planning to and I don't even know if this falls under the ISS Utilization Program but we were planning to do *{our investigation}* on increment at the last minute it was nicked off. They had done a lot of preplanning for it and then didn't get to fly.

– Looking at the entire story from the preliminary conception up to the data analysis we are performing now, I should rank it 9 or 10. The only general and specific recommendation I would make is to have more time dedicated to astronaut training, but I know that the crew time is not a waste available even when they are on ground so if I have to make a comment I should say more time dedicated to training. A 9.

– I would have liked to have gotten more done. Depending on how I look at this I could give you anywhere from 2 to 9. I think in view of my understanding of what's going on there and the constraint that you're put under, I would have to say probably an 8. These might come out in other questions but I think. What increment was Mike Foale up there?
{interviewer} – It was the next one, Increment 8.
- So, ok we've got to do a survey for that then?
- {interviewer} – At some point down the road later this summer, yes.
- Are we off the record now?

- {interviewer} – No, I'm afraid everything is on the record.
- Ok.
- {interviewer} – But you understand that everything is anonymous, all right so your identity is kept confidential. So, your comments will be seen by people in the payloads office but your identity will not be attached to those comments.
- I think we were sheltered by the POIC or whoever is down at Marshall or who is ever down at Johnson from having direct interaction with *{the crewmember}*. I think we could have gotten more done.

– I would say 8. I think the bottom line was after the Columbia accident we really thought *{our investigation}* was out of the picture as far as flying and I felt the ISS Utilization Program really viewed us as a viable payload and went to some extraordinary lengths to make sure that we got onboard the Russian vehicles and were very supportive as they walked us through a whole new process so I think we really have very few complaints because everybody really, I felt, went above and beyond.

– I give that a 6. I don't know if one of the issues that we get into now is that we talk about trying to rate maybe the whole ISS Utilization Program when all we were doing was real time ops, I don't know how much that muddies the water. That's why I was looking at these types of questions. I was almost going to look at it as non-applicable because in essence all we were doing was ops. On Increment 7 compared to 6 changed. One of the main situations is that the crew went from 3 to 2 and that created a different situation plus I believe there was a huge changeover in the cadre and it seemed like we lost some things. If I were looking at ops I would have it down as a lower number as opposed to a higher number. That's why it makes this question kind of difficult if we're just saying Increment 7.
{interviewer} – I understand. We have thought about that and we understand that that conundrum sort of exists and the way we think about it is, for your purposes for Increment 7 ops folks at POIC and that interface represents the entire program so to the extent that you're satisfied or dissatisfied with them, you're satisfied or dissatisfied with the entire program.
- Ok, I probably would give it a 6 then.
- {interviewer} – And I'm going to type a quick note that says – It's impacted by experiences with ops. And you'll give us more feedback about that later on.
- Again, you know, sometimes you look at, well even if you get a 5 it means you're satisfied, like that's not necessarily a bad thing.
- {interviewer} – Just to calibrate you on that, calibrating psychological scales is difficult but I would say that a mid point between 5 and 6 is a state of mind where you're really on the fence, you're super satisfied, you're not dissatisfied, you're sort of right I the middle, right in the pivot point. And then going forward or backward from there is grading into respectively more satisfied or less satisfied. So to me a rating of 6 means you're marginally satisfied but not significantly satisfied, only marginally satisfied.
- Ok, then let's give it a 7 based on your words there.

– I would rate it a 10. I just have a couple of overall general comments. Since we are a repeat payload in that sense, we have seen a lot of improvement in the reverse with various international space station organizations that support us so we see both increase in communication as well as increase in understanding of what we are trying to accomplish so they anticipate what we would need and we are given the opportunity to work very closely with them so I think overall we have seen a very positive improvement over several increments. The bottom line is because when you work long you sort of both earn trust and understanding of your colleagues and the station team.

{interviewer} – Let's emphasize Increment 7 specifically and if we get a question asking about previous things we'll just put in not applicable if it's appropriate.
- I'm not sure what is meant by ISS Utilization Program.
- {interviewer} – That is a specific thing and by utilization program we mean essentially everything that has been done to support your investigation after the investigation was funded by NASA headquarters. So, it's easier to say what it is not than what it is. And what it is not is that it doesn't include like dealing with getting the funding from NASA and replaying to NASA research announcement but once you were funded and it was decided that you would fly on Station, everything that happened from then on in terms

of support from NASA whether they're at JSC, Kennedy Space Center or any other places that's all grist for the mill in terms of your evaluation. The big components for you are the support in particular that you got from *{your RPO}* because for you a lot of your interface was defined by your experiment support scientists and so forth, the people in *{name's}* shop that supported you and they're part of it. They're part of the program and so when you're thinking about evaluating things, you need to fold in what they did for you. So the rating scale is there, it's a 1 to 10 scale. 10 would be anchored at you being very satisfied, 1 would be very dissatisfied and then it's sort of a linear scale from there.
- I'm trying to decide between 8 & 9. I guess I'll say 9. There was a lot of work done during this increment to try to boost our participation rate. This is regarding the ground portion of our studies. We were having difficulty getting a satisfactory amount of participation from the mission control staffs who are also filling out our questionnaires and the ISS Utilization Program provided a lot of creative tactics to try to boost participation and was persistent in continuing to try more and more new things until it paid off. Also one thing that was new during this increment was that I went to Russia to do the post-flight debriefing of the subject in Star City and that took a lot of extra logistical support that hadn't been done before for our study and that went well. There were some glitches but I think that's just the nature of trying to do something like that.

– So this is like the overall experience?
- {interviewer} – Yes, that's right. If you're looking at everything integrating over, everything that's happened on Increment 7. Right, but some of the things that would make me less satisfied had nothing to do with them. It had to do with the fact that things changed so late. I mean we were a little unhappy that we didn't get pre-flight data but that wasn't anybody's fault, I guess.
- {interviewer} – That's still part of your overall satisfaction in a general sense.
- {interviewer} – Now you've got my interest a little bit.
- First of all, the US crewmember didn't sign up for our project so that left us with the Russian crewmember. The Russian crewmember, it's my understanding, got changed out rather late and so that's why. The one they changed out he did agree to do the experiment but it was late so we couldn't do the pre-flight biopsy because they needed six weeks and they need a little time after the biopsy.
- {interviewer} – {interviewer} and I really try to avoid coaching people on this.
- I understand. The only reason, the main reason that I was not as satisfied as with 5 or 6 is that I have this problem with not getting my pre-flight data but nevertheless it was a better scenario than not having any data. I'm just going to say everything else I thought was as good as 5 and 6 in my opinion.

– I think Increment 7 were very happy with; we made a lot of progress; we tried things; we made a lot of progress and we revamped things; it was our first space flight experience so we had a steep learning curve; people were extremely responsive in helping us setup mechanisms for communications that facilitated our traveling; we didn't have to travel to Houston every experiment; I don't think that frustrations are relevant to what I'm remembering. 3? 3 – I'm at a loss. 2? 2 – no, I recall that Ed Lu was very helpful when we had the PI conference and when we got the first set of images back and we were trying to figure out what the reflective light was on the images and he had all sorts of ideas that were helpful for us. 1 - well, we haven't heard from 3 , he's being political; I think, being polite, but I think we're trying to improve things at NASA; I think we have, see when learning about how this thing worked and how to communicate and how to get our points across, we had a lot of difficulty understanding why we couldn't just directly communicate during the experiment and get things fixed; we had a lot of; you know we were novices and we just I don't know whether that's good; maybe you want to hear how frustrating it is for a novice to work with this program. {interviewer} – there are going to be dedicated questions in the questionnaire that are going to speak to that; let's just think top level you know sort of overarching right now and think about, again if you look at this rating scale if 10 is at the top, 1s at the bottom sort of a middle of the scale would be between 5 & 6, give me a number, please. 3 - I find this very problematic because when did Increment 7 end? 1 – Increment 7 ended when Ed Lu left. 2 – right, we didn't do any of the mixing experiments; it was just the camera setup and the discovery of the bubbles. 1 – the camera setup, did we even get the bubbles from that? 2 – yeah that was; it was no paper

tube, no. 3 – right but when did it, was it September? 2 – it ended in October. 3 – in October. 3 – in October. 2 – so we didn't get. 2 – so it was last summer's activities? 2 – yeah, it was when we both had gone to Houston. 1 – it was before we had IVOD and we had a lot of yelling on the telephone; I remember we were yelling our heads off trying to get like one idea through all the way to COM. 2 – and he had the idea of the lab notebook. 1 – and the lab notebook idea, yeah, but we're; given everything that we understand now, I'm coming up with like a – but we didn't have very many activities with him. 1 – I know but this whole thing is about is whole day, this whole interview is just about improved the process in 8 tremendously with the conferences. 3- then I give it a five. 1 – I guess we would give it a 5 because it was only in 8 that we improved it; we were not able to communicate until 8 so we'll give it a 5 and we'll say that the major thing that would improve things is to (1) give PIs, get PIs on IVODs immediately; (2) get them whenever possible the program for the KU coverage for the video; and (3) institution of the crew conferences; those 3 things were major improvements to the process; at the point of se are the things we are recommending.

– (3 people – *{names})* We had some variation but we think around at basically stems from our sort of disappointment with the lack of crew time available to complete the operation. We started *{our investigation}*, it was to support the in-between time before the shuttle launched and provide some science with no mass up and to fill in so we were led to believe that we would be able to complete the activities in a short order and we haven't actually completed, we haven't actually done the soldering tests yet. We've done all of the prep work necessary but we're still waiting to complete *{our investigation}* and that may not even be until Increment 10 at this point.
{interviewer} – Any other comments?
- We may get into some of them about putting in the products and the safety process.
- {interviewer} – Things get more detailed as we go on.

– (2 people *{names}*) I'll put a 9 on that, very satisfied. There's always room for a little improvement.
{interviewer} – When we get higher ratings from people generally what we try to ask is sort of what did we do right. Any comments there?
- For Increment 7, Ed, the Marshall PODs and the PCOs and the LISs were all very accommodating at trying to work to get any questions that we had to him and so that was helpful. Having that communication chain going and so that's probably my main point for all of Increment that communication back and forth and coming up with ways to do that without burdening the crew and they actually tried to protect us a couple of times from the crew giving us too much to do.

– A 9. I would just say that everything went very smoothly for this experiment.

Question 1.1.1 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– I'm very satisfied. Rating is a 10. No comments because I think it's difficult to improve 10.

– Rating is a 9. Continue to cross-feed data inputs. One entry should get to all of the end users. We're not quite there but I'll give it like a 90% rating.
{interviewer} – Ok. So what you're seeing happening is you have fewer cases where different people are asking you for the same data.
- Correct. That's markedly improved. I didn't have to do an awful lot.

– Rating is a 9. I think Mike Foale is very approachable.
{interviewer} – In terms of direct interaction with the crew, that helped to improve how things went for you on that Increment?
- Yes, particularly during repair operations.
- {interviewer} – Now I'm curious. Was that repair of the *{supporting facility class payload}* or repair of your payload?

Of my unit. Primarily one of the gears that got stuck, the Teflon we think expanded and it stopped the run.

– Rating a 2. The point of entry for the investigator talking {???} asked to do the same paperwork over

and over and you get different parameters that turn out to be different down the road and it's very frustrating. You have a number of telecons when you get basic information in a very repetitive manner that is not helpful at all. You have to deal with persons that have no science in your area and it makes it very difficult.

– I would say and think for us 7; was a learning process. We had to export our hardware to Russia. I think by the time we got to 8 with a two-person crew we'd learned a lot lessons from both getting stuff up and people on orbit with a two-person crew and using our stuff onboard. 8 was much easier for us.

– For Increment 8 we got all of the data we wanted to get. Some of the problems that we had initially on some of the last missions that I told you about regarding our power issues and the UPS. We did get UPS' and we have a full, complete data set without any problems, so we got everything that we wanted to get when we went out there. At least in regards to the power and the issues we had before, it's been completely solved so we got everything so I'd have to say a 9 or a 10. Well, we got everything so I guess I'll have to give it a 10.

{interviewer} – I remember the thing about not getting power over there in Russia.

- Well, we had a power conditioner and a power converter, but not a UPS. We had sent it over but the delivery was late and so we didn't end up having it for our data collection and it caused some havoc on some of our equipment and we did have some problems with some of the data with that, but since then between 7 and 8 the UPS' did arrive and everything has been cleaned up and we're good.

– Does this include the integration to get onto the Russian vehicle, the Progress vehicle to get up there?

{interviewer} – Yes it does and what it includes is specifically whatever support you got from NASA for doing that. What it excludes is rating the Russians themselves. And there's a dedicated question on that later on in the questionnaire. Maybe you've seen it.

- 1 - No we haven't seen it but I for one am very glad to hear that.
- {interviewer} – Well, we can talk about that.
- 1 - We're torn. Let me give you my thoughts on this. I think it was a good idea to go up on the Russian vehicle, but I think it was very poorly planned and the pathway was not laid out well for us, for the PDs. We got thru it just fine. We had an excellent PIM that gave us an incredible amount of help, but I feel like the program kind of dropped the ball there. They made the decision that we were going to fly on Russian vehicles, which is good, but it didn't seem like they took the steps to clear the way to actually make that happen.
- {interviewer} – Ok, understand.
- 1 - Now, having said that, I think other than that.
- 2 - Yeah, on the other hand in dealing with team or teams that do the planning once you're on orbit and the crew training, etc. I had a really great experience with all of that. Much improved over the first increment.
- {interviewer} – Ok, and there are dedicated questions dealing with that further on in the questionnaire.
- 2 - Ok, but I think when we have to rate our overall satisfaction we have, it's not uniform. It depends on what aspect we're talking about.
- {interviewer} – I know and that's what makes these over-arching kind of questions really kind of nasty because you're asked to integrate over everything and then come up with a number and it's hard to do. I just ask you to do your best and take a shot at it.

2 - Well, then we have to go with the average and give it a 5.

– Rating is a 10. We had virtually flawless communications with the crew members on board and we got a lot of very, very useful and valuable imagery from their operations of the camera and so on.

{interviewer} – Remind me of something. I've got to remember about the window problem. The window was closed during 8?

- I believe it was.
- {interviewer} – So, you were using windows out of the service module?

I think so.

– A 10, very satisfied. Everything went very well and we were so pleased that the PI of our study actually

commended the ISS team at a recent meeting where Gerstenmaier was giving, so very happy.

– This may be a bit unusual that we were already a funded investigator and then the 0 upmass opportunity came and we started that a year ago last March so just from that point on, not including any of our prior NASA work, right?

{interviewer} – That's correct, it's primarily *{investigation name}*.

- So this includes Marshall and interacting with ???.
- {interviewer} – Sure any interaction you had to get your investigation developed and flying, so whatever points of interaction you had.
- I liked the people at Marshall. I'll say 7. The Marshall team was excellent and the team there worked very, very hard. It appeared to though that NASA headquarters had an unrealistic expectation of what a 0 upmass experiment involved and it certainly was not 0, well, I don't mind my time but it certainly took an enormous amount of time for something that seemed to me rather trivial. We spent, actually let me see. I kept track of how many emails I've received to inject honey into water, 619 to date. There's probably about 15 to 20 hours of telecon plus I've gone up there and visited at least once to help. Some of this was clearly necessary, but I was, it seemed to me it wasn't a well thought out endeavor from headquarters' point of view of what the effort really would be involved. As I say, the effort on my part I enjoyed but except for the safety stuff but we can get to that later.

- Rating is an 8. I guess it's just the realities of the program that you have to deal with. You have to be very flexible in your scheduling, etc.

– A 5. In general, we had a hardware problem and the whole communication process didn't seem to work very well in resolving that and working around to trying to help us implement for the next expedition. Communication was an issue from the big level.

– Is this to do with crew interactions as well?

{interviewer} – Yes, it's very integrated. The scope of this is really quite broad. It includes just about all of the support that you've gotten to get *{your investigation}* done. It also integrates up to, for example *{Payload Developer}* and the Lockheed staff in Bldg. 37 or wherever that supported you. The only thing it doesn't include is whatever you had to hassle with headquarters to deal with your funding.

- Ok, well then I'd say we were highly satisfied and I think we'd give it a 9. I'd say we had outstanding support from the team led by *{Payload Developer}* and I think you're probably going to be hearing the echo there on a number of these responses, and I think that with every stage of the game we had great ground support. I don't know where this will come in, but the only time I can think we had a few issues were there were times when the POD would not transmit exactly the things we wanted transmitted for reasons that we weren't able to figure, and I don't know where, you might advise me as to where that might come in.
- {interviewer} – Again, this is a case where we might really have had to put this under Payload Operations and it might behoove us to go back and.
- And uncheck Payload Operations?

{interviewer} – Yes, let's go back and try that. I don't generally do that but let's give it a try.

– It's a 10. I am just delighted with the performance of the NASA engineers that have been assigned to this from the start and the Lockheed Martin support people. They represent the interests of this study to NASA very well; have gone to bat for the study on several occasions. Yeah, I'm really happy with them.

– Rating is a 3. I think that the research funding was very problematic. It was significantly delayed and it was altered multiple times by Headquarters making ridiculous reworking required at my end so much so that I've had a single person working on just this, a single experienced research grants manager working just on this, whereas she's been able to do 10 or 12 other NIH similar proposals in the past. That is just incredibly problematic. On the people side and on the actual integration side I had no problem. It is just the CODE U and the funding mechanism, that if I were rating just that it would be a 1. If I were rating the remainder of it, it would probably be at the 9 level.

– We thought like a 3 or 4 for this activity and reason being would be the lack of prioritization across the program; we were given marching orders to, after Columbia, to hurriedly with great emphasis on

schedule urgency to come up with these no up mass payloads to utilize astronaut time and to get science while the fleet was grounded; the whole rest of the process had never heard of any no up mass solicitation and any sense of urgencies; the entire process crept along at the same pace as if we were a full up regular payload with flight hardware. 2 – Just to give you a data point, we ran our first experiment right at 1 year after we started this activity. 1 – The original march orders we were given was to have it ready in 3 months; and another thing that was extremely frustrating was that due to the fact that there was no process tailored for no up mass payloads, we tried to write a memo for record that would identify how we were going to go about trying to get thru the process what pieces we thought were applicable, what pieces we thought were not and we circulated that to the OPS folks and to the *{increment payload manager}* and basically saying that instead of doing a project plan because we thought a project plan was overkill for something that had no hardware to be developed, we wrote this memo for record basically stating what deliverables we were going to provide and what process we were going to follow and we got no feedback on that and we built our schedule on that and then what happened was everywhere that we said that we thought something was not appropriate and we got no feedback from space station saying oh yes, yes you will have to do that, I felt like somebody never came along to us and said you're dreaming, you need to do something different; we're not going to be able to tailor to the extent that you've put in here; instead what happened is our schedule just got blown up all over the place because every time we got to another wicket we got told no, no you've got to do this other process; that happened on the procedures baselining, we thought we could just go in with an OCR and put this stuff on the timeline and do an OCR our procedures into place and we thought we were going to be able to just use the OCR process to accomplish the approvals needed that you would normally get through a COFR because it has the safety wicket and all that kind of stuff so we didn't think we were going to have to do the crew procedures ECR process and we didn't think we were going to have to do the COFR process and we stated that in that memo; we wound up having to do both of those processes; actually we had to do the ECR process for the procedures and then they made up some kind of procedure instead of the COFR which was actually more cumbersome than the COFR and we requested they just go back to putting us with the COFR because it would have been easier to mark all the NAs on the COFRs than to come up with the format for what they wanted for the other review they created was unknown and changed daily; all of that was very frustrating; from a program perspective when we put that memo for record out people from the different parts of the program should have commented back and said you're not going to be able to do this. {interviewer} – Let me ask you, in particular you mentioned *{name}* , would you have anticipated that *{name}* would have been the main point of contact to give you feedback on that or would you expect, for example, you know, *{name's}* part of the PMIT, were there any other individuals you were expecting feedback from but didn't get it or didn't get it in a satisfactory way? We also sent it to the POIC representatives so I would have expected Rod Lofton to come back and say I'm going to have something, maybe not a COFR, but I'm going to have to have something besides an OCR and I expected the POIC people to come back and say you're going to have to go through the baselining process for your procedures, you cannot do a new procedure using an OCR process so I would have expected at least those two.
2 - I think also in the safety world, we thought with everything being onboard and all it would be a fairly simple process to get through the safety and we went through excruciating pain to get through the safety process.
1 - And I've got more comments more specific to the safety process later on, but that's more specific to that particular process but in general we had expected that the safety process would be expedited because there was nothing on board that hadn't already been through the safety process, honey and water and plastic syringes, chewing gum and things like that that we were asking about; if you were to go on the fleecing of America the amount of effort that was expended to do this, incredible. Basically, again the lack of prioritization and the lack of a process were crippling; the lack of response when we tried to knock out a process.

– Rating is a 9. Everything was smooth and we got very good results from a scientific point of view so we are very happy with that.
{interviewer} – I'm a little curious. You got good results on Increment 8 in addition to Increment 7. I

seem to remember for 7.

- Yes because we had two different crew members executing our protocols so we got interesting results.

{interviewer} – Ok, very good.

– Like I said, this is like the first one that I've ever worked on so it may not be based on anything, but I say it was pretty good. A 9. No comments.

– (3 participants J – 1, L – 2, P – 3)

3 – I'm thinking a 6; 2 – I was going to say 8 because we were able to get a lot more done and the crew member would initiate some things on his own that were helpful for us. He was aware of what we wanted to accomplish so he would call down when he had ideas.

3 – That's true. I'll go up to a 7.

2 – But then towards the end we had that problem, so a 7.

3 – A 7.

– I'm very satisfied. It was very smooth. Rating is a 9. I can't think of anything I could really recommend.

– I'll give it a 7. No comments

– (2 participants – J-1; P-2)

1 - Rating is an 8.

2 – We initially had marked this a 7, but we agreed to go up to an 8 for Increment 8. The trend there would be that we see the process improving. I don't know what *{name}* rated it earlier, but we might have said a 6 for Increment 5, but now it's an 8 so overall maybe a 7 is an average. But for Increment 8 we scored it an 8 because we do see some improvement.

– Rating is a 9. For *{our payload}* everything went very smoothly and the utilization program is very supportive.

– 2 interviewees 1 – *{names and job titles}*

1 – I certainly think we're very satisfied so I would give that a 9.

{interviewer} – 2, do you concur?

2 – Yes that is my consensus. We discussed some of these items beforehand.

{interviewer} – Do you have any comments of an appropriate top-level nature to add here?

1 – Yes, we could give you some rationale in terms of that. We felt in terms of overall support that it was excellent and a lot of individuals worked and interfaced with us very hard in terms of us getting the activities timelined and we got tremendous support in terms of coordinating the conferences with the crew and the PI. I think that was very valuable and as a result of that we were able to really accommodate the PIs in terms of the research we were conducting on orbit.

2 – And there were some adaptations that had to be implemented regarding our operations that were not envisioned prior to the mission so they required changes to procedures, writing of new procedures and things like that and we got really extraordinary support for those.

1 – I think especially in regard to working with the timeliners we really had, in terms of the turnaround, we had very short turnarounds, I think less than 2 weeks in fact, and so we really had excellent support in that regard.

– I'd probably say 7.

{interviewer} – Ok and each of the questions has a chance where you can make some comments to some extent to try to explain what was behind your choice of the rating. So, for example, a 7 indicates there is some room for improvement. I don't know if you have any general comments.

- Since this seems like a summary question, can I come back to this later? It seems like there might be many more specific problems.
- {interviewer} – Yes, recognize that it is a specific question and if you have specific comments t hose are going to be covered in other questions downstream from here.
- Maybe I'll wait for that then. The thing is I don't have a whole lot of experience dealing with large organizations because *{of career level}*. But overall it did seem like in general it took a long time for things to get done in many cases just because I had to go through many levels of asking different

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people. I don't know if it's to say this is a problem or something and needs to be improved, but obviously NASA is a very large organization and a lot of times decisions seem to take a long time. But, on the other hand, *{in respondent's present position}* we're used to getting instantaneous decisions, so maybe it's not a fair, I don't really know.

- {interviewer} – No, that's fine. You're going in the right direction. Don't worry about that, whether you have experience with it or not. It's how satisfied are you and what did you feel about the organization. Don't worry about that.
- Ok. It seemed that a lot of things just required many levels of beau racy or decisions or something and so it seemed like certain things could have gotten done more quickly or more efficiently. I guess the specifics we can cover later.

-– Rating is an 8. It seemed at time to me during this increment that the system was more concerned with minimizing hassle to the crew than they were with proactively looking for ways to accomplish as much science as possible.

Topic Area: Overall Satisfaction – Overall Satisfaction Index
Question 1.1.2 – *Please rate the degree to which the ISS Utilization Program met your expectations*

Question 1.1.2 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– They were learning as much as I was learning and providing details. Increment 7, especially going through the process to integrate the payload into WAR, turned out to actually be a good experience. It wasn't like pulling teeth.

– Concerning the Timeline and Crew Participation, we received everything we got.

– I do not feel like I got any extra and I do not feel like anybody fell short.

– No comments.

– No comments.

– It exceeded our expectations. See previous comments.

– I'd give that a 10.

– I would say 100%. A 10. Everything was as expected and in some cases in terms of utilization problems, it went bad of what was expected so I'm really pleased.

– I suspect again what I was promised or scheduled or expected wasn't met, but everything I got was really good and great. I think all things considered I have to give you an 8 again on that. I think *{name}* and the people down there, and who is, was *{name}* his boss then?
{interviewer} – Yes, I guess things were sort of changing at that point, but I guess *{name}*.
- I was happy to talk with them and I think they were very understanding and as helpful as they could be. I think they had a tough job there and I think they did ok and I think I came out ok on it.

– A 10. As I said, I think we thought we were going to step down and not see anything happening for *{our investigation}* for quite a while and really even never thought and when they came forward and asked us to get ready they came forward with a lot of support to help us make that happen and by far exceeded expectations.

{respondent} – We'll give that one a 6.
{interviewer} – So, marginally met your expectations. Do you want to give us any comments?
{respondent} - I don't think so because maybe eventually we're ferreting out some words here that later on that might make it applicable. Again, we're going to just go to some of the issues with the real time ops.
- {interviewer} – I understand what's going on in your mind about that. You'll have opportunity to give us detailed feedback on ops later.
- {respondent} Then again, part of it is ok if you're looking at the situation given the significant change in essence that ISS had to go through with the 2 person crew and the issues, let's just say housekeeping order, but a lot of station duties and things like that. I'll put to the fact that I know these activities had occurred and it changed the game so because the game had kind of changed then if it looks like you're getting a little bit lower rating, but you know, again what context do you take that in? Ok, given the fact that we know there's only 2 folks and things had to change, well then maybe that should change applications and bump things up a little. But that's kind of the whatever in terms of trying to honestly answer this.
- {interviewer} – And in fact it's interesting that you should mention this because I've had this exact issue brought up by other interviewees and that is how do you calibrate your expectations based on your knowledge of the program and we have to think about that. I'm not going to give you any guidance there. You just do what you think is, you know, what comes to mind.
- Well, that's would I figured as we would discuss things it would. That's why I went through it first and filled it out with one mindset, but then when we talked about it in context, so we could push that as a because it is a shifting of the mindset.
- {interviewer} – I'm reluctant to change your ratings to some extent. The only think that I try to help people with is the sort of psychological calibration of the scale. So that's all I'm saying. I refer to keep it

as a 6.
- These kind of upfront general questions are kind of difficult to deal with.

– I would rate it at 10. We had positive feedback and positive relations with the station so I don't think there is any specific thing I want to add in terms of improvement. Increment 7 gave us an opportunity to see that the Station had an interest in what we were doing so we were really well supported.

– I'm going to say 6 because there were a couple of things that we were disappointed in and I don't think it was because of the quality of their work, so that's why overall I gave it a higher rating. We were disappointed, well there were 2 crew members on the Expedition, one of them chose not to participate and we had hoped that we would be given a chance to check with that participant to make sure that they really intended to refuse because we thought it might have been a miscommunication or something like that and also a long time had gone by since the original refusal and the crew was different and had a different composition then so we wanted to check one more time with the crew member, and we were not able to do that or not able to be sure that that question had actually gotten all the way to the crew member himself. So that was a disappointment. I think each individual person was doing his or her job correctly and that's sort of the way the system is set up, but we had hoped for that. Also my trip to Russia was sort of confusing exactly as to who was supposed to do what and a lot of the confusion was caused by Russian colleagues being a little bit less, I don't know what the word is. They were a little bit less precise than the American side on exactly who was going to do what. The Russian side would pass off the questionnaire and give it to someone else to give to me and the NASA side was trying to be very specific about the exact chain of custody of the questionnaire and so those were two different styles. I think they were both fine but they didn't really interface very well with each other. So it got to be confusing about who actually had the questionnaire when. It turned out fine because I just asked around until it ended getting to us eventually and there was never a question about that in my mind, but it was a little bit confusing. I guess we were disappointed with the amount of data we were getting from the ground but that was a continuation from previous increments and actually improved a lot during Increment 7, but we still would have wanted more.

– I'll give that a 9.

- 1 – in guess that would be a 5 again; the specific comments were this particular thing. I expected that our procedures once they had been written would be; I think this has to do with the flow chart of how things are done right now; currently the validations that take place are done for a variety of reasons but the reasons that we care about the most is the success of the experiment; and we would like there to be a final verification by a member of the crew, someone who's not well versed in the experiment who knows everything, but we discovered in ors in our procedure even though they had gone through the validation process; I had expected by the time a procedure got on Station that anyone on the ground could get a hold of the procedure and just do it especially since we were working with OBT so somebody could get the OBT and the thing and do it and there's no reason not to test that on the ground before using valuable astronaut time in flight; and that's the specific recommendation that we then improve things again in the next increment. 3- when we introduced the concept of a wet run and dry run and that met a little resistance. 1 – I learned more about that 3 you have to be careful; there are a number of both wet runs and dry runs but they all lead up to something called the validation of the procedure; however after the validation of the procedure, we requested sometimes changes be made but we think the more effort on the ground that can be made, once the procedure is finalized; you realize that we were under a lot of time constraints and we weren't able; because of the way you schedule things you don't always have the time between procedures to do 10 steps but you can do 3 steps before going, but in this case it was an error that was in the actual procedure itself. {interviewer} – we can talk a little bit more about OPS stuff and procedures. There are some questions downstream that are dedicated to that. 1 – ok, but the 5 is because the summary is that basically we had expected more ground testing.

– I think we would have to say a 6 and again that's relevant to the aspect of not being able to complete the activities for *{our investigation}* in the timely manner that we thought it would be completed.

– I'll put a 10 on that one. I expected to get the job done and we did.

– Again I would say 9. No comments.

Question 1.1.2 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– It exceeded our expectation and I will explain why. Rating is a 10. The specific point is that we did not formally expect to receive the data immediately because it was foreseen to receive the data later on together with our hard disk, but we received the data via mail and it was really great. This operational aspect gave us more than our expectations.
{interviewer} – So you received your data from a downlinked email?
- Yes. I think it followed the normal path via your side and then bounced it back to us and it was really great.

– Rating is a 9. I don't have any specific comments. I'm so used to the process now. I expect a certain level of support and it's there. It's very friendly.

– I would give that a 9 also. I think they made an effort to get our experiments done all things considered.

- Rating a 2. Disappointing that science was not the driver. Not enough. Disappointed that time lines could not be defined even when changed. Parameters given by staff were not well communicated. Points of contact led to repetitive re-scoping as requests were returned from management.

– I think it would be a 9. I think when you're *{investigation name}* and you're a small, very simple payload it is just wonderful when you see the utilization program really respond to you in a manner that you feel certain they respond to much more complicated and perhaps intense payloads. That I think is what we feel is that we really get a lot of support even though in the payload world we're probably not the most complicated or difficult. We feel we get equal support from your office.

– Expectations were high and we got all of the data, so I'll say a 10. I think this is going to be a bit of a boring interview, I'm sorry. We have everything that we needed.
{interviewer} – It's not boring to me. For example it's not boring to learn that the problems you had initially have been solved.

– 1 - I think we're going to have to go in the middle again on this one because it's the same thing as the first one. Rating is a 5.

– Rating is a 9. I think the rating is based on the fact that we have a long working relation with the program components and we have fairly smooth operations with them.

– Rating is a 9. We've come to have high expectations and they were met, but they weren't exceeded.

– I expected it to be difficult. I guess I'll say 8. The actual people I interacted with both from Houston during the flight, during the investigation and the Marshall team were extremely efficient and a pleasure to work with.

– The problem we had with Increment 8 was getting crew members, well really this is the cosmonaut back from Russia and that has a reality of the program too because right after they land it's hard to get them back in the US and the BDC we need to get done. We had all sorts of negotiations, we had a number of telecons and we thought we had an agreement and it was broken. So we ended up getting our BDC later than we expected. So that's why I'm probably not going to give it too high a score. I know there are a lot of people involved with that. It's not like we can point any fingers or anything. I had contact with the PI in the whole situation so I guess I would give it a 4.

– A 4. We really felt like we had expectations that the program would help us resolve our problems and we didn't feel like they helped very much, or not to what we expected, the level we expected.
{interviewer} – Can you think of a specific example where you would have expected to get better help and you didn't and it was a specific interaction or a specific event with the payload?
– I think that the general feeling was in a lot of ways we felt, the investigative team, felt like we were having to push the program and the support element to enable our experiment instead of having; our expectation was more that the team would say, "what do we need to do to get this thing to go forward" and instead we were having, "well prove to us that it's ok to go forward" particularly when it's not a safety related issue but just an implementation related issue. That really didn't meet the expectations of our team.

– I would give that a 9 again. No comments.

– That's a 10. It's gone much more smoothly than I expected and the people are much more committed to the science than I expected. Everybody except the scheduling people.

– This is little bit challenging as well and it should be in the questionnaire. You know Columbia happened right in the middle of my experiment requiring an awful lot of rework on the experimental team's part. Again I thought we did a pretty good job on that. We significantly compressed the timelines, changed our scientific requirements and our objectives a little bit. I would suggest that the NASA side of things could have been a little bit more responsive relative to their compressing their timelines as well to make the flight timeline that we did. I mean I was scheduled to start on Increment 13 and here we are on 8.

– We gave it a 3; again I think the thing that's been the hardest to swallow is that by the time that we got all of the stuff done, there's no astronaut time so all of the pressure that we were under to try to get all of this stuff turned around and by the time we got it all done there's no opportunity really.

– Rating is at least an 8. No comments for this part.

– Probably an 8. I don't know if I have any comments. I expected pretty much what I got.

– 2 – I thought we would have finished with more than one iteration. A 5. I just thought we would have gotten more done.
3 – The balance was that we expected to get more done but we discovered a lot of new that we didn't expect, so in having discovered problems that we had not anticipated and then started to evaluate how to solve those problems, that was good. Then on the negative side we did not get as much done to answer the original basic questions that were posed.
- Rating is 6.

– I'd give it a 9. No comments.

– 1 – The answer is 8.
2 – Some comments. Overall when we were going through development we had heard about crew time shortages and not enough K band down and limitations with commanding, but when we were on orbit we found that, it was still limited, but we had more KU than we were led to believe. For crew time we seemed to get a lot of response from the crew so it exceeded our expectations there which is why we chose an 8. The reason we didn't choose a 10 is because we thought we were going to be able to process more samples and I think we only got 3 done in Increment 8 and so if that helps. One thing we'd like to add, I think J (1) and I have talked about this on ISS program meeting our expectations. During Increment 8 we were given the opportunity to work interactively with Mike Foale and we thought that was a definite plus that our hardware developer could talk real-time on space to ground with Mike Foale to fix one of our problems with our gear system.
{interviewer} – I understand and there will be a question dedicated to your crew interface further on in the questionnaire. Maybe J-1's already seen it, but you'll have an opportunity to tell us more about that later on.
1 – Yes.
2 – Sorry for jumping ahead.
{interviewer} – No, that's perfectly alright because you have to say what comes to your mind and you might forget to mention it later on. We sift through all of the comments and analyze them for topic areas later on so that's fine.

– Rating is a 9. No surprises

– 2 – We agree that the program actually exceeded our expectations and many of our expectations were based on our experience during Increments 3, 4 and 5 and the type of flexibility and the type of timeframes we were dealing with and the accommodation to changes was really superior to what we had expected based on our past history.
{interviewer} – Look at the rating scale and suggest a number, please.
2 – 10.

– I'd probably say a 9 here. I got a lot more hands on contact with the experiment, designing the protocol, training the astronauts, talking to the astronauts on board and getting feedback and data much, much more

so than I ever expected to, so by that standard I'd probably say a 9.

– Again, I'm going to say an 8. Pretty well, but and I'm trying to remember. It's a few months removed from the situation and I forget the titles of all of the different functions of the players. When we would – this is not my comment but leading up to my comment. When we would want to do some sort of payload procedure, the Marshall folks that we coordinated that through, the POD that general group ({interviewer} – Payloads Operations Director / Payload Operations Integration Center) the Payload Operations Integration I would say. I felt like that they, not in all cases did I feel that they functioned as an advocate for me as the payload developer. My English could probably be a little bit better on that as a comment.
{interviewer} – No, I understand what you meant exactly. That's fine. Your expectation was that they would be an advocate for you.
- Yes, and they did not meet that expectation. There were a number of instances where they did not meet that expectation.

Topic Area: Overall Satisfaction – Overall Satisfaction Index
Question 1.1.3 – *How close to your ideal organization for ISS Utilization management would you rate the ISS Utilization Program?*

Question 1.1.3 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– Payloads group doesn't seem to be quite as seamless as it should be. Can't point to any specific instance, because the Payloads organization isn't represented in the front room here at JSC, but it could be a little better. And that is not a knock against the folks out at POIC. They will bend over backwards to advocate any payload they've got. Some of the situation awareness and the little maybe could be represented better if the Payloads Ops Organization was actually here at JSC. It's not one thing I can put my finger on and say this would be better. But that's one of the comments that I have mentioned to a couple of folks here and there that if the Payloads Organization were co-located here with the MCC, I think some of the Payload situations that arise could be averted before they even happen.

– No comments.

– The distance between me and the top-level program. The Program passes things down through management levels. I've always had this concern. We just got an ECR on a crew procedure that was supposed to be reviewed. It was sent out the beginning of May, they wanted a response within 3 weeks, but by the time we got it we had 2 days to review it. The system of documentation is set up a particular way, and they don't focus the users on the documentation that is important. We either get all the documentation, which is too much, or we don't get to see the documentation early enough to make an impact on the documentation that really effects us. Too much overhead trying to get the job done. You see that in other things, for instance the information that just came down from the Crew Office about changing all of our displays from square button to rounded corner buttons. That's an impact to all of us and nobody seems to care.

– I think it is really well organized and really great.

– I don't know because I don't know what the structure of an ideal organization is. I have a limited number of needs and those are more or less accomplished. I think it is a pretty reasonable organization, I can't say it is ideal, but I'm happy with it.

– No comments.

– I would say think the thing that concerns me is the fact that there are so many different working groups and teams and boards and what have you that you have to interface with to make sure that you get all of the information that you need to get and that you need to convey to make certain that everything goes smoothly.

{*investigation name}* for us was the mission number 30. We are a small company but we did up to now 30 space missions and so I'm quite familiar with management of space mission experiments in space and if I have to give my rating I would say 9 is appropriate.
{interviewer} – He said in the customer info page for other experience, we put no previous experience because I heard him say although I was the principal investigator I only did something on ISS and the question asked any space background. He just said he was on mission 30, he's very experienced so we need to revise that.
{interviewer} – What {interviewer} my colleague just pointed out to me was that you made a comment that you've done 30 space missions, but when we were filling out on the customer information page, there was a question there that asked about your experience with previous space experiments. The thing there was the options on that question was that if you had flown on the space shuttle or Spacelab/Spacehab, Shuttle/Mir but there was another box. What I'm thinking that what you've flow, ISA missions is that correct?
- Yes, that's correct. Most of them Italian Space Agency or ISA missions and most of them with an attitude more from payload developer than for principal investigator even if the boundary is not always so distinct.
{interviewer} – Ok, that's fine. We just went back on our copy and changed the answer to other and you don't have to worry about it on your computer, so we just changed that. We had the ideal organization question and {interviewer} and I were just wondering whether you had any comments. {interviewer} already typed in that you have considerable experience and therefore, I have to comment that your rating is

very interesting from that standpoint that you're experience with other organizations. Is there anything else you'd like to say?
- From a management point of view because this is relating to the ideal organization and looking for management effort in order that all of the things are properly prepared and smoothly conducted, I am very happy because I found the people from your side with a very collaborative approach in order to solve problems and to speed up processes and so on, so I'm really pleased.

– I would like to see more experimental time scheduled. That's probably impossible. I'll put that one at 6.

– Give that an 8. I think it is excellent. I think I still struggle a bit with understanding the overall structure of how everything is set up and I think that just may be something you need to learn as you continue to do these payloads. In a perfect world I think I would kind of see an org chart type situation or a process flow that would make it a little bit easier for me to understand where everybody fits into the process, but I think all in all that's becoming clearer and I think our PIM really has been invaluable in helping me understand where everyone fits into it.

– I'm in this 6 to d of situation again. Given the environment, let's just give that a 7 right now.
{interviewer} – What could we have done or what could have happened in order for that rating to have been higher? And if it's the ops thing, then we can talk about it later but it's helpful to know that this is largely driven by ops or other things.
- I think it's largely driven by ops and again, the handover between increments that seemed to bring some new cadre members onboard, new flight directors and stuff. You know, your ops seems to be going along and everybody understood what you were doing and then you were starting to get questioned for a lot of things you were doing and then all of a sudden that made it like, as the customer we kept kind of getting questioned and have to justify things.
- {interviewer} – This has to do with this issue of what we call cadre consistency. You might have even brought that up the last time we talked and other people have so it's a known issue.
- So, this may be jumping ahead, but one of the suggestions – I don't know if I mentioned this last time – was that if a payload is going to be operating for a bit of time and everybody is kind of feeling each other out as to how it's going to go between people like us doing a remote ops and the folks at Johnson and the folks at Marshall, that maybe after a week or two of something like that that you have your own little telecon between somebody from the cadre and maybe somebody from flight ops and the payload and just kind of say, how are things going. And we as payload what could we be doing better, what don't you like about what we're doing or whatever and vice versa. The cadre and stuff could say we've got a few bumps here and here's how we can work them out. Maybe that's a way you get through handover inconsistencies. I don't know if you have these assigned telecons or whatever that you just tag up and try to help each other through a few things. Certainly I would have been open to if somebody didn't like what we were doing or how we were planning and if we could tell them that this is it and this is why we're trying to do it and if there's a way you see to help us get around it better, we're open to that.

– I would rate it a 10.
{interviewer} – Any comments? These are high rating and usually when we get high ratings, we ask the question of what were we doing right in brief to rate such a good response from you?
- I think as I mentioned and I'm sort of repeating here, but what basically has happened over the last several increments is that people who work with us have understood what we are trying to accomplish and so they are anticipating of both our needs and operational things and we have a more established working relationship with them.

– I guess I'll give that an 8. I know that the organization is set up to deal with a lot of competing pressures, there is the pressure to protect the crew from people like me who want a lot out of them and then there's the pressure to provide me with the data I need and to get it from the crew, and then there are all of those logistical and management and coordination issues that need to be done so those are all very complicated to do all of that. But somehow I feel that the organization is more complicated than necessary, but I know it needs to be pretty complicated but it's hard for me. I've been here 2 years now and I've only just started to get a feel for who do I call for what and what are the different subgroups called and what do they do and

things like that. So, it's confusing. Sometimes, especially when you're trying to find out whether the crewmember really was refusing our study or whether he just said something once and that was the only chance we'd ever have. It was hard to know what's going on when there are multiple levels, layers of people between you and the crewmember.

– Taking into consideration the fact that we're operating out of Russia and given the conditions I would say 8.

- 1 - I found for me communication is the most important thing; it took time but I found that the organization was responsive ultimately to all of our requests in terms of management now; it helps us if we talk about how we would improve the management. {interviewer} – and that is key for us. 3 - It took a while until we figured out the appropriate offices to contact and the people who had the jurisdiction over the questions and problems we were raising. 2 – we didn't know the proper channels. 1 – it wasn't until we talked to *{name}* that we got anywhere. 3 – so an organization chart that really lays out who is responsible for what in regard to if you have this problem call this person could help. 1 to amplify that, a lot of the people that we worked with had a preconceived notion that people higher up would not want to be bugged about our issues and it turned out not to be true. they were very interested and responsive; so I'm not sure the entire management tree understands what the level of, you know they always have to make judgment calls as to when you bug the next person up the chain which is normal and natural; and we found that we had to push to get to a place, but once we got to somebody who understood how our concerns were melding; when we got to the flight director we got somewhere, what was *{name}* the payloads office? {interviewer} – he's called the Lead Increment Scientist. 1 – he was the LIS; when we got to the LIS everything was perfect so I think early in the process a meeting of minds between the LIS and the PI would smooth a lot of concerns; I would say 7.

– Our consensus is a 5, somewhere in the middle. I think it was just a little burdensome. It was just a lot of hoops to go through for a 0 up mass payload that was supposed to be on fast track.
- We discovered early on that just because we were a no up mass payload didn't mean we had to do everything else that a regular payload had to do which isn't necessarily bad but we weren't expecting the integration to be as complex as it turned out to be.
- We wrote a PIA which from my understanding of a PIA, that's an early on document to document your requirements whereas we were actually going to be putting our requirements in other systems. At that point we thought we would be operating within 3 months from the time we basically initiated the project. Why would you need to go write a PIA? But anyway we did that and I think the other thing is through the safety review process we were told that would be work out of board and when it was actually done it probably was in a 6 week timeframe from when he would originally deliver a package until it got signed so it wasn't really any faster so there were some things, but that it was hardware that was already onboard and had already been approved and we were using it in its intended capacity, not exceeding in any way what was to be done with the hardware.

– As of right now it looks pretty good. I can't think of anything that stumbles out as far as a change on the way management is done within that program. I can't even think of a middle manager that I chop, you know, so I'll put a 9 on that one too.

– A 9. No comments.

Question 1.1.3 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– It was really great. Rating is an 8.
{interviewer} – Any comments that could help us improve this further?
- Difficult to say. Sometimes we receive mail from different people, of course, you have a wide organization so sometimes it's difficult to recognize who is sending the message and so on, but normally, of course, it would be better to have only one interface, but I understand this is not feasible with such an organization, so I think it's ok.
- {interviewer} – What the payloads office is trying to do is have the PIM, in your case *{name}*, be as

much of a single interface as possible. Do you feel that *{name}* was sort of as much of a single interface for you? Do you feel that he was a single interface or there were still too many people you were talking with?

- *{name}* was really, really great in his job. The point could be that sometimes we received messages also from the other offices, of course, with copy to *{name}* and sometimes it's difficult to understand what is the task of each one. But maybe from a general management point of view could be helpful for the principal investigator and also for the payload developer to have a matrix of the values and responsibilities of the people which during the mission are involved with the PI or the payload developer in order that it is possible to understand immediately who is responsible for what and how the information flow is directed. This is important.
- {interviewer} – That's a good suggestion. We've heard that before and I believe the payloads office is acting on it. Thanks.

– Rating is a 9. It's very supportive and it's very accessible.

– I would say as far up as I know which is not much past *{name}* that was all excellent. They all worked very hard and were dedicated and did everything they could to get the experiments done. But beyond that, then maybe I don't have the same impression.
{interviewer} – Well think about it and then make an assessment.
- I'm hesitant to give them a number because I think the people, I think we talked about this last time, further up the chain I don't know what kind of constraints are put on these people and who puts these on in terms of management. I would give that a 7 primarily. I think I start to get a little. In my little environment here it's like walking thru air to get something done. When I get a little higher up then it's like trying to walk thru fog or snow or something. It gets a little tougher. It's harder to see the picture, it's harder to understand why this isn't happening. You know you don't know why you can't talk to the guy and stuff like this.

- Rating a 1. I'd say from my vantage point it seems totally disorganized. I'd say repeat requests in short timeframe were diametrically opposed.

– I would say an 8. I think it's been a learning experience for us in this office and that actually the more you work with these folks you begin to see the structure a little bit better simply because you understand everyone's roles and responsibilities as you do this a little more often. I think for me that an org chart or something like that would have been helpful in the beginning, that maybe it would have helped me put everyone in their place and sort of see everyone's specific roles, but over a period of time of doing this I think that knowledge has come. But I think that may have facilitated that understanding a bit in the beginning.

– Rating is an 8. No comments.

– 1 - Rating is a 3.
{interviewer} – Again, the Russian support is an important factor here and how you look at the organization.
- Yes.

– I would rate it a 9. No comments.

– Rating is a 10. No comments.

– I don't think I have enough knowledge to say if the organization. I'm not sure I even understand what the organization.
{interviewer} – what they mean really is that you have an idea of, probably a picture in your head, of how an organization should be run and how efficient it should be run and what should be done.
- It seemed as if, given that the requirements that were there, the organization operated with them efficiently, so I would say that the management and the actual people I interacted with, I would say 9.

– I would probably say in

– A 3. We feel that our opinion has changed somewhat since the beginning. We have felt that we have had better support in the past on previous expeditions and this one just didn't feel as good.

– This is complicated, of course, by the whole return to flight issue because the management was, of course, working under very adverse circumstances for Increment 8 as far as availability of upmass is concerned. So within that level, I would probably give that a 7.

– A 9. No comments.

– Again, if I'm doing it globally I've got to go at about that 3 level with some very high and some quite low. Just a reiteration of my comments on overall satisfaction.

– I really couldn't differentiate that much from the rest of it, Again the lack of prioritization; the fact that priorities are not communicated through the management chain that part is what I felt was missing; that indicated some kind of problem.

– Rating is a 9. I think that it's a pity that we cannot have much more crew members onboard the Station because I think this could improve the science onboard.
{interviewer} – Let me ask a question. For *{your investigation}* , is yours a type of, I mean I'm a little bit familiar with it but does your experiment benefit from having a larger number of subjects, experiment subjects?
- Yes, sure because since it is an experiment related to the strength and the posture of the upper limb so as many members using our payload could give us much more results, so it would be interesting to see the difference between each crew member executing the same protocol once onboard and comparing what they were doing in flight and compare it to what they did on ground before leaving the earth.

– A 9. No comments.

– 2 – We found out things as they happened so I would not say not very close.
3 – I concur. There's still surprising difficulty in integration across the different programs, our program and the JSC program, getting all of us basically on the same page. At times it seems there are other hidden agendas that we may or may not have an any inclining to but influence how things proceed or don't.
2 – We just don't know what the protocols are and no one informs us until something happens.
3 – So, it's sort of a management from crisis to crisis usually generated by something we do or say that was inadvertent and had we known either the protocol of the times required for certain activities to take place, the chain of command in terms of who had to sign off on things at various times, if we were aware of that, if we had a little guidebook of how this all runs at the NASA end, I think that would help.
{interviewer} – Understand. That's useful feedback. We've heard that before.
3 – So I would say a 3.
2 – I agree.

– Rating is an 8. No comments.

– 2 – We're kind of debating this. We finally kind of settled on a 6 and my thought there was there seems to be a lot of people involved in the process and when you get a core team of ten people interfacing with a number of different people, probably my ideal organization would have fewer people involved, but maybe those people are necessary.
{interviewer} – Ok, and there will be a question dealing with that further in to, but you're ok. You're going with a 6 on that, and again the main reason you think we're falling short is to some degree that there could be fewer people involved maybe.
2 – That's been improving. During development we got a lot of questions from a lot of different people and if we had a problem on orbit, we found out all these responsible people involved that we didn't realize that we interfaced with. But I will say that each increment has been getting better and better and overall we're pretty satisfied but that gives you some background.

– Rating is a 9. Again, the management is very supportive of *{our investigation}* .

– 2 – We feel it would be a 9.
1 – I think what is very valuable is working together, all of the different entities of the team and it's so helpful when we're working with the PI and trying to accommodate the PI as best as we can and if we get the support on the utilization side on the management and they understand what's driving these requirements and what we need to do, that really is most helpful.

– In this case I think I'd say a 5. I'm pretty neutral on this one because I don't have a whole lot of pre-existing opinions on how such an organization ought to be set up. I don't think this contradicts my previous response because partly I was told that it wasn't clear how much we were going to get done on account of the fact that NASA is a very large organization and there are lots of steps. So I guess in the sense that things ended up really well did exceed my expectations, but on the other hand from an organizational standpoint I think certain things might have been more difficult than they absolutely had to be. In this case it seems like there is good and bad so for this question I'll probably answer a 5.

– Rating is an 8. I think, again looking at it from a kind of top level, my previous comments kind of fold into this rating.

Topic Area: Overall Satisfaction – Research Priorities and Outcomes
Question 1.1.4 – *Please rate how well the ISS Program gave priority to research during the current Increment.*

Question 1.1.4 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– They realize quite well the reason for the station. The systems still take priority and you have to have a healthy ship in order to do research. Going down to the 2-man crew seemed to have dampened spirits, but the priority given to research was equal or better with the 2-man crew that it was with the 3.

– No comments.

– I feel that sometimes the Utilization group takes the shots for some of this, and I don't necessarily think that they are ones at fault for a lot of this. I think there was an attempt to stress for the research, but the physical demands of the crew and everything else that was going on didn't allow them to do it.

– Rating due to Columbia and the many things that have been changed.

– They made the crew available as soon as they could, I don't know that they could have done any better. I think it would be much more applicable to somebody that is trying to do research up on Station. I cannot answer the question knowledgably, because I have not been in contact with investigators from other experiments on this increment. This is a very important question to ask for this increment, because the station was so challenged – with 2 crewmembers and the need to keep the thing flying. It was a pretty hard time, and if I had been on the phone with other people who have not just pre-post but actual real investigations up on station, I'd be able to give a sense of what the priority was. I just don't know.

– Within the context of this increment, with a crew of 2 and the limitations transport vehicles that were utilized and based on our particular experience in which we were given a high priority and we were accommodated in a way that was very satisfactory to us.

– I don't know if I can answer that one because for Increment 7, I think that was when I had first come on board in terms of having the responsibility for an experiment that had an in flight portion and that was the first increment that we did after 10 it's kind of difficult to answer that with all of the circumstances surrounding that increment.
{interviewer} – Ok. Well, we can select not applicable if you want. It always helps us to get some feedback but if you don't feel you have a basis.
- I'd like to say that well with the caveat that it wasn't the fault of the program. I think everyone was just overcome by events. Let's do a 3.

– This is an interesting study because you certainly know that *{our investigation}* was originally programmed to be on the ISS with STS-114 which had to leave on the 4th of April last year, I think, but then due to the Columbia mishap, of course it was stopped and so we were very much concerned and at that point we had from (either ESA or NASA) the proposal to bring *{our}* payload onboard the ISS with the Progress capsule so this is a clear indication of priority to our research has been given by you. So this allows us to have the hardware onboard and this was also related to another event which was that the astronaut onboard was the one with whom we performed the training on *{our investigation}*. Then the priority given to our payload even if it arrived on board not exactly as foreseen, the priority given to our payload and to the execution of our experiment was extremely appreciated from our side. A 5 rating.

– Under the circumstances, I expect they did as well as they could. I don't know all that was going on up there. I didn't follow all that was going on up there.
{interviewer} – It's just asking from as much perspective as you can muster, how would you rate it?
- Does the ISS program cover everything?
- {interviewer} – This does not include headquarters. This would include the. No, sorry in this case it includes everything. I stand corrected.
- Well, I would give that a 3, I think.
- {interviewer} – That's mid scale. You're really on the fence at that point. I'm not trying to make you change your rating, I'm just trying to calibrate you.
- I think they did what they could. Perhaps they could have done more. I mean their blocks of time are chiseled into stone, I think, and it's pretty hard to break out of their routine and their schedule. I think Mike

Foale did it a couple of times. I think with Ed Lu, I think they could have pushed him a little harder to do some more science.
- {interviewer} – Interesting comment, thanks.

– From my very limited viewpoint, I thought very well. Every meeting I sat in I felt the message was very clear that even with a 2-person crew that we're looking at making research the highest priority given limited resources and time. A 5.

– In light of the situation, I'd give it a 4. Probably if there was a crew of 3 and things were going the way they were, I would have given it a 3 so with that situation I guess I'd hedge toward a 4 side.

– From my point of view and from all of the other things that have happened including the capabilities to get things to the station, I would probably say 4 here.

– I think it had relatively less priority than other increments where there were more crew members because it was the first with only 2 crew so they had to spend proportionately that much more of their time on keeping the station going so I think under the circumstances they did very well, but on the other hand it had a lower priority so I'm not sure how to answer. I guess I'll say a 4 because we definitely felt that our research had become a little bit of a lower priority than it had been in the past, or research overall had been.

– That was kind of difficult. I'd have to say 3 because maybe with a little higher priority we wouldn't have this problem. I'm putting a 3 there. The only comment I would have on that would be this rapid changing over of the crew member right before the flight made it difficult for science.

- 3 – I sense that with all of the problems it is understandable that there was very little effort in priority to research; and I would give it a 1 not for full finding but just for the circumstances that even created the SDI. 1 – they let us go over our time; in terms of the time we were slotted and the support and the lot of people that go into it, I don't think; the ISS is in the midst of construction and it's had a number of blows to it so its amazing that they have been able to continue the research so I don't think I would go down to a 1. 2 - I know that everybody wishes they had more time but I kind of agree with 3 but then I agree with 1 too; they did let us go over on certain occasions but I think that was more with the next increment; with Increment 7, we were given a certain amount of time and they stuck to that time. {interviewer} – keep in mind that this is for research in general; your perception of research in general not just specifically your investigation but what you perceived during the increment and what kind of priority it was given. 2 - I was surprised at how few hours per week is dedicated to research but given the circumstances. 1 - This is very hard to answer; rate how well ISS program gave priority to research during that increment so let's compromise at 2 then because the reality is that it's not an operational research vessel yet.

– I think we'd have to say a 2 and this is an increment specific rating. We felt like for this specific increment the priorities; the research was on the lower end. We actually had operation (tape skipped) on the next increment we felt like it was given a little higher priority so this is sort of an increment specific comment.

– This is from the ISS total program, not the OZ part of ISS, correct? I think that as far as ISS program with what they, boy they're in a pickle. That's all I have to say because I think my impression is the managers like Gerstenmaier and ? really do want to get research done, however, because of the up mass and down mass type thing their hands are tied and also with the Russian consideration with flying tourists and whatnot and payloads and other cosmonaut types that go up and down in the Soyuz, their hands are tied so I guess what I'm saying is that this is hard. They gave priority to research so I guess if I have to pick a number for overall research, I'm going to go ahead and put 4 down because I know they were in there batting for us as much as they could for Increment 7. If I had to do just *{our investigation}* , I would put 5. With *{our investigation}* we just felt we were right in there because all of our equipment was there and we could do almost as much as we had asked and they sent more than enough imagery down or Ed did. It didn't quite meet up to Don's standard but he did a good job with that.

– I think I'll go with a 4 and I'll say it seems to me like the program tries to prioritize science to the best of its ability under the circumstances.
(A lot of conversation between {interviewer} and interviewee about whether to contact PI again for an interview)

Question 1.1.4 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– First of all, it was not foreseen to have Increment 8 basically because I think that the basic agreement was to have the unit for one increment so we get some part of Increment 7 and then they start Increment 8, so I think that the priority we received to our research was quite high, so I'm glad of that. So I would give a mark of 5.

– I clicked a 5. Again we were back down to 2 crew members but people were bending over backwards to try and get every ounce of research done that they could.

– Very well. All things considered, I think they could have come up with one hundred excuses not to do this.

- Rating a 1. Not at all.

– Very well. I think we were surprised and very happy to get as much done. Our expectations were not that high that we would get as much hardware used on orbit as we did and we got everything done that we needed to.

– That's a good question. You're saying not only from the perspective of my experiment but in general as an overall perspective?
{interviewer} – What I'm saying is if the only perspective you have is your experiment then rate it on that basis.
- That's the only thing I really can do, I suppose. That's my window. Well, considering that we got all of the data takes we asked for in terms of the time and the post-flight time schedule, so I would rate it a 5.

– 2 - Rating is a 2. I have to qualify that a little bit. In terms of the people who are representing the science at Marshall, I think that I would individually rate that probably a 5 because I think they did a great job of going to bat for the science team, but my sense was that they were fighting to make that stand and take that position to give science a priority and I noticed that. I'm not sure who the fighting was with, I have my suspicions, but it just felt like from a scientist and having them represent us that it was always kind of a struggle to get science as a priority in crew time just in overall thinking that a lot of people just, the Station had a so many other things going on, there were other issues and other problems. It just seemed like they were always having to fight some sort of battle to get the science needs met. And that doesn't seem right and that's why I'm giving it a 2

– I would say the crew photography priority is pretty well covered so I would not mind giving it a 4 or 5. I would probably give it a 5.

– Rating is a 3. Mostly because it's only a 2-person crew so there wasn't so much time for research. We lost some of the time we would have had otherwise. I think they do their best.

– I know all of the things they had to do, but I'll still say 2. They didn't have much time so we were constantly being pushed, pushed, pushed back on when we were able to do it and it seemed to me structurally they weren't able to spend much time on research. They didn't have much time to commit to research on that increment.

– Rating is a 2. I think research is not nearly as important as it should be.
{interviewer} – Do you have any specific examples where say for *{your investigation}* that you felt you weren't given priority where you could have? We mentioned about the cosmonaut.
- Yeah and it all kind of comes back to that. Because from what I understand there was no real good reason why he didn't come back on time. I heard there was some sort of parties or something in Russia he needed to attend. I don't think that's a good reason. I don't know if that's true. So, if that's the case then obviously research is not given the priority it needs there.

– A 4. We understand just the reality that's going into 8; your resources are not very good for much of your resource for science budget anyway and in fact, that's the area that blends into some of the other questions. Overall, I thought yes it was a reasonable emphasis. The issues that we had that we talked previously had to do with implementation and then had to do problem solving through it.
{interviewer} – Just so I won't forget, do you feel the implementation is reflecting more on OPS stuff and

things in the POIC or other stuff?
- Actually I think it's probably even before it gets to the POIC so it's somewhere between the investigator team and the actual POIC. I doubt if it's the limitations of the folks that work at Marshall in the sense that they'll schedule what we put forward. It's just getting things put forward was much more difficult this time.

– We have really no complaints about that. I think we have a lot of crew time and I'm ranking that a 5, very well from a personal perspective. I do not have the broader perspective.

– Ok, we're talking about expedition 8. Michael Foale was very committed to the science. I would say with the ISS program in general, they're doing their very best. I'd say a 5.

– I guess I don't have a complete data set to comment on that except that I understand that there were a lot of operational concerns with now a crew of 2 and lack of payload capabilities, but I think research was pushed back considerably. I would give it a 2 on that. I was scheduled to have 2 crew members. We did two baseline data collections and then due to operational constraints we were cut back to just 1 on Increment 8. So now we have to go to an additional increment just because we couldn't have had, we needed 1 hour on flight and we couldn't get it.

– See previous comments.

– Rating is a 4 because of course the Columbia mishap affected the science onboard because we should have reduced the fuel so that they have less time to give to experiments and that's why I suppose their researches have been less time than before.

– Based on my experience, I would say a 5. Based on just during operations, if we had a problem with like a procedure or one of the astronauts didn't focus correctly or something, the PIs had feedback or anything, they were all for feedback and they'd try to schedule another run in and everything so I'd say it's pretty good.

– 3 – I'd say a 1. Most understandably they were limited by the personnel on Station. There were a number of mechanical and other problems that had to be dealt with, so I think most of their time and thought was occupied by other things not having to do with research.
2 – I agree.
{interviewer} – So your number would be?
- A 1.

{interviewer} – This is a little tough for you because you're doing pre-post so you're not necessarily watching the operations.
- I mean the thing I ran into was how soon could the astronaut get back and all that. Research wasn't the top consideration there. I think they did a good job of advocating it the best they could. I'll give it a 4 which still I think pretty reasonable.

– 1 – Rating is a 4.
2 – We might have chosen a 5 if we'd been able to do more samples. I guess we got 3 done and we thought we'd get maybe 6 done during Increment 8.
{interviewer} – What was limiting that? Can you name something quickly that specifically would have allowed you to get more samples run?
2 – I guess it was

– Rating is a 5. For as much mass transfer capability that was available, I thought they handled it nicely as far as the priority that was given to payloads from *{our investigation's}* standpoint.

– 2 – I don't know if we have sufficient information in general because of a couple of aspects. One is that the environment at the time with the small number of crew members and the problems with upmass and other things, considering that as a caveat in terms of our investigation we really felt that they were very well supported but as far as how overall science support fit into the rest of the activities I don't know if we have enough information.
{interviewer} – I understand your comment so what I usually say in this case is if the only perspective you have is primarily your own investigation, rate it on that basis, please.
2 – A 5.

– This is Increment 8 right. All right, I'll have to think about this because it's kind of been a blur because for us the only thing that changed was the identity of the astronaut.
{interviewer} – Right. I apologize for that. I should have clarified the fact that they survey is increment specific and this particular one was Increment 8.

- Let me be careful. Let me think about this.
- {interviewer} – You can change your answers if you want.
- I think I have to back my brain up to how I felt about these questions at the end of April, right. Well, at least what my experience was to that point, right?
- {interviewer} – Right.
- Actually I'm not so sure I'm going to change anything because. This was Mike Foale, right?
- {interviewer} – That's correct.

I'm going to give this a 5 because our samples got up there at the very end of January and within a month Mike Foale had run, well I guess it was at the end of March, but he gave very high priority to this and I'm going to give it a 5. I guess I don't see how much higher of a priority they could have given it, so therefore it corresponds to the maximum in the sense that our samples got up there two thirds of the way through the increment and we still got started within a month and got a whole lot of data so in that sense I think I'm going to give it a 5.

– Rating is a 4. I would say I think they tried to prioritize research and I think they did a pretty good job under the circumstances that we had for I8 but there still was significant room for improvement.

Topic Area: Overall Satisfaction – Research Priorities and Outcomes
Question 1.1.5 – *Please rate the extent to which the amount of raw data collected by your ISS Investigation during this Increment was worth your participation in the ISS Program.*

Question 1.1.5 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– It's a broad ranging thing in the ISS Program. Very worth it because of the audience for the payload and the assistance that I had to get ready for Increment 7 was excellent. The amount of raw data, the payload has become very dependable. The crew goes out of their way to make sure it is set up and operating correctly and the program do the same. We were able to meet our schedule requirements; that is a big deal to teachers in the classroom.

– From my perspective, right now there are 4 opportunities a year to collect data and that is it. That is one of the reasons I lobby to go out and collect this data in Russia because the opportunities are so limited, despite the logistics difficulties, it is well worth it given the alternative, which is not collecting the data.

– We really have a good feel for the environment up there.

– Completely satisfied with the flight session and ground session, too. We got very important data.

– I got data back. I'm really thrilled with the sample size that I got and I've already published some of the initial data. Some of the comments that I've heard is that the study really moved the field forward.

– This particular investigation is a multi-increment investigation, so part of what is performed in the following increments hinged upon what was accomplished during Expedition 7.

– A 5. My PI was happy with the data that he got.

- *There was a question here about recommending to someone about being a payload developer. Respondent stated they would be very likely to recommend it because it is an effort that every payload developer should try an once-in-a-lifetime because it is really exciting and you are proud when you reach the ground.*

– Very likely.

– We had all the experimental data of super quality and the only minor point is that due to the change of the flight schedule it was not possible to perform the 3 experimental sessions during the increment, but apart from that all of the data we got is really very, very good so I would rank it a 4.

– With the tele-science we got a tremendous amount of data that I'm very happy with. We still have a lot of tape up there, the Foale tapes and the samples are still up there, but they're up there for a good reason even if they could be brought down.
{interviewer} – Are these the samples for *{investigation name }* or for *{investigation name}*?
- *{investigation name}* . I haven't gotten any data on the *{investigation name}.*
- {interviewer} – Ok, remind me. This was *{investigation name}* and what?
- *{investigation names}* {interviewer} – Yes and you've got to remind me what the science of the investigation was about?
- That was where we used the transparent analog systems to look at bubble formation, mobility and affecting them things like this and micro structural development in gravity. Looking at thermal capillary ? by gravity things like this.
- {interviewer} – Ok, so it's a material science experiment.
- Yes, for exploration holes I think I've got to give that a 5, but that's mostly because we had good tele-science. We got tele-science and data downlinked. The data gathering and the data real time video and the astronaut intervention, those things could all be improved.

– And we would certainly give that a 5. I think we got everything we wanted and more. We were very pleased and in our case media footage.

– This is one where I put not applicable for myself because it's either our project scientist who is a local Glenn guy or the PI. I guess I probably should have gone and asked him the question.
{interviewer} – That would have been helpful but it's not essential.
- So for me it's not applicable since it's not my experiment. I mean if you want I could pose that question to the right person and email it to you or something like that.
- {interviewer} – We might discuss that. So we can just deal with that by email.

– I would rate it 5. We got a tremendous amount of earth looking images and this it is a great contribution to our data collection.

– This was an interesting one. I'm going to say 5, very worth it. We only had 1 crewmember subject on this increment but it was very well worth it. With such low numbers of subjects each one makes a huge difference to the statistical stability?.
{interviewer} – Tell me about it. We have the same problem because we've just got populations of just maybe 34 or 22 people and I've had to do all kinds of statistical things to deal with statistical significance of comparing data sets that are that small.
- The good news is that it's a large proportion of the population because the population of astronauts is so small. And that's why we have a repeated measures design that gives us more stability and so that's why it's so important to us to keep pushing for them to keep doing it every week and that's been difficult for those programs to implement but they've done a very good job with it and it's been well worth it.
- {interviewer} – You did mention that people on the ground are also doing this survey, right? How does that factor into your response to this question?
- I was thinking about the in flight data because I'm assuming this survey is mostly geared for flight. But I think it's like you know pulling teeth to get this small amount of data that we're getting that each little bit that we're getting is critically important so again it's worth the effort. We got enough that we can use it so that's the bottom line. The difference between 0 and a little bit is ?

– 4 and my comment again is not getting the pre-flight data before the flight reduces the worth but still makes it worthwhile but not as worthwhile as it would be with the data collected actually pre-flight rather than one year later.

- 1 - Given that we're interested in doing *{supporting payload}* activities and given that we discovered bubbles; I would give it a 5. You can't improve it.

– I would say this is not applicable.
- Yes, we got pictures. We got real time video in Ed actually folding the flyers, the coupons didn't we? So *{our PI}* was able to see how he was preparing them and wrapping the solder. He didn't wrap the solder. He actually cut the coupons.
- When we got our pictures and we actually had the coupons cut we were thrilled so I would say it was very worth it because that was the initiation of our experiment.
- {interviewer} – I don't think not applicable is appropriate here. I think you guys can give us a rating on this, even if it's not a good one.
- I think what we're saying is that when we did get the data, my initial reaction is not applicable because they haven't completed. Our science so to speak is getting the coupons back ultimately after the soldering is complete so that *{our PI}* can look at those and compare those to samples that he did on the ground and compare those. But, of course, Ed Lu cut and formed the coupons and we did get video of that and by that time we were thrilled to have actually gotten initiated and gotten that amount of the operations done, but it wasn't the science so to speak if that makes sense.
- {interviewer} – Ok, I understand. But again one thing about this question is that it's not necessarily asking about the amount of science or research result, it's raw data.
- Ok, so 4. I think because we got good pictures.

– For Increment 7, let's put a 5 on that. Ed did a great job for collecting our images. Even though some of them were cloudy or he didn't get the right context because of the mission parameters, you know the track was just a little bit east or west type thing, he really did try his best. So that's why I gave him a high mark there for data.

– A 5. I would say that my understanding from the PI is that he was very happy with the data that he got.

Question 1.1.5 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– Very worth it, a 5.

– I said a 5. It was very worth it. Because I'm a very simple payload, my operations are real important and

to support the school kids and people made it worth my while.
{interviewer} – Ok, so you feel there was enough downlinked stuff that the school kids could have their sessions and so forth.
- I had plenty of resources.

– I would say it was very worth it. A 5.
{interviewer} – I think I did see that you had some pretty good productivity for *{your investigation}* on this increment.
- Yeah, we did that and we got data so a student is probably going to get a PhD out this and the whole bit. That was all that increment.

{interviewer} – Really? Well, that's great. Good. Again, the scientist part of me is glad to hear that because it's hard.

- Rating a 1. We don't have any raw data. We haven't got our samples back. We would love to get our samples back.

– In our case we usually think of that as our video and we would rate that a 5. We got great video. Met or exceeded expectations.
{interviewer} – I'm just curious. Give me an example of a couple of things that you did. Obviously the space toys thing is well known.
- Well one of the things that we saw during Increment 8 was something we called a wood block or a tools block. Basically we were looking for that demonstration. It's a block of wood that has a screw, a bolt and a nail in it and we're asking crew members to use onboard tools. What we were looking to see is mutant laws and action in a microgravity environment and of course what we got was the video of a crew member turning the screw and spinning around as he did that.
- {interviewer} – Was he using an electric screwdriver?
- Not an electric screwdriver. We only had the typical hardware store variety screwdriver. That was sponsored by the St. Louis Science Center. They had developed an educator workshop, programs and exhibit type stuff using that video and would supplement that with what they planned on the ground. So that's kind of what we did. Sometimes NASA will actually be the entity that will use that video and develop an education product within the agency. Sometimes it's an outside customer and in the case of what we did during Increment 8 it was a group of museum science centers.

– Rating is a 5. See previous comments.

– 2 – Well, this one's difficult to answer because for *{our investigation}* we still haven't gotten the samples back home yet. And that is part of the program, that you know, again it goes back to this priority, science priority or low priority that science has that it hasn't seemed important enough for them to make an effort to get that data back to us. On the other hand, we did receive some on orbit data in the form of photographs and feedback from the crew member.
{interviewer} – Yeah, I understand. So you need the samples in order to really access productivity.
2 – But if we could get the samples back soon, not too much further down the road so that they're still valid then I would say it would be a 5. But if you throw in that factor that we haven't gotten them back yet, then no if we don't get them back it wasn't worth it at all.
{interviewer} – Boy, this is an interesting thing. Sometimes I have to do this – pick a number. The reason I say that is the alternative would be to select NA, but usually what I've found is people are able to make some rough assessment of how things went on the increment.
2 – Well it also says collected during the increment, was worth your participation. Assuming we're going to get the samples back, then a 5. We wouldn't have done it if we didn't think that.
1 – Right. And we downlinked data for GCF. We got everything we needed there.
2 – Yes, we did. So if you look at *{our first investigation}* and *{our second investigation}* together, I would say it's probably a 4 and once we get the data back it would be a 5.
{interviewer} – We'll just make sure that in the comments it reflects the fact that getting the *{samples}* back is key to accessing research productivity.
1 – Not just getting them back, but getting them back soon. The samples are only going to remain viable for

a certain amount of time.

– I would say very worth it. Lots of targets and very meticulously observed and documented by the crew members.

– Rating is a 5. We were looking for group level data and with 2 people technically it's a group. More people would have been much better, but we can use data from 2 people.
{interviewer} – More people would have been better but the data you did receive was sufficient?
- Was sufficient and they also provided data on almost all of the times that we asked them to. They participated very well.

– 5. We couldn't get it any other way.

– From what I understand, *{PI name}* is still looking at the data that we actually got one year past landing, so we haven't obviously reached that point yet. But I know he's very happy with the pre-flight data. It almost got to a point you can't really say for sure. How do you recommend my answering that question? The data we've received thus far, except for maybe that lot late post flight was good.
{interviewer} - Ok, pick a number.
- I guess I'd give it a 4. Since I'm not the PI, I don't know exactly. But as far as us getting the data and physically sending it to them that was great.

{interviewer} – Ok, that's partly what we're focusing on in this question. Thanks.

– A 5.

– I'm rating that a 5.
{interviewer} – So you feel you got adequate science return?
- I do.

– A 5. Michael Foale did a great job.

– Rating is a 4. On the one subject, we got all of the data we wanted and then some secondary objectives so relative to what we were ultimately able to accomplish I was pretty happy.

– A 4 and we felt like the only thing that would have been better was we know that the video downlink coverage is constrained and that is the problem. {interviewer} – this is all good feedback so thank you very much. So if you had gotten video you maybe would have given it a 5?
- Right, if we had gotten all of the video and been able to see all of the stuff; some of it the astronaut didn't turn on the video to let us see some of the prep; he did a lot of it; I feel like he did as much as he thought was appropriate but we would have liked to have had all of it and then the rest of it was coverage constrained so we didn't get to see it and there were improvements that we would have suggested earlier on had we been able to see everything that would have helped the resolution like we realized the background he was up against was dark and we had him put a piece of paper behind the syringe so we could see it better but that was after two runs so the first two runs were a lot harder to see, so those kinds of things if we had had more coverage we would have made comments earlier on.

– Rating is a 5 because we had everything we were expecting.

– A 5. The PIs are very pleased. They've seen things that they've never seen before.

– 3 – I'm troubled by the nature of the question because it's not the raw data that counts but the knowledge that's gained following the analysis and ultimate understanding of the data collected.
2 – Which goes to the way the people we work with kind of judge it. They feel that when we're done with the activities on Station, we're done and we're trying to get them to understand that we have to analyze the data before we're done.
{interviewer} – Right. We thought about this when we designed this survey question, the problem being that we're surveying you at a very intermediate stage of analysis of your data where you might not be able to answer about how large was the scientific payoff. But still to some extent, often in a project you can get a feeling for how much data you got. Did you get some numbers, for example, did you get something done in terms of raw results?
3 – Yes, we did and I think the most important thing was not the amount but the type. The fact that we found out the problem of bubbles and how it will relate to all of the future activities using the TCM. So it's

not really the amount but it was the information gained. So I would go with a 3.
{interviewer} – So P (3) you're a 3? L (2)?
2 – I'd bump it up to a 4 because compared to the last increment we certainly got a lot more than that one so I'd give it a 4.
3 – I'll go with a 4.

– Very worth it. I would give it a 5. Every data collection that we have is worth its weight in gold as far as I'm concerned.
{interviewer} – Ok, so you were able to get your pre-scans done?
- Pre, post and now we're waiting for the one year.
- {interviewer} – Oh really? Ok, and the last time I talked to you I think you said you published a paper, right?
- Right. A very well received paper. It's the best bone journal.
- {interviewer} – Which bone journal?
- Journal of Bone and Mineral Research and people couldn't believe that we were able to collect that volume of data on astronauts. It was just the type of measurement was so unusual really being able to get such strong results in such a difficult area of study. I've already stated crunching my mind in terms of the next publication. I'm not waiting until the last one year data to come in because just in debating back and forth with my colleague, there are lot of really interesting hypotheses that we can explore with the data. I think one reason that we can explore is the data is just such high quality and was so efficiently collected.

– 1 – Rating is a 5. It was good and it was worth it.
2 – Our PI has been, of course he wants to get more done, but he's been very happy like (1) said.

– Rating is a 5. We received a large quantity of images which we still have to catalog to determine the total success. So we collected a lot of raw data, if you will.

– 2 – That is definitely a 5. It's very useful, particularly to future cell science investigations. This particular experiment has a risk mitigation aspect to it that will be very useful as well as streamlining some of our operations on orbit.
{interviewer} – And I understand the rationale behind it, but you felt in terms of the actual results that you did get, that that again was considered worth it on your part.
2 – Yes, there was good quality of data and if there were a couple of bumps we were able to deal with them well. For instance, the extent of our data was based on just imagery. The quality of the images was very important and we received images of very good quality. But in terms of quantitating those images, we had an issue with the appearance of bubbles but we were able to deal with it two ways; one was by digital extraction of the bubbles and the other one is I developed procedures that would exclude them on orbit so we have been able to receive very valuable data.

– Based on what we knew out of Increment 8, I'll give it a 4. There's always room for more data so it would be hard to say that we couldn't have gotten anymore but other than that we were pretty happy with that.

– I would have to give you a 5.
{interviewer} – So you got enough data that was necessary to balance out against the work that was necessary to get it?
- Yes.

Topic Area: Overall Satisfaction - Customer Loyalty
Question 1.1.6 – *Assuming it did not change your own odds in competing for ISS research opportunities, how likely are you to recommend to a colleague that they perform research using ISS?*

Question 1.1.6 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

I'm driving to scientific groups here in Italy and I'm pushing in order that they make proposals for the utilization of the ISS as I'm also doing myself so very likely. A 5.
{interviewer} – I'll tell you that it's significant not just that you are likely to recommend but that you actually have recommended is an interesting piece of feedback and useful for us. Thanks a lot.

{ - I guess I would say a 3. I think I would want to warn them about a lot of the difficulties because I wouldn't want to feel responsible for getting somebody into the field who didn't have their eyes open about all of the difficulties, but on the other hand it's a fascinating field and it's a unique set of data so it could be worth it to someone who really has the right kind of an idea or enough motivation, but there are a lot of difficulties so that's why I would give it a 3.

{ - 1 - Someone who wants to do microgravity research; it's better than any of the other options; 5.

Question 1.1.6 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– NA

2. I would just make sure people had their eyes wide open on what they could realistically obtain and how much effort it would take to obtain it. With many people I talked to think well they do this in space and you're tempered by enthusiasm a bit to think it's a very very difficult process and it's a unique opportunity but it still takes a lot of time, much more so than any other type of research I've been involved in. There's a tremendous amount of non-research overhead to interact with the agency that is required that's not true if you're doing work on any ground based type of research including ground based NASA research.

– NA

I would say a 5. Would you recommend it if it didn't? Because it is a 0 sum game. No comments.

– I'm going to give that a 2 as well just because the CODE U and the funding side of things was just such a pain that I'm reluctant to carry forward myself much less inflict this on somebody else.

That's something I haven't really thought about too much. Since I'm *{at a different career level}* here and I'm very far away from looking for my own, at least at this point *{based on career level}*
{interviewer} – I have to admit I'm interested in your answer….. because…. you're going to go on in your career and whatever happens to you, at some point someone might say or you might get a call from a colleague that says, hey I have this chance to do this NASA research. You did NASA stuff. Should I do it?
- I was told many, many times through this process that my experience has been extremely unique due to various circumstances. For example, our upmass and a lot of things aren't going up so we've gotten a lot of attention so based on only my experience which I guess is how you want me to base this ({interviewer} – Yes), I guess I'd have to say a 4. I've had a great time with it so I guess on what has only been my experience and not what I'm told is typical, then probably a 4.

Topic Area: Overall Satisfaction - Customer Loyalty
Question 1.1.7 – *Assuming it did not change your own future opportunities for ISS support work, how likely are you to recommend to a colleague that they become a payload developer for ISS?*

Question 1.1.7 – *Comments from Increment 7*

- NA

– I guess my first question when I read this, when I said assuming it didn't change your own future opportunities, I just wonder why it was worded that way?
{interviewer} – Because it's a competitive game out there so if you're really gung-ho to do work we're envisioning an environment where people are chomping at the bit to use station. I think you understand why we worded it that way.
- I was just kidding.
- No, but it's a factor, you know.
- Right, I agree. I think we were looking at a 4 because we think there's good science to be done. I think people just need to go in with their eyes wide open as to what it takes to get to that point and that because there are limited up mass opportunities and there are all these little backlogs, then their opportunities are limited but, there's good science to be done and we all agree with that.

Question 1.1.7 – *Comments from Increment 8*

– NA

–1– If seems applicable to what they're doing, I would recommend it. So a 5. I just think when everything goes alright and you get your data back, then it's a good thing.
2 – The process may be difficult but the resource, I think, is valuable.
1 – There you go. Very well said

- NA

– I'd say a 5 with the caveat explaining to them that there are a lot of, how should I say this, make them aware of the reality of resources. That would be the one thing I would want to bring across to them but at the same time I would encourage them. At the same time, there's not much of an alternative. It's pretty much this is it. But things can be worked out, certainly.

– A 1, right now with the up mass and crew time we don't even know; we're still got 4 runs that are thermal runs and right now our only shot at getting them done in Increment 9 is Saturday morning science and we doubt very seriously they're going to give us 13 hours worth of Saturday morning science to do it, so even you've got no up mass and it's simple as just injecting honey into water and water into honey and you can't get scheduled and all of the overhead for trying to do it, it begs the question as to whether it's worth it.

– I'd be very likely if they have the opportunity or the ideas to support one. A 5.

– 1 – The answer is a 5. I was going to go with NA being that I'm not a PI, but the answer would be 5.
{interviewer} – This question is actually framed specifically for payload developers.
2 – Given, of course, part of the reason we rate it a 5 is space station is really the only opportunity to develop experiments cheaply, but I'll add for people that listen to this recording that the Microgravity Science Glovebox facility was very flexible. We could design our hardware a lot cheaper than we would have if we had to develop without the data and video resources and the containment resources that MSG provided. So we definitely recommend people to propose and development experiments for MSG.
{interviewer} – What you're saying is sort of validating the entire concept of the facility class payload that you build this rack level facility that then has simple to use interfaces that make development, as you said, less expensive and easier.
2 – We just built the MSG rack. We're an investigation that goes inside the work volume but overall we're happy with the Microgravity Science Glovebox as a user and would recommend other people to develop glovebox investigations for that facility.

Topic Area: Overall Satisfaction - Customer Loyalty
Question 1.1.8 – *Assuming you could get research funding, how likely would you be to choose to pursue another research investigation on ISS?*

Question 1.1.8 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– Actually we are preparing another experiment on another payload which is still an experimental payload from the Italian Space Agency and we are getting research funding from that and we are pushing for the ISS so very likely, it's a 5.

– I give that a 5. Because although there are so many constraints if you can think of an idea that fits within them, then it's a fantastic platform for research, and I think I've thought of them.

– 1 – 100%. We've already chosen.

Question 1.1.8 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– Rating a 2. It's just not worth the multiple repetitions of the paperwork. The management is too labor intense to justify the science.

– 5. It's awfully cool and once you have all of this information and experience it would go much easier. There's a learning curve and after doing years of work from KC-135 to ???? rocks and stuff, I just would be able to do it much more quickly and I still would like to have another opportunity because it is extremely enjoyable.

– NA

– A 5 also. I hope to have additional research at some point and everything has worked so well with this study that I would not hesitate to apply again or submit another proposal.

– Again, I would rate it higher just on the research platform and the potential for research I would rate it. The score is dragged down again by the redundancy, the requirements for documentation and the challenges of funding through CodeU.
{interviewer} – I hear you on the funding thing. Let me just mention that, and it's useful to hear that stuff about funding. Maybe {interviewer} explained that what we're asking you to survey does not scope in your funding issues.
- Well, I can only tell you if you're asking me to globally rate a program, it sure as hell does because if I'm going to ask a colleague to do this it's the whole ball of wax, you know.

{interviewer} – Yes, that's true. I know it's hard to separate out. That's fine. We can discuss this off-line maybe.

– It depends less on funding and more on if I had a good idea. It's not just the microgravity environment but it's also the way things are working on the ISS. I could imagine for the future that certain problems would be much better solved on the ISS than others even if they all were funded and required a lack of gravity, so I guess I'd probably say a 4. But at this point I don't have a very good idea of what I would send up.

Topic Area: Overall Satisfaction - Customer Loyalty
Question 1.1.9 – *Assuming it was not your only option for work, how likely would you be to choose to develop another payload for ISS, given the opportunity?*

Question 1.1.9 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– No comments.

– This is not our first experience with the program. We had some experiments in Increments 3, 4 and 5. Some of those experiments were developed in beginning years prior to the nominal launch date. The whole ISS platform was new to everyone and I think there were some growing pains associated with that. There were aspects that were definitely improved from what we experienced in Increment 7 as opposed to our early experience and that was very positive. In addition to that, there is the perspective of flexibility in which we were accommodated and afforded flexibility beyond what we expected.

{ NA

– This gets pretty high too because it's all up our alley.
- I think we're all saying very likely. That's the field we work in and we enjoy doing this type of work.
- {interviewer} – So your rating would be a 5?
- Yes.

Question 1.1.9 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– I think it's the same, a 3.

– NA

– NA

Rating is a 5. 2 – I think same as the last comment. The resource, I think, is valuable.

Probably a 2, it's the only game in town right now but if I could figure out a free flyer or could figure out something else, that's what I would go for. Also, the manned overhead is significant on Space station if you could get to a free flyer and didn't have to deal with as much of the safety it would be better.

Rating is a 4.

A 5. I'm also working on other projects that are also for the space station. Right they're in Phase A Link, Phase AB but smoke. I don't know if you've heard of it or not, it's an LSG experiment.

2 – My answer would probably be a 4. I debated, I flirted with 3 but I'll probably say a 4 and the reason I don't say a 5 is because during the development of *{investigation name}* and *{investigation name}* we spent three and a half solid years doing it. It was a very rewarding experience but at the same time we gave up a lot of our time to do that. That's probably why I would say a 4 is because I'd like to develop hardware again for space station, but I don't know if I want to give up another three – three and a half years of my life.
{interviewer} – So what you're saying there is the time investment is driving against a higher rating for this question.
2 – Yeah, because of the amount of time that me and other folks on our team too put in. I know (1) put in very, very long hours, more than 40 hours a week during various points in the project.
{interviewer} – (1) do you concur on that rating of a 4?
1 – Yes, I'm fine with that.

Topic Area: Overall Satisfaction – Program Improvements
Question 1.1.10 – *How would you compare your experience with the ISS Utilization program for the current increment to your experience on previous Increments?*

Question 1.1.10 – *Comments from Increment 7* (click left link to return to corresponding datasheet)

– I'll flavor this with the integration process that I had to go through for again for the WAR. Much better, the whole program, the whole system, is learning, and this references back to the comment I made about *{name}*. She pulled all the PIMs together and after they met for a few times, then I started meeting with *{name}* again, the PIMs had a definite impact on guiding that process. *He {name}* actually took over and did a lot of the work, had the work done for me outside of the data that I had to provide to him. *{name}* was the PIM, and I don't think you'll find a better one.

– What makes this different is that in Increment 5 we collected post-flight data at KSC, and for 6 and collected it in Russia. It is about the same. Cannot say it is worse because, it is only worse because it is more difficult because we are collecting in Russia. It is worse only because of the situation we are in, not because of a logistical or management problem not being solved by the ISS Program. I can see both sides of the fence. As a customer, given the logistics I would give it a 2 if I were relating it to Increment 5. Comparing Increment 5 and Increment 7 like comparing apples to oranges.

– The Utilization Program is working. There are certain areas that should be applauded for the efforts that they have done to improve the process.

– Our experiment is well defined. We scan the guys before they go up and we scan them when they come down. We get them a year later. We have a protocol that we follow and everybody knows what they are doing. We are sort of on cruise control now. If it had deteriorated, you would have heard some complaints.

– I would say about the same.

– So this is sort of comparing Increment 5? So this is Lu and Peggy? I would give that a 2. I think we had more trouble getting runs scheduled and extra runs scheduled and other little problems handled and things like this. But that might be someone on the grounds fault too.

– For me and this may be certainly just personal, but it was much better. I came in on the tail end of Increment 5 and sort of had to do some housekeeping in cleaning up all of those details. For me I saw a much more straight forward process through Increment really thought I got a lot more help as I began the process with 7, meaning that in wrapping up 5 I was kind of floundering, but once I began the process with re were plenty of people ready to step up and tell me, "this is what you need to do next", and I think once again that goes back to the PIM that we have now. The rating is a 5, much better.

– I gave this a 2 because it wasn't the same; it was a little bit worse.

– It was better. I would rate it a 4. See previous comments.

– I guess I would give that a 4. It was about the same but I think the program overall made an effort during this increment to help us improve our ground to participation rates. Although we've gotten more used to working together so getting reports done on time and things like that was more streamlined.

– It was the same so about the same. What does 2, 3 and 4 mean? The fact that if it was the same it's a 4? {interviewer} – No I would say 4 would be sort of better.
- It was the same. But I thought it was ok before so I'll put a 3 there, I guess.

{ - NA

– I'd say about the same overall because again the communication level was good. People were working that. Crewmembers worked well with it and that was with the help of the operational folks so I'd say about the same.

– I would say about the same. I would say that I don't recall that I had any particular issues or problems relevant to this experiment for increment 6 and so the limited involvement that I had with the program for this experiment, I thought that you did as good a job on increment you had on increment 6 which I felt was real good.

Question 1.1.10 – *Comments from Increment 8* (click left link to return to corresponding datasheet)

– I gave it a 4. It was good. It's getting to be old hat but it was good. Like I made the comment earlier, we're beating people in the submission and everybody is getting a lot more comfortable in making things work. It's very small incremental steps with the support teams and everybody so it's continually getting better.

– Let's give it a 4. I think for us Increment 7 was a little bit more challenging because it was, as I mentioned, getting the hardware there, getting on orbit operations, working through some logistical problems that we found that occurred simply because of a lack of resources, for example video tape on board. So for us it definitely was better than we saw during 7. I think we got smarter too.

– I would say much better. See previous comments. We got better productivity and better interaction I think.

– Much better, a 5.
{interviewer} – Do you think it would be appropriate for Becky to put a note here - largely dealing with your data collection in Russia being better.

- Yes. The arrival of the UPS' smoothed everything out. I would recommend anyone doing anything out there. We've actually gone ahead and even sent a couple more out as backups because they are worth their weight in gold.
- {interviewer} – Is it mainly power smoothing or also interruption of the power?
- Well, it's everything. Of course you need power conversion but it's power smoothing in terms of getting rid of the spikes, but it's also getting rid of dropouts as well because if you are smoothing it but still experiencing dropouts, you're going to have a problem so you need to do all three and we're finding out that's essential. Particularly there too because here the chances of losing power are relatively rare but there it seemed like we had a lot of spikes going on and dropouts and things much more frequent. So you have to really put a premium on them. They're not really nice to have; they're essential if you're going to do anything.

– rating is a 5. It's getting better.
1 – All except for that Russian thing. That's actually getting worse, I think.

– We have had good experience on the previous increment also, so I would probably rate it a 4.
{interviewer} – Ok, so you think it was a little bit better,

- Yes.
- {interviewer} – Just briefly, what do you think made it better? You got more observations?

More observations and better crew communication. Crew communication was improved.

– Rating is a 4. It was a little better because during the previous increment we had an additional ESS join the team and we were confused about who should do what and that was all worked out. By the time this increment began everything went very smooth.

– Rating is a 2 because of the baseline data collection.

– A 2. See previous comments.

– I would say it was slightly worse. I'm going to rank that a 2.
{interviewer} – Can you give us any comments to help us understand your basis there?
It's hard without getting into personalities here to do that because you see our experiment is totally crew member dependent

{interviewer} – We have a software glitch. I'll just ask you this question verbally. The answer scale is 1 to 5; 5 being much better, 3 being about the same, 1 being much worse.

– I would say the medium grade since most of our job has been completed due to Increment 7 because we had to double up the payloads to deliver….During Increment 8, as I told you, we only had payload support.
– {interviewer} – So you would say a 3, about the same?
– Yes.

– 1 - Much better, a 5.

2 – We had more time during this increment.
1 – We had conferences. And the crew was really into it.

– The same. It’s all the same. I mean I6 was more of a nightmare because of it coinciding with Columbia.

– 1 – The answer is 5. See previous comments that things are improving.

– 3, about the same. No comments.

– 1 – Again I think one item that really helped us was the fact that again there was, not having as many payloads up there allowed us, for instance, to have several crew conferences and under normal circumstances, on previous increments, there just wasn’t that luxury so I think in terms of the situation we’re in we were made available a lot of additional, if you will, things that we wouldn’t normally get.
2 – It was better than what we experienced in the past. It would be a 4.
1 – More flexibility and more accommodations.

– Pretty much relative speaking, pretty generally relative to the chromosome experiment, I would say 3, about the same. Comment wise – that is good in that we’ve had good service for the chromosome experiment and again for I8 I felt like it was good.

Topic Area: Program Processes – Ease of Doing Business
Question 1.2.1 – *Please rate your level of satisfaction with the overall ease of doing business with the ISS Utilization Program.*

Question 1.2.1 – *Comments from Increment 7* (click left link to return to corresponding datasheet)

– Reference above comment.

– No comments.

– We have had good experiences and bad experiences. Will defer comments to more specific questions.

– No comments.

– I have good lines of communication and when the crew was returning and we had to present arguments which dictated when we would get the back for the repeat measurements, I felt that my views were taken very seriously. I felt it was very easy to communicate the views and I felt that people were eager to listen and that's very nice.

– No comments.

– A 3. again, I think that's the same comment of just all of the events that led up to increment causing it to not be the most satisfactory experience.

– When communication and information was exchanged it was quite efficient so I'm much pleased. A 4.

– Let's give that a 4 only because a lot of the business was taken care of, you know the scheduling, by other people. When it came to running the experiments, they in principal went well. So I think I give that a 4 saying that the people that got me to the experiment either did a good job or didn't tell me about all of the bad stuff.
{interviewer} – I understand. Things were transparent for you and as you mention that's probably how it should be.
- And then again my interactions with *{name}* were good, I think. And *{name}* too.

– I would say I'm very satisfied. One of the things that we did differently with that we had been split with doing our procedures and everything here at JSC for EPO and starting with moved everything to the folks at Marshall. It just made a much more seamless process for us all the way through, you know, looking at things like iURC and all of that. That was the best thing that we've done so I would say it was much easier this time.

– A 4. No comments.

– I would give it a 5. See previous comments.

{} – Ok, I give that a 4. Like I said before, what I think could be improved is that the system is very complicated but what I think is good is that we've had a lot of help in reminding us about deadlines in time for us to meet them and things like that.

– I put 4 and the comment is the fact that we're operating out of Russia makes the ease a little tougher because we have to coordinate shipping of this sample which is not easy and can lead to problems. Fortunately it hasn't led to any but it has been more difficult to coordinate shipping of our samples.
{interviewer} – Actually I don't know if it was last time for Increment 6 whether it was you or some other people made comments about shipping problems and you should know that the payloads office has a corrective action at this point that grew out of those comments about those aspects of integration with the Russian program.
- In some cases I think that I might say this was little better than 6 because they learned that when we actually went to ship our sample that they really needed a translator because even though we had all of the right paperwork the people at Customs when we were going to get on the plane didn't understand it so this last time they actually sent someone there who spoke Russian. I think that was an improvement so maybe I should put 5 instead of 4 but anyway that would be a comment. It was better than 6 because on 6 we actually had some problems, we got our samples back but it was like a big deal when we were actually going to get on the airplane where this time that was remedied by having someone who was fluent in Russian and English. I'll leave it as a 4 but with that comment.

{ - 1 – I can't rate this high. It was not easy. How could it be easier? Certainly what I said, just being able

to get the ear of the LIS is very helpful for PIs. I think the biggest problem is the places where the PIs are plugged in. People are very busy and you have to handle a number of PIs so all of our communications go thru the head, the *{supporting payload}* people. Our weekly telecons about the science. This survey really is going to be dealing more with the upper management. {interviewer} - Try to integrate as many of your points of interaction with the program as you can; and actually it does include the support you got from the Bldg. 3ks because that RPO or Research Integration Office is also what we're trying to evaluate. 1 – I think the biggest problem; I'll say 2 or 3. 3 - Initially 2; now it's much better since we have all of these mechanisms for contact. 1 – Again, I think that what PIs need very badly is an orientation to the ISS that outlines very clearly the roles, the hierarchy, who makes what decisions; in the beginning everything was completely hidden from us and it was this we'll take care of everything, but here are the rules; and it was frustrating to not understand what was generating the different times and leads; it was a parabolic experience; when we fist got started we thought everything should have been faster but now we think we should have more ground time dedicated; we support delays much more now than we did when we didn't understand them or how important they were. 3 - Personally it wasn't until I went to Houston and was on console for one of the procedures that I even began to understand the process; so for many, many months in trying to do things we were doing it in the dark. 1 – For example, there's no way to find out what equipment is on board; it took a long time to get information and it took a long time to find out how to utilize the raw data; how to get the raw data transferred up here; we finally like everything when you finally find that one person who knows everything you're golden but it took us months to find Jason. 1 – For increment 7, it was 2.

– We rate that a 3. I don't know that there would be anything different than what we've already addressed or will be addressing in future questions.

– I have to narrow in on Increment 7. Let's see, doing business. I'll put a 4 there as far as ease. Direct communication to me would be easier but I understand the reason why you have to go through people so that's why I put a 4 instead of a 5. 5 would be if you were talking directly to the crew but my understanding is that that's not possible really.

– I'm scratching my head and thinking about this a little bit. I guess I would give that a 4 and say that I was pretty close to very satisfied. I didn't experience any particular problems but we are, after all, a government organization and it does seem to kind of get bureaucratic at times and I can't really put my finger on anything. I guess I just look at the phrase "overall ease of doing business". It's not like just walking up off the street and renting lab space and going in and doing your work, but it wasn't a real erroneous process either so I would say I was pretty well satisfied.

Question 1.2.1 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– We are satisfied, a 4 so you have a margin to grow. No comments.

– Again, I clicked 4. There was a big jump in the support and all that for I7, but again I8 we're still climbing up that curve and the higher we get, the better we get so that's why I said 4.
{interviewer} – That's an interesting comment. If you look back over the trending from increment to increment, and certainly you're in a good position to assess that, you'd say you noted a jump or improvement between I6 and I7.
- Yes.

– I think I'm very satisfied but in principal it's probably not applicable to me because everybody else did that business for me. I was quite satisfied because I didn't have any of the headaches if there were any.
{interviewer} – I got it. In other words, you were so well supported that you had other people like Linda doing the hard stuff.

– Rating a 1. Same problems as before. Paperwork was redundant. Junior staff didn't know what management wanted. Very poor flow of paperwork and management information.

– We were very satisfied. A 5. As I say, I think we had learning during 7. I think everybody understood our requirements, we understood the perimeters on orbit and once again I think we just felt a lot of support

from everybody that it was valuable to get this stuff done. It was a great increment for us.

– A 5. No comments.

{interviewer} – The scope of this survey is pretty broad and includes a lot of end-to-end things about how your payload was supported. For example, it includes even your SPD support because when we developed this survey SPD folks were involved in developing this survey.
2 – I still think I'm very satisfied and you're very dissatisfied.
1 – Yes, we're going to have to go in the middle again because, and I mean it's just the Russian integration process again was just not a good experience.
{interviewer} – So if it's 1 to 5, you're saying you want to select a 3?
- Yes.
- {interviewer} – And, again the Russian integration is pulling your rating down?
Definitely.

– Rating is a 4. No comments.

– Rating is a 5. Everyone is very responsive and businesslike.

– 3. It seemed from my first experience that there was a tremendous amount of, if not paperwork, electronic work that it wasn't obvious to me that that was essential to assure the safe and effective mission. There was a lot of work that I'm not sure was necessary to achieve a safe and successful mission.

– Rating is a 2.
{interviewer} – That's interesting. There's definitely room for improvement there on our part. Obviously the issues with the baseline data collection must be playing a role here.
- Right, that's absolutely what it is because that's completely what this study depends on. It only has three sessions of baseline data collections and the second ones got screwed up. Granted, the PI might be able to work it out with the data he has, but it's very frustrating in the fact that we went to all the trouble of getting even the crew office involved and it still didn't work. Again, I'm not pointing fingers but something is not working.

– A 2. See previous comments. Communication and our inability to get what we needed done and inability to get the help we needed.

– Rating is a 4. No comments.

– They have made it very easy for me. A 5. Once the project was selected. Peer review was the big hurdle and once I got over that, then there were NASA people assigned to this project whose job it was to Shepard this study through that series of hurdles. I couldn't have done it by myself and their constant attention and so forth that made it such a fluid process and it just went very well and I was amazed at the number of people who would attend the various reviews. There were 30 or 40 people in the room and all of them very supportive of the research. Many coming up with ideas to facilitate the process and lots of encouraging comments. There were things, I wouldn't even call them critiques, but things that I needed to respond to, but they were all very constructive in their approach. I was delighted with the entire process. Very satisfied.

– I'd give that a 3 and again due to, I will now stop talking about CODE U and funding which I can't say enough bad about. Once we actually were selected for flight and got through all of the challenges, I would give you about a 4.5 or a 5. Some of the problems were getting through the wickets to get there and the multiple phases that this is split out into that were quite redundant quite often and I thought some of the interviews – I forgot, they're all mnemonic letters and things like that – but there were multiple interviews I had to go through down at JSC that were, I thought, conducted a bit out-of-scope. My anticipation was that they were safety interviews, that they were programmatic relevance interviews, they were looking at is this software compatible and things such as that, but many of the people there would talk more about the science and they're questioning some of the scientific relevance and I thought that was judged upstream in the review process and was sort of off-table and so that was somewhat frustrating.
{interviewer} – That's interesting feedback. Thanks for that. I'll tell you we've heard some similar things so this is very useful for us to hear.
- *{name}* somebody or another and I went at it at one of these. I'm a surgeon and I'm the head of a whole multi-million dollar hospital complex here and so I was not having any of this. So I just stopped the

interview in the middle and we had it out and I figured I'd never hear from you guys again after that because I thought it was completely inappropriate. I have given that feedback to a couple of other people and I think at least my recommendation would be that people need to be reminded of the task at hand. And there are a lot of other interesting corollaries that would be well discussed off-line and not in a large meeting that would take you off-task.

– A 1 for this activity. See previous comments. There was an issue between the PSRP process and the CHIT process; there's duplication there. The PSRP wants you to go out and get written memos and we had emails and then one group of people said the emails weren't good enough and we had to get memos so we went back and got memos from the people that said that we could use the expired syringes and we could use the duct seal and we could use the straws and we could use all of the stuff so we go through all of that with the PSRP and then we have to go through it again with the CHIT process but the CHIT process is authoritative; if they come forward at the CHIT process and tell us no you can't use it well then you've got to go back through the PSRP process; it looks like to me that that doesn't make sense; like you get some kind of agreements in writing for the PSRP process but they're not worth anything when you get to the CHIT process; either the CHIT process needs to be done before you go to the PSRP or what you get at the PSRP ought to be forwarded to the CHIT process and people ought not be able to change their positions without significant rationale.

– Rating is a 4. At the beginning when we start with the project, it was our first time with NASA. So the ISS program is a very big one so it was not so easy to start. But once we met the team, the Payload Integration Manager (PIM) and the other colleagues everything went smooth.

– I thought it was pretty easy so I'll say a 4.

– 3 – I'd say a 4 and that many of the glitches of communication that we had in 7 we started to improve upon.
2 – It took a long time to get the raw data back.
1 – I'd still say a 3 It's not the easiest thing in the world to be involved with. We think it could be easier.
{interviewer} – Ok, we're going to go with a 3.

– Rating is a 4. Anything I need I just communicate and somebody gets back to me.
{interviewer} – And you communicate that generally to *{your PD}*?
- Usually to *{my PD}*. When *{my PD's}* not there, there's a person named *{name}* who's very helpful. Another Lockheed Martin person.

– 1 – We were sort of struggling with coming together for the answer here but a 4.
{interviewer} – Any comments or suggestions for improvement?
2 – Maybe we're learning given that this is our 4th increment. I guess we're learning to use all of the processes. We had a lot of confusion because a lot of us were new. It was kind of a learning experience with Increment 5 plus the station folks were getting accustomed to payload operations as well. And I think we've learned a lot in the last year and I think the payload operations people have learned a lot and that's why it's a little bit easier. The reason we didn't rate it a 5 is we have to launch new video tapes and sometimes that process doesn't seem to be quite as smooth to get the video tapes up and the reason we didn't rate it a 5 is at one time folks were going to put our hardware in Progress to be burned up and we had to get it pulled out of Progress because we do want the hardware back. So some of that might be driven by the Columbia tragedy affecting what we can and cannot do with manifesting. Maybe too much information there.
{interviewer} – No, that's fine.

– Rating is a 5. I think because everyone is familiar with *{our investigation}*, they are very supportive. So it's easy to work with the utilization program.

– 1 – A 4.

– A 3.

– For *{investigation name}*?
{interviewer} – I'll open this up. I may shoot myself later when I'm analyzing the data but I'm very interested in the fact that you've got some larger perspective on things because we're always interested in

getting better feedback and new perspectives on things. So I'll open it up. Think about if you're the *{identifying information withheld}* , why don't you do a rating on that basis.

- Ok. And since we're recording things I would say that as far as the *{investigation name}* I was very satisfied and would rate this a 5. For overall activities of all the experiments and all of the support that I was involved in for I8, I would say a 4 because the problems that I encountered were in areas other than the chromosome experiment.

{interviewer} – I'm going to put you down for a 4. And we're going to make sure that Becky has it down and we've got it on tape that this is factoring in that your other experiments were maybe not so great.

Topic Area: Program Processes – Ease of Doing Business
Question 1.2.2 – *What is your opinion of the number of personal contacts you interacted with in order to accomplish your ISS project?*

Question 1.2.2 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– It was just right. I had to meet with *{names}* and they were pretty much the primary players. They each understand their roles in the project, and I didn't have to repeat myself. I was able to get them data that they needed and share with the others and I knew the purpose for it. It's just right.

– Just right. Not excessive.

– Too many personal contacts that we have to do. It's pretty bad when I have to have a person on my team that has to make all these contacts, while I'd rather utilize people on my team worry about payload development and then have someone in the infrastructure of the payload utilization to do that contact to get me through that area of expertise while I can concentrate on the actual developing of the hardware. Every contact we have we have to have. This is starting to change and now my PIM is doing a lot more for me than they originally did. It is a lot better starting point than what is used to be. My old PIM was very good, but now I don't feel like I'm asking him to be more that what his tasks are because the role has been expanded.

– Sometimes there were too many people, and it wasn't clear who was responsible for what.

– In the past it has been too many, but now it has been improved and it is just right. I would just make my needs know to *{name}* and I think I would have an interaction or two with *{name}* . It was not unwieldy this time around.

– It felt like it was an efficient process.

– I'm going to say just right.

– I think the number of contacts was just right as needed, not too much atrophy and not too less, so just right, 3.

– I think it was just right and the thing that was really nice was that you saw continuity that you tended to interact with the same people over and over again.

– I put 3. It's one of those, you know, the program is pretty large and there's various pockets to deal with and stuff like that so right now I put that as a 3. I figure you have all of these indifferent areas and who we had to deal with and I guess I don't have an issue with that.

– I would say just right, 3.

{} – I would have preferred it to be fewer so I'll say 4, a little bit on the too many side.
{interviewer} – Can you think of any particular set of interactions or people that you were talking to that you thought was unnecessary or redundant?
- I guess not offhand, no, but it seems like there are a lot of people who are splitting their time on different projects since there were fewer of them and each one did fewer projects. It might be easier for 4 or 5.

– I think that was adequate or just about right. I put 3.

- 1 - Too many; there should be more dissemination of information in the ISS support team

– We may have different perspectives because we worked different aspects of it. I worked with *{name}* as the PIM and he was really great. He was very good and very proactive. He did so much legwork. It was just right. It was one of the best experiences of working with a PIM that I'd ever had. He was very good. Of course, I know you all had other contacts.
- We had gone down to JSC to work with the maintenance work area with *{PI's name}* to do some preliminary experiments and they were great so I would say it was probably just about right. Do you think there was any extra thrown in?
- I don't think so, *{name}* ran a lot of interference and they really worked on his side well.
- {interviewer} – Ok, so the number you would select there is a 3?
- Correct.

– We're to a point where it's pretty narrowed down; we just have a select group as far as a method of who we contact with. So for us with an understanding of the system, I think it's just right. So I'll put a 3.

Because of our experience and who we've dealt with in the past we have the selected people that the process is working and there are not extraneous people that we have to deal with.

– I'm going to say 4 because with us having to do business with Russia that added another level of complexity into things and we had to work out an arrangement, make sure that we had an arrangement worked out with ESA to handle our blood samples and get them to our PI and it wasn't a real easy thing to do and it almost makes me want to go back, but not quite, makes me want to go back to the previous question and think about that some more, but I would say the personal contacts that was something that was a little bit tricky. I mean we got it done and ESA did their part and the program did it's part in kind of helping all of that come together and everything, but it did make me a little nervous having to do all of that business in this foreign country that we had to go through customs and all of that kind of ??? to get our samples out.

Question 1.2.2 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– A 4, in the middle, just right, not too many. This is in the frame of what I was saying before.

– I think it's just right. I'm a real simple payload and basically I only had to work with *{name}* and in this case *{name}* because the WORF didn't fly, so it was I think just right. I didn't get pulled in too many directions.

– I would say it was just right.

- Rating a 1. Number is a funny question. There were two junior points of contact, they didn't know the area. We needed a more suitable contact, rather than more contacts.

– I think a 3. It was just right. I think one of the good things is that we're beginning to see continuity. I know people move on and people change, but I think we see our contacts not just from a personal level but actually whatever their role is that those are staying pretty steady and common to each increment. We're not seeing a lot of new offices or new people we're having to deal with. That's good.
{interviewer} – Yes, that's a useful piece of feedback because it's relevant to one of the things the Payloads Office is working on, so thanks a lot for that.

– The way it's arranged is through Lockheed Martin. We have a direct contact, one of their folks who coordinates everything for us so usually I'm working through that person almost exclusively so I wouldn't say it was too many. I'd say it was just right. I haven't encountered that problem.

– 1 – I think just right. We'd say a 3.

– Just right. Generally *{my PD}* and once in a while I might talk to Al Holt.
{interviewer} – So you did talk to Al once in a while?
- Once in a while, yes.

– It still seems like too many to me. I'll say a 4. But I'm not sure how I would rearrange things since I don't think I have an advantage point to see the big picture.
{interviewer} – It felt like too many were in the whole process.
- At least we knew how to do this time so it went smoothly, but I still don't quite understand why there need to be so many.

– Well, I had sufficient support and without the people working on it, it never would have happened, so it seemed to me just right.

– Well, you know it was actually great until we ran into these problems with the post-flight data collection after a landing. Because really I work internally. We get our BDC schedules through our own Increment Science coordinators here at Lockheed and they work with the crew schedulers and everything works beautifully. The problem we ran into is when we couldn't get the Russians to come back on our time scale. That's when a lot of personal contacts got involved and it did get a little hairy and it didn't even get us anywhere. So in that particular case I would give it a 4. Other than that, I would give it a 3.
{interviewer} – But 4 is what it is, that's fine.

– A 3. The routine direct contacts we think are reasonable.

– I think it was just right for us because we were coming back to get into our team at JSC. They took the

majority of the load in all of these interactions.

– It was just right, a 3. If I didn't know anything about the process I would think there were too many. Geez, why would you need all of those people. But in the early development stages there were several people who were involved and it was very useful.

– I think it was very good. All I had were good.
{interviewer} – That's interesting. So you're rating would be?
- 3, I guess. That's right where you want to be.
- {interviewer} – Ok, not to beleaguer it, that's an interesting rating in light of some of your other feedback, but that's fine.

You're just talking about a number here. I mean there are redundancies in the program and the personal people that were taking care of the care and feeding of my proposal and the experimental document and things like that, I think you had an adequate number of people.

– I put a 2 on that; the interface with *{name}* who was our PIM was a great example of a single point of contact; he did a great job but the PSRP interface kept turning over and the person we were working with didn't seem to be authoritative and everyday they talked to somebody new they had new priorities and we might as well have been talking to each individual PSRP person ourselves.
{interviewer} – let me suggest we change the number on that based on what you just said because the scale is 1 to 5, so let's go on a 4.
2 – One other thing and I don't know that you can get around this, but we did cross increments; we were originally planned to go in 7 and so we prepared all of that and then when we went into Increment 8 we had a different increment director and also we had to redo everything each increment.
{interviewer} – Right, another important piece of feedback because the payloads office did have some corrective action in place about this issue of having to redo things. We're going to have to revisit that.
1 – I can almost understand it with something that has hardware because you need to know how long it's been sitting in storage and there are things you need to evaluate but for this type of activity it looks like to me it's a job jar activity; I don't know why we need to go in every increment and verify that the procedures are still the procedures to run for the next increment.
2 – We even had to go through the safety cycle again.
1 – We have to go through the safety cycle every time and we're still using all of the same stuff.

– It was just right. Rating is a 3.

– There seemed to be a lot of them but they all had their own specialty. Sometimes it's hard to know who contact. I'd say a 4 just because it's hard to know exactly who to contact but it seemed pretty much just right after you know who – you know what I mean?
{interviewer} – Yep.
- You can use those as my comments.

– 1 – Well this is the whole business about when we got right in on the daily planning thing. Once we had IVODs going everything was much better. We were down to the right number of people, I think. There was a person for each job. We got rid of the 7, the telecons when we had to go through 4 different people to get to the COM. It was much better with the IVODs.
2 – Yes, but that wasn't the route we were supposed to go.
1 – We were welcome to go to the DPC. All of those mornings when no one was there. I thought it was just as good. Like the last ones we did when they were handling more of the stuff, that was even better. For us it was really a huge learning curve, I think, to really incorporate and understand how they operate, but then when we finally learned how to do all of this stuff they said we shouldn't do it that way ever again. They changed our accessibility, which we think is a bad idea.
{interviewer} – Ok, they reduced your level of accessibility?
3 – Right.
1 – They reduced our crew time so severely that we have no idea. We haven't gotten to try it again in a while. But after January they made it more formalized and I thought it was better. I thought it was eating up less of our time and we had a better idea of how things were proceeding.

{interviewer} – Ok, see if you can capsulate those thoughts on a numerical rating on this.
2 – But after January we only had March as the only activity.
1 – I thought there were too many because we still had to do our own digging through things to figure out what was on station. We had to go through 4 people before we finally found Jason and if we had just been given the big list of the most important people right up front we would have been bingo, right? I think it's 5, too many,

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– I would say it was just right. I remember on I6 I was dealing with half a million different people and this has been very helpful and a lot less. I guess what happened is that I6 was such an emergency situation. The whole manner of data collection changed with the Soyuz landings and it was such a priority to straighten out the research that everybody and their manager was jumping into it. But now that things are kind of back flowing smoothly, it was fine.
{interviewer} – Remind me about your post-flight scans. Ok, they're not done in Russia. They're done here, r right?
- Right.
- {interviewer} – Are you able to get both crew members or just one?
- We've been able to get both.

– 2 – For now for Increment 8, probably a 3. Earlier we had said that there seemed to be a lot of people that we were involved with, but we've noticed that it might have been like a score of 4 earlier but it's been getting better as the increments go along and now we seem to be pretty comfortable working with our folks, so 3, about right.

– 3, just right. Again, I think it's just familiarity.

– 2 – We feel that it's pretty close to optimal, so it would be a 3.
1 – Yes. I think that's a very important aspect because if there are too many individuals, it's better to be able to integrate your inputs and interface with a few individuals, I think. I think that's very important in terms of efficiency on both sides.

– I definitely felt there were too many to keep track of so in this case I'm going to say a 5. I got bombarded by emails from people I've never met and they're asking me for stuff and it's very confusing to figure out what's going on. Granted, I don't, again maybe this is just the nature of the beast, but I definitely felt there were a very large number of people involved. I should say more specifically, there's also on the other hand and chain of command isn't the right word, but there's sort of a hierarchy of a smaller number of people that I'm supposed to deal with but often times it just seemed as though people were talking to me from very differencing levels. The *{Payload Development}* team that we had worked with, there was a small of contacts of people that I talked to frequently, but then were also people in Houston and sometimes it seemed as though the requirements were conflicting, but people wanted different types of things at different times and so in that sense it wasn't so coherent and I think that was not entirely the most efficient way of doing things at times.

Topic Area: Program Processes – Payload Data Library
Question 1.2.3 – Please rate your level of satisfaction with your direct use of the Payload Data Library (PDL).

Question 1.2.3 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– Not good. It is improving. We were getting ready for Increment 7 when they brought PDL on-line. There were still bugs in the system. Joseph was able to go in and help me out, determine that we did have problems, and I wound up doing things multiple times because of that and eventually Joseph got comfortable enough where he actually took data and we were both inputting data into PDL. He started taking data and doing it for me. It just was not a very graceful system when it was fielded.

– It is not easy to be introduced to this kind of software but due to the help of some of your colleagues, I have been able to input all our info then everything went smooth.

– I have some familiarity with it, but I am not the person who directly interacted with it, so I am a step removed. Prior to this interview, I talked to several members of the team and requested their feedback and just to confirm my own perspective and what I'm expressing echoes their feelings. They were very happy with IU{interviewer} and PDL worked well, so I have to give it a high mark.

– NA, I think because I don't think we had too much to do with the Payload Data Library, maybe more from as a payload developer. From a PI point of view I would say that it is not applicable.

– Well, we had a small team here that I interacted with, maybe 3 or 4 people and then occasionally *{name}*, but not a lot. And those other people probably interacted with more of the other people so I would have to say for me it was probably just right.

– We've been working with the life sciences data archives.
{interviewer} – That's something different.
- So I'm not familiar with this but I would like to say that this kind of thing makes us really uneasy because the nature of our data is mental health and so I think our study is different from other investigations in terms of how sensitive the data are.
- {interviewer} – I'm going to put not applicable for you.

{ - 2 - I found out about it just by searching the internet on my own. I had to get permission to use it by the people we were actually working with then they told me that it wouldn't be useful and I never actually went in to see what was there.

– We didn't do any PDL.
- We were so short of a turnaround that we OCRd everything.
- (F) Right, we OCRd. We were supposed to be within 3 months. Of course, it's been a year.
- {interviewer} – Then it's not applicable.

{} - NA

Question 1.2.3 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– I put 3. It's ok.
{interviewer} – Since PDL is big focal point for process improvement, let me ask you, do you see any trending of change or improvement or is it just largely due to you becoming more experienced or whatever?

- I'm going to say both so this is probably a 3 – 3 ½. The whole PDL process is getting better.
- {interviewer} – They are working on it. The changes certainly would not have floated down to I8 yet.

– Rating NA.

– NA

– 1 – Let's say NA, we didn't actually do it.
{interviewer} – So you didn't have any direct use? You had other support people.
2 – None of us did here.

{interviewer} – Was that done by your PIM then?
1 – I don't think so because she would have asked for information.
2 – I think it might have been done after the fact or during the fact or something kind of funny. I know that the training data got put in there and that was not by the PIM but it's there, I checked.
1 – No, I mean she didn't.
2 – No, it wasn't by our PIM. I think our SIM engineer had something to do with that to make sure that whatever training information I had given her got into PDL because, and I may have approved it at one time, but I don't think there was any other data on their PDL.
1 – No, I didn't do anything in a PDL and neither did Mark and the reason was is I think there was some confusion. We didn't, nobody knew if we needed to at first. So we ended up not doing it, but some information was put in there by somebody and we're not sure who.
{interviewer} – Ok, that's helpful. You guys have had sort of a non-standard experience there, but that's helpful for us to know.
2 – We've had lots of experience with PDL on other increments.
{interviewer} – I understand. We're trying to scope it to this increment.

- NA

- NA

– Can you explain what that is?
{interviewer} – It's actually more often used by the payload developers to input data that is critical for developing any given payload and you probably wouldn't have had exposure or use for that so we will put not applicable.

– I didn't use it. NA

- NA

– I don't think I used that. For me that would be a NA.
{interviewer} – What about Kathy? Did she have any use of this database?
- Not that I'm aware. I know what it is and I haven't used it.

– 1 – The answer is NA and that's because back in increments past I've had to use PDL but that's all changed now, so I don't interact with PDL anymore so I would say NA for this increment.
That's the same with (2).
{interviewer} – Yes, I understand.
2 – The Microgravity Science Glovebox investigation integration team, they handle that for us.
{interviewer} – All right. I want to make sure we note that. It's transparent to you based on support from the MSG team.
{interviewer} – That's useful for me to know to keep things straight about who is interacting with PDL or not

– I have no idea what the Payload Data Library is.
{interviewer} – That's not surprising. People at your level generally don't interact with the PDL. That would have been something for *{your Payload Developer}* to deal with.
- I'm checking NA.
{interviewer} – Sometimes investigators do interact with it, so we had to ask the question.

– I'd say a 4 and again this is going to be kind of consistent with what I told you on previous increments that I thought pretty much the integration process has been pretty good and I give it a 4 because there's still room for improvement.

Topic Area: Program Processes – Payload Data Library
Question 1.2.4 – *Please rate your level of satisfaction with how effectively the data in the Payload Data Library (PDL) are used by the ISS Utilization Program.*

Question 1.2.4 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– I know why they need the data. Having gone through the process, I know it is applicable and we have to populate it with data so the engineers can evaluate my system and make sure that we do not "kill the crew" by not knowing what the payload is doing. But again, there were times when I was putting data in there and I had no clue how the data was going to be used. It may need more explanation especially to new payloads or international partners. That's not going to be a good area.

– N/A

– No comment.

– One or two steps removed, we have a positive sense of that. Even though I don't have as much information as may be ideal to answer that more completely.

– NA

{} - NA

{} - NA

{ - NA

{} - NA

Question 1.2.4 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– I put a 3 and that goes back to my comment way at the beginning. The data is starting to cross-feed. There's still a couple of cases where I see disconnects between the payload tactical plan and the data that I'm putting in the PDL.

– Rating NA.

– NA

{interviewer} - There's a second question about PDL, 1.2.4 and I suspect it's NA as well.
1 – We'd have to say that same thing.

- NA

- NA

– Not applicable

{interviewer} – Also not applicable because you're a PI and you were shielded from that.
- Yes, very well.
- {interviewer} – And *{PD name}* was your payload developer POC in Bioastronautics, isn't that true? Yes.

- NA

- NA

- NA

Topic Area: Program Processes – Payload Integration
Question 1.2.5 – *Please rate your level of satisfaction with the ISS end-to-end payload integration process.*

Question 1.2.5 –*Comments from Increment 7* (click link at left to return to corresponding datasheet)

– I was satisfied. There were times when I was cursing at it, but for the most part I came out feeling real good about it.

– No comments.

– No comments.

– We were able to reach all the targets for our side. It has been completely a success. It was our first time with payload integration with NASA and it has been a great success. I think this collaboration has been very good.

– No comments.

– I remember we had to handle some medical interview and employment consent and so on, but there was really no problem. I did not find anything wrong or too heavy to handle or boring so I'm very satisfied. {interviewer} – Ok, I'm going to put a 5 if you say you're very satisfied.

– We were very satisfied. I thought there were reasonable expectations and I felt that you provided support. I'm not an engineer by trade, I'm an *{deleted}* . I think the thing that I value most from the office is that even though we're flying very simple payloads that you give us, that the people who work through that process, really convey to us a sense of importance to our payloads and I don't think based on comments from former staff members that you always saw that in the past. But I will tell you, I think for subsequent payloads we feel that despite the fact that we're small and certainly not significant science-wise that everyone is providing really the same level of support that any other payload would get.

– I would give it a 5. The only comment is sort of an elaboration on my comment earlier that in the case of the integration process. People now understand the solidity and details of what we are trying to do so integration goes smoother.

{} – Well we did have one issue on Increment 7 where usually we have our data brought back on a disc. I don't know if that has anything to do with payload integration.
{interviewer} – Yes, it does actually.
- This was the first time we had our data sent down via telemetry and again because of the confidentiality of mental health information being so important, that was a big issue was to make sure we got the crew member's consent and on and on like that. That was handled very well and I'm very satisfied with that. I'll say 5 given that they had to do something to integrate with the much lower mass that they had. I felt they handled that well.

{} - 1 - I guess there the issue that we're still worried about is the method by which the things were mixed. 2 – You mean from just picking out the beads? 1 - This is all of the work that we did with the beads and to pick the solutions.; that the mixing was sterile. 3 – Does this include the fabrication of the holders? {interviewer} – Yes, it does include fabrication of hardware. 3 – Because that went very well, I think. 1 - I was very happy with that. {interviewer} – But again this is trying to go back to include processes and things that went on prior to you actually starting to operate on orbit. 1 - I thought that everything was appropriate; I don't remember any; there was some business with funding of the bead purchase but we were able to help out with our own money. 2 - There was the issue that we couldn't put anything to keep the mL antifungal. There were some safety issues. {interviewer} – Yes, this includes safety issues for example. 1 – There were limitations, but I think everyone was working very hard for that. 2 - There were things that being unfamiliar with the whole process I just found out as I went along. I had no guidelines from the beginning so that was sort of my problem. I just found out I couldn't do things as I went along and again there was the issue of I didn't know what was up there. 1- I'll say 4; I have a specific recommendation for integration. I think a management tool called matrix reporting should be involved. When an emergency integration has been identified like the FDI, we had very little time to perfect something that we thought might have flown in a few weeks. So the integration process was

compressed to a very short time that there were too many people asking the workers what to do. There were too many supervisors. I think for integration it's worth exploring the notion of having the team report to the PI as the supervisor for a short period of time when emergencies like that come up so we can just get the job done with full time work of a small staff and that's a management recommendation. 2 – And there was no way to check; everything had been packed up and had been sitting for several months and there was no way to judge if anything had been growing in the bead solution before they were shipped and that was a concern and that could have been a small disaster that everything could have been contaminated when it got to Station. 1- Their point was that the thing had been put together in a sterile fashion. And our concern was that we all know that accidents happen and we'd like, I think the general issue here is that we'd like more safeguards against deterioration of samples when storage is unexpectedly incurred.

– I think because *{investigation name}* and there were a couple of more in the same category as *{investigation name}* , MFMG and some others that were being developed. MFMG and *{investigation name}* did not and they were actually trying to create a streamlined process for these no mass up payloads and I think the slightly frustrating thing was that they were trying to create that process while we were in the midst of it. There was a little bit of back and forwards about what do we need to do and how would we go through, say the COFR process and that sort of thing. I don't really have an issue with how it all worked out ultimately, I'm just saying it was that they were trying to define that while we were in the midst of actually trying to go through and meet all of the wickets?
{interviewer} – You were a pathfinder, in other words.
- Exactly. Two big wickets? Were added as we got to them also.
- Like in the COFR process and what level we would participate in that, although I don't really have a problem with how that ended up. It just would have been good to know as we were going through it what the process was. It was just being defined.
- {interviewer} – We still need a rating from you.
- Maybe a 3 because we're on the fence there because we're not real satisfied but we're not dissatisfied because it did turn out ok.
- We'll put a 3.

{} – Very satisfied because it was extremely easy. We really didn't have any so I'll put 5 down there. As far as the integration part, it just was continuation basically from Increment 6.
{interviewer} – You know what, I'm going to suggest a change there because if it was that easy and you had almost nothing to do, then we might suggest putting a not applicable on there.
- Well, we did have to by integration, we have to update documents so we did have to update the IU{interviewer} and we update systems photo TV document and go through the IWG for the IRD so there was some. Once again, it's very easy.
- {interviewer} – I stand corrected and we'll stay with a 5.

Question 1.2.5 –*Comments from Increment 8* (click link at left to return to corresponding datasheet)

– I picked 4. It seems to be very team oriented and the PIMs are playing a big part of this. That whole process is getting better.

– Rating a 1. Lack of priority led to multiple reloads.

– NA

{interviewer} – The term end-to-end is in there usually for people who are flying on their first increment, but if you sort of ignore end-to-end but just think about whatever payload integration tasks you had to get accomplished for 8, if you could rate your satisfaction with how those went.
- We were very satisfied. A 5. I was not here in the early days but I would tell you my experience starts with Increment 5. It's getting easier and I find that the process and the integration is becoming a little clearer all of the time. You kind of know what people expect of you and you know what you can expect of them, so all in all I think we would say that this is our best increment yet.

– 2- My experience was pretty good. I'm going to say a 3 because I don't think it was perfect. 1 – Yes, a 3. {interviewer} – Let me clarify something here about both of your rolls. Is one of you, for example are you associated more with *{first investigation name}* than *{second investigation name}* and is more associated with *{second investigation name}* or do you work both investigations? 2 – We have different functions with each of those payloads. She does more of the integration. 1 – Hardware integration. I say it all with the Russian documents and export control documents and safety. 2 – I do the mission operations, defining the requirements for operations, the crew training and then the real-time operations, as well. {interviewer} – Ok, there will be dedicated questions about that coming up. That's fine. There's overlap between the two of you. I just wanted to make sure that you weren't somehow hard separated, one into one payload and one into the other. That's all I was trying to check. - No.

{respondent} – Well, we didn't really integrate a payload. It was 0 upmass. Does that count? We were using equipment already on the space station.
{interviewer} – Ok, whatever you had to accomplish to integrate that investigation physically or in principal on station, so if you had no physical integration, that's ok. We can.
- {respondent} – Well I guess I could say 2 and I'll explain why. We had to get permission naturally for any material we were going to use that was on the station which was reasonable, but some of the material we were just being held up and we couldn't go ahead. We couldn't get people to basically sign on off on saying we could use certain materials and that was just very frustrating because we didn't or couldn't get, for whatever reason, approval to use this thing called "duck seal". We couldn't use that, we had to redesign everything how we were going to do it and it just seemed very difficult to get somebody to actually agree that yes we could use it. This whole process was sometimes just – some of the materials, and I'm not sure exactly why, were difficult to get approval. So that made a very long process.
- {interviewer} – That sounds like some of your tangle with the safety process.
- Right, but it was fun because it was basically an orbital scavenger hunt and we had to try to get the materials and so that process in working with *{name}* at Boeing who would then get sample syringes sent to us and stuff all worked very well considering we had to just kind of guess what was up there but a couple of times it got rather cumbersome and slowed us down.
- {interviewer} – Is that *{name}*?
- {respondent} – Yes. Never met him but talked to him a lot and had a good time.

– NA. We were using hospital facilities.

– A 4. We felt the hardware integration part went reasonably smoothly particularly considering we had to split our hardware into two loads.

– A 5. And mine was accelerated. I understand that it often takes a lot longer than I had to experience. I mean it routinely takes much longer. Mine went very quickly, probably because there was not a great deal to it. It's the most low-tech of all the studies. I mean it could have been done with a pencil and pen.

{respondent} – I have no idea what this means. {interviewer} – All right then we'll probably put not applicable just for discussion. These are all of the tasks, paperwork, requirements, hardware verification and otherwise.
{respondent} – I had no hardware so.
{interviewer} – So the point is, you were investigating the effectiveness of the ultrasound that's on the HRF, not necessarily, the ultrasound is not your baby in terms of hardware.
{respondent} – No, not at all. I guess the only hardware I had was that we flew a software program, so I guess that is a payload but a pretty minor one.
{interviewer} – Let's put NA for that.

– 1.2.5 I thought was also not applicable; we really didn't, since we didn't have hardware we didn't go through an "integration" process.
{interviewer} – When we wrote this question in the questionnaire we interpreted it pretty broadly to mean not just hardware but also paperwork.
1 – I guess from that standpoint the only thing that we thought was, I guess if you look at the PIA; we had to do a PIA and that was ridiculous; the entire book, what is it 150 pages, was NA except for like 3 pages.

Basically the only thing we were given through the PIA was the list of stuff we wanted to use and that same list of stuff we wanted to use we had to go through a process with the PSRP to go through that list of stuff we wanted to use then we had to go through the CHIT process so what we put in the PIA seemed to have no relevance at all; we had to keep going over that one list; that was the only relative piece of data that was in the whole book and it didn't seem to help us any.

– This is one of the ones that Kathy helped me with feedback. She put down a 3. She had some comments too. Do you want me to dictate them to you?
{interviewer} – Yes, please.
- It is confusing because there are so many things to accomplish and they just seem to keep popping up. It would be great to have a concise flow chart of all the activities and contacts for the activities and the order and date in which these activities need to be accomplished. There are so many aspects to integration it would be nice to see all that is involved and what is coming up in the schedule.
- {interviewer} – Ok, so something up front early on that would give a milestone or flowchart so you could see the whole process flow.
- Like from like once you get accepted basically until you're operation or your experiment has finished running basically.
- {interviewer} – Ok, so you all felt that maybe things were presented not spontaneously but just a chunk at a time rather than seeing the big picture.
- Right. When they were needed they were presented, but we didn't know if they were coming up right then. I mean we might have known they were coming, but not exactly when.

{interviewer} – This is a little tricky because what we have is we've never interviewed you folks before. I believe I've interviewed Linda at one point before, but as far as our bookkeeping goes we call you new, you're sort of new interviewees. You're new but on the other hand you've been with this investigation for a while from the initial increments where you had to do a lot of hardware integration stuff. It went up on Increment 5, didn't it?
2 – Affirmative.
{interviewer} – So there would have been a substantial amount of hardware integration that you would have had to do for Increment 5. But now we're talking mainly about Increment 8. Let me ask what {interviewer} thinks. Should we ask them to include the way back stuff on hardware integration?
{interviewer} – Being that they're new I think we should capture the experience, at least.
{interviewer} – I'd be interested for you to include even the way back stuff about payload integration in formulating your answer.
2 – Probably a 4. Our glasses are kind of rosy. Six months to a year before we launched. We launched June 2002. That was a real blur and we had all sorts of deadlines and due dates and deliverables but looking back I guess a 4 would be appropriate.
{interviewer} – And that's a factor on our end. We struggle in this process because the timeframe when you get feedback from people has a big effect on what they say. It's an issue with doing this type of analysis but we just have to live with that.
2 – I might have rated it a 3 if you had asked me soon after the launch.
{interviewer} – Well, I wouldn't have been surprised if it had been lower soon after the launch.
2 – There was a lot of late nights there. 60 hour weeks, sometimes 70.

– 1 – We had everything on orbit so we just had those activities in terms of time lining and coordinating the real-time ops,
{interviewer} – But you had mentioned early on when we were combing through some of the demographic information that there was some kits and other stuff that you had to pack on.
2 – That is correct but we sent those on board 12P, so it preceded Increment 7. We can comment on those.
{interviewer} – That's ok, we'll just put NA.

{interviewer} – You've got to clarify something for me. The hardware for this, did it go up in a Soyuz or did you use hardware that was already on orbit?

- We were photographing basically chemical type samples and so I made the samples, but the photography of the samples which is the main thrust of the experiment, that camera was already on board. So basically I'm going to answer this question as only pertains to the samples I made because that's the only part that I did.
- {interviewer} – So you made the samples and they went up in the Soyuz?
- Progress.
- {interviewer} – They went up in a Progress. What was *{the PI's}* other experiment early on, the other colloid experiment.
- PCS.
- {interviewer} – *{investigation name}*. Did you use that hardware for your experiment?
- No, definitely not. That was a rack system. That's why I don't think there was actually a rack that was used on this. You'll have to check on that. Basically it's a camera and a small sample holder that we set up on the maintenance work area so I don't think it was a rack at all.
- {interviewer} – Ok, that clarifies things. So the payload integration process involves what you had to manage to get the samples up there, to get them onto the Station and actually it also involves planning the operations to get the photographs taken and to get the data down. It's a fairly end-to-end process and I'd like you to give me a rating of your satisfaction with it.
- I'd say a 3.
- {interviewer} – Any additional comments?
- Some of the samples that I sent, when *{the PD team}* loaded them they kind of destroyed, destroyed is a little strong, but they were filling a chamber and I guess there was a spill or something so some of them couldn't be used. I wasn't so happy about that. The way we get the data down is not particularly organized. They have like 500 photographs and they just kind of put them on one single web page and that makes it very difficult. You basically have to download literally several hundred images before you can figure out which ones are which. For example, I think it's really silly that they put all of these files names which are actually sequentially numbered and taken sequentially in a random order on the web page. I don't know who's responsible for that.
- {interviewer} – That's an interesting piece of feedback. We're going to make a note of that one. That's just silly. Then nobody can find anything. It's not just me, it's everybody. We go and get this thing off this DIMS exchange. So actually I haven't been real thrilled with this one. On the other hand, the stuff works so I can't really give it a very strong negative rating either so like it's good enough to go but only barely. It could be better with some more intelligent thinking I think that this in particular could be better.

Topic Area: Program Processes – Data and Documentation
Question 1.2.6 – *Please rate your level of satisfaction with the amount of data and documentation you had to produce and deliver to meet the ISS Utilization Program's requirements.*

Question 1.2.6 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– The front-end process needs to be tailored specifically to a payload. I was generating a lot of paperwork that I do not think I had to. I have a simple system. It is already basically on-board, and I am killing trees just to satisfy somebody's requirements, {Requirements for engineering evaluations} so they can "x" of on a little box. I may be a little unique in this case because my hardware is already on-board. All I am going to do is move it from one location to a rack they are going to put in my way. If something did not get signed off, what are they going to do? Bring me home? I do not want to sound that way, but at times that is what I felt like.

– With the pre- and post-flight component our amount of document is only the experiment document and that sort of thing. It has not been overload in terms of documentation from our perspective. I assume that is going to change over time as the in-flight component comes on line.

– I do not know if, in the world we deal in, you will ever get better rated than 1 or 2, because you are always going to have a lot of documentation. The thing that I think we really need to look at, because of the multitude of stuff, is we do get flow down of requirements coming from different areas. An example is the fire detection (1) requirement. We get that requirement in our safety packages. It flows down through our integration. Here at Glenn our Quality Safety Organization also flows down that requirement to us and it is goes back to the same requirement. Everyone thinks they own the requirement and tries to pass it down to the payload. The problem is they change the wording slightly so when it gets down to us, it is hard to piece this back together. After several years of working this, I can look at it and say that is all the same requirement, but a lot of the newer payloads that do not know that and you end up with multiple verifications and a lot more tracking, even though it is the same requirement and you are meeting the intent of the that requirement from the source document. This is one of those things that have to be continually improved. Some of the improvements in the payload office have trickled down, but 30% reduction of a mountain, still leaves a mountain. I think they have done a good job with the improvements and getting rid of some of the other requirements that are fewer requirements than they are guidelines. But from a standpoint of getting the paperwork down and putting more concentration on the hardware and getting the requirements met., I do not see how you can ever rate this better than a 1 or 2.

– I don't think it arduous at all.

– Sometimes some documents seem to be heavy, sometimes they are not enough, so I think we are in the middle.

– It seemed reasonable in the context of our previous experience and it was efficient for that particular increment.

– I'm very satisfied, a 5.

– In my opinion, it was just the minimum necessary level so I'm very pleased. A 4.

– Flying on mean since it was already up there, there probably wasn't very much so I think maybe it's not applicable.
{interviewer} – Well, you still would have had something, but if you had nothing then we can put not applicable.
- I'm not aware of any.
- {interviewer} – Then we'll put not applicable.
- I personally don't recall doing anything like this.

– I think we were very satisfied. Once again, reasonable expectations for what we were flying.

– For Increment 7, I don't recall us really having to do, in terms of documentation, for that increment and if things that were put in. Again, there's an MSG payload. They served as our integrators. They did a lot of the document preparation stuff so I'm thinking for myself I can't even recall what I might have done for Increment 7, I gave it an NA.

– I would say 4. Very reasonable.

{} – I guess I'm going to say a 2. It seems like we are constantly putting out reports that all say the same thing so it seems like there could be fewer of them.

– That wasn't a problem. I'd say satisfied, a 4, no problems.

– 1 – I think that was very satisfactory; they did all of that work; we were very satisfied with how they handled the paperwork.

– Again since we were in a streamlined pathfinder process, there were some things we didn't have to do like PDL and other inputs that needed to be made because we weren't in the timeframe to make those, so the process was streamlined and there was some less data, but then there was some that initially we were told we wouldn't have to do. Like I said, developing a PI and going through the COFR process that we did. But it wasn't unreasonable. I guess I would say a 3.

{} – For a repeat payload I'm very satisfied with the amount of, it's very streamlined so I'll put very satisfied on that. A lot of it was just copying and just making minor modifications and being able to basically copy it into the next increment.

– A 4. My comment would be that I would say probably closer to a 5 than to a 3. It would always be nice if there was a little bit less documentation needed but I didn't find it really to be a problem.

Question 1.2.6 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– For Increment 8 we did not have to produce anything specific.
{interviewer} – Ok, given that that is true then what would you select as a rating?
- I think we are satisfied with the documentation we had to produce because in effect we did not have to produce too much, so it's ok.
- {interviewer} – I understand. So what number would you select?
- Very satisfied.

– I clicked 5. For me, I'm very simple and I'm rolling forward from previous increments. Just a few emails and a couple of data submissions and that's it.

– I don't think I did any of that. Occasionally I might have had to write a little summary science or something or contribute to some quarterly report or something, but I'm not sure if that went back to the ISS Utilization Program or if it did it didn't bother me so I guess I'd be satisfied. Let's give it a 4.

– Rating a 1. We did many different sets because junior management asked for many what-ifs. So very dissatisfied. This is probably our major dissatisfaction drive. Requests for document were not notified as document and was an extremely short time frame.

– I think we were very satisfied. I think we were not asked for anything that was unreasonable or out of the ordinary. It was great.

– You know I've already produced that document upfront when we first started doing the experiment.
{interviewer} – Right and obviously that's where the big push is, when you first do your integration, but the thing that we don't want to have happen is for a continuing investigation, like yourself, to be overburdened with data and documentation.
- I think you know if you're starting off a project, the experiment documents and all of the things you put together it can be burdensome for someone first coming in from the outside I can see that from their perspective not being familiar with it. But once you're in the stream of things there's not too much documentation in addition to what we've already done. So a 4.

– 1 – Mine was not easy.
2 – I'm a 5, you're a 1.
1 – No, I think it was fine once we figured out what it included. I'd say probably a 4.

– Rating is a 3, which is about the same because most documentation I do jointly with Sue.

– I'll say a 4. It seemed a little bit onerous but I don't think unreasonable. I'd rather have less.

– 4 I didn't have to do that much. A 5, I was satisfied with what I had to deliver. It seemed very

reasonable.
{interviewer} – Do you want to change from 4 to 5?
- Yes.

– I'll give it a 3. It's not that bad for a pre-post.
{interviewer} – Any particular data or documentation you felt could have been eliminated?
- Just in general, when one piece of data can be easily obtained from another document, why does it have to go back to the source yet again? I guess kind of having to review it over and over again. I guess that's kind of the general gist. I can't remember the names of all the documents that were involved, but that's basically why I didn't give it such a great score.

– The normal documentation, because once you get rolling it's much more minimized compared to the first startup expedition. So for the normal documentation type stuff it felt it was very reasonable and we would probably give that a 5. For the documentation required for dealing with the hardware malfunction we would probably maybe put that around 2 or 3.
{interviewer} – So what do we do here, we have to mix these ratings.
- You can just put that in the comments. You can put 5 because overall we were satisfied with the general process but then in the comments that particular documentation associated with the hardware malfunction was a large amount.

– Again, I'm very satisfied because I didn't have to provide very much at all.
{interviewer} – Right and that's typically true of continuing investigations, but it's important to ask you that to guard against the fact that you have a repeating investigation that all of a sudden was still burdened with paperwork which is something we're trying to fix. So pick a number there, please.
- I did pick a 5.

– I understand that that's all needed so I'm very satisfied, a 5. I mean I had to come up with things but it wasn't extraordinary.

– Let me give you a 2 on that. Again I understand the requirements. Let me tell you they are pretty redundant. We filled out these same forms 48,000 times and it seemed like there was some siloing going on there that certain people did not appear to be sharing with others so we had continually re-educate individuals, not continually but periodically re-educate.
{interviewer} – I understand. This particular piece of feedback you've given us is something obviously we've heard before. I have to say that it's something that the payloads office, at least, is working very hard to fix.

- I'm sure it was way worse before. It's still not perfect though.

{interviewer} – Yes, and that's very useful to hear.

– A 1 and again it was for the PIA and the extent of our PSRP package, the memos and all of that.

– Rating is a 3. As you might know, we normally work with the space project in Europe with the Russians or with the European Space Station, so the documents needed are more or less the same so I think we are used to.
{interviewer} – Ok, let's talk about your rating here just to make sure that you gave us the rating that you intended because on this scale, it's a 1 to 5 scale; 5 would be you're very satisfied with the amount of data and documentation that you had to produce and 1 is you're very dissatisfied. So if you give us a 3 on that.
- I'm sorry, a 4. I didn't understand.

– We were a fast track program so we didn't have to spend a lot of time. I'd say 3. I mean when you're doing it you always feel like there's so much data and documentation, but when you look back it doesn't seem like too much. You know what I mean? We were a fast track program so they kind of helped us out in that respect in producing the documentation. We had different RDR and everything was all like compact. We were operating after just over probably about a year after we got funding for it.
{interviewer} – Let me just ask you. You made an interesting comment there, you said, "while you're doing it, it feels like there's a lot but when you're done with it and you look back in retrospect it wasn't that much".

- That probably has to do with the fact that we were a fast track program. Just because like at the time there was so much to do, but like verifications for example. We had to do those in a quick amount of time and that's probably why it felt like it was so much, but usually you spend like months doing verifications instead of weeks.
- {interviewer} – So when you get to compare it to others you realize at the end of it, gosh we got through this pretty smoothly.
- I mean it was a lot of work at the time, but looking back it was worth it.
- {interviewer} – Did you feel at any point you were inundated so much that you couldn't keep up with it, or?
- No, just like on the go type thing.
- {interviewer} – So you gave that a 3?
- Yes.

– 1 – For increment 8 I don't remember too much Mickey mouse stuff, extra PowerPoint, extra this and that like we're getting now.
2 – This is the one that had the good data and bad data. That we had to put the slides in a particular order and everything. I thought it was strange.
1 – A 4.

– It was fine. I would rank it as a 5. What we're doing is we're just cloning the previous increment documents, so I barely have to do anything at all.
{interviewer} – That's true. This question is still relevant because believe it or not, even though things have improved on this score, we had a lot of issues in the past where people doing continuing investigations felt that with each cycle of repeating increments they still had to do a lot of paperwork, a lot of documentation and people were to some extent complaining saying, "wait a minute, "you know I've got a continuing investigation but I'm still filling out as much paperwork as I would have in order to fly it the first time". But it's good to hear that you didn't have that problem.

– 1 – A 5.
2 – We agree on a 5 for Increment 8. I might have been tempted to say a 3 if you take into account the whole payload development process just because when we started out we were supposed to be a very low cost experiment and we ended up running over budget quite a bit due to all of the data and documentation we had to deliver, but as far as Increment 8, definitely a 5. The ECR process and the payload planning process was pretty good.

– Rating is a 5. It was minimal.

– 1 – Well, we were satisfied with the amount of data and documentation. I think in terms of overall, you're addressing in terms of the requirements and the processes, right?
{interviewer} – Yes, the requirements and the processes but there's two questions about data and documentation. This one deals just simply with the bulk amount of it that you had to manage because obviously what the payloads office is trying to do is reduce, where we can, reduce the burden on payload developers in terms of paperwork.
1 – Right and I think that's just a good direction. If we can improve on it even a little bit more that's great. Now my understanding recently, since the last POIWG, is that there's going to be requirement that's been placed to submit more OCRs and that that would be more of a burden from how we've done business previously. ({interviewer} – Interesting) And if you need additional feedback on that we can get that to you, but I think yes if we can keep the amount of paperwork and processing down and make it as easy on those that work on submitting and providing the necessary information, I think that's a good direction. We want to keep it efficient and simple. I think that's always a good way.
{interviewer} – Ok, but what would be the assessment of that for you folks for Increment 8? I mean where do we stand on that with regard to your Increment 8 experience rating on the 1 to 5 scale.
1 – I'd give you a 4.

– I'm somewhere between a 1 and 2 on this. I don't want to give it a 1 because that implies that it couldn't have been any worse so I'll give it a 2 which is dissatisfied but not the absolute worst. It just

seemed as though as I was constantly being told to generate the same documents over and over again and this was actually an extreme annoyance to me. Since this is an anonymous survey I can actually give an actual response here, but it seemed as though somebody was always asking me for another chart or something else and I was often asked to do things like prepare slides and stuff where I had given them a graph before. I was actually asked many times to convert this file to another format so somebody could put it in a PowerPoint presentation. That to me was just kind of absurd because if I send a graph in a format that somebody can read once then ostensibly they ought to be able to do the file conversion to something they can use. But I sort of felt I was being asked to do secretarial work for their PowerPoint presentations which to me was not the best use of my time and got actually very tiresome at the end.
{interviewer} – Ok, your comments here are very relevant because one thing the payloads office has been trying to do in it's corrective action processes is try to correct the exact problems that you just described. This thing about redundancy, people being asked repeatedly for the same information. We feel like we've made some progress on that but your particular experience is interesting in light of that. Can you give me an example of which points of contact, who were the people that were asking you for these redundant feeds of information or asking you to do this so-called secretarial work? It's ok for you to name names.

- Primarily the *{the Payload Development team}*. I have some more summary comments but basically the interaction between *{the Payload Development team}* and the people at JSC in Houston was not great at times so I sort of felt like I was caught in the middle. I will be happy to talk about this but I'm wondering if it might be better to leave that until the end when I've seen all of the other questions that are going to be asked.
- {interviewer} –That's very astute of you. We have a couple of completely dedicated questions that will cover exactly your interface with….. your Payload Developer and we're going to ask you to rate them a little bit later in the survey.

So I'm happy to talk more about this, but I wonder if we should just wait until then.

Topic Area: Program Processes – Data and Documentation
Question 1.2.7 – *Please rate your level of satisfaction with the required schedule for delivering the data and documentation you had to produce to meet ISS Utilization Program requirements.*

Question 1.2.7 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– The template is fine. I am real satisfied with that. Joseph actually put together a matrix of all the requirements, and I knew when my delivery dates, etc., were. That was not a problem.

– They are good about informing me of what I need to do and when I need to do it and it really benefits me to do it. I am usually aware of all the deadlines and they are really good at it.

– Improved a lot. They have legitimized the schedule a lot as they have updated things.

– It was a really tight schedule due to the late start of the project. Luckily we were on time with the schedule, so everything was moved. The schedule is always tight.

– Sometimes people ask for things at the last minute, but I think their contacts ask them for things at the last minute. I don't think that they are being inconsiderate; it is just that things change on a rapid time scale. I wish sometimes that there was more lead-time to do things, but generally I'm very happy. No one is trying to be a burden or unreasonable.

– During this increment we experienced an accommodation that was beyond what we anticipated.

– I would give that a 2. We had to do things on an accelerated schedule just because of the accident leading up to that increment.

– A 4. The tight schedule was initially in some ways it was very close but it was ok.

– I think that's the same thing, NA.

– I think we were satisfied even despite the fact that we had to redo it all, redo a lot of it to get it ready for Soyuz and do some additional work. There were a lot of people helping us make it happen so a 5.

– I gave this an NA as well.

– We were satisfied. The schedule was fine. I would rate it 5.

{} – Those have all seemed reasonable so I'm going to say very satisfied and I've been given enough warning by my ESS about that; otherwise, it would be hard to do.

– That's not a problem. I'm satisfied with that, a 5. And I might add, I don't know if this is the place to add it, but I was quite happy with the availability of the crew to discuss the flight afterwards. We have a 30 day report and both 6 and 5 crew members that met with us and talked about their experience and that's very helpful to the data, especially we had this interaction with exercise that's going on up there.

– 1 – Nobody likes to get a deadline, but I think it seems reasonable at this point in time though. 2 - I think once you had said something 1, about the timeline for them is over or ends when the activities on Station are over and for us it's still continuing; then we still have the data analysis and I think that now that's changed. 1 - We were required to deliver data too quickly. It was too pressured. It was not realistic over the holiday season. Let's put it this way, it's very simple; there's no balance between. Let me go back, the number I would say is a 3. The specific dissatisfaction is that we think that if you want the PIs to work 24/the data that you should have the dissemination of data from the Station and have a much higher priority; once the procedure is over on station, everybody thinks its a success and its over, but it's not over until the data is analyzed and we can't get the data, if for example our thing is on a Friday, we can't get the data until Monday or something like that, or in the case of 3 day holidays it was much worse; so we specifically think that NASA should think about increasing the manpower for Jason's team, the people who disseminate or whoever's team it is for the dissemination of data to the PIs; the raw data that we need to analyze; we found dissatisfaction with this specific question because we could not meet the schedule and the reason was that we could not get the data; we could turn it around in a day once we got it but we couldn't get it and we needed more than a day; we needed time to think and cogitate on what it meant before we made the a suggestion for the next procedure so they should also give more time needed between the procedures; and they should have a realistic or dry run of how long it's going to take to get it off Station into the PIs hand and then cranked and then back to the team; that was unrealistic; demands were put on PI team, a) and b) extreme frustration in getting the data off Station.

– We hit the same wall because we didn't know what was supposed to be delivered to keep the schedule straight. We couldn't keep an accurate schedule. I'd say a 3 again.

{} – Again for us I was very satisfied with that. We didn't have to deliver it too early but that's based on a repeat payload as well so very satisfied on that one.

– I was pretty well satisfied with that. A 4.

Question 1.2.7 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– We were not pressed too much so I think we are satisfied.
{interviewer} – Ok, what number would you select?
- A 5.

– Very satisfied, a 5. It's published, it's in your face and it's well published.

– I would give that a 4. Again, this stuff wasn't a hardship I don't think.

- Rating a 1. See previous. Remembering that most of what we did never saw the light of day with upper management.

– I think we were very satisfied. I think once again what we learned by looking at using Russian vehicles to get our items on orbit we have learned a lot from our previous experience and the time tables were a little clearer for us. The one thing that your office does very well is you communicate well when those deadlines are and sometimes we may struggle to meet them but it's not because we haven't been told when you need the stuff.

– I'd give that a 5.

– 1 – There was a schedule?
{interviewer} – Ok.
1 – NA.
{interviewer} – I'm sensing some sarcasm here.
- Yes.
- {interviewer} – I'm going to suggest maybe not NA, sarcasm notwithstanding. Pick a number.
- 2 – I was fine with it. They told me when to do it and I did it. It seemed ok.
- 1 – A 3.

2 – The reason why is because thinking back on increment 8 and *{investigation name}*, things didn't always seem to sync up quite right. There were conflicts in the due dates for the Russian documents versus the normal NASA documents that we submit.

– I don't think we had any problems with schedules because our payload is well known so I would give it a 4.

– Rating is a 5 with the caveat, I guess, that it would be pretty much impossible for us to meet the schedule without constant reminders but luckily we have that. It works for the team to be reminding us when things are due and remind us ahead of time to do that.

– Very satisfied, a 5.

– I would give it a 3.

– 5 and 2 – see previous comments.

– I have to give that one a 3 because we always get things. This is us delivering things prior, correct?
{interviewer} – That's correct.
- I probably would have to give it a 2 in the sense that things always come with an extremely short fuse. For example, we get the ED to review and we'd have to get it back within 24 hours or we'd get the data sharing agreement and it would have to be back immediately and this is a feature of all of my interactions with NASA that I think that NASA tends to feel that everyone with whom it interacts has no other life and that if there's a meeting in Houston tomorrow, well of course you're going to be there even though you found out about it 3 days ago. So this is a feature from me that in all of my interactions with NASA, I think could be better managed. Did I vent suitably?

{interviewer} – That's just perfect. Thank you.

– A 5. The faster they want to go the better it is for me. And the Lockheed Systems Engineer who supports the project always gives me considerable lead time when there's a deliverable or something. She always gives me plenty of lead time for requirements when there's a document I have to submit or something.

– Let me preface this by again, I'm moved up 5 increments so our timeline was compressed, so I got an awful lot of messages "we need this by COB today" so I'm going to have to give you a 2 on that, but much of that is not your fault. On the other hand it seemed like I was getting an awful lot of calls from *{my PD}* that would say, "Hey, *{name}* " that I know she knew about but did not get to me until it was like go time. Now that's ok as long as NASA responded in kind, but my perception was I always had to produce things within 12 hours and then NASA would produce things within 4 weeks and so it was not parity.

– I didn't really know how to respond to that one; your schedule wasn't the driver, our schedule was.
{interviewer} – You're saying that in the sense that you sent this memo out saying, ok folks this is how we're going to do it and here's the schedule and you decided that's the schedule we're going to follow; is that right?
1 - I think in general this question in the past when I've dealt with it has been when the station program has requested stuff much earlier in a payload developer's cycle than what they can deliver and in this particular case since we weren't really developing hardware and things like that, everything; I thought the program accepted our input, the template issue didn't come up.

2 – The only thing that I can think of along this line is in terms of a lot of times we would get documentation ready but we had to wait weeks sometimes like for the PSRP to meet or things like that so I don't quite know how that plays into this, but you know that in itself delayed us several times in trying to get through the process.
1 – We had problems with the PMIT meeting on the CEF process and we had problems with the PSRP process; they both dragged out; like the ECR/OCR in those specific areas, but as far as the required scheduled template that was not ever an issue; we were not told that we couldn't deliver something because we were not on the template; that I thought was good.

– Rating is a 4 because we are good enough to respect the schedule, so we are quite satisfied for that.

– I'd say it was pretty good. A 4.

– 1 – That's where we had the big problem over the winter, the schedule was impossible. The winter schedule was impossible and the holiday schedule. It was impossible for us to produce the data in the timely fashion that they needed because they couldn't get us the data to analyze and it's as simple as that. Too rushed. Four experiments in two weeks are too much. Too many procedures in too few weeks with no time and they expected us to work 24/7 and the support teams were not working.
2 – Well that goes back to the activities when it's done on the station and they don't include the analysis.
1 – No, the schedule that we needed to require the data was too severe. We're very dissatisfied, a 1

– Rating is a 4. No comments. It's just the same as last time.

– 1 – Rating is a 5. Increment 8 was not bad. I guess with hardware already up there and it was a smooth transition basically to get stuff done.
2 – I agree with 1. For the hardware that's already on orbit. We do know that during development pre-Increment 5 we were constantly red on of the stoplight charts as far as operations and crew training integration. Part of that was that we were so busy with the design development and fabrication of our hardware, that's why we were red on the stoplight charts, so we would have rated it much lower for pre-Increment 5. But like (1) said Increment 8 on orbit a 5 is appropriate.

– A 5. Things were carried over from Increment 7, so things went well.

– 2 – Again, we were very satisfied because it exceeded some of our expectations in terms of accommodating us, again based on our experience in previous increments, so we were very satisfied. That's a 5.

1 – I just wanted to make a little comment in regard to the OBT working group in terms of working on uplinking our updates for the OBT CD, we got very good support.
{interviewer} – That's an OPS thing.

– That I almost want to give a –1. I mean that's really no question because I was basically told to hurry up, you know, we need this for our reports, we need this for this. I don't know what they called them and then sometimes they would sit on it for weeks so that I'm thoroughly annoyed with. I'm going to give that a 1.

– I really don't. I have a vague sense that if I had done my homework and talked with my guys about some of these questions before, I could give you a little bit better answer, but I don't have anything concrete to tell you about schedules. So I'll give that a 4 also.

Topic Area: Program Processes – Program Review Processes
Question 1.2.8 – *What is your opinion of the number of ISS Program formal review meetings that you were required to prepare for or participate in?*

Question 1.2.8 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– N/A since payload was flying already.

– We had a PDR for our in-flight portion. Number was just right.

– N/A

– We normally do projects with European Space Agency and we have the same reviews. It was normal to us.

– N/A

– No comments.

{ - NA

– Just right.

{ - NA

– And really I only had to present at one safety review panel, although I attended a couple of other meetings where our PIM actually stood up, but from my perspective really the only thing I had to do is prepare a presentation for a safety review meeting, so for me it was just the right amount. It certainly was not unreasonable. A 3.

– Not applicable

{} - NA

– I think it was fine. Just right.

– 1 – We have, I think they're just right.

– It was actually fairly limited because we were in this streamlined process. We had a couple of briefings actually where *{name}* presented it to the JSC payload folks. But from our perspective, I guess presenting through the COFR was the main thing so I don't have a problem with the number of reviews. So probably a 3.

{} - NA

– I would give it a 3, just about right. We did not with the experiment have to do a PDR or a CDR, I don't believe. I think we were able to skip that because there was so little to do. We did take him to the BPHS and HRMRB and formal review meetings and that was basically about it. And you've got to go to the IRB; you just have to do that so I don't have any problem.
{interviewer} – What's the IRB?
- The IRB is sort of a generic term, Institutional Review Board and our IRB is now called CPHS, Committee for the Protection of Human Subjects. Every institution has to have this board to review your protocols before you can go off and do experimentation on human subjects, so that's just the way it is and the way that it should be. And then there's HRMRB is a bi-lateral or international IRB that meets quarterly for you guys, for ISS and the Russians and the international partners participate in that where our JSC CPHS is just local, it's just for JSC. But you have to go through the CPHS before you can go to the HRMRB before you can go brief astronauts and recruit subjects and do the research. That's really the way it should be. I would have been surprised if it were not that way.

Question 1.2.8 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– From a scientific point of view, no. I think we only had a conversation with the astronaut and with his doctor. I think it was just, as principal investigator, it was just right because it was one or two telecons.
{interviewer} – Ok, so I'm going to select a rating of 3, just right.

– NA because I really didn't have a meeting. All I have to do is submit email.

– I think we did all of those prior to any flight experiments and then this is just redoing the same stuff so I don't think we had to participate in anything.

{interviewer} – Ok, let's put NA then.

– Rating a 5. Asked to prepare what-if scenarios in short notice; would've been helpful to have a simple list of review meetings and steps to be taken, but this was not provided. Can't be proactive if there are not steps to follow.

{interviewer} – Did you have any reasonably formal review meetings that you had to work for Increment 8 and again I'm remembering back to 7 where you talked about some of your issues with safety. I don't know if you had sort of a repeat process for safety this time.

- We did. It was actually part of the same payload that we took to safety and it was really Increment 7 items with which we had those issues with safety. For Increment 8 and the hardware that we used during Increment 8 we really did not have any specific issues with safety on these hardware items. Well, I'm going to backtrack a little bit. Safety was not as great a concern for Increment 8 as it was for 7 for us. We did the payload all in one swoop. It was just very specific items that we were going to use during Increment 7 that we had the difficulty with so I guess my question to you is since it was all done in one safety review, should I address that ({interviewer} – No, I wouldn't) or should I just say it was just right?
- {interviewer} – Again, just remember the theme of this question. The questionnaire has two questions about review meetings. This one just deals with the out and out number of them that you had to deal with.
- Ok, I think just right. Not a problem.

– Just right.

– Rating is a 3.

– NA

– I don't think we did any for this particular increment. I guess I remember a couple of telecons that were fairly formal but I don't know if that's the kind of meetings you're referring to.

{interviewer} – If you participated and if in any way you were required to submit, prepare or deliver any kind of, or to participate in any kind of discussion rather than just the passive listening role, then sure, that could be included.

- Ok. There were times where we had to provide a rationale for why did we need the number of data points that we were asking for and did we really need them and why, but we were glad that we were asked rather than decisions just being made about us. So I would say just right.

– I didn't have to. I mean the preparation was done by the Marshall team and I didn't actually participate in it so I guess I was satisfied or not applicable. I never actually had to do it myself.

{interviewer} – Ok, so you really didn't prepare for anything or participate. Ok, let's do an NA.

– It was just right.

– NA

– It was just right for us. We had to do some new IRB things and those were to be expected so I felt that it was just right.

– I understand perfectly. It was just right. I mean the ECR and the CDR and so forth. That's the way it should be, just right.

– Let me give you a 4. I just thought we could have compressed one or two of those into a quicker meeting. You know I'm a surgeon and it might be a little bit easier for a PhD who just has lab things that they can put on hold, but for at least clinician investigators to come down repeatedly to JSC is challenging.

– Obviously there were too many and the biggest example of that was the whole COFR versus this on the fly defined operations readiness review that nobody knew what the scope of it was or the point or it or what was required as the deliverables and we had to keep meeting back on that.

– NA. Did not have any formal review meetings for Increment 8.

– A 3. Like I said we had our safety meetings, we had Phase 01 at the same time and 23 at the same time so being faster that really helped out.

– 1 – A 3, just right.

- NA

– 2 – We're looking at NA. But the payload integration cadre, the POIC, they have a PAR Status Review Team (SRT). Is that considered an ISS program formal review meeting?
{interviewer} – We could include that as long as we make a note that it's the part that we're talking about that particular OPS review because the scope of this survey definitely includes OPS. So we could say that and if we throw that into the scope then maybe you could give us a rating.
2 – Ok, a 3, just right.
{interviewer} – We'll make a note that this pertains principally to the PAR Status Review Team and PAR is Payload Anomaly Report.
2 – As far as Increment 8 goes that's the only really formal review we had.
{interviewer} – Yes and that's typical for continuing investigations. The number of reviews, of course, is fairly small. It often turns out to be NA.

– 3, we didn't have any.

- NA

– I didn't actually have to go to any of those, I don't think. In that sense it's either NA or just right. I can't recall if a formal, I think that's what the *{the Payload Development team}* had to take care of for me so it's either a 3 or NA. I don't know how you want me to answer that.
{interviewer} – Let's do a 3 on that.
- That's fine. I had a couple of telecons but literally I can't even remember more than one or two so they didn't make me sit in on any of that stuff.

– I'd say a 3. I didn't really have a problem with feeling like there were too many and certainly I didn't have a problem with feeling like there were not enough.

Topic Area: Program Processes – Program Review Processes
Question 1.2.9 – *Please rate your level of satisfaction with the ISS Utilization Program's formal review processes in general.*

Question 1.2.9 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– N/A

– No comments.

– N/A

– We normally have these kinds of review for Safety, Design Review, so it is routine to us.

– N/A

– For this particular increment, it may not have been a typical payload for us, because we used some items that have flown before, so we didn't go through all the exact same processes, but we were satisfied with them.

{ - NA

– I think 4 is appropriate.

{interviewer} – We'll put NA for that.
- Well, if we're talking about the *{first investigation name}*, we should also throw in the *{second investigation name}*.
- {interviewer} – We are trying to integrate over both of them. So, for example did you have any safety stuff to deal with for the *{first investigation name}*?
- Well that's curious because I think the answer is basically no. But the gist of it is that if we were going to send up some solder there would be all kinds of problems but since it was already up there, there were no problems.
- {interviewer} – I guess it was the opportunity of the experiment, right?
- I guess.
- {interviewer} – So, are you a material scientist?
- Yes. Primarily metallurgical, solidification phenomenon. So, what should I put for 1.2.9?
- {interviewer} – Let's put NA.

– And certainly my experience is only with the safety and I think for us we'll give that a 3 and if I could just explain a little bit why. We felt that in the safety meeting that what came into question was not only the safety of an item but also the education value of the item. We felt that we were there to only present this as a safety, you know we were there for looking at safety of the items and we ended up and we did actually one before I came a safety review and then we did a second one which I presented. In both cases what were questioned were not just the safety requirements but also the value of the item and the education value. We felt that was not the correct venue for that to happen.
{interviewer} – That's an interesting comment and we might flag that.
- And certainly I can elaborate a little bit more. Prior to me coming in there had been one safety review and a lot of the questions dealt with why are we flying and certainly you know and you've seen the footage. We fly very simple toys and there was some question as to was there any value in this and our point would be that in serving as the role of PD that we've already gone to the PIs, they've established value, we come to you only to get this through the safety process and that's not the role of the safety review.
- {interviewer} – I understand exactly what you're saying. That's why I sort of focused a little bit of interest on this. It might be worth pursuing a little bit more down the road.
- You know, and my take on that is and I hope it's pretty reasonable. I think everybody has some experience with education and so it's very easy to look at something in weigh in on an opinion of whether that's worthwhile or not. I think in our case what we would want to do is we would hope the program office would view us in some manner as experts as you would anybody else coming with a payload and have that to some degree out of the way before you go to these safety things. So it's just a comment and we may never see that happen. Again, it could have just been the makeup of that particular panel and the

CB reps that were there too.
- {interviewer} – Were you able to challenge that at the meeting?
- We were and we still, and I'll mention this later on, we still had some issues once the items were on orbit with crewmembers and lead scientists and some other people questioning the education value. We had a number of meetings where we addressed that. I had one conversation where they were saying that we perhaps we needed to make these public affairs events as opposed to, you know, using PAO time as opposed to payload time. Once again, we felt that once the item is on orbit, to us that should have been addressed way out once the payload was first proposed. And part of that was crewmember. You know I think there was some question on behalf of the crewmember as to why they were doing it and we really reached a good compromise. I think they asked us to develop our procedures a little bit more, add a little bit more education meat to it to make everybody happy. After a number of meetings I think we got it all taken care of. I think for us that's just something that we didn't expect and perhaps it's something we'll face again in the future. Our thought is that if there are going to be questions about the education merit that the minute we submit the initial paperwork for the items in the payload, perhaps that's the time we need to talk about that rather than once the stuff is up there or in a safety meeting. So anyway that's probably the one thing we bring out of this is that we want to be sure we do that right and make everybody happy. We just want to know the appropriate time to have this discussion.

– Not applicable

{} - NA

– I think my experimental manager handles a lot of this so maybe it's not transparent to me. I have no problem with this, I'm satisfied. A 5.

Question 1.2.9 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– Good, a 4.

- NA

– NA. I guess in thinking about it, some people would go down for astronaut training and stuff like that. I don't know if that counts.
{interviewer} – Well, we're coming to training in a minute so we'll cover that in a couple of questions in the future.

- So 1.2.9 is NA also.

{interviewer} – That's correct.

– Rating a 1. Junior POCs required multiple redundant paperwork for series of short time frames. Again, we were asked to prepare a lot of what-if scenarios. About 20 different hardware configurations for what-ifs that never got to management. It would be very helpful for the investigator to have a simple list of all the review meetings, all of the steps at the initiation. You can't be proactive if you don't know the steps and the approximate time line. Would've loved to participate in formal reviews in a constructive manner, but we were not participants in meetings.

– I think we'd say again here, the same statement that we made for Increment 7 that we would give this a 3 is that we would want when we got to a review that the specific tasks that review board be what we needed to discuss and I think you remember what we felt was that when we had a safety review that the education value of the items rather than the safety concerns were part of the discussion. So we would just want to say that one more time that it's important to us that when we go to safety we talk safety concerns and that we would be the ones to address educational issues.

– Rating is a 4.

– 1 – I thought it was. Definitely an improvement over what we've experienced in the past.
A 5.

- NA

– I'd say very satisfied. It seemed like the appropriate people were there and that they listened to us and made an appropriate decision.

– I wasn't involved directly so I can't comment.

– I'd give it a 4. There's not too much involved with this experiment so it's just fine.

- NA

– I have no information to really judge that because that was all done at the level at which we were not involved.
{interviewer} – Ok, select NA.

– Very satisfied. Like I said, I received constructive comments. The reviewers were very supportive of the research, optimistic about the outcome and their comments were supportive.

{interviewer} and I spoke about this before you came. I think that they went out-of-scope and off-task a couple of times, so let me give that a 2. Again, I had a number of individuals that were to be blunt sticking their nose where it shouldn't be, so talking about scientific robustness and statistical analysis and things (this was in my safety meeting). What the hell are you talking about this for? This is a scientific question.
{interviewer} – All right. That's important what you just said. The fact that it was in your safety meeting is quite notable if this has happened before.
- It's ridiculous. You've got a bunch of really smart people there that know a hell of a lot and I'm sure that information is important, it sure isn't in that format though.

– I guess one of the common denominators that we were frustrated with was we're required usually before you go to the formal review we have to go through an informal review and that's true for the PSRP package and also true for the crew procedure ECRs and the comment cycles associated with those do not necessarily help you in the formal reviews; in fact, you can actually wind up having to unchange changes that you made from the informal review to the formal review so either the informal review needs to get better and have more integrity to it or we need to just take more time for the formal review and do it right.

- NA

– I was just coming on to that project when most of this stuff was going on. I wouldn't say not applicable but I'd say a 4. They gave some valuable comments and feedback. I can't think of any examples though.
{interviewer} – But you did participate in some of these?
- Right.

- NA

- NA

– 2 – I think very satisfied. We had a couple of payload anomalies. We worked with the POIC and it was pretty good. They had the appropriate level insight. We had problems with one of our gears and we were given the opportunity to work directly with Mike Foale and repaired the hardware and got it functioning 100% again. And the reviews involved with that, very satisfied, a 5.

– 4. From the meetings I have attended, fair treatment of all payloads is emphasized and that's overall. But just pertaining to *{our investigation}* , the review process was easy and simple.

- NA

– NA
{interviewer} – Because you didn't participate in them, you can't really rate the quality but the fact that there were few of them it means that the number was just right.
- Although I have to say as a comment and I don't know if this can be added. It seemed as though there were a lot of steps that people were concerned about that. It seemed to take a long time. I didn't actually go to these meetings but I would be told we're trying to figure this out and get this certified and it just seemed to take a very long time so I don't know how many meetings they had to go to but it seemed like a lot considering how simple our experiment was.
- {interviewer} – All right. Do you want to change the scheme? Do you want to give us a rating on 1.2.9? I'll take a number if you want to give me one.
- My feeling is that we had very small samples and it seemed as though there was all this concern about safety and that kind of stuff that just didn't seem to me to be sensible. I mean these things are not explosive and they had to have all of this level of containment and they had to seal the thing up. I guess the formal review process meant they had to do all of these things, but then the bad part is that for

example, when they sealed it up, I don't know what question this is speaking to, but when they had to seal up our sample chambers they trapped a bunch of dust in there and due to the fact that it's sealed up they can't open it up to clean it up or anything like that. So I don't know if a different question is going to answer that later.

- {interviewer} – Just give me a number on this one. What were you going to say a 2 or 3?

I'll just say 3.

– I'm going to go ahead and give you a 5 on that one because I thought the meeting and the review process really went pretty well.

Topic Area: Customer Support Interface – NASA Research Program Office Support
Question 1.3.1 – *Please rate your level of satisfaction with the support your ISS Investigation received from your assigned NASA Research Program Office/Research Integration Office.*

Question 1.3.1 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– They control my resources and they come to me if they have questions. They do not bother me that much, they take care of me.

– Post Increment 5 they have been really supportive of our desire to go and collect Russian data. They shipped all of our equipment and provided support in Star City and provided support for a couple of my people to go out there a do pre-set up trips. They have done everything they can do to make it happen.

– I feel I am getting the assistance or support that I need to get, but nothing extra. But this is better, because I have rated other surveys as dissatisfied.

– They completely gave us all the needed support and we are very satisfied with that.

– I haven't needed much support from them and I feel like, if I ever needed the support and I needed to move things up to that arena, I feel like I would be listened to and satisfied. When I've had issues in other increments those have been dealt with fairly. *{name}* and *{PD's name}* are great. I don't have that much experience with *{name}*, but if he is anything like Dave Baumann, he's great. *{The PD has}* been great too.

– No comments.

– I'd give that a 5. Her team was very proactive in responding to the accelerated schedule that we had to meet in order to continue investigations on increment 7.

– The support we received from you guys was super. I'm very, very satisfied. It is not simply a technical issue, it's also a question of relationship and good willingness to do the things together so I'm really very, very pleased and satisfied so it's a 5.

– I was very satisfied. I have to admit we were really thinking that we were out of the picture completely and we were very pleased that everybody was so supportive and so interested in getting *{our investigation}* up during Increment 8 ({interviewer}talked over her.)
{interviewer} – Did the Code M folks weight in at all on this question that you just discussed previously about when is the appropriate time to evaluate merit?
- And they did. At that time it was with *{name}* and I talked a little bit with *{name}* more informally and we did discuss that. I don't think we ever came to a decision because of course that was a time when we were really just scrambling to get everything done and what I guess I'm trying to say is I don't think we ever said, "when is the appropriate time in the process to have you present the education value of your payloads". I talked to *{name}* and also *to {name}*. So a lot of conversations there about the educational value, but no clear definitive answer on when we should be doing that.

– A 5. We were very satisfied. They did fine work for us. Basically they were good advocates for our payload with the management.

{} – I guess I'll give it a 4 because it wasn't completely perfect. If there were a 4½, I'd give it that. It was just confusing to us as to who we were supposed to turn to for what since there was an additional person, but then overall the job got done fine. I think it was a little bit confusing for them so sometimes they thought that somebody was doing it and nobody was but that got ironed out over time.

– I'm very satisfied with that person and they're doing a very nice job so I don't get burdened by things that may be happening higher up. I don't have a lot of contact. There's a business sort of manager who interacts with that person, but they coordinate the budget and they coordinate the science but with the science research support person. Those are the only two people that I have like weekly contact with.
{interviewer} – I would say that they're representing the HLS RPO and you can formulate you answer therefore based on your interaction with them.
- Ok, well I'm very satisfied with those personnel. I think they're doing an excellent job and especially considering some of these rapid changes we've had, first going to Russia and setting up a lab over there. We do testing over there as well and coordinating that and then the budget area I'm very satisfied with the way they've adjusted that also because there is a little more cost when you've got to go over there. So I put

5. I thought it was a very good with making rather rapid changes with the crew change out and whatnot.

– 1 – I think *{supporting payload name}* was a 4.

– I would say we're very satisfied. A 5. I think they were very supportive of *{our investigation}* and it's actually become more important now with the new exploration so they're very interested in seeing *{our investigation}* completed. I feel that we got good support.

– Very satisfied. They do a great job on keeping track and making sure that we're informed of things so I put a 5 on that.

Question 1.3.1 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– Very satisfied. Again, it's low key. I have plenty of time to respond to their requests for data. If I need something they're very approachable.
{interviewer} – And are they able to get it for you in most cases?
- They champion my requests. They may not be able to get everything that I need which is understandable, but I'm very satisfied.

– Rating a 1. Same issues. Junior point of contact, multiple conflicting sets of paperwork, multiple what-ifs, no decision making, no knowledge of the process.

– NA

– Very satisfied. *{names}* are just extremely supportive and very much, we feel, actively involved in *{our investigation}*.
{interviewer} – Ok, so they did an ok job of communicating with you and keeping you in the loop on what was going on?
- Absolutely. They are great communicators and no matter how small, there was always an email or a phone call to say "here's a potential change, here's what's going on. They could not have been better.

– Is this from *{name}* and those folks?
{interviewer} – That's correct.
- A 5.

{interviewer} – Now this is going to be tricky because, as you explained to me, part of it, at least for *{your investigation}*, part of it is flowing from Ames Fundamental Biology and then some of it is flowing from SPD.
2 – According to any official paperwork and documents that you have for the survey, is it more geared toward FSB, since you weren't aware that part of it was SPD?
{interviewer} – I wasn't completely clear on the arrangement. I thought it was somehow that you were acting as a middleman or doing services for Ames to fly an investigation that was basically theirs, but you guys had the hardware, which is the *{payload hardware}* , right? I mean you were the people who flew the *{payload hardware}*.
2 – You've defined half of the experience exactly correct.
{interviewer} – Right, you were the *{payload hardware}* folks and then there was *{the PI}* who is the PI was flowing in thru Fundamental Biology. So what I would say.
2 – Yes, this is going to be tricky. If we rate the FSB part, we give it probably a 1.
{interviewer} – I'm going to have to warn you about something – I sent Lou this earlier in the morning. There is a going to be a little micro-survey that I'm going to ask you to do to rate Ames.
1 – Oh good.
{interviewer} – They have asked us to be their conduit for collecting a little bit of feedback about their support.
1 – Are they going to know where that feedback came from?
{interviewer} – Well, we can talk about that. The issue is there's just going to be two different sets of feedback so, to some extent it's not going to be too hard for them. I mean they're going to have a 50% chance of guessing who it is.
2 – So, we'll try to be really honest and not have to worry about future relationships.

1 – Can we choose not to participate in that?
{interviewer} – Yes, you can. You can choose not to participate in any of this.
1 – Ok, we might have to think about that.
{interviewer} – I was putting that off towards the end. What I'm going to do is the following, I'm going to ask you to rate only your SPD side of support and leave your Ames support out of this question and then do that in the dedicated questionnaire. Whether you choose to do it or not, that's fine.
2 – Well, I've always felt supported by our program, so we give them a 5.
{interviewer} – Note – This pertains only to SPD support.

– Rating is a 5. They have been very supportive and they answer all of Sue's questions and my questions. They have been adequate advocates in our payload.

– I would say very satisfied – a 5. Since the beginning of the study we have had difficulty getting data from our ground subjects. We haven't had problems really with the crew members. We're also collecting data from the ground and during this increment the team made a very concerted effort to help us increase our participation right off the ground and we really appreciate that. They came up with some creative solutions that were helpful.

– Is this headquarters or people I dealt with at Marshall?
{interviewer} – It could be personnel from either, but it was the Research Program Office or Research Integration Office that contributed support to your particular investigation with either personnel, technical or funding requirements.
- The direct support I had or the interaction was all with the team at Marshall and I was very satisfied.

– I'm say a 5, they did everything they could.

– A 2 – again because of communication.
- What I think we're trying to communication is this, you get above the level of the ESS and you start going between the ESS and into these higher levels; that's where we saw a disconnect between advocacy for the experiment. That's where we expected to have, you know. For *{our investigation}* , we were one of the few science experiments that were on that increment and what we as a team felt is that we're having to push our experiment through the system instead of having their support.
{interviewer} – But did you feel you got decent support from two individuals, your ESS, I don't know who that was unless that was *{your PD}*.
- No, our ESS is *{names}*. We felt we got good support from that and we got good support from our engineering.
- A 5.

– I give that a 6 which I cannot give it, so a 5. We are really very happy with them. I don't think there was a request that we made at any time that they didn't try their hardest to implement.

– What would that be?
{interviewer} – I think we were saying that your RPO was the Human Life Sciences RPO and actually they evolved into RIOs – Research Integration Offices.
- That's here at NASA, that's *{name}*?
- {interviewer} – Yeah, Bioastronautics Program.
- Not headquarters, but at JSC? I've had 3, *{names}* and all 3 of them have been excellent. They are just terrific. A 5.

– {interviewer} – I'll explain what that is if you're not clear.
- Please.
- {interviewer} – You were supported by JSC Human Life Sciences, Bioastronautics. *{name}* is the head of that, *{our PD}* is part of that and any other support you got through people, for example in Bldg. 37 and so forth is rolled up into that. So what we'd like to do is get your feelings about how they supported you.
- So this is *{our PD}* and crew?
- {interviewer} – It's *{our PD}* and crew. There'll be an opportunity a little later on to rate *{your PD}* specifically, but it's that entire sort of pantheon of support that you were getting.
- You know what, I don't. *{My PD}* was my only contact. I talked to absolutely nobody else so I have no

idea. I don't have a big comment on that.
- {interviewer} – You didn't have an experiment support scientist?
- Is that like *{names}*? from the contractor's side, from Lockheed Martin?
- {interviewer} – It's possible.
- Ok, if it's those guys I'm giving them a 5. I would have to take that down a couple of notches if you throw *{our PD}* in there as well.
- {interviewer} – What I'm going to have to ask you to do is just take your best shot and integrate over that.
- A 4.
- {interviewer} – I'm sorry this is not an exact science.
- Yeah, that really will not be good data then.
- {interviewer} – All right, but for the comments we do want to note that there seems to be a difference in your satisfaction with, say *{the PD}* side, versus *{name}*
- Yes. *{names}*. This is being recorded so let me.
- {interviewer} – Yes it is recorded but *{other names}* names are not – everything is identity blind.

Ok, so let me say the contractor support scientists were exemplary, were spectacular. In fact my experimental scientist support person just won a Silver Snoopy. She's fantastic. I can't share similar ebullience with the NASA support office coming from my direct support and her supervisor which was lackluster at best. It appeared to be this was the first time they had ever done something like this and we had to continually learn things like it was the first time. It was very painful.

– I think I am that organization – NA.

– I'm satisfied with it. I can't think of any instance when we didn't get support when we needed it. So, a 5.

– Very well. Rating is a 4. No comments.

– 1 – I really did not interact much with the office. I got a few calls every now and then. I think (2) got questions too, so I don't know if we need to say NA.

{interviewer} – That sounds like a low level of interaction which usually translates into a NA.

2 – Primarily our project manager, *{PD name}*, interacted with those folks the most. I agree with (1) 100%, NA.

– 5. The CODE M, now Space OPS RPO is very supportive and informative

– 1 – It's been excellent, they've really been certainly very accommodating and work very well with us so I give them a 5.

– I really want to give it a 2 but on the other hand, I don't want to have to get them all mad.

{interviewer} – I know but to make an omelet you've got to break eggs. We can't make things better if we don't get honest feedback. I will tell you that we've been doing this for a little over 2 years. I have found no instance A, where someone has gone to all of the trouble to reconstruct who said what on the survey and B, where they got mad about it. So what you're concerned about has not happened yet in the course of this project. It's an obvious concern but it actually has not turned out to be a problem.

- Ok. This is my personal level of satisfaction because obviously they did their jobs well enough for us to get stuff done, but there were a lot of unsatisfying aspects about how it got done so that's how I'm tending to answer this question.
- {interviewer} – That's perfectly fair.
- I mean this is not a rating like on a scale of 1 to 5 did they perform their tasks because they performed their tasks but there were certain aspects of it which were pretty unpleasant.
- {interviewer} – That's right. Look at the anchor terms, it's your satisfaction. How satisfied are you?
- I'm going to give that a 2 and that's a general question.
- {interviewer} – Any specific comments about what they did or didn't do that rates a 2?
- It seems like there are more specific questions coming?

{interviewer} – Yeah, there's going to be a set of questions that refer directly to your payload developer coming up so let's move on.

– I'm going to give me a 5 on that because I thought that maybe because I'm more intimately involved with our processes and what we do and I have more interaction with my RPO or RIO, I feel maybe more

comfortable with the activities. I thought it did a pretty good job of support.
{interviewer} – Can you just remind me of your organizational structure these days. I'm always trying to keep on top of things. Bioastronautics or Human Life Sciences, does that still flow up to Cindy Haven?
- Yes, it is Cindy.
{interviewer} – Ok, it's helpful for me to remember who's up at the top of the chain in the organizational structure. Thanks.

Topic Area: Customer Support Interface – PIM Services
Question 1.3.2 – *Please rate your level of satisfaction with the services provided by the Payload Integration Manager (PIM) assigned to your Investigation.*

Question 1.3.2 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– I do not think you can ask for a better PIM. He interpreted the template and literally built a matrix of everything that had to happen for us to get through the integration process. If I was having trouble trying to satisfy one of the requirements, he was able to define it better, and/or work with some of the integration engineering folks to determine exactly the data that would satisfy the requirement. I hate to keep saying this but *{investigation name}* is a unique little animal. I am not designing and building hardware that is going to be flown. I am using stuff that is already there and this is my complaint when someone has to have data so they can fill in a little box on a piece of paper and if I do not get it, it is not going to happen. Well I am using stuff that is bought, it is COTS, and it is flying already and now I have to go find data that nobody has really done any formal testing with. He simplified that process and was able to argue out of a lot of my requirements, simply because of the nature of the hardware and the fact that the hardware is already flying. *{name}* really made the integration process into WORF simple, because he was just helpful, plus I was one of his first payloads, and he was learning the process and as he learned it he was taking over and saying, "this is what I can do for you" and he did it.

– N/A

– We were getting nailed with multiple PIMs every month. We had a contract change for the PIMs and that affected the service I was getting. We also went through PIMs that were being shifted around. Before Increment 7, I had a great PIM. At the end of Increments 8 & 9, I have a really good PIM. But the Increment 7, was during that turmoil.

– I am very satisfied with *{name}*, because he was always available for any questions I had.

– N/A

– No comments.

{ - NA

– We had *{name}* who acted as the PMI in a very efficient way and we are really grateful to him. So very satisfied.

– 1.3.2 is asking about your Payload Integration Manager who is the person over here at JSC who orchestrates a lot of the paperwork you know, dealing with verification requirements and is sort of your main point of contact. It's possible that Lucinda dealt with him and you did not.
- Who would it be?
- {interviewer} – I don't have a record of who it was.
- Ok, for the *{investigation name}* one it was *{name}*. I'm going to give him a 5. He did a tremendous job. I don't think we could have gotten half of what we got done without him. I don't know who the PIM was.
- {interviewer} – Yes, I should have had that on record, but I didn't.
- I guess since I don't know.
- {interviewer} – Well, it's a question that if I had known I might have jogged your memory. So I've got to make a note to have that in the future.

– Very satisfied. *{name}* is our PIM and he is fantastic. He keeps us out of trouble and he keeps us very informed. I would say that I feel from him he gives value to a very small and simple payload in an equal amount that he would give to a much more complicated payload. He is very, very helpful, always there to answer questions, always there to prompt me to do the next step in the process.

– Satisfied. From my own experience I work largely through *{the PD}* but every once in a while I do talk to the PIM and I'm satisfied.
{interviewer} – So I'm going to put a 5 then.

{} - NA

{ - NA

{ - NA

– Very satisfied, 5. We'd give him a higher rating if we could. He kept our schedules, he found what was onboard that we could use.
- He negotiated because there was the concern about the amount of solder that we wanted to use. He negotiated all of those quantities.
- He set up our meetings at JSC with the training folks. He was just in every aspect of it, except real time.
- He was excellent.
- And he would have loved to have been here for real time.
- He was so integral to the accomplishment of ISSI.

{} – Let's put not applicable because I didn't really have to use the PIM.

{ - NA

Question 1.3.2 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– Rating is a 5.
{interviewer} – All right, that's a good rating. Any particular comments? I'm asking because the payloads office is very interested in the performance of PIMs and they're trying to improve it so I don't know if you have any comments?
- Well, my comment is that he did a great job. He took care always of our funny requests and gave advice and supported to us in any manner, so I think that he has really done a great job. I'm very pleased.

– I'm going to say a 4. It's much, much better than it has been and again we're still climbing that curve, so I'll just leave a little wiggle room at the top.
{interviewer} – Ok, that's what I was going to ask. Obviously there's some room for improvement there and given the significant focus on the PIM function and the payloads office, they would certainly want to know why it was not a 5 as opposed to a 4, but you say it's climbing that curve, room for improvement. Let me press on it a little bit and say, can you give us some specifics about how it could be improved.
- Sometimes the customer contact wasn't always initiated by the PIM. I came upon something or knew something so I had to, where I would have expected the PIM to send me an email or give me a call and they went to them before they got to me.
- {interviewer} – Ok, that's useful. Who was your PIM?
- *{name}* And say it's because I sit over in D05 inside an internal NASA office, you know I'm finding out a lot of stuff that may or may not affect the payload that I'm not sure if it's actually, well they should know about it and they should contact the payloads. If it were an external payload, they would have never known and it may have had an affect on the payload ability to operate.

- NA

– Rating a 5. This was excellent - very satisfied. Knowledgeable, constructive, very interactive. Investigator was specifically requested not to interact with the PIM under any circumstances, but met her at unrelated NASA meetings.

– Rating is a 5. *{name}* keeps us out of trouble basically. Not only does he communicate well, but he's a good translator for us too. What I mean is that if there is something we don't understand or a requirement or an email that comes across our desk, he is the person who always takes the time to talk us through and to explain why this came, why there's a change occurring. We've very dependent on him, very dependent.

- NA

– 1 – That would be a big, big 5.
{interviewer} – Remind me who your PIM was.
1 – Yvonne Simms. We could not have gone through that, we could not have flown on 13P without her help. She went well above and beyond to get us on there and we wish that she was still our PIM.
{interviewer} – And your PIM has changed?
1 – It has. Several times actually. We have two now

– Primarily Sue does that. NA

– I assuming that's the person we're sending budget reports to who is the manager of our ESS?

{interviewer} – That would be. You might have been insulated from your payload integration manger who is usually attending the payload developer, so if you do not know who that is you can put not applicable.

– Who was that? *{name}*? Very satisfied. He did a great job of keeping us in the loop and getting us all of the information we needed.

– I'm not aware that we had one. I don't feel comfortable answering when I'm not sure who it was. I guess they were behind the scenes. NA
{interviewer} – Yeah, I might go look that up.

- NA

– We know nothing about that. NA

– You know I never understood what the titles were. There's the NASA woman, the NASA people the sequence of 3 engineers and then it's been Karen Lawrence from Lockheed. Is she the PIM, the Payload Integration Manager?
{interviewer} – I believe so. And I will confirm that, but it was someone that was assigned to your particular investigation to answer questions and guide you through the integration process.
- I'm very satisfied. But I still deal with *{name}* and *{name}*. We correspond every week.
- {interviewer} – That's correct. That's their role.
- And during the development phase, *{name}* – a young, she was right out of a university engineering program – was extremely good in having weekly teleconferences, the team there at JSC the 3 or 4 people that were involved and me wherever I was in the country, and it was just wonderful. It kept us, I mean without that I would have been in the dark. It was just very easy for me as a brand new PI.
- {interviewer} – So, they were able to attend to your concerns and answer your questions and chase down information readily when you needed it?
- Yeah and inform me actually of things, keep me informed of what the issues were. Everybody did a great job. So 1.3.2 would be a 5.

– I thought he was a 5; *{name}*; we like him; he was very helpful; he did everything he could do in the face of all the crap we were dealing with.

– The maximum. I would say a rating of 5. He has been really a great support to us.
{interviewer} – Please tell me the name of your Payload Integration Manager.
- It was *{name}*.

– 5. I have a comment from Kathy – she says, "wonderful".
{interviewer} – And who was your PIM at the time?
- We've had two of them. *{name}* and *{name}*? Or something like that, but I think it's back to *{name}*.

– 2 – For this one, if they're talking about the PIM as JSC with the station payloads office, we'd say NA. We interfaced directly with the Microgravity Science Glovebox and they in turn interfaced with the PIM.

– A 5. We didn't require any services from the PIM, but she let us know if she heard issues relating to CEO.

– 2 – We're one step removed from the direct interaction.
1 – In terms of this experiment. I'd say whenever we have hardware and more involvement we've been more involved with our PIM in the past, but we're fine with that. We'll give them a 4.

– That was *{name}*, right?
{interviewer} – Yes it was.
- He's always been really great and helpful to me so I'll give him a 5. I can't say I interacted a whole lot with him but what I did was great. He was really helpful. Not so many things because I didn't interact with him a whole lot but it certainly was a pleasure to deal with him so I'll give him a 5.

– I'm going to put a 3 down for that. I don't have any major problems to complain about but there were just some times in going through this process that I felt like our PIM was kind of unaware of what was going on or it seemed like there were a couple of times that we had made some submittals and then we got a request from the PIM for those submittals after we had already made them.
{interviewer} – All right. Who is our PIM?
- Juliet Sang.

Topic Area: Customer Support Interface – Crew Interface: Training and On-Orbit
Question 1.3.4 – *Please rate your level of satisfaction with the support the ISS Utilization Program provided to your investigation in the area of Crew Training.*

Question 1.3.4 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

{ - N/A – Respondent did his own training, the program gave no support.

– N/A

– We do not think much about this, because it usually goes off without a problem. Sometimes people are there from the Crew Office and they have their own unique ways of looking at things and comments. They do not really add to the training process and it is almost irritating to us, to have them come up and say "You should not be doing it that way." Well, that's how it has been done for the last 5 increments, so what are they talking about. Some of these people have got to get off there high-horse and be team players, especially when you got systems that have been around awhile, you cannot treat them like they are new. I have been very happy dealing with the crew, because they are very polite and flexible.

– Alan Taylor has been a great trainer because he was involved in the training of Ed Lu and then for Tate and Mike Foale. He has been a great help to us.

– N/A

– This was an unusual situation because of the short turnaround because of Columbia and the change in vehicles. We had to develop, in short order, a Progress compatible low up mass payload because of the chronology of that time there was no time for crew training. This was our first experience with on-board computer based training. So we developed OBT, we worked with an OBT working group and we received very good support from them. We did not work directly with the crew on the ground because of that limitation, however, the OBT worked very well on orbit and our interaction with OBT WG was very positive.

{ - NA

– I think in the way the crew training proceeds, it's ok. I probably would need some more time to be dedicated, I mean some more sessions of crew training especially when the training is performed as your increment performed, I think, one year before then the risk which was not the case, but the risk could be that something especially in physiology payloads that something is not executed correctly. I am satisfied of the support of course so if I have to rank the satisfaction level it's certainly very satisfied. I would stress this point on increasing the training of the crew.
{interviewer} – But you would rate that a 5?
- Yes.

– I think somebody went down there to train, not Lu, but probably the next guy.
{interviewer} – That would have been Mike Foale.
- I think the crew training stuff here went as well as it could.
- {interviewer} – Well, if you feel you've got a basis for giving it a rating, give it a number but if you feel that you don't have a basis, then we'll put NA. It's up to you.
- I would give it a 4 because when those guys go down there for training and they come back, they said the guys were receptive. For Increment 7 when they went down there to train them on the PSMI units, it was great so I give it a 4.

– You may have to help me with my answer on this one. For Increment 7, we did not do any crew training. We did work with the folks at Marshall and did some OBT, developed OBT for these items.
{interviewer} – Well, I would say if you had to develop OBT and you worked with Marshall to do some of that, then you have a basis for giving feedback on that support.
- All right. We were very satisfied. I would tell you being able to have that smooth interface through the whole process with the folks at Marshall. They were extremely knowledgeable and helpful and it really helped us out because we had really not had a great deal of practice doing OBT and certainly not using Marshall resources to do that.

– We do our own crew training but in order to accomplish our own crew training successfully, we do

have to get some information from Huntsville about certain technical details so that our crew training is customized to the better astronaut training, so we get a small amount of support, not a whole lot but we do get support. I would rate it a 5. And the comment I want to make which I think I've made in my previous survey with you is that CEO would probably like more time with the crew but still it's an issue which is much larger than just the interim of the time allocation for each flight.

– I don't remember doing that myself. I do remember training the crew for Increment 8. But I've certainly trained a lot of ground personnel who supported Increment 7.
– This is focusing on training the crew but it's not necessarily you training the crew, it's whoever trained the crew for you or supported you in that area whether you wanted to evaluate that. You can always put not applicable if it's not something you're too familiar with.
- I'm familiar with some of the issues about crew training. I just don't remember if they're specific to Increment 7 or not but they were pretty recent.
- {interviewer} – Based on what you know give us a rating.
- I'll say 4. I think the training curriculum was not developed by me so I think it could be more streamlined probably with our team that developed it anyway. But the main issue I've had with it was just in setting up the telecommunications link or trying to decide whether we needed to be there in person or not. I was never quite clear on what the criteria was for making the decision about whether we needed to be there in person or not and then I guess we decided not to be because logistically it was easier not to, but then we had difficulty with the telecommunications link so that made it more difficult to do the training and to create the kind of rapport that I think is necessary when you're asking someone to do something that's really tedious over and over again. I just think that needs to be resolved a little bit more.

– For this particular increment we have had the time to do the proper training on the tests so it wasn't anyone's fault other than the crew changed out so short before the flight. I guess I'd put a 4 with the idea that there really wasn't enough time for training.

{ - 2 – For this increment, it was all ready finalized when we received it and that was a little bit of a problem because we had no. 1 - It took us a while to get our input into the OBT; but what do we say 3 and then the improvement is to allow time for PI team input. 2 - We were allowed to participate during OBT but the actual CD that was written we were not allowed to make any changes to.

– We did an onboard training CD and that worked out great. We had the training folks over when we were doing operations and doing some testing and they did a wonderful presentation for us. Very satisfied, a 5.

{} – NA – Did own crew training, no program support.

{ - NA

Question 1.3.4 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

Yes, we had to do crew training but I think that's being performed directly in Star City from your people which, of course, was previously trained by our people during Increment 7. So we received the feedback after the training from your guys and so we could check that everything was done according to our protocols and got the feeling that the astronaut, that Mike Foale was correctly trained. Very satisfied.

{interviewer} – Did you have to get any program support for crew training on this increment?
- Just scheduling. They schedule me for my class and I sit down with the crew.
- {interviewer} – Ok, then let's put NA because basically you sit there face-to-face and train the crew.
- Correct.
- {interviewer} – So they don't have a bunch of people in Huntsville doing things and so forth.

No, the only thing that I need is somebody to schedule the class and I take care of the rest.

Somebody went down and trained Mike Foale on how to use the PSMI apparatus. It all worked well and then he repaired it well so I would say very satisfied.
{interviewer} – Alright we'll put a 5 on that.

Rating a 5. Very professional, charming, competent.

{interviewer} – What about crew training? I don't know how you worked that for Increment 8. Do you do onboard training?
- We actually did both for Increment 8. We were originally scheduled to do actual crew training here at JSC and we ended up having approximately 30 minutes for that and then we also worked with Marshall for OBT. I think we'll give that a 4. I think in a perfect world we would have liked to have had more crew training time face-to-face. However, the OBT that was developed at Marshall was excellent. And I would tell you and I think this may come further along, I think what we see as a pattern is that if we don't have that face-to-face crew training we tend to get a lot more questions and concerns from the crew members as they do their review or OBT that's it's a face-to-face where they ask us questions and it saves a bit of trouble further down the road.

NA

2 – A 5. I think that was all very well done. We were well supported. Well, I guess I have to give some credit to our SIM engineer, Cindy Norton, because she does a lot of behind the scenes work to make it look easy to me so I think that the 5 rating is largely due to her working for us in the background.
1 – She watches out for us and we appreciate that a great deal.

NA. Generally, we our seeing crew training improve and we are getting slightly more contact time but I think on this one I'll just choose NA because I was not directly working that issue.

Very satisfied. That went very smoothly. There was one expedition where we had technical difficulties with a telecon. We were trying to do it over a telecon rather than us going there and training the crew in person.
{interviewer} – Do you recall? Was it Increment 8?
- I think it was but if we're talking about this expedition then the training would have occurred. Yeah, actually I did that training. I did that training over a telecon with Mike Foale.
- {interviewer} – You had some technical difficulties there?

I think those were mostly our fault and those were sorted out. I would say the training that I'm thinking of was for expedition 9. For expedition 8 now that I'm recalling that crew training, that was fine. Very satisfied.

We developed a crew training document with Marshall and I was very satisfied. They did a great job in preparing and then I went up there and spent a day developing the procedures and the support and they did all of the work. I just helped out and they did a great job.

NA

A 5

A 5

We got great support for that, a 5.

Very good, a 5. We also had a training person there during the rehearsals and they sent someone I think even to the training sessions that we have there's a monitor there to make sure that I tell them what I'm going to tell them, tell them and then tell them what I told them. That's a 5.

Rating is a 3. I think that the research funding was very problematic. It was significantly delayed and it was altered multiple times by Headquarters making ridiculous reworking required at my end so much so that I've had a single person working on just this, a single experienced research grants manager working just on this, whereas she's been able to do 10 or 12 other NIH similar proposals in the past. That is just incredibly problematic. On the people side and on the actual integration side I had no problem. It is just the CODE U and the funding mechanism, that if I was rating just that it would be a 1. If I was rating the remainder of it, it would probably be at the 9 level.

We thought before the people that prepared our OBT and their responsiveness to the team was outstanding; we were a little bit, I think as everyone is, concerned about the lack of the actual adherence to procedures but that's kind of out-of-scope probably for this.

Yes, the same. It was *{name}*. He has been priceless to us. Rating is 5.

I wasn't involved in crew training, but Kathy was and she says 5.

1 – OBT we had a lot of issues with but I think in the end we figured out how to resolve all of those issues. We're still very dissatisfied with OBT, so a 1.

NA

The program always supports the training, but that was fine. I was actually training the crews personally.
{interviewer} – So what would you rate it then?
- I'd give it a 5. I think training is running smoothly.

1 – The answer would be 4. I guess I was struggling with a 3 as well, but for crew training we always desire more crew time to train the crew and it's always limited time. But the training is good, everything seems to go fine but we always desire more time to train the crew so I guess I'll stick with a 4.
{interviewer} – Do you concur 2?
2 – Yes, I think (1) did a good job summarizing. I know we always put in the amount of crew training hours that we thought we needed and we always got maybe 50% of what we requested or substantially less than what we requested so we had to learn to make due with what we had.

NA because the utilization program didn't have to do anything for CEO crew training. We're still somehow grandfathered through the systems folks.

2 – If we're concentrating on Increment 8 at that time there was no time available for crew training so we did the training exclusively by means of on board training and we have had excellent support from the OBT working group. We have had actual crew training for some of the subsequent increments but not for Increment 8. But we got, again like I said, excellent support from the OBTWG. A 5.

I went to Houston several times to do crew training. So who am I rating now?
{interviewer} – What you're rating is the people that supported you in order to get that training done.
- Do you have a list of names?
- {interviewer} – No, I'm afraid I don't.
- So this is like people at Huntsville?
- That's correct.
- *{The Payload Developer}* I rated separately, the PIM I rated separated so this is just the other people at training who were not those other people that I rated so I think this is just people at Huntsville and then the people at JSC that physically helped us out?
- {interviewer} – That's correct.

Ok, I'll give them a 4. They were all very good. A 5 would imply that everything was perfect and it wasn't, but it was very good so I'll give it a 4.

Rating is an 8. It seemed at time to me during this increment that the system was more concerned with minimizing hassle to the crew than they were with proactively looking for ways to accomplish as much science as possible.

Topic Area: Customer Support Interface – Change Requests
Question 1.3.5 – *If at any time during your Investigation's development, integration and operation your requirements of the ISS changed, please rate your level of satisfaction with how the ISS Utilization Program responded to your change request.*

Question 1.3.5 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– I had procedure changes and some schedule changes and I do that through the OCR process at Marshall and it works extremely well. I know when I submit an OCR it generates, for the planning world, PPCRs and things like that and that happens almost automatically and they bend over backwards to try to clear up the OCR.

– N/A

– We have received good support on this.

– They were helpful to us when we had to change from Shuttle to the Progress for upload of hardware, etc.

– No changes this increment.

– Because we did have changes and because of the timeliness in which they were addressed and the support that we received, which was beyond what we expected that is why we are giving such high numbers. We did have changes, and we got extraordinary support for those changes, from every entity – LIS, PODF the OCRs were taken care of very promptly and the process went very smoothly in less time and with more flexibility than we expected. We were very happy with the way changes were dealt with. Changes are not ideal, but in this case we had to tweak some of the hardware we were working on orbit and we had to develop procedures in very short order and the way we were supported was really beyond what we expected.

{ - NA

– The experiment has been conducted as foreseen. I think that if any changes, there would be some changes in the technical procedure during the flight due to the connection to one point or the other or moving the target object left or right of the PC, but I think that everything was conducted very smoothly and I don't see. I didn't have any problem. A 4.

– We had a bunch of OCRs. Some were because something didn't work right or we overran time or things like that.
{interviewer} – What's your satisfaction with how the program processed and handled those OCRs?
- I'd give that a 2. I think personally think there's too much requested of you to make some of these things and I think there are some double standards also here. For instance, one time I asked the glove box guys next to me how much time I had left on my tapes and they said, "Ed forgot to turn them on", so basically we lost an hour and a half of science so we requested to have our run extended an extra hour and a half, and as best as I understand it we asked if we needed to put in an OCR for that, and strange as it is we didn't have to.
- {interviewer} – And so you're saying that's not being consistent?
- I wouldn't think so. Of course, it might not look good if someone forgot to turn on the tapes and it came out in an OCR, but I don't know about that.
- {interviewer} – That's an interesting comment. That's the kind of comment that we're looking for because it's very specific about a procedural thing that you feel you weren't satisfied with.
- And I think they all have their reasons and they're probably reasonable safety reasons. I mean we would have maybe liked to have run further on or stopped and then run further on, but we were constrained to pull this back and it wasn't really clear that these were why we couldn't continue on when everything is running automatically, but I guess these are safety issues and I guess they are reasonable if you look at them hard enough.

– We did have some changes that resulted from, of course, changes to the increment and in as far as my standpoint, it was really transparent. *{name}* helped us with those as did the folks at Marshall so really I was very satisfied. Really had no problems with those.
{interviewer} – We'll put a rating of 5 then.

– Not applicable

– We did have to change our software for the ground subjects but not for the crew in flight.
{interviewer} – Did you have to do any CRs or change requests to get those changes baselined with the program?
- No, we didn't request a change. We were requested to make a change and we made it and then we distributed new copies of the software so we didn't ask NASA to do anything. They were the ones asking us. It was a big elaborate process.
- {interviewer} – I'm going to put not applicable.

– There was no change. The change was only when it was ending on 6 when we had to start going to Russia but not since we already knew that was happening. Not applicable here.

{ - 1 - We have lots of OCR familiarity; because this was a seat of the pants operation here. 2 - I think the OCRs we weren't familiar with that; they were done but we didn't know that that's what they were during Increment 7; and this was part of that we were not familiar with how things were done and we didn't know what the deadlines were that certain things had to be done and uplinked at a certain time for the team; so they were done but we didn't know about them; we made changes but and they did do all of our change requests; they responded to all of our changes; sometimes it took more of a push though.

– We had CEFs to actually request being operated in subsequent increments since we didn't complete our operations in Increment 7. We prepared a CEF for increment 8 and 9 and then we did OCRs to do our timeline and also our procedures and they were all very responsive.
- And the 6 that they responded to quickly so we would give that a 4.

{} – A change that we did have for Increment 7 was that we added some sights for Lewis & Clark. It was sort of like an added investigation if you will and I didn't have to use formal documentation as far as like an OCR or a ({interviewer}talked over her) but we did generate like a point paper, send it through LIS and send it up through the system to Ed to describe what it was and follow-up messages about it. I say very satisfied because it was a quick turnaround. It went through the system very easily. People were interested in making it go forward and seeing how it was going and that sort of thing, so I'm very satisfied with that.

{ - NA

Question 1.3.5 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– I don't think this is applicable because as far as I remember there was not really a change with respect to 7.

– I didn't have any for I8, NA.

– We had a couple of those and I think they're kind of a pain in the butt but they seemed to go ok. I'd give that a 4.

{respondent}– Rating a 1. We had multiple, multiple changes. Our requirements didn't change, but we put in numerous change requests based on junior points of contact and management. Confusion between junior points of contacts and senior management led to multiple what-if scenarios leading to more change requests and what-ifs for paperwork.

{respondent}– We did not generate those ourselves, but I believe we did have some OCRs that came along for 8 based on some video requirements that we had. You know normally and for us we've been very satisfied because typically for *{our investigation}* an OCR is not generated within our office. It's the program that recognizes that there needs to be a change made and working with the people at Marshall and with our PIM they help us with that. {interviewer} – So it sounds like there some was activity of that type. {respondent}That may have all taken place during 7, to be honest I can't remember, but it was based on the requirements that we needed a live downlink and that changed the scheduling and how we could do these things.
- {interviewer} – Ok, I'll go out on a limb and say whether or not you can remember if it's Increment 7 or 8.
- What I'm saying is that whatever we did for 7 would have been applicable for 8.

- {interviewer} – Why don't you look at the rating scale and pick a number.
- Very satisfied, we were very pleased.

- NA

– 1 – That was fine. We'll say 5.
2 – I think part of that is my learning curve, as well though. The process probably hasn't changed much from Increment 2 to Increment 8. Maybe it did, but all the CEFs went fine.

– *{My PD}* managed all of the changes. I didn't get involved. NA

– We did have some, no we just had scheduling for the post-flight debrief but that was handled very well. Other than that, we didn't have anything about how the data was collected, so I would say not applicable.

– The only changes we made were actually in direct contact with Mike Foale, that he suggested. So we didn't actually change any.
{interviewer} – You didn't have to put forth any formal paperwork for change requests?
- No, I didn't anyway.
- {interviewer} – Do you want to give that a rating?
- I was satisfied, a 5.

- NA

– This gets a little more transparent to the investigators.
- I know there were problems but we really didn't have to deal with those too much. That was that communication problem and getting them through but other than being told "no it got taken off" or whatever, got delayed or they want more info. We didn't personally have to push those through.
- A 3.

– We did make a couple of in course changes particularly because of the upmass problems, and I felt they were handled very well indeed so I'm very satisfied with the way those changes were handled. Rating is a 5. You can see I'm a pretty happy customer.

– A 5. Everything went so smoothly.

– I'm very satisfied. We had a number of these. They did their best to accommodate us and I'm very satisfied.

– See previous comments. Again, the CEF process and the fact that we had to keep going through it for every increment and just the fact that to carry things from one increment to the next involves a bunch of change requests; and the processes are pretty cumbersome.

– Yes, because some part of the setup has been changed due to the UOP onboard and some other supplies to be used; something not related to our payload, but for the general setup. Rating is a 4.

– In the beginning it seemed we were doing much better than Increment 7 and we were happy but then in the end we couldn't get the bubble thing in.
2 – Yes, that ECR never got finished. It's still in there.
1 – It started off really good but when the big change happened, it was a stone wall and we're stuck now and will probably never get that. We're very unhappy. Rating is a 1.

– Kathy put notes on this one too. A 5 and wonderful. It's been pretty good. I know we've had to change the procedures a couple of times, just your OCRs and everything. That's been good. We've submitted quite a few OCRs. I don't know if that's on the level that you wanted. With every OCR they've really helped us out like making sure they know what we want and everything.

– {interviewer} – To your knowledge, did you have any formal program changes that you had to push through? A formal configuration management change that had to be approved and go through any process like that?
- We had to get permission to collect some questionnaire data and get access to some exercise data.
- {interviewer} – Ok, so did you have to go through any formal?
- Yes, we did.
- {interviewer} – Ok, thinking about that could you rate your satisfaction with how that went for you?
- I would say it was a 3.

- {interviewer} – Ok, so it sounds like there was a little room for improvement on that?
- Yes. I don't know how it can be simpler but I just think that people could be more encouraged upfront during the general experimental design to say, look, think of any data because I think they have to go through higher for human research they have to get higher ? data, higher ? approval and things of that nature so that always takes a while, but I think what should happen is that really upfront while they're kind of training PIs in how to work with the NASA system, they should tell people to think of all the data that could possibly be relevant to your goals. Or even the things that don't seem too relevant now but might be some direction you'd like to go in the future. So you don't have to go back and change anything.
- {interviewer} – I seem to remember, were there some issues about diet that you had to?
- Exercise and medications.
- {interviewer} – And you had to get approval for that?
- Right. I mean it wasn't like it was a horrible process, but like any beau racy it took its time and it was certainly no worse than getting approval for something here at the university. But I think it's something, you know, they have some fairly nice PI get-togethers when the program first started and probably to know if I were NASA I would probably bring in a metric PI and just sort of have them recap what they went through and what people should do in the future to avoid having such delays.

– 1 – Our answer is 5, very satisfied. They would jump on those OCRs pretty fast and get stuff going so I would say a 5.
2 – From our standpoint, I agree with (1) completely. Our standpoint it was mostly OCRs. I don't think we did any CRs. There were some Change Evaluation forms for manifesting tapes and bringing hardware back, but MSG in many cases did that for us.

- NA

– 2 – Again for this particular experiment we did have a number of changes, some of which were not anticipated and the support that we received through their implementation was really excellent so we give it a 5.

– We had tons of changes and they seemed to accommodate all of them even if it took a little while so I'm going to give that a 4. We were constantly changing things. Sometimes it took a little while to get things through so that's why I'm not giving it a 5. I'd like to give it a 5 but things took a little too long sometimes I think or at least they got held up for reasons I didn't think were entirely sensible so I'm going to give it a 4. But overall I'm pretty satisfied with this.

– I'm going to give it a 3. Before in the pre-mission, pre-operations area of changes I was pretty satisfied with how that went. I did feel like we had some problems in the area of OCRs. I've got a folder of about 10,000 emails in here that I'm going through while I'm talking to you, and I'm having trouble locating exact examples to give you. But there were a couple of times during the operational aspect of things that we felt like the OCR process kind of fell apart.

Topic Area: Customer Support Interface – Communication with Support Personnel
Question 1.3.6 – Please rate the level of your satisfaction with the communication flow between you and the personnel in the ISS Program.

Question 1.3.6 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– Communications flow is great. If they have a question, they call and ask. If I have data I need to provide, I provide it. It just happens. It is excellent.

– Communication between *{the PD}* and our experiment coordinator, Lockheed Martin, and us are almost too good. I get several e-mails a day. There is not a lack of information and I do not feel like I am being left out of the loop.

– The Program (or after you get out of the Program) needs to flatten itself. We used to give information out to multiple people all the time, but that has improved. We still are asked to give information out, and we do not know what it is going to be used for and that bothers us because people are still collecting data, putting it in a document and I am not sure that it is necessarily used. When we are asked to give the data, we like to know how the data is going to be used, so we can better understand the data that they are collecting and the format that we need to give it in. We still have a problem with Annex 5 with Table 9 in it. That document, if you look at it, people plugged data in it in different units. So, it's obviously not the same from project to project, so how is anybody using that data, because they are not totaling it. We have been asked for data that we decided we were not going to provide anymore because we weren't able to get definitions, and people just stopped asking for it then.

– I had good answers from the people I asked.

– No comments.

– No comments.

– I honestly don't remember actually communicating with anyone in the program for increment activities for Mobility since it was pre-imposed.
{interviewer} – Well we can put not applicable.
- Ok.

– All the people involved were very, very efficient and the solution at the end I was very satisfied.

– I think that was all, with the people I could speak to directly, that went all real well. But for instance, when we wanted to talk to Ed Lu everything gets really filtered and we had a real good experiment planned but it involved him having to go get something and move it back to where it was, and they didn't even ask him to do that.
{interviewer} – Ok, there's a dedicated question coming up that speaks to that exact point.
- What we wanted was that, I forge what they call it, that cord out front moved back in front of the glove box so he could snap it a couple of times. So he would have to go down to the middle load and bring it back, and I think as best as I can recall the response that we got back was, "do you have some other way of doing this experiment or do you not want to do it at all"?
- {interviewer} – I see, in other words, they couldn't help you.
- Well, they couldn't help or they wouldn't help. I don't know. They wouldn't ask Ed. Well, with 95% of the people I talk to, I'm very satisfied. I'll put a 3.

– I was very satisfied. I felt the good thing was there was some redundancy which sometimes that word has a negative connotation, but what it was was that I would get the information from the PIM, I'd get it from *{name}* so I think that what I saw was there were a lot of people very aware of the payload and making sure that I was aware of what was going on, so I thought it was great.

– A 5. Communication is improving.

{} – For this increment I'm going to say 4. It was quite good but again because we had a new person it got confusing. We had an additional role that we didn't understand.

– I'm very satisfied with those people, a 5.

{ - 2 - This was the problem because we didn't understand how everything worked during this increment.
1 – So the specific recommendation for a novice is that how would they possibly learn how things

worked. 2 - they need to explain the deadlines for the OCRs and the uplinks and that they have these DPC conferences and everything and all of the time lining has to be explained. 1 - I think the recommendation was made that there be a PI Bible or maybe communications with seasoned PIs should get together to teach people the ropes; the meeting that we have are based on the granting of the funding of the science not based on; there's no real PI meeting. {interviewer} – That has been discussed about having a PI working group. 1 – or a telecon with Dan Hartman and the astronauts; you know, the fact is with all of this pressure on the precious 30 minutes per month that you might get in flight; it's not and I don't understand why and I've met people a year after they've flown for example and they are working at headquarters often but there's no mechanisms to get PIs and astronauts that have research experience together and when I did get to have dinner with someone it was amazing how much we shared the same identical frustrations and we didn't know how to communicate with each other.

– During the development of *{our investigation}* I probably had daily to every other day contact with *{name}* and we had good communication so I would give that a 5.

{} – I'd put a 5 on that one. Sometimes there might have been a couple of misunderstandings in what we were trying to ask, but as far as communicating and trying to keep things going and gaining understanding, I'd put a 5 on that.

– I would say 5. I was very satisfied. Actually I don't remember any particular instances of communication between the ISS Program and me but I'm sure there were some in the course of doing business and I don't remember any problems.

Question 1.3.6 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– Rating is a 4.

– I clicked a 5. It's a real neat team. Everybody is pulling to satisfy the research.

– I think I would give that a 4. I think they're always willing to talk to you and I think they're generally pretty good in explaining why or why not something can or cannot be done, or will happen or will not happen.

– Rating a 1. There was none. We only interacted with the junior points of contact. Same issue - junior points of contact with poor flow of information to and from management. Example: we were asked to sign off on submissions to various committees and we only got the submission page and we were asked to sign off on things we didn't see, that we only got the submission page on.

– We were very satisfied. I think we go back to the CODE M folks and to the PIM who work with us often but I would also have to just compliment other individuals who picked up the phone and called to let us know what was going on, so definitely great communication.

– Rating is a 4. No comments.

– 1 – I think that was good.
2 – I think we both agree it was a 5. I'm speaking of the point of view of the operations side of things and I think part of it is due to having known some of these people for such a long time that we know how to work with each other now.
1 – And from the integration side of things, that was good.

– Very satisfied, a 5.

– I would give that a 5. It was smoother than the last increment because we understood who to talk to about what now more.
{interviewer} – And that was because you were more experienced in the program and you had the participation of your ESS?
- Yes.

– I was very satisfied.

– Except for the on the Russian side, I would give it a 4. Again, it falls back to the same issue.

– A 2.

– We have weekly telecons. They were always held, rarely cancelled and our communication channels were wide open so I'm rating that a 5.

– If you're talking about Karen and Kathy and her predecessors, it's a 5.

– Again, my science support people took care of business on this. I was very satisfied.

– 2 – Our main interface was with *{name}* and that was excellent.
1 – I had marked it a 4 because our interface with *{name}* was outstanding; the fact that nobody responded to that memo for record was a black eye in my opinion.
2 – We did not have as good interface with the safety I don't think.
1 – Right, the safety point of contact was awful.

– Very satisfied, a 5. In principal we had a good feeling. We had a faster answer to our questions so it was really good cooperation.

– A 5. It went pretty smooth.

– 1 – I thought it was much better for this. We didn't always get what we wanted, but we certainly got to communicate a lot. Rating is a 4.

– I was quite satisfied. I'll give it a 4. I could call anybody and get an immediate response and people are very helpful. It's a very friendly collegial sort of setting.

– 1 – I would say very satisfied, a 5 for Increment 8. Things got much better in Increment 8 so I would say a 5.
2 – I agree. We might have chosen a 3 for earlier increments because we did have so many people come to us asking us questions when we had a payload anomaly or planning, but it got substantially better in Increment 8. A 5 would be appropriate.

– A 5. The routes of communication are pretty established so it's fairly easy for communication flow to understand how it flows and who's doing what.

– 1 – For this specific increment we really didn't have much interaction.
2 – LIS, we had some interaction and it was very good interaction with the LIS.
{interviewer} – And you felt that your interaction with the LIS was good, for example, that would have been an important interface.
1 – Yes, especially for coordinating on orbit crew time and the crew conferences and they were really instrumental, so as a result we were able to advance our science and get a lot done.
{interviewer} – Give me a rating on that scale, please.
2 – A 5.

– This is very mixed. Some people I want to give a 6 and other people I want to give a –1 so I don't know how to answer that question.
{interviewer} – You'll have to average.

- Then I think I'm just going to split it right down the middle and call it a 3. Some people I've been very satisfied with. Some people have definitely been great and some people have been pretty bad so I guess on average it's a 3. But that answer does not reflect the fact that there's almost nobody that I feel neutral about. Some people I'm more than happy with. The communication has been great and they've been very helpful and other people have been pretty unhelpful so let the comments reflect that this is an average and that in fact people fall in the two groups more or less tending toward 5 or tending toward 1.

{interviewer} – That's a very helpful comment, thanks.

– I'm going to give that a 3 also. Again, I would say pre-mission I thought the communication flow was good. During the mission there were some times that we had comments that we maybe wanted to get into the system. You know there were some real-time things going on where our POD support didn't really seem to be listening to us. There were just a couple of instances in there where I remember my guys telling me after the fact that some things were being discussed on the loops and they were trying to get some comments in and were kind of basically cut off or not listened to. I guess I should probably go ahead and give this a 4 because overall in the end-to-end process I thought the communication was pretty good. I feel like there were some times in the operations area that things didn't go as well as they should

have, but I guess I shouldn’t really let that cause me to downgrade the whole thing down to a 3 so I’ll give that a 4.

Topic Area: Customer Support Interface – Information Sources
Question 1.3.7 – *Please rate your level of satisfaction with the ease of locating necessary information.*

Question 1.3.7 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– Most data is web based. It is not totally perfect. Once I knew what to find and someone gave me an idea of where to look. I may have been looking in one area but after conversations I realized I might need to be looking an organization's web page that I did not associate with that type of data.

– Questions about the current state of the Program are constantly in flux, and it is hard to find one web site that you can go to find the current schedule of flights and that sort of thing. Maybe it is out there, but I haven't found it. Maybe that could be improved. I realize it is constantly in flux. Sometimes a question will come up about putting us on 12.A or 12A.1 and I want to look at a schedule. I'm sure it is out there but it is not always easy to access that information. Suggested being able to download a PDF file that has the current state of affairs regarding the increments and the Soyuz flights in order to see the big picture. If there was a way the community could have that information or a link to that information that would be a good thing.

– This is one of the things *{name}* and I talked about. What we normally do is call the PIM and the PIM tracks the information down. The thing that bothers me about information, and it is more from the outside, is there Jedi page and the PODF (Rico) page, and you really need both of those in order to continue to work. Those tools are out there, but you have to have a UserID to get to the page you want. MPV, the Crew Procedure Viewer, iURC you need to VPN to get that information, but Glenn does not allow you to VPN out. They start to modify the way you tie in to these tools. So depending on whose firewall you have to go through to get to this stuff, we cannot get there. When they make a change, and they're making it more secure at their location, and I have to come outside of a firewall at Glenn, and I cannot get to it any more. They make these changes without coordinating with the end-users. We have been fighting that a lot. The URC has been the major driver, and there are all these other tools that are behind that are going to do the same thing. We have actually been the catalyst to get Glenn talking to URC, so hopefully we will have a work around before that actually comes in. My issue is that is why is it that a small payload with a limited budget is spending time making sure that the tools are available. Why isn't the Program making sure that the tool is available to me?

– We were helped in our search by the PIM and it wasn't so difficult. When I would do the search by myself we would use the PALS system, but you know there are a lot of documents concerning the Space Station Program, so we needed some help to find the right info.

– If I had a question I just asked *{the PD}* . It's very simple. It's the simplest human interface that you can have. A human interface with a human.

– I am a stepped removed from the process, but the individuals who work with me and needed to identify the information were happy with the mechanisms that were available and they were able to find what they needed, based on the input I received.

– I can give that a 5. I would typically go to the RPWG website.
{interviewer} – To the RPWG website?
- At that particular time that was the only place I knew to go.
{interviewer} – It's still interesting that you would mention that. It's just that no one has mentioned that yet. Yes, I say it's interesting because this is the kind of thing we're trying to find out is what tools that are out there are things that people are using.

– When I needed to know something I called the PIM and I got the answers all directly or through your flow. The level of satisfaction is ok, so it's a 4.

– I'm not exactly sure if we had to look for anything. About the only think we ever looked for was *{our investigation's}* data that's just provided by the PIMs up at Glenn so you just log into their site, so it's not big deal. What do you mean by necessary information?
{interviewer} – Necessary information is anything you wanted to know. For example, if you needed to

know when your experiment was going to be run. If you needed to know, what the conditions were. I don't know that much about the glove box but if you needed to know the conditions in the glove box or what.
- I would say a 4 on that, that was good.

– I was very satisfied. Let's give it a 5. But I will tell you that my comment would be is that I was always able to call someone, the PIM, folks in Code M to help me locate that information. I depended on personal support a lot to help me find the things. It's great to have that phone number to call.

– I would give it a 5.

{} – I guess I'll give that a 4. For the basis things that we needed to collect our data we were able to find everything, but what was difficult to find out was who was who. If they did some kind of way to look up an organizational chart that would have been helpful especially when I went to Russia I was trying to figure out who was who there. It was very complicated for me, but in terms of getting the basic job done of getting data we had everything we needed for that.

– I don't really know, that's sort of not applicable. I don't have to locate anything. I haven't had any problems, but I haven't really had. I think maybe my science manager has taken care of that for me.

– Great.

– As we discuss this, we think it's a 3 because ease may be a little bit of an ??? Because there were some days it was not readily available. We were fortunate that *{name}* had good contact and maybe had background in certain areas that he was able to find data that would have been more difficult for us to find and make those contacts. Had *{name}* not been the core in the project we probably would have had a more difficult time, but it took some work. I'd say a 3.

{} – For Increment the time we were trying to use more of the information available on the TSC as far as vectors and whatnot, so I'm going to put.
{interviewer} – *{name}*, let me interrupt here for a second. If you're thinking about that particular case, can you do me a favor and sort of divide that up into two parts; one is how easy was it to simply locate where the information was and then in the next question we're going to ask you about accessing it. It's something that we've drawn up as being a little bit separate.
- Ok, locating let's put a 4 on that because it was a matter of finding the right person.

– I'm having trouble thinking of any information that I had to go and locate relative but things like schedules and things like that I would say 5, very satisfied.

Question 1.3.7 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– I'm very satisfied. We received always a prompt answer to the questions so I will give it a 5.

– This is a 4. Again, with everything pretty much being web based type data, it was easy for me, once I knew it was there, to go get it. I just had to ask questions.

– I don't recall any difficulty in locating necessary information, but I don't recall trying to locate any necessary information either.
{interviewer} – Then let's put NA.

– Rating a 1. It's impossible to find forms, the information they want. Requests for information clarification were seldom clarified.

– {interviewer} – I might modify this question a bit just to say obtaining information in general.
- Ok, not necessarily web site access but just information from individuals, correct?
- {interviewer} – No, I would say that you can throw in web site access because we've changed the questionnaire a little bit with respect to that topic on this go around.
- Let's give that a 4. I would say that in dealing with individuals excellent. The web site had been a bit of a challenge because from our standpoint we realized that to access some of the data bases we needed to have a static IP and it wasn't until we attempted the process that we learned that we needed to do that and to get that has taken months and months and months. Much longer than we ever expected to get that static IP address, so we've had to depend on CODE M and our PIM sometimes to provide us with

information until we got that set up, so I think what we learned that would have been helpful is that perhaps if we had known these are things that you're going to need to access, these are the requirements to access those would have made the process easier because we could have started much further in advance. We're still kind of working on that now to get that all straight. It's just funny because we switched the PCs. We felt the PCs were going to take care of the databases and then we found out there's still that one more step and as I'm sure you know at JSC getting that static IP can be a paperwork trail so that would have been helpful if we had started that at the same time that we'd started the PC transition.

- {interviewer} – So how long ago did you change from Macs to PCs because I thought the entire center went to PC only.
- Our contractor, OSU, provided us with Macs. That was the first challenge was that we were Macs in a PC world and that was the first thing that we were told that we couldn't access a number of the payload and ISS databases because we had Macs and so then we negotiated to move to ODIN PCs and then we tried again and then we learned that there was a requirement that not only did we have to have PCs but we had to have the static IP.

– What kind of information?
{interviewer} – The question has a pretty broad scope. It's almost anything. It's when you're working on a day-to-day basis and you say I need to know, for example, about some schedule or crew training or anything and you need to know it. Generally what you do is call your payload developer.

- We normally call our ESS (experiment support scientist) when we have a question like that and they would usually answer us.
- {interviewer} – But that's ok.
- I would say a 4.

– 2 – That's sometimes a little difficult.
1 – It is. I mean obviously we did locate all of it.
2 – But not with any small ease.
1 – Well yeah, I don't think it was easy.
2 – From my point of view I would give it a 3.
1 – No, let's stay with a 3.

– I called *{my PD}* and very rarely I might call Al Holt and get information I needed. Let me ask, this information is related to just my specific payload, not related to necessarily the whole Station thing?
{interviewer} – Given the fact that you're a long standing user of Station, I would say if there was any case where you wanted to find out something more about Station or its capabilities, things like pointed information, attitude, that kind of thing would be included.
- Ok, if that is the case I'll put a 5 here because I do get information from other sources than *{my PD}*.

– Well, if we actually had to find information on our own, I think we'd have a hard time doing it so we had to just lean heavily on our ESS and their team and they've been very good about getting it for us. I'm not sure how to answer that. That worked well.
{interviewer} – Well, that's fine. If you used that type of vehicle, a human vehicle, that's ok too. So that can be part of your rating.
- Ok, so that's my comment and I'll say very satisfied.

– I was very satisfied. I always got a response to anything I needed very quickly.

– It wasn't really a problem with this experiment. I have noticed with other experiments it can tend to be a problem, especially for PIs that aren't local. I don't know if this could ever be done but central location or a web site where there could be links that kind of would help all of the Payload Developers and PIs, but for this experiment it was fine. There really wasn't much to it. A 4 rating.

– A 4.

– Most of the time. There are certain things about crew operation that impact our experiment so we are still really struggling to find out so there is a bit of a disconnect, or there has in the past been a disconnect, between the experimental infrastructure and the operational infrastructure. So, for example,

understanding precisely the configuration of the exercise equipment and as it was used during the day of our experiment is something that has proved extremely difficult for us to obtain, and yet it's relative not only to our experiment but to the way in which our data can be used by the program. I feel there needs to be more interconnection between the PI, the PI support structure and the operational side of the house. I'm checking a 3 for that.

– A 5.

– Very satisfied.

– I had marked that a 4; for the most part we could find everything we needed; the biggest problem was the undefined process.

– NA for Increment 8 because we had no documents to prepare so we only had to provide support and it was easy for us.

– I'd say a 4. We always had the POD or LIS to ask for information or our PIM or something if we couldn't locate information, but not all of the time could we locate it on our own.

– 2 – A 1.
{interviewer} – Give me some comments.
2 – It's still the inventory. We didn't know what was on station or where it was and nobody was able to provide information. We also had the high bandwidth downlinking problem with the video. We didn't find out until the end of the increment until all of our video was downlinked at the low bandwidth except for our last activity and we didn't find that out until the very end and the person that we needed was at JSC the whole time.
{interviewer} – And I remember working that problem with you (respondent 2) about the station support equipment and hopefully you're satisfied with that. You've gotten what you needed?
2 – We're still working on it. We have firewall issues.

– My usual thing is I ask *{my PD}* and one way or the other I get it. I give it a 4.

– 2 – We thought a 4 because I know there's a website where we can download some documents if we need them, station documents. The Phantom, the video folks, were very helpful in helping us locate video and pictures during our gear problem that we had. Our gear system ceased up at one point and they were helpful in helping us get some pictures of that and the POIC folks approved an OCR for us to do a video survey of our hardware that really helped us kind of narrow down where the problem was. But sometimes the websites to download documents or to get pictures aren't easy, so we had to ask for help. That's why we rated it a 4 instead of a 5.

– I put a 5 on that basically because we have what we need, but during Increment 8 the ISS TOPO team? had helped us access sectors in the telescience center on some certain websites and helped us gain access to those.
{interviewer} – What's the exact name of that team?

- TOPO it's the pointers or the people. It doesn't mean topographic. It's the people who are in charge of the attitude and the sectors.

Projectory ops something – I forget what it stands for.

– 1 – That is I would say a task where Wyle really supports us a lot and I haven't heard any comments in regard to any difficulties in terms of obtaining any data whatsoever so we always have been able to get the information we need.
2 – Yes, and that is as long as a document the instrument is available because I believe there are some changes that are going to be applied in the future that will facilitate acquisition of other types of information such as an inventory of all materials and items that are available in the ISS. I don't believe such a thing has existed and it's evolving into something better.
{interviewer} – Yes, *{name}* at Boeing is kind of managing that, SSE – Station Support Equipment, laboratory support equipment and I think it's going to extend to other things.
2 – And that would be very useful so we've been able to locate information as long as information was available. Rating is a 4.

– Somewhere between a 1 and 2. I'll call it a 2 because it's possible it could have been worse but

definitely in this case a lot of times it took multiple phone calls or phone tag or email just to answer some of the simplest questions. I found this actually generally pretty frustrating. Things like scheduling was always up in the air, what was asked of me often times was not very clear like if I had a question a lot of times it was just very difficult to get a reasonable answer so I'm not real happy with this.

– I didn't have a problem with that. I didn't feel like that was an issued so I'd give that a 5.

Topic Area: Customer Support Interface – Information Sources
Question 1.3.8 – *Please rate your level of satisfaction with the ease of accessing necessary information once it is located.*

Question 1.3.8 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– I had problems trying to get to the right web page or getting permissions to access certain web pages. There are some small housekeeping-type activities that tend to hinder that. Once I got the permissions then I could get access to it. I understand that with security concerns it needs to be protected data, but it does not have to be so tight.

– See above.

– I would like to get the security guys for the agency and get them in a room, and make them come up with a plan as to how NASA Centers are going to be able to talk to each other. I know that another problem is tying in the universities. But having a problem with the universities is one thing, but we should not be having a problem with Centers talking to Centers. I was on a telecom with someone on the Program, and they understand this problem because they have trouble dealing with the security folks also. But, the weight of the Program is a lot heavier than the weight of a small project.

– Now that the system is integrated to an easier method, we have tried it and we are able to access information.

– No comments.

– No comments.

– I'll give that a 5.

– A 4.

– I don't recall any problems accessing anything once we found it. It was sort of accessed and found at the same time. Well, that's not quite true. For instance, looking at Sam's data in the glove box. You've got to go to the PIMs and you've got to work down the chain until you find the right stuff.
{interviewer} – That's right. I worked micro gravity before I was working this stuff and I'm familiar with that. You had to use their web site. You have to navigate through it to get to the data and that's the kind of thing.
- That was no problem. I mean especially by then it wasn't a problem. It may have been a problem the first time we tried it, but then again those Glenn people are extremely helpful with that stuff and we didn't have any problems since. I give it a 5.

– For us, I would rate that a 3. That is not a problem so much with the program but our contractor had provided us with Apples so what we found that by being on those particular machines, we were not able to access a lot of the information we needed, especially the stuff at Marshall. We have since switched to PCs and now we're in the process of going back and making sure that we have all of the proper information placed to get to the databases and things, so for us that was part of the dilemma is having the Macs but I think we've taken care of that on our end.

– I would give it a 5 also.

{} – I don't recall any difficulties with that so I'll say very satisfied.

{ - NA

– 1 – Like 2 said it was hard to get into certain databases. 2 - For ex, once I found that to get permission; I didn't know about it in the first place but the permission came from the people we were actually working with so that was very frustrating and then the IVODs; we didn't know about the IVODs and these things I found, I found purely by accident. That's been a lot easier. The people at Marshall have been very helpful. 1 – The specific recommendation I would make is that the PI team once it's accepted as a PI Team which is the biggest competition that they should be given a certain set of permissions for accessing the information. 2 - It's different for different things, it's specific for different things, it varies. 1 - I think once you've selected your PIs it's a very small group of people that you might as well give them right off the bat the passwords and the list of where things are so they can learn stuff; information is the key to the success of any organization. 2 – I guess they're worried about protecting other people's data. 1 – I'm not asking

for data; this is information about the process, this is the customer support interface question so this is like these databases; we shouldn't have write permission that would change the data, I'm only asking for read only permission or with a specific requirement for passwords for read only accesses to databases. 2- If there was some way to just find out about everything off of that going back to the PI Bible so that people don't have to search for things.

– I didn't have any problems accessing the information once I knew where it was from the OSO people and from inventory from the ops (tape skipped) and I think that's the only interaction that really happened (tape skipped). I think a 4.

{} – Let's put a 3 on that. It took a little while to get the account numbers and to get the clearances and whatnot, not any clearances, but getting the paperwork in and getting to the right folks to get that done, so sometimes they're not the same.

– I'd give this a 5 also.

Question 1.3.8 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

Topic Area: Customer Support Interface – Crew Interface: Training and On-Orbit
Question 1.3.9 – *Please rate your level of satisfaction with your Investigation's interface to the crew on-orbit.*

Question 1.3.9 – *Comments from Increment 7* (click link at left to return to corresponding datasheet)

– Working through POIC, PayCom and POD was excellent. If I needed to get words up to Ed to change or do something, it happened. We actually did speak as Ed was speaking, it was an interactive process. We were watching video as Ed was setting up *{our payload hardware}* and I was able to get a couple of comments up to him while he was doing that.

– N/A

– I think our access to the crew has been pretty good. Increment 7 had its own issues with the crew, but our interface to the crew was pretty good.

– We were able to have a closed loop with Marshall Center during the flight session of *{our investigation}*. Any questions for our side, we were in contact so it was easy to solve any matter. I would recommend for future operations for payloads like ours that involve the QSS side and I suggest the video link because it is important to see real-time what is happening to the crewmember. We had the closed loop so we could answer any questions coming from the crewmember, but it could have been important to try to give him some hints in case he would need that. We hope that in the future we could have this opportunity. This was our first payload so we didn't have the experience to request such a requirement.

– N/A

– Another aspect in which we were able to have interaction with the crew that exceeded our expectations.

{ - NA

– It would be a 5 because we were on the loop via the POCC and we are very satisfied of our interface during the operations in orbit. We were able to follow the execution of the experiment so we're very satisfied.

– That could be better. I think we had some problems, but like we mentioned before. If you want to stick with en we were disappointed sometimes when things didn't get done or things were rescheduled because, for instance, maybe they ran a half hour on Saturday or something like that. Again, the crew may have no idea of any of this. I think things get slowed down and we're not allowed to talk directly to the crew and not pertinent to this increment, but to Mike Foale's when we had those repairs on orbit. But things went a lot smoother when our hardware developer here was able to talk directly to him. So I think this firewall they put up. I suppose there's some justification for it and when I did have a chance, I never spoke with Lu but I did speak with Foale, and before you can speak with him it's all scheduled and they give you a list of do's and don'ts, and t hey give you a break, break if you say the wrong thing and on and on. I suppose there's some justification for that, but it's. For that increment, I give that a 2.

– I would give that a 4. I think one thing we saw that we perhaps would have had a bit easier time if we had had time for crew training prior to flight. I think no matter how good your OBT is that that personal interface with crew members allows you to perhaps convey a little bit better not just what you want done, but in our case certainly we perhaps could have conveyed a little bit more why we doing that and the educational value. We did have a crewmember question somewhat why we were doing this and I think that just reflected not having that one on one time. Although in the end it all worked out just fine.

– I would say 5. Especially with Increment 7, we had opportunities where we interacted quite well and actually this Increment 9 is much better. This is not part of the survey but I want to tell you that we had a very nice and productive session within just a couple of days ago.

– What ended up happening is that the American crew member was not a subject, but the American crew member had to downlink the Russian crew member's data because the American crew member knew how to do that so there was some communication that went on. I guess there was one point where we wanted to make sure that somebody checked with them to see if they had any questions and they could contact us and we weren't sure if they got that message. I guess I had the feeling that if I really needed to contact them that I wasn't sure I'd be able to but so far we've never really needed to. So I guess I'll say a 4.

{ - NA

{ - 1 – For was horrible, it's a 1 because I was on the phone yelling my head off and everyone was too busy to listen to me and to get the recommendation in it was very difficult. 2 - I wouldn't say it was a 1 because you had the one crew conference with him; the crew conferences are very short but they actually in that short amount of time the crew members are able to give quite a lot of information; he had a lot of suggestions because we had this mystery with the pictures and why the pictures looked so strange that he had; he has some ideas. 1 – We're not talking about him and what he did but I want to emphasize exactly what you're saying that the IVODs, we got the IVODs in order to have the crew conference but once we had it helped the interface tremendously even to hear the DPC and the procedures so our level of involvement was markedly increased with the IVOD; so before IVOD let's say it was a 1 and after IVOD let's say it's 4. 2 – So we didn't have IVODs for this increment. So are you including activities? {interviewer} – Yes, we're including that. 2 – I don't think we had any of those messages for this increment. {interviewer} – So give me a number. 1 – I guess a 3 but the specific recommendations are to have Crew conferences and to have PIs on IVODs in the room and permission to talk when it's important and to be able to see what's happening; that tremendously helps the interface.

– I'm pretty satisfied. I would rate it probably a 4 because he did our OBT and he had questions and he did take pictures of all of our coupons and he was responsive so he was interested in what we were doing. {interviewer} – Right, but what this question is asking a little more precisely is your interface to Ed. You know obviously the way ops works there's different intermediaries between you and him that relay information or requests and so forth and how did you feel that process was?
- I'm going to say a 4, I was pretty satisfied with them.

{} – I'll put a 4. It's good, again it's sometimes more direct communication would be better. But actually for Increment 7, there were a couple of cases where I think it was *{name}* who was the LIS, had like a payload session where we could get discussion going if we had an issue or whatnot with Ed at the time. So, it was available. I'll just keep it a 4.

{ - NA

Question 1.3.9 – *Comments from Increment 8* (click link at left to return to corresponding datasheet)

– We were on the voice loop, of course, during the experimental sessions, but everything went smooth so there was no need to redirect the operation or to modify anything in the experiment execution so the interface to the crew in that case was, of course, in the voice loop and just enough to give us the confidence that everything was going smooth, so I'm really satisfied.
{interviewer} – Ok, I'm going to give that a 5 then.

– No requirements.
{interviewer} – Just remind me – *{your investigation}* is largely controlled from the ground, right?
- Correct. Once the crew sets the hardware up, activates the software, we're autonomous.
- {interviewer} – And it's just staring out the window.
- That's it.
- {interviewer} – So NA.

– Very satisfied. I think there was some good interaction there, particularly during repair operations when I guess the payload designer and builder down here was actually able to bypass filters and speak directly with Mike Foale. Things really went smoothly then. And I did have a nice talk with him also prior to doing the experiments.
{interviewer} – Alright, so you were able to get some direct interaction with the crew which you think helped?
- Absolutely.

– Rating a 5. It was excellent. Downlink video, real time communication was excellent.

– Excellent, very satisfied. They did a great job.
{interviewer} – And you were able, in cases in Increment 8 when you really felt you either had to talk to

the crew or desperately get information to them or they needed to get information from you that you were able to accomplish that sufficiently well?
- Yes, very much so and I think in addition to that I think that we felt that people were anxious to facilitate that. That if we felt we needed to share information with the crew or if the crew had a question there were many people in the process who were very anxious and intent on making sure that we had that good communication. Whether that was sitting in the TSC and being enabled or whether that was via email.

- NA

– 2 – Can we give it a 10?
{interviewer} – Well, so that went well?
2 – That went very well largely due to the crew member we were interfacing with.
{interviewer} – Ok, this is I8 now.
2 – Yes, for *{our investigation}*. Specifically for *{our investigation}* we had never required that we have video downlink during the operation of *{our investigation}*, but Mike Foale thinking that it was important to the experiment and really wanting to communicate with us during that time, he chose to downlink video during the operation and it was key that he did that.
{interviewer} – Interesting. Well, obviously we don't have a 10, so I'll give it a 5.

– I'd rate it a 4. Quite good. Because we're a long standing payload the crew has gotten to know us better.

– Very satisfied. We didn't have very much but we knew that they knew they could contact us if they wanted to. I don't think we had any direct interface, but we were also able to send up messages to them thanking them for their participation and things like that, and we were confident that those were indeed sent. We felt like if we needed to get a hold of them it could happen.
{interviewer} – But you didn't have any direct conferences?
- I don't think we did. We did on expedition 9 but not on 8. So I guess it would be either very satisfied or not applicable.
- {interviewer} – I guess it's not specifically defined here, but if you feel that you were able to communicate by some means and that was successful to your satisfaction, that's fine whether through indirectly.
- We did send up some messages to them via our ESS.

– First let me just think here. It seems strange to me that we couldn't talk to Mike unless he talked to us. So it seemed sort of odd that we could hear the question and then we would answer the question and then somebody in Houston then would relay exactly what we said. That seemed a bit cumbersome to me unless he specifically asked to talk to me which we had a couple of conferences. That just seemed sort of cumbersome that we just basically hear the person repeat exactly what we said when we were sitting there listening and could have answered directly. I mean I was satisfied that he requested conferences and they downlinked him to me in my office for a post-experiment conference and we had a pre-conference, but during the experiment it just seemed to be sort of odd that it was being relayed through someone else.
{interviewer} – Understood. That's good feedback. We appreciate that. What would you give this on a rating scale?
- A 4.

– NA

– A 2. We had one conference with the crew on orbit and the setup for that was great; everybody did a good job.
{interviewer} – Do you feel that, and this is not just necessarily talking directly to the crew but it's any times you felt you needed to get information to the crew through whatever system directly or indirectly. Are you reasonably satisfied or how do you feel about that? Were there any times you felt you needed to get information to the crew but couldn't?
- A 2. We give you a 5 for setting up the conference with the crew but if you talk about all of those other things then you get a 2.

– I think that would be a 2. Our messages generally got truncated, our words for the daily load summary were abbreviated and we did not have any conversation with our crew member subject during the

increment. So I rate that a 2.

– Well, ok, I would have to say. Well, first of all let me say before I give you a number. There are both institutional and cultural obstacles in place to limit contact with on orbit crew for obvious reasons. If anybody could call they'd be bothered constantly. So they need an equivalent of a Spam filter to prevent people from bothering them. However, it's carried to the extreme to the point that on orbit crew would like to have communications but there are obstacles to it and it's my understanding that Michael established some procedures that facilitated communication with PIs for experiments because he was so interested in doing the science. He wanted to do as much science as possible. One occasion that I had to communicate with him, well there were a couple of things. His birthday occurred early in the expedition and I wanted to send a birthday greeting and it was probably not going to happen if I went through the normal channels, but I had met a woman who was a PayCom. She had attended one of the ICDs that I had delivered, not for E-8 but for a subsequent one which ended up being E-10, I think. But anyway, I asked her about this because I had told her what I wanted to do in a month or two and she said, "write to me, send it to me and I'll see if I can get it done". So, I went around the system in order to do this. And it all has to be cleared. The message had to be cleared by a couple of different levels before it went through but it got through and Michael was delighted with it and stuff because I had also communicated with Arthur C. Clark the famous science writer that they had watched 2001 in their first week of orbit and were talking about it for a week. This I didn't get this from my journals but from watching NASA TV and streaming video. So I reported it to Arthur C. Clark and he wrote back, "oh, he's delighted. I helped to entertain the astronaut and please convey my birthday wishes to Dr. Foale". And so I followed up with another request and wrote the woman at PayCom and said, "I know I told you I wouldn't do this again, and it's a day later and here's this other message if it's appropriate please pass it on, and they passed it on and Michael wrote that he was just delighted and it really impressed Sasha, his crew mate to have a message from Arthur C. Clark. So I've gone around. But then in the middle of the mission, every month MCC downloads the journal files, leaves it there but downloads a copy and then it's encrypted and then they call, the TSC people call me and I retrieve it through a VPN, a secure remote provided with a pass phrase and then I open it, confirm that it's intact and then I copy it to another medium and then the TSC deletes it from their computer and then calls MCC and they delete it from their computer. This went fine for the first 3 months and then whoever downloaded it deleted it from the on orbit computer, deleted the file after downloading it and, of course, Michael wanted it back so that he could review what he'd written before when he's making his entries. They told me to send the file to the MCC and I said, "well, I can't do that because I've promised confidentiality in my ICDs and I saved the encrypted version. I will send the encrypted version back and they can then send that up". They said, "No, no we're not going to send encrypted files to the Station. It will take them too long to decrypt it". It takes like 10 seconds, but they're very, very protective of bothering the crew. And I guess from the Skylab days when they overloaded the crew with work and the consequences were pretty grim that they don't do that anymore. Anyway, so I wouldn't do it. I said, "I need to have verification from Dr. Foale that he wants me to do this". And I waited a day, got the message from Mike and then sent it back and they sent it up and that was it. I mean it's password protected at all times, but I promised them levels of encryption that was greater than that and I couldn't unilaterally violate that promise to the crew by complying with the MCC without the permission of the crew.

{interviewer} – You were always going through PayCom for this?

- Well, for this one I sent it to Michael's email address. I guess it was intercepted and then passed on by, not PayCom, but CapComs. And it worked. So, am I satisfied with the investigators interface to the crew on orbit? I've done isolation studies in the past, full mission simulations for the military. We always have some sort of off-line channel to have a line of communication for things that go wrong as a contingency. It didn't seem to be in place for this sort of thing and I would have preferred to have a more direct route. That was a lot of information. I hope you didn't write all of that down.
- {interviewer} – That's all good stuff. The program likes to know what's going on and your level of detail is just fine.
- When I gave my ICD to *{names}*, actually *{name}* wasn't there in the room but anyway. I have slides that

say this is what you'll do if you agree to participate in the study and I had a slide called "The PI Promises" and I listed all of those things that I promised to do in terms of the confidentiality and returning and all of that stuff. At the end Michael said something like he's been in many ICDs over the years and stuff and it's the first time that he's ever seen one where the Principal Investigator actually promises to do something and why did he do that? I said, "I don't know. Maybe because I'm new"? And he said, "I think everybody ought to take a lesson from it. It's really useful and it helps me as a crew member, he said, to feel more confident about the science". It's like I was committed to those promises not just because of his reinforcing comments in the ICB but because it was the right thing to do and I just could not violate his confidence by responding to the request.

- {interviewer} – How about a rating number?
- Well, I was successful. How about a 4. I was successful. In every large organization that has rules that limit things like this there are always ways around them and I was able to succeed so I guess I'll give that a 4.

– rating is a 5. We had great access.

{interviewer} – Really? So you were able to talk to the crew or at least get information to them?

- We had multiple, well we had direct communication during my experiment which was quite good. And then we had a session afterwards with the crew that was again on orbit was very good. 15 minutes of direct communication about it and then we had access to the crew in Russia and then access to the crew back here, so it was very good.
- {interviewer} – It sounds like you've had some good things and some bad things.
- Well the actual experimental conduct was great after we got through all the pain to get there.
- {interviewer} – I see, so the execution, real-time ops was good, but getting there was painful. Ridiculously painful.

– We were very satisfied from the standpoint that we were pleased that the crew member requested an initial prep type thing and he also requested a debrief which was not standard so we were pleased with that.

– Very satisfied, a 5. They were very fast to download the data to us after the experiment conclusion so we are very satisfied of that.

– Very satisfied, definitely a 5. Kathy wrote wonderful so put that down and I was very satisfied with it as well. Every time we had a comment, I mean the crew actually wanted feedback from us on how they did and vice versa so we liked to give our feedback as well and everybody communicated. The chain of communication was great. We always got everything up that we wanted to tell them. They always sent us little voice clips of what Mike and Mike (Increment 8 Mike) were saying. They even requested crew conferences so it was great.

– 1 – I thought it was much better. The interface with the crew was great, we had IVODs working.
2 – And we had several crew conferences.
3 – I think a 5.

– NA. Question – they don't let PIs talk directly with the crew, right?
{interviewer} – It happens. It does happen but there a procedures and protocols that tend to try to, for lack of a better word, I don't want to say they discourage it, but it's just the system is set up to not have that happen too much. The reasons behind that are out of my scope of understanding because I'm not an OPS person.

– 1 – The answer is a 5. We were very satisfied on Increment 8.
2 – Michael Foale requested some crew conferences with *{our PI}*, and I think he had a conference with our PI and our hardware developer, one of the key hardware developers Guy Smith, was able to talk real-time with Mike Foale before he tried to repair the thermal chamber and actually during the repair and they were able to, as Mike was taking the gear apart and asking questions, they were able to talk about "well I don't think you need this much lubricant, hey that looks great Mike what you're doing there" and he asked if he could remove a little Teflon disk from our ?. Guy told him yes after we consulted on the ground with the folks. So there's a lot of information there, but the bottom line is it's a 5.

– A 4. Overall good, there was still a reluctance of sending questions that we had for the crew to them. For

instance, we had questions about a lens Mike Foale was using and we never did get them resolved until Mike Fincke got up there.
{interviewer} – Maybe you can elaborate a little bit about when you say there was reluctance. Can you trace the part of the program where that reluctance might have been residing?
- I think it's more in the real-time ops. It would be, I honestly couldn't say whether it came from PayCom or POD, where in that hierarchy. It was just hard to get questions to Mike about this particular issue and we're not quite sure why. I don't know if there was a sensitivity there we weren't aware of or whatnot, so.

– 2 – It exceeded our expectations. We had several crew conferences.
1 – We really felt we got a lot of mileage having those crew conferences and it really allowed the PI and the crew to interact to be very efficient in terms of activities and information.
2 – So it improved the science return and the PI was very pleased. Rating is a 5.

– You've got to define this a little bit for me. What do you mean by this interface?
{interviewer} – It varies from investigation to investigation. Certain investigations don't have that direct access to the crew. Their crew access is managed by intermediaries. Some investigations get a little bit more direct access to the crew. What I'll do for this one is paraphrase it and say, when you felt you needed to provide information to the crew and tell them something or at least pass on information to them, do you feel that the process for doing that was adequate? What's your satisfaction?
- This is the JSC / *{Payload Development Team}* distinction?
- {interviewer} – Well, actually most of this would have been handled by the people in Huntsville once your operations are up and running.
- Ok, when it gets to Huntsville they're sort of sending it up, but there's a vast difference between the LIS and when they wanted something from me and when we agreed to go via that route to send something up to the crew, I was extremely satisfied. They allowed me to have my own documents that I made, for example, an Adobe Acrobat file. Why that was nice is because then I could include graphics and say exactly what I wanted to say and it wouldn't get tampered with before it got sent off. I mean it would have to get approved but then at least it was my own words so in that case I was very satisfied. On the other hand, some of those documents that went through *{the Payload Developer}*, *{the Payload Developer}* sat on for weeks before they sent it up so I don't know if that's part of the same interface question, but in that case I was extremely very unhappy with the level of that interface. So in a general sense if it's the people at Huntsville I don't see any reason to be anything but very satisfied with them. But if it's sort of the whole process it depended on whether the document went through *{the Payload Developer}* or went through Houston.
- {interviewer} – We've recorded your comments on that so we will understand what's behind your rating, but now I'm going to have to ask you to try to average it out and give me a number.
- I'll give it a 3. Some of the documents were fantastic at a 5 and some of them sat around for a week at a 1, so that's a 3.

– Every once in a while I see something that reminds me of this duality of this questionnaire and I would say for *{our investigation}* we didn't have any need to have any interface with the crew during orbit, but overall I would say a 4. It was just a matter of like I say, there were a couple of times that we felt like we wanted to get some words up to Mike and the words either got changed or not used at all, or whatever that we felt like we resulted in some problems. I know that's always a judgment call, but that would keep my level of satisfaction from being very satisfied. And in fact, since we're not officially done with this question, there was a point in there with our renal stone experiment that we had some leftover hardware from a previous increment, like maybe I6, and we wanted Mike to pull out that hardware and do some inventory on it and because, and it seemed to us like there were a couple of things that he said that indicated he either didn't understand why we wanted him to do that or didn't see the merit in doing that and the result of that was that some of the leftover renal stone hardware from I8 that we were hoping would be able to be used on a future increment before it runs out of useful life, we're not sure exactly where all of that hardware ended up. There ended up being some confusion as to whether some of the old stuff got opened up and got stowed in with the current or if the current stuff got stowed in with the old, and we're not sure

exactly what happened with that and the inventory now is going to have to be done by someone who's not as familiar with all of the hardware as Mike was.

Topic Area: Customer Support Interface – Information Sources
Question 1.3.10 – *Please rate your level of satisfaction with any educational/orientational information you received from the ISS Utilization Program at the outset of your ISS Project.*

Question 1.3.10 – *Comments from Increment 7* (click left link to return to corresponding datasheet)

– I think this kind of information could be improved. We have experience with this kind of project, but if I were a beginner I would have needed more information.

– No comments.

– This is not applicable because it is related to educational, right?
{interviewer} – But it's sort of your education of how the program works. When you were starting up that you were going to fly on the ISS, obviously you know would it be helpful for you to learn as much about the integration template, you know, how things work in the program and we're just concerned or trying to find out when people first begin work with the program do they get adequate information to help them understand how payload integration is going to work, what's going to be done and so forth. So, that's really what this question is asking about.
- Ok, with that approach, I think 4 is appropriate.

{} - NA

{ - 3 - We didn't get anything until I went to Houston. 1 – I didn't think we got anything so very dissatisfied; we did it in telecons;. it was all verbal and there were some emails; we think there should be more formal information.

– I don't think it was required. I don't think it's applicable because *{PI's name}* was doing *{investigation name 1}* before he did *{investigation name 2}*. He was already operating in here. We were already on different teams and came together from our different expertise.
{interviewer} – Let's do a not applicable.

Question 1.3.10 – *Comments from Increment 8* (click left link to return to corresponding datasheet)

– Rating a 3.

– {interviewer} – I'm going to have to elaborate a little bit here because it's complex for you two. You've got one investigation that's new and then one that's been flying for a while. This question is really directed at people who are brand new flying for the first time and being interviewed or surveyed for the first time. So we can do a NA or we can do whatever you want to do.
2 – Well, I was thinking that if we had been a first time payload with *{our investigation}*, that scared me because we wouldn't have made it and that's largely due to this question, educational/orientational information.
1 – There was none.
2 – There really wasn't any. We did the whole thing based on our experience and the good help of people that were there that we knew.
{interviewer} – Ok, your comment tells me that you would have a basis for doing a rating on this one, so I'll ask for a number.
2 – Had you not asked this question, we wouldn't have realized that we were supposed to get any educational/orientational information.
{interviewer} – I understand that. I will tell you that I've heard these comments before from other people.
2 – So knowing that, I hate to be so harsh but a 1. I know the information is out there because I've come across it by accident on web sites. I've seen it, I just can't remember where I saw it

- NA

– We went for training on how to enter things on the computer and stuff and it was fun so I'll say very satisfied.

– I didn't receive anything formal in any sort of way from the utilization program, but I can tell you we do some training when we come onto our position. So depending on what you want me to answer I guess I'll

have a different response.
{interviewer} – Ok, what the question is really focusing on is and I'll say that I'm sure that within your organization you got training. What I'm trying to find out is whether you received or got information that was flowing out of say, the ISS payloads office or other parts of the program that helped you better understand the process for payload integration and using the station.

- Not that I'm aware of. Everything is internal.
- {interviewer} – So, based on that look at the rating scale and see what you can come up with for a number.

I'll put a 2 down because I didn't know about this portal, I guess.

– A 5. It was a great little conference that really opened our eyes to things that was held there at JSC for PIs. One of the astronauts spoke who talked about how we really do have a lot more time than they think we do. And that certainly has come across. That's scheduling.

– {interviewer} – What about your satisfaction with educational information about the program that you got when you were getting things started up? In other words, when *{your investigation}* was in its infancy and you were told you were going to fly, did you feel that you got enough information from the program about what the program was about, what the station's about.
- Volume wise I got lots, but in the standard that NASA formats, you know, 103 pages are better. If one would suffice, 103 pages are better so it was pretty voluminous and to be honest with you, I just asked my experimental support people to wade through that and give me the specifics. I'll give you a 3. It was all there. It was probably not in the most user-friendly form.

– I know where the information is out there, but it didn't address this case.

– Not applicable to me. I'm not sure. We have a lessons learned type of thing just for us personally, like our team and on that we have that there is a meeting for operations team at Marshall or something or somewhere before we actually do operations and we didn't attend that so I'm not sure if that would have helped or not but it might have.
{interviewer} – Let me just go back a sec. You mentioned that you're a newcomer into (interviewee – right) so it's not only lessons learned but it could be just whatever information that would serve as educational orientating to you to get a leg up on the program, on the process, utilization on Station or whatever it is. When you came into that, were you exposed to any of that and was it helpful?

- I was exposed to it as it happened. Like if we needed to do something I was either trained on how to do it or told where to go to get information and we had TSC training and everything. I guess I forgot all about the TSC training.
- {interviewer} – TSC training.
- So I'd say the TSC training was very helpful and the SIM so from what I had, I would say a 5. But other than that, I didn't have any kind of formal training.
- {interviewer} – That's fine. But it sounds like it was more on-the-job learning versus at the outset.
- Exactly.
- All of that on-the-job stuff helped and I was satisfied with that.

– {interviewer} – I haven't interviewed you folks before and I'd like you to go back in the days when you were starting up in the project when you were getting ready to fly in Increment 5 with the project, you know getting ready to fly in Increment 5 and so forth, and with that in perspective could you rate your satisfaction with any of the educational orientational information you got from the program as you were starting up with the project.
1 – Our answer is going to be a 4.
2 –We debated. (1) thought maybe a 5, maybe a 4. The reason I thought maybe a 4 is because we got a lot of good training on station itself, but our interface is directly with the Microgravity Science Glovebox. It was nice to know about the thermal control system and the data system in the space station, but a lot of that MSG handles for us. We're talking about the academy training we had. There's a series of courses, I forget what they call it. Something academy training.
{interviewer} – Really? That's interesting. {interviewer}, have you heard of that?

{interviewer} – No, I have not.
{interviewer} – You just pulled something out of the air which I have never heard mentioned.
1 – It's called the Payload Academy.
{interviewer} – The what? The Payload Academy, how come I'm not a graduate?
1 – And they get us trained on the EHS system so that we can process OCRs and PIMs and they show us all of that and how to sit console and the words to say.
{interviewer} – This is a POIC thing?
1 – Yes.
{interviewer} – This is a POIC. They should call it the Payload OPS Academy.
1 – Ok. They probably should.
2 – They may do that too, I don't know. I would almost be very satisfied with it because they do give you a lot of training on the space station system and how to sit console and do OCRs like (1) said. The only reason I didn't give it 5 is because they give you a lot of extra stuff that little glovebox investigators don't really need to know. Almost a little bit too much training.
{interviewer} – Ok, well that's interesting but it's pertaining mainly to OPS.

– I got next to nothing. On the other hand, *{my PD}* might have gotten stuff and maybe he didn't pass it on to me. My understanding was that this was supposed to be a quick project to get some stuff up after the Columbia disaster and so I think people were sort of scrambling from the beginning. So in that sense I really didn't get much information at all about what I was supposed to be doing so maybe a 2. On the other hand, I'm going to probably say a 2 because that's the honest answer, but in this case while I'm very annoyed at some of the other aspects of the program, this really make a whole lot of. I mean I understand they were scrambling and exactly what we were trying to accomplish wasn't necessarily defined at the beginning so I'm actually fine with what happened. But I still think objectively am I satisfied with the information I got, well no, so I'll give that a 2.

Topic Area: Customer Support Interface – Information Sources
Question 1.3.11 – *Please rate your level of your satisfaction with the Payload Information Source CD and its companion website as an informative and useful resource.*

Question 1.3.11 – *Comments from Increment 7* (click left link to return to corresponding datasheet)

– n/a – I have been flying for so long, I did not have a need for that.

– Never heard of it.

– I received that, I looked at but I never used it.

– Never heard of it.

– Never heard of it.

– May have heard of it but have not used it.

– I'm not familiar with these.

– Never heard of it.

– Never heard of these.
{interviewer} – Client looked for it, but couldn't locate.

– I have heard of it. I looked at it but I didn't use it enough to rate it.

– I've heard of it but I've not used it enough to rate it. I'm aware of it but I've had no time really to evaluate it.

{} – I know we've been getting CDs in the mail that seemed like they contained information that we didn't need but I'm not sure if this is the same CD or not so I guess the correct answer would be that I'm not familiar with this CD. Haven't heard of it.

– I don't use it. Never heard of it.

– Never heard of it. It's a deeper problem. I didn't understand that payloads had anything to do with science. I didn't understand that payload was this entire organization. I didn't understand that I was a payload. I thought payloads were something that in the cold war they talked about some; I just didn't know; working at NIH we get lots of newsletters from different entities that support us at NIH, but typically they concern issues that are within the small group of people talking to each other within that organization at NIH, I'm not talking about NASA so when I got one of these things I didn't understand that it would relate to me.
{interviewer} – Part of the issue here is that in certain cases the payload developer organization, *{PD's name}* and the people who would work with him and the people in bldg. 3e trying to sort of shield you folks from a lot of the process aspects of what was going on. Some PIs are shielded and things are transparent to them, and so it's entirely possible that you might not have heard of the Payloads Office. Now *{PD's name}* most certainly would have heard of the Payloads Office but to some extent sometimes payload developers like to work it that they shield the PI from as much of this stuff as possible. It sounds like you folks had sort of a partial experience where you were shielded from some things but not shielded from others.
1 – Well we broke through all of the shields that we could. We needed to get. We wanted this thing to work and we kept on trying hard.

– We've never heard of it.

{} – I know there are information sources but I didn't use any of it. So I guess I've heard of these but didn't use to rate. I honestly didn't have to use any of them.

– Never heard of these.

Question 1.3.11 – *Comments from Increment 8* (click left link to return to corresponding datasheet)

– I've heard of this but didn't use it.
{interviewer} – But you say you have heard of it?
- Yes, I heard that there is a payload information source but I don't remember ever navigating it.

– Not on me, but the teachers love it.

{interviewer} – Right they do. But on question 1.3.11, it's asking specifically about this payload information source CD.

- I want to give credit to whoever put it together. It's excellent and the kids love it, but it wasn't applicable to me as a PD. In a PD function I didn't need it, I was well passed that process.
- {interviewer} – That's funny. Just for fun since frankly most people haven't heard of or used this product. You're one of the few people who at least knows something about it. I'm going to ask you just for fun to give it a rating.
- Very satisfied. There's lots of useful information on it. A 5.

– We talked about this last time. And I still think I've never heard of these. Well, I've heard of these from last time, but.

{interviewer} – Alright. Let's just put head of these, didn't use enough to rate on both of them. Obviously you've heard of them from me last time, but you still haven't necessarily used them.

- And to further on that, I don't even know where I'd find them to use them.
- {interviewer} – We can see that you get mailed a copy of the Payload Information Source.

Let me look in my desk drawer here for a second. I don't see that CD anywhere. I don't think I have one.

– Rating a "Heard of these, didn't use enough to rate." Heard of the website but not the CD.

– I have heard of it. *{name}*, our PIM, has talked to us about it and gave us a copy but I have not used it enough to rate.

– Heard of this, but didn't use it enough to rate. I know it exists, but I haven't used it.

– 1 – Ok, that's really easy. We've never heard of that.

– We heard of it but didn't use it.

{interviewer} – That's what we want to know.

- If we needed to find something that would be the place we would have started though.

– I think *{my PD}* has used it and I've talked to her about it, but I've not personally used it so I'll pick heard of this but didn't use enough to rate it.

– Never heard of these.

– Never heard of these.

– Never heard of these.

– I'm clicking never of these.

– Never heard of these.

– Never heard of it.

– We never heard of either one of them.

– Never heard of these.

– Never heard of these.

– 2 – We never heard of it.

– I've heard of these but didn't use them enough to rate.

– 1 – We've never heard of these.

– Heard of these, didn't use enough to rate. Really didn't have to use it.

– 1 – We have heard of it but we really can't comment on it. I think anything to facilitate a new investigator coming on board or whatever, that's great.

– Never heard of it.

– I'm not familiar with that. I can't tell you if I've really heard of that or not. It's kind of hard to say I've never heard of it. I looked at that and my initial response to level of satisfaction wit the Payload Information Source CD was "what is that".

{interviewer} – Ok, never heard of it. That's fine.

Topic Area: Customer Support Interface – Information Sources
Question 1.3.12 – *Please rate your level of your satisfaction with the Payload Developer Web Portal as an informative and useful web-based resource.*

Question 1.3.12 – *Comments from Increment 7* (click left link to return to corresponding datasheet)

– Heard of this. Did not use enough to rate.

– Never heard of it.

– I like the premise of the Portal, but I do not believe it really handles the gateway the way I would like to handle it. I would like to go to that Web Portal, login and be able to access all the resources and everything, through that one protected interface. It should either be a login to go to the protected area, or not login to access things straightforward. There were places to put information into the Web Portal about the project and contact people. We were supposed to have the capability to change that, and I guess we have a little bit, but I just do not see people utilizing it. The utilization just is not there at this point. When I first heard about this Web Portal, I thought I would have it bookmarked and the first time I needed to do anything I would go there. Well, that is not it. In fact, the times I have been there, there seems to be a lot of information out there and I guess it all depends on what kind of audience you are putting it there for. Maybe it is not necessarily there for the more senior projects/payloads.

– PIM developed a web page where we exchanged information and documents, etc. On the NASA website there was an HPA web page where he put the documents that were related, pictures, etc. It was useful because when information was updated, the web page was updated too. Have not heard of the Payload Developer Web page.

– Never heard of it.

– I have had limited interaction with it. I have not explored it or needed to explore it as much as it can be helpful. I don't think I have enough background having utilized it to provide a good answer.

{ - Now this was available during increment hadn't heard of it at that time.

– I know that and I think that *{name}*, the PIM, prepared some material for that so I know that and I would give it a 4.

– Never heard of it.

– Once again, I've heard of but didn't use it enough to rate it. But I will tell you that's one thing that our PIM talked to me about, explained to me how it would work and actually offered to come over and sit down with me and go through it. So I would hope that for our next payloads load that I'll be a little bit more up to speed and be ready to use that.
{interviewer} – Ok, that's interesting and {interviewer} and I might make a note that the PIMs can play an important role in publicizing that capability.
- And I would also say that about the CD as well. He actually talked to me about the CD, what the value of it would be, the next time we started this. He even talked to me about would there be value in sharing the CD with the education community that we have identified as our PI and how we can, because they're far removed from NASA, how could we use these tools with them in order to make them better as they planned their payloads, so you're right, these are things I might have thrown in a drawer and never looked at except for the PIM.
- {interviewer} – Interesting. Thanks for that. That's really useful feedback.

– Heard of it, but not enough to rate it.

{} – I've heard of it but I assumed that I didn't need it.
{interviewer} – So I'm going to put, heard of this, didn't use enough to rate.

– Never heard of it.

– {interviewer} – I suspect this is something you hadn't heard of either.
2 – Is that where the PDL database is?
{interviewer} – Yes, you can get access to the PDL database from the payload developer web portal. It's not the only place you can access it.
1 – It's a portal we didn't use. We didn't have to deal with all of the paperwork that they have to deal with.

{interviewer} – So 2, would you say you've heard of it, or you've never heard of it?
2 – I've heard of it.
{interviewer} – Let's put heard of it, didn't use enough to rate.

– *{name}* had heard of it, I had not but we wouldn't have enough information to rate.

{} – I have heard of that. Is that in effect right now?
{interviewer} – Yes it is.
- Ok, I thought it wasn't going into 12.1. So, I've heard of this but I didn't have to use it.
- {interviewer} –So put "heard of this, didn't use enough to rate."

– Never heard of this.

Question 1.3.12 – *Comments from Increment 8* (click left link to return to corresponding datasheet)

– I think that I heard from *{my PD}* but I never used it.

– I know of it and my PIM has pretty much taken care of me. I haven't had to use it.
{interviewer} – So heard of this, didn't use enough to rate?
- Correct.
- The PIMs have actually taken on a much larger workload to support the payloads than they have in the past.
- {interviewer} – And that, of course, is by design.

– Heard of it, never used it.

– Rating a "Never heard of this".

– Heard of that, seen that, but haven't used it enough to rate. But I will tell you that's one of the real valuable. That's where *{name}* is very valuable to us because these are the kinds of things that he talks to us about. Even if he doesn't think we may need them, but he really likes to keep us informed about these kinds of things and even comes to the office and shows us these kind of things so it at least makes us aware that they are there. We talked with him about that as we looked toward a new *{investigation}* for future increments that these are the kinds of resources that we'll go back and use. We're sort of in the midst of this now but that as we get smarter and want to do this better that these are things that will be really valuable for us.

– Didn't use enough to rate.

– 2 – It's a little difficult to get access to, but once you do get access to it, I found it very useful. I didn't use it a lot, but I used it enough.
1 – In my experiences, I've gone to it looking for things and have not had a real big success rate.
2 – I would say it's probably a 3 though because I can remember thinking being a little bit frustrated with being able to navigate to where I really wanted to go.
1 – Well the forms and the things that we needed were not there at that point. They may be now, but they weren't then

– *{my PD}* uses it. I've visited the portal a couple of times so I would also rate it as heard of it, but didn't use enough to rate it.

– Same thing, heard of it but didn't use it.

– Never heard of this.

– That's excellent. Wish I would have known about it sooner. Never heard of it.
{interviewer} – It's accessible off the ISS Payloads, the OZ home page and you might take a look at that.

– Never heard of this.

– I'm clicking never heard of this one.

– Never heard of this.

– Never heard of it.

– Never heard of it.

– I don't know if it's exactly what we had because the PIM, *{name}*, developed for us a web page but only

for our payload. I don't know if this is what you are referring to or if it's a general portal web.
{interviewer} – No, this is a more general web page.
- So I would say, "never heard of this". But it was useful to us to have this web page dedicate to *{our investigation}* because there were all of the documents with the changes, some pictures, some minutes of meetings and so on, so it was useful to the project developer.

– Never heard of it.
{interviewer} – Do you know if Kathy had offhand?
- Not to my knowledge. What kind of website is that? That's not like an operation website, it's like?
- {interviewer} – No, it has a link to PDL, there's documents, resource documents, program documents.
- Ok, sorry.

– 1 – Never used the portal, didn't hear of it.

– The same goes for this one.

– 2 – For *{our investigation}* on Increment 8, (1) and I agree that we never heard of this for Increment 8, however, I'll say that I'm now working on the facility as well. I've been asked to work on the facility and recently I've had a chance to go out there to the Payload Developer Web portal and look at the questionnaires. But if this is just limited to Increment 8 and my experience with PFMI, (1) and I never heard of it.

– Heard of it, but didn't have to use it.

– 1 – We've heard of it and the comment from our Wyle support personnel was that it was a very helpful tool.
2 – We'll give it a 5.
{interviewer} – We'll note that your staff said it was a very helpful tool.

– Never heard of that.

– I would say that I didn't use it enough to rate. There seemed to be once or twice that I got over there for some information, but I can't really tell you whether it involved I8 or one of the other experiments that I'm starting to put together. So, I have heard of that but I couldn't really rate it.

Topic Area: Customer Support Interface – Activities in Russia
Question 1.3.13 – *If your investigation had significant payload integration/data collection activities in Russia, please rate your level of satisfaction with the support the Program provided for these activities.*

Question 1.3.13 – *Comments from Increment 8* (click left link to return to corresponding datasheet)

– Of course, referring to Increment 8 nothing specific has been done in Russia apart from baseline data collection, I think and repetitious training. The support from your people from Russia was fine and I also received information after the last baseline data collection has been performed that we received the data immediately via mail and we also then received the information that you were going to ship back the training model with our ground support equipment from Russia to Houston. So it is fine, very satisfied.
{interviewer} – So I'm going to give it a 5.

– We set up in the service module so we had to get Russian approval.
{interviewer} – We have to be a little discriminating here. We can't ask you to rate Rosaviakosmos' performance on that, but we can ask you to rate your support from NASA for getting that done.
- The support that I received from NASA, I give a 4. Some of the times I was in the dark as to what's going on as the process moved forward. I don't even think they knew, but I was well supported. It's a pain in the butt to deal with the Russians and they do it.

– NA.

– Rating a 5. *{name}* should be canonized.

– Let me just ask for payload clarification. We did fly on Russian vehicles so would that be considered payload integration?
{interviewer} – Yes.
- We were very satisfied. Honest to goodness we never thought we'd have this happen, but it was seamless. I mean after learning a bit with the stuff for 7, this just went extremely well.
- {interviewer} – So you had things that had to go up and down both?
- No, only up. We flew on 12 Progress and 13 Progress and 6 Soyuz.

– I'd rate that a 5. Those guys are great out there. They really work hard, the whole team out there, to get what we need. I'm really happy with them.
{interviewer} – We added this question largely based on what you and a lot of other people, especially people with pre-post investigations. So you thought the support for that was good?
- Yes.

– 1 – We had ground controls for *{our investigation}* that were run in Russia and I would have to say that went very well.
{interviewer} – We talked about Russian stuff at the very beginning of this conversation and so that was a strong factor in some of your negative ratings so we need to make an overall assessment here. Sounds like there's some good, some bad.
1 – The NASA person, and I don't remember his name now, that ran the ground controls for us over there. That part of it went excellent, but if you're going to include integration that was terribly difficult, so that's going to bring it back to a 3.
2 – We probably should separate those 2 things out because they're very different. Payload integration with Russia versus data collection in Russia, those are very different things.
{interviewer} – Yeah, that's true and I'm actually breaking a good rule of customer surveys, you're not supposed to try to rate two separate things with one question, but there it is unfortunately.
1 – As long as you can capture that in the comments though, it'll be fine, right?
{interviewer} – Right. So now which one was good and which one was bad? Integration was good or bad?
- Good.
- {interviewer} – Integration good, data collection bad?
- 1 – No, the opposite.
- {interviewer} – Integration bad, data collection good?

- Correct.
- {interviewer} – So you want to go with a 3 on that?
- Yes.

{interviewer} – Ok, that's great feedback.

– NA

– Very satisfied. We got pre and post-flight data. It arrived briefly in our lab. It was collected there. It arrived safe and sound so we were very satisfied with that.

– We did have to get a can of Russian honey. We did get those so I was very satisfied. We were actually able to get samples from Russia. So, very satisfied.

– We didn't do our BDC over there. We considered it, but we have to have it over here, so the way that question is worded it's NA. We worked with the Russians trying to get them back over here, but all of the BDC was done here in Houston. It wasn't physically done in Russia.

{interviewer} – Ok, let's do NA.

– A 5.

We sent a person from our lab over there and many of the biomedical activities there are coordinated a lot within our building with med ops collection as well and there's a lot of thinking up that happens to that. And because that team is all, you know a lot of that team is in bldg. 37 and it's very well agreed that people have done it fifty million times and you're working with folks that you know so that went quite smoothly. And so in a lot of ways that team is sort of pre-greased for a lot of the biomedical activities and we coupled into those activities that you're doing things like urine collections for both medical ops and payload activities and you're synced up with the people that are over there all of the time.

– {interviewer} – I think you understand that we're asking you to rate the NASA support. It's out of scope of this to rate whatever the Russians did or did not do for you.

- Do we get to rate them?
- {interviewer} – Unfortunately because our ability to do corrective action stops at the certain level of international borders, it's not necessarily productive for us to ask about that. Obviously we could but at some level we can't do anything about it.
- Ok, well I'm going to put a comment in there just for the sake of it. I'm going to say that I was very satisfied with the customer support but that the quality of the equipment for base line data collection in Russia was marginal, at best. And I understand that nobody may read that or be interested in reading it.
- {interviewer} – No, we're very interested in everything that's obtained from this and someone will read it. Unfortunately there is just a case where there are some things we can't fix.
- Yes, I know and I would add to that comment that there was. Of course I just want to make sure here that these comments are not attributable to me. Is that correct?
- {interviewer} – We do everything possible to remove your identify from the verbal transcripts that we can. There's a limit to that because there's going to be feedback that a reasonably savvy person can figure out. I will tell you that we've been doing this feedback project for about 2 years now and I would say that managers are not interested in finding out the identity of people so that repercussions can happen or whatever. They have a very hands-off. They're not interested in identifies, they're interested in substance, what is said and then they go off and fix it and they don't necessarily care who said it.
- I'm really talking about crew members, where the crew members get to see the feedback and attribute it.
- {interviewer} – Because a report is released, ok, essentially to the pubic and these comments by the way will be in that report, again identity blind, the crew members names will be in there. Up to now we have been putting crew members names in there. If you would like to not mention the crew members names that's fine, but here's the thing, you flew on Increment 8 – there's a 50% chance that we can guess the identify of the crew member, but you can leave the name out if you want.
- Give me one moment offline to discuss this question?
- {interviewer} – Sure.
- That science requirements should drive the scheduling of post-flight crew activity and I'm going to just leave it at that. So, I would say that science requirements should drive the scheduling of post-flight crew

member activity.

- {interviewer} – I will share with you that I have talked with *{your PD}*and I've heard similar comments so I can share that with you. We understand what's behind that comment so that's fine. Did you already give me a rating number for this question?
- I did not and I'm going to give you a 3.

– Well, we don't have extensive data collection but they do fill out a. There are 5 questions that they do answer just before launch or within just a few days of launch and then they're supposed to put their password for their electronic journal on that. I'm not going to comment, I'm just going to say that the data collection worked just fine. So I'm going to give that a 4.

– Rating is a 4. That worked out pretty well. Unfortunately, we had to move from Star City to Moscow and to be honest with you this would have been very challenging had not one of my co-investigators been Russian. So he worked some deals and it went very well. I don't know if I can give you guys all of the credit about that, but you came through where you had to so it went pretty well.

– NA.

– Yes, very satisfied. We had the pre-flight and post-flight data collection in Russia and we got all we needed.

– Besides being shipped and launched from Russia, we didn't have any data collection or anything so I'd say, would that be applicable then?
{interviewer} – Yes, if there was any kind of integration of your payload and your investigation there, we'd like to get your feedback.
- I'd say it was pretty good. I don't remember any. I'd say satisfied. They even informed us that they had to leave the long payloads out on the dock in freezing weather so I'd say it's pretty good. A 5.

– NA

– NA

– NA
2 – I'll agree it's not applicable. I'll caveat and say that I think we had some video tapes go up on a Soyuz or Progress but that integration was handled by the Microgravity Science Glovebox so for *{our investigation}* Increment 8 it was NA.

– NA

– 2 – NA
{interviewer} – Ok and the reason it's NA is those samples and other hardware that you sent up, that was done before Increment 8.
1 – Before Increment 7. We launched on 12P.

– NA. I mean we launched with Russia but I don't think we did anything with them.

– I'm going to go ahead and say 5. I think the NASA folks, including my RPO, RIO did a real good job and did the best they could.

Section 2.1 – NASA Payload Development

Please rate your level of satisfaction with the various services and support provided by your NASA Payload Development Team

Section 2.1 - *Comments from Increment 7* (click left link to return to corresponding datasheet)

– I am well taken care off. People are very easy to deal with. If they have questions, problems concerns they come to me in a very professional manner. I do get notified and have to review their documents.

– No comments.

– This portion of interview lost due to equipment malfunction.

– No NASA PD.

– I really like the people. I don't have any real problems with the processes.

– Not enough interaction to form a judgment basis.

– No NASA PD.

– I think the *{my investigation}* operation I think that's a minor miracle that it got up there in the time it did and working as well as it did. And the soldering for the critical review it's gotten, which isn't much, I think that was put together very quickly and started and hopefully we can finish it. In terms of the people here who facilitated that, I'm extremely satisfied.
{interviewer} – So for the first line where it's asking about the services, what numerical rating would you give it?
- A 5.
- {interviewer} – What about the processes they set up, their time lines, their schedules, templates that they put up?
- The people that I work with?
- {interviewer} – Yes, the people that you work with.
- They facilitated as well as possible given the information that they received. A 5.
- {interviewer} – And what about the people?
- I think we have very strong, very hard-working teams in both investigations. I give that a 5.
- {interviewer} – This may not be relevant. This is not the payload or the investigation hardware. This is any tool that supported things. It's possibly not relevant or NA.
- Wouldn't that include the glove box and the workbench on station?
- {interviewer} – Under the rules of this questionnaire we set that up as separately. What you're really asked to rate here is supporting hardware, not the actual payload hardware. I know it seems like a strange distinction, but that's how it got set up.
- What kind of hardware?
- {interviewer} – Any other supporting hardware. For example, hardware that the payload development team might have had to provide so that you could do testing, pre-flight testing and that kind of thing.
- They made a ground unit *{of my investigation}* and they had to develop equipment to fill the samples and stuff like that.
- {interviewer} – Ok, thinking about that hardware, give us a rating.
- I'd say very satisfied. I mean it's done its job and it's still running. They had to develop all kinds of software to run the equipment and collect the data, so I'm very satisfied with that.
- {interviewer} – Were there any controlled documents, written documentation they had to provide?
- Yeah, I'm sure they did all of that. I'm very satisfied that I didn't have to do it.
- {interviewer} – What about deliverables? That pertains to data documentation that you had to make up yourself and say hand back to them.
- You mean if they wanted stuff for progress reports and quarterlies and stuff like that?
- {interviewer} – Yes, that's part of it. But other things would be, say *{name}* said we need to give this stuff for ops or to the POIC about what was the length of time you needed to do a run and that kind of thing.

- I can't think of anything that bothered me about this stuff.
- {interviewer} – Let's do a NA for that.
- All right.

– Services I was very satisfied, 5; processes 5; people 3; hardware tools (I need a little clarification on what you mean by hardware tools)
{interviewer} – it's probably not applicable.
- That's what I had thought and software tools not applicable. The documents I was very satisfied, we really had no trouble with that and the deliverables I was very satisfied, reasonable expectations.
- {interviewer} – You've got a standout rating there and I don't want you to change your rating. This would be a rating that would be given to your Code M support.
- Oh, so this Code M?
- {interviewer} – Yes, this is your Code M RPO.
- Ok, then could I change the people to a 5?
- {interviewer} – Yes.
- They were fabulous. Thank you for clarification. I was perhaps thinking of some other people. Those folks are outstanding. Their support to *{our investigation}* has just been above and beyond and I really think they did a great deal of extra work to make us fly as often as we've flown in the last year or so, so definitely a 5.
- {interviewer} – Now I'm a little curious though that when you gave the 3, whom did you think you were rating when you gave the 3?
- I was thinking RPO. I perhaps was looking more at, I kind of hate to say names because I'm not sure exactly what this person. Our difficulty came and I don't mind you recording this at all, but our difficulty came really when we had a question from a crewmember about the value of doing this and then we became involved with the increment scientists.
- {interviewer} – That's ops stuff. Let's consider that.
- That's where we began to struggle a little bit.
- {interviewer} – Well let's discuss that when we get to Payload OPS.

– Services 5, Processes 5, People 5, Hardware Tools not applicable, Software Tools not applicable, Documents 5, Deliverables 5.

– For services 4, processes 4, people 5, hardware tools not applicable, software tools not applicable, documents 4 – sometimes things were written on our behalf and we had nominal editing to do, deliverables 5. I think that the team has to be more flexible than they're used to in terms of how to get the preflight post-flight data to us from Russia and also how to get the data to us from space. It had to be done via telemetry and they arose to the challenge and we got the data and we're very happy with it.

– I've been very satisfied with these people. In that case 5 for the first question, processes 4 because of logistics more than anything, people that was excellent 5, hardware is not applicable, software is not applicable, documents very satisfied, no problem there, deliverables a 5, no problem. No comments other than these people that are interacting with me, the 2 areas that I talked about are excellent. I think they're doing a great job.

– {interviewer} – It's my understanding that on *{your investigation}*, you were supported by *{PD's name}* who we've named as your payload developer so you had payload development support in essence supplied by NASA because I think *{PD's name}* is a civil servant who works for NASA. This is most likely an area that you have a basis for giving us a rating on so what I'm going to ask you to do is click yes on that question below and then go to the next page. On the next page you'll see a matrix and listed on the matrix are different points of interaction that you had with *{PD's name}* and other members of the team, for example the services that you got from them, their processes, the people and how they performed and we'd like you to as efficiently as possible just consider these points of interaction and give a 1 to 5 rating on each of them, and then at the end if you're interested you can give us so me additional comments.
1 – So this is *{PD's name}* and his entire team?
{interviewer} – That's right, *{PD's name}* and his entire team.

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1 – Well I thought the interpersonal attributes were fine for his team. 5 for that.
3 – 5 for the hardware tools.
1 – hardware tools were great.
3 – software is not applicable.
{interviewer} – What about services, guidance they gave you, how they clarified things for you, how they supported you?
3 – I'd say it's a 3. It was a learning curve.
1 – 3, it was a big learning curve and it was very hard to communicate. Processes?
3 - I'd say 1 or 2 because that's where we were clueless to start.
1 – Well they told us when they wanted things by, right? They gave us a timeline for schedules for each of the things that they wanted from us.
2 – They gave us deadlines but they didn't explain how things worked which would have helped somewhat.
1 – Well, we still had to meet the deadlines. The question is did they give us false deadlines.
2 – We had deadlines and then there would be another deadline for the same thing. There were their deadlines and there was a deadline that they had to turn it in.
1 – So let's say 2. We have 3 for services, 2 for processes, 5 for people, 5 for hardware, software is not applicable, documents not applicable.
{interviewer} – What about deliverables? Did *{PD's name}* come to you or members of his team call you on the phone and say you need to fill out this paperwork that describes these things or gives these parameters?
1 – Yes, they did that fine. That was no problem. 5
{interviewer} – We've captured some comments. Do you have any closing comments about this area?
1 – It was an honor to work with all of these people so hard on this thing and it was a big team effort and we were very happy at the end of the increment, I think with our discovery. I think in the beginning we were asked to say something about what's right. I think this is a very dedicated, involved NASA team.
3 – I would just add that my understanding is that the procedures that we used in order to get this whole thing to work was very atypical and considering that a lot of it was by the seat of the pants (1 – everybody showed extreme flexibility) it was remarkable that we got as far as we did.

{ - No

Section 2.1 - *Comments from Increment 8* (click left link to return to corresponding datasheet)

– See previous comments. Junior point of contact.

– No comments.

– {interviewer} – This does include Linda and any other people. You mentioned somebody else's name besides *{name}* that was part of that team.
- *{name}* maybe. I would say this team did exceptional.

– 1 – We do that, we don't have NASA do that.
{interviewer} – So, what we do is. We just select no NASA PD and forget it.

– No comments.

– Well we designed the payload flight even though it was in space but we did design it. Hardware tools – I guess I got all of the sample stuff we needed from *{name}* so very satisfied.

– We gave all categories very satisfied except for hardware tools and software tools which were not applicable.

– Now let me say there were only minor additions to the payload between Increment 6 & 8 so all of my baseline comments about payload development would be as they were given in Increment 6.
{interviewer} – I understand. The way we set the survey up we look on each survey as a fresh process and so without necessarily looking back to your previous comments, and there are several reasons behind that but that's how we do it. So I would ask click the next button, please, and you'll see what you're up against there and you'll see a question table that's going to ask you to the extent that you can to rate your satisfaction with different points of interaction that you had with your payload development team. The

services, the processes, people, hardware tools, software tools and so forth. Again, that would be largely on how they supported you on Increment 8.

- I've checked 5 in every column except in the Hardware Tools I've checked NA because we didn't have any and in Software Tools I have clicked 3. The reason I've done that is because we found that the data interface on the VPN that we have.
- {interviewer} – Say that again.

We have a secure website that we retrieve our data from the DSC. We found frequently there would be changes of configuration or passwords that they simply had neglected to inform us so when we were getting setup for data collection or data transfer, we would have to call the help line and they would have to go thru a procedure of trying to figure out what update we didn't have and that sort of thing, so they need to be more on the ball that when they make software changes, they need to let the users know. So, just to repeat I've got 5 in the first 3 lines, NA in the 4th, 3in the 5th and 5 in the 6th and 7th.

– There's one thing. I was told that if I specified a certain number. I was encouraged to specify a number of astronaut journals to be the criteria. I said 10, the absolute minimum and at the current rate that would take 5 years to get 10 astronaut journals assuming everyone chose to participate. I didn't want this to drag on forever and become a nuisance to NASA and so 10 was the absolute minimum criteria number and naturally I would want 10 cosmonaut journals as well, but I was told that it was unlikely that the cosmonauts would participate at the same agreement level that the astronauts would in which case it would take a really long time. So I was encouraged to set it to say 10 astronaut journals and as many cosmonaut journals as possible, which we did. Somebody there at NASA, at JSC has taken that as an indication and read a lot into it that wasn't there, that I'm not going to analyze the Russian journals, that they're not important to the study, that they don't need to be, why are we bothering with them if they aren't going to be used, and I never said anything like that. I've had to explain on about 4 different occasions to get this, I think it's one person, who persists in circulating this misunderstanding about the Russian journals and Russian participation, including last week. I gathered all of the emails, all my explanations of why I selected 10 astronaut journals and as many Russian journals as possible as the criterion. Now, I was encouraged to do that and what's happened is, let's see I briefed 4 Russians. Three out of the 4 Russians agreed to participate in the study and so it appeared that that was bad advice that I got so I guess it will all remain to be seen whether it was accurate or not.

{interviewer} – You were advised by?

- The NASA people.
- {interviewer} – Was there a particular?
- I don't remember exactly who it was that encouraged me to do that.
- {interviewer} – I just wonder what role this person had.
- They were the. I don't know. I do know. I don't want to say who it was because I'm sure the person was trying to give the best advice and it might turn out to be correct, but I'm just saying it created this enormous amount of misunderstanding in one person who has been circulating this stuff even though I have made it crystal clear in teleconferences and in letters and everything. It cropped up again just last week so I don't know what to say. Except for this one little thing it's been flawless. The guidance and everything has been very good. How about if I say 4 for the guidance for the first one, Services, guidance, clarification and support.
- {interviewer} – Ok, that's fine. And your Processes?
- 5, 5 for the next. NA for software tools. 5 for documents and 5 for deliverables.

– How do I split out my contractor experience versus my NASA personnel experience? I have to do that.

{interviewer} – What we'll do is that we'll have you split out in terms of your comments. You've already given us comments that there was a difference between the contractor and NASA support and that's recorded on the tape and in your comments. For doing these numerical ratings I'm afraid I'm going to have to ask you to try to take your best shot and integrate over it. You can mentally average it or whatever.

- Here's my concern, Roy. Ultimately, these scores go to management and then decisions are periodically made on this. If I pull down the score for my Lockheed Martin people who were spectacular by the NAS

people and there's some arbitration about that, that's inappropriate so I just as soon not answer this if that is a possibility.
- {interviewer} – Just keep in mind that your verbal comments are weighted just as high and are looked at very closely so you'll be able to mitigate that.
- {interviewer} – Yes, {interviewer}'s right. I mean I have to say that our management is not mindless bean counters. They're not.
- I know but there's going to be a graph generated somewhere, I can just feel it.
- {interviewer} – There is.
- And this graph is going to go up in some meeting and stern looks are going to go across the room at some people in certain areas and some of those people may be the inappropriate recipients of these stern looks.
- {interviewer} – Ok, {interviewer}, should we let him make the call on this?
- {interviewer} – Yes.
- {interviewer} – Ok, you call it . Rate it or don't. It's up to you. But just remember what we told you.
- Well, I'll tell you what, I will go thru some. I'm not going to rate the people on that one just because of that.
- {interviewer} – All right.
- For Services I will give you a 4; Processes again I'm going to give a 2 because of the NASA slowness; People I'm going to skip.
- {interviewer} – Hardware Tools is probably not applicable.
- Would that count the HRF rack?
- {interviewer} – Actually not, I'm sorry. This is a bit of a flaw but it's more your supporting hardware and let's put NA. And also, strangely enough even though you were given software to use the HRF, we're not asking you to rate that.
- Ok, I have no comment there then.
- {interviewer} – Was there any particular documentation.
- I'm pretty happy with that. I'll give you a 4 on that one as well.
- {interviewer} – And stuff that you had to give them in particular for HRF stuff.
- Yeah, I'm going to go down to 2 on that one because of redundancy issues.

{interviewer} – All right. We've got your comments about the breakout between the two different groups.

- No

– No.

– Services 4; Processes – 3, if that includes scheduling of activities and getting feedback on various documents, I was dissatisfied because sometimes they appeared suddenly Friday at 5PM and were due Thursday at 4. There was essentially no time and it wasn't clear whether something happened that was emergent in which case we could understand why we got it at the last minute, or if they had known all along that certain things were due so it was never clear to me when there were absolutely hard deadlines because of situations that had emerged or whether there was just poor integration of when things had to get done.

1 – I think a lot of that had to do with the fact that we had this superhumanly rushed schedule, but I would agree that there wasn't enough clarity as to the actual degree of process that was on the other side and more clarity would have been better in those cases. I would say 3 for this.

1/3 – People 5, they're all pretty nice people.

- Hardware Tools NA; Software Tools NA; Documents NA; Deliverables NA.

– Services 4, Processes 4, People 5, Hardware Tools NA, Software Tools NA, Documents 4, Deliverables 4. No comments.

- NA

– Services 5; Processes 4; People 5; Hardware Tools NA; Software Tools 5; Documents 5; Deliverables 4. I'm not sure they can ever be fixed but where the improvement might be is that if requirements aren't levied at the last minute on the RPOs and then as a result they have to get answers from the payloads on very short notice and get responses to questions back to whomever requested it from the RPO so it's sort of a jump to

or a knee-jerk reaction to get responses. In our business I'm not sure that will ever be fixed but it would be nice to have a little more notice or handled more calmly and it doesn't reflect on the RPO, it just reflects on what's levied on them to find out information.

– Services 4 – overall they did their job. We got the data. Processes – I wasn't too happy with that. They seemed to take forever. I'd give them a 2. It wasn't bad enough to not get their work done. People – Now I have to integrate over all of…*{my Payload Development support}?*
{interviewer} – Yeah, I'm afraid you do.

- So if I give them a 1 that implies they can't get any worse and that's not true so I'll give them a 2. There were definitely some times. Once the astronaut volunteered some extra time at the end of the week and *{my Payload Development support}* was supposed to check out a few things that I asked. And I called and they said no we can't do that, we don't have this or that and….*{respondent believes what was requested could have been accomplished}.* There were other times when….*{issues developed between Payload Development and areas of the ISS Program at JSC, and the respondent received some phone calls that he believes were unnecessarily contentious}.* I'm going to give them a 1. Some…*{areas of the Payload Development support the respondent is very dissatisfied with}.* Hardware Tools and Software Tools is NA.
- {interviewer} – Hardware Tools does not refer to your payload hardware. It just refers to any supporting hardware they might have provided. For example, bench stuff..*{at the payload development location}.* They loaded your samples *{at the payload development site}?*
- Yeah, but {*the respondent was very dissatisfied with the process*}…. so I feel like giving them a 2. I asked if they could send sample holders. They didn't send any. I asked if they could send a camera that I could play with, they couldn't send one. I'm really unhappy with that, so I'm going to give them a 2.
- {interviewer} – Ok, was any software relevant?
- No, they provided nothing.
- {interviewer} – Ok, let's make that NA. Were there any documents that were unique to *{the payload development process}* that you had to deal with?
- They seemed to write up a lot of documentation. They were *{making constant requests for}* documents they had to write for I don't know. If that's applicable here, I'm likely to give them a 2.
- {interviewer} – It's your option.
- The only question is do I give it a NA? I just want to make sure I'm not rating the wrong documents, that's all. I guess I'll give them a 2.
- {interviewer} – Deliverables would be things that they had asked you to deliver to them that were somewhat unique to what they needed.
- So what am I supposed to rate about them?
- {interviewer} – It's the requirements for data and documentation delivery from you which is to say, and I'm not trying to tip your hand here, but it would have been things they asked you for.
- Ok, then I'll give that a 2.
- {interviewer} – That would be consistent with what you said. They asked you for something and then they asked you for something slightly different that they could have changed, that kind of thing.
- Yeah, I just want to make sure that this is the question that's asking that.
- {interviewer} – That's the question.
- You know what, I'm going to give it a 1. That was a constant source of frustration the entire time. And then other times they asked me for stuff and then they sat on it for weeks.

Section 2.2 – NASA Research Program Office (RPO) Project Management

Please rate your level of satisfaction with the various services and support provided by your NASA Research Program Office.

Section 2.2 - *Comments from Increment 7* (click left link to return to corresponding datasheet)

{ - This portion of interview lost due to equipment malfunction

– No comments.

– No comments.

– Ok services 5, processes 4, people 5, hardware tools – I'm a little confused.
{interviewer} – Hardware tools is not applicable. Software tools is also not applicable. Documents is potentially applicable. There would have been some in-house things that you may or may not have had to follow guidelines, interface documents, that kind of thing.
- Ok, I'll put a 3 there. No, I'm going to give that one a 4 and then the next one a 3.
- {interviewer} – Deliverables is a 3 and documents is a 4.
- For this particular increment, I think the group did a great job in replanning and continuing research using the Russian vehicles for launching the hardware and what have you. I believe that because that was the first increment that we had done the replanning on, there was some information that either did not get disseminated in time or in enough detail, so there was some confusion in certain areas, but overall I think they did great job.

– Services 4, processes 4, people 5, hardware tools not applicable, software tools not applicable, documents 4, and deliverables 4.

– And this once again would be the Code M people?
{interviewer} – No, this was the RPWG which during Increment 7 was run by, was *it {name}* or was it *{name}* at that point?
- I think it started with *{name}* and then maybe *{name}* took it over. I was very satisfied with the services, the processes, actually the people in that particular group very satisfied, documents very satisfied, deliverables. I really had no difficulty.

– First 3, very satisfied, hardware tools not applicable, software tools not applicable, documents very satisfied 5 and deliverables a 5.

– {interviewer} – Same as 2.1.

– Same as 2.1

– Skipped.

– Yes. We've rated all of these a 5, very satisfied and this is based on our interaction with *{name} {our investigation's}* PIM.

{} – I'm just very satisfied. Basically *{names}* have watched out for us and included us in all of their discussions. They've come up with a pretty good process. *{name}* has a nice system where he keeps track of his own timeline that helps him stay up with the ISS timeline so that's a nice thing that he does. Services, very satisfied; processes, very satisfied; people, very satisfied; hardware tools, NA; software tools, I didn't have to use any software. I know he uses software but you mean for me, so NA; documents, for Increment 7, the RPO we didn't have to do any so NA. He did some but I didn't have to put anything in; deliverables, yeah, we didn't have any deliverables per se. I guess information to him so he could fill out some of his forms is a deliverable, so very satisfied with that. It was very easy.

Section 2.2 - *Comments from Increment 8* (click left link to return to corresponding datasheet)

– Services a 5; Processes, a 5; People, a 5, extremely satisfied; Hardware Tools because I do use systems hardware. They provide everything so I'm very satisfied, a 5. They make sure I get what I need. Software Tools is NA.
{interviewer} – Are there any CODE M RPO unique documents that they may have? It's their unique documents as opposed to other payloads office documents.

- NA.
- {interviewer} – And again, on the same theme any Deliverables that are unique to CODE M that you had to give them as opposed to all of the other stuff you had to deliver.
- It's NA.
- {interviewer} – Any comments? You've already given us comments but if there are any I-forgots on this.
- No comments - just an excellent team.

Services rating: 1
Processes rating: 1
People rating: 1
Hardware Tools rating: 5
Software Tools rating: NA
Documents rating: 5
Deliverables rating: 5

See previous comments

– Services very satisfied, 5; Processes really good, very satisfied, 5; People 5, Hardware Tools NA; Software Tools NA.
{interviewer} – Did they give you any unique RPO documents and this is not necessarily other documents but sometimes RPOs have their own unique documents, and if they didn't then it's not applicable.
- Not that I remember.
- {interviewer} – Ok, let's make it not applicable. Any deliverables that were somewhat unique to the RPO? This isn't all of your deliverables; it's just things that they particularly asked you to deliver.
- That's not applicable.
- {interviewer} – Are there any further comments you wanted to give?
- I would just mention again excellent support from the CODE Ms, but now they've changed names, right?
{interviewer} – Yes, Research Integration. It's not even CODEM anymore. It's Office of Space Flight

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- Services 4; Processes 5; People 5; Hardware Tools NA; Software NA; Documents 5; Deliverables 5.

– {interviewer} – What we're going to do is parse this out so that this applies to SPD, not to Ames.
- Rating is a 5 for all.
- {interviewer} – For Hardware Tools let's do NA, Software Tools NA and Documents and Deliverables a 5.
- {interviewer} – Why don't we at this juncture talk about the Ames Feedback, rather than leaving it towards the end because it's a similar theme. I sent this little questionnaire to *{name}* , but I suspect maybe it didn't make its way to you folks.
- 1 – It hasn't yet.
- {interviewer} – I just sent it to *{name}* this morning.
- 1 – Ok, we wouldn't have gotten it yet.
- {interviewer} – I thought that he might be sitting in on this. All right, let me read the questions to you and you can decide whether you want to reply to them. The rating scale is the same, a 1 to 5.
- 1 – We would rather not do that part right now because we need to have discussion about that first.
- {interviewer} – Ok.
- 2 – Lewis really should have a say on what we.
- {interviewer} – Ok, great. Let's do that. He's got it. Let's make it as an addendum and I'll give you folks a couple of days and then I'll just email *{name}* and ask what have you decided.

1 – That's great, that's perfect.

– Services 5; Processes 4; People 5; Hardware Tools NA; Software Tools NA; Documents NA; Deliverables NA.

– We had one issue. I'm trying to remember if it happened during I8 or 9 though. I think it occurred between when they landed and when they did the debrief so it's still during our involvement with I8 so I'm

thinking about that when I'm answering these. Basically we had one of our team members unexpectedly leave and we hired somebody else and it was very complicated from a budget point-of-view. So Services I'll say very satisfied; Process very satisfied – you're not showing any comments on these.
{interviewer} – If you have any comments.
- Ok, the comments, what I'm thinking is pretty much the same things as I said before. It's a good thing they reminded us or we never would have been able to make it. People were very easy to work with. Hardware tools.
- {interviewer} – I'm sorry, would that be a 5?
- Yes, a 5. So three 5s in a row and then for Hardware Tools not applicable; and Software Tools not applicable. We have study software that we're using but they didn't' provide it. Documents very satisfied; Deliverables – we do a weekly report so I'll say very satisfied for that as well. We needed sort of react quickly and in a very detailed way when we had the unexpected personnel change and the staff was very understanding about that and very explicable and answered our questions and helped us work it through in a very timely way and we really appreciated that.

– This is all of the stuff I did with Marshall? Because I didn't work on any higher level than that. I never interacted with anyone above Marshall. Services 5; Processes 4; People 5; Hardware 5; Software Tools NA; Documents 5; Deliverables – what I had to do is fine, 5.

– Services 5; Processes 4; People 5; Hardware NA; Software NA; Documents 4; Deliverables 5. No comments.

- NA

– 5, 5, 5, NA, 3, 5, 5. See previous comments.

– Yes, I will go on to the matrix. 4, 5, 5, NA, NA, 5, 5.

– {interviewer} – This is going to be really easy because in your particular case for Bioastronautics people, you don't rate it twice. You rate it once which you just did and then we just use the same responses as before because the two groups are merged in your case. You can't break them out.
- Ok, so we're going to go NO and then NEXT?
- {interviewer} – You can select NO and go to the next one.
All right.

- No

– No interaction personally.

- Services 4, Processes 4, People 5, Hardware Tools NA, Software Tools NA, Documents 4, Deliverables 4.

- NA

– Services 5; Processes 4; People 5; Documents 5; Deliverables 4. Same time issue of requesting responses again. Again, I don't know. Sometimes it's the RPWG that's requesting these but sometimes it's headquarters levying on the RPWG so it's all of the jump-to's that often occur.

– 1 – Now you're aware in terms of our submittals to the RPO, some of the forms and the processes have been recently changed.
{interviewer} – That I was not aware of. You'll have to try to integrate over that to try to access that.
1 – Services in terms of guidance and clarification for support tasks? ({interviewer} – that's right) I have to say that anytime something isn't clear we've gotten very good support from Todd in terms of getting that clarification, but I think some of the new processes. Anytime it's the first time around you're kind of working them so I would give that a 4. Processes 4; People 5.
{interviewer} - Hardware Tools is most likely NA. So our Software Tools but you can correct me if I'm wrong.
1 – We've had databases we've had to provide on specific information.
{interviewer} – Really? You had databases? In other words they have databases?
1 – Templates, I'm sorry. Templates where we've had to fill in information and specs in regard to our hardware.

{interviewer} – Ok and that was implemented through software?
1 – Yes, you know the templates are provided to us and we fill them out so I wouldn't say specific software.
{interviewer} – Ok, so let's do NA. Why don't we roll those templates into the last item, Deliverables. Were there any documents involved?
1 – No, not really.
{interviewer} – Ok, let's put NA for Documents. But then on Deliverables I would say the templates could encompass that or be encompassed within Deliverables, things that you had to populate with data and hand back to them.
1 – I'd give it a 4. I think that with time they'll improve more on those.

– Services 4; Processes 2; People 1; Hardware Tools 2; Software Tools NA; Documents 2; Deliverables 1.

- Services 5; Processes 5, I was very satisfied; People certainly a 5; Hardware Tools – ({interviewer}) That's supporting hardware. It actually doesn't mean the payload hardware. I don't know if there was any hardware that the RPO supplied for chromosome, for example, that wasn't supplied by other parts of the program.
- That's where I just need a little bit of clarification from you guys. We have over in Bldg. 9, the Payload Development Laboratory that we do sometimes some training in and sometimes some crew BDC activities in and things like that and that might be a hardware tool.
- {interviewer} – So why don't you rate that then.

Ok, I would give that a 5; Software Tools, I can't think of any so I'm going to say NA; Documents, I'm thinking in the area of work instructions and things like that, a 4; and Deliverables I was ok so I give that a 5. Comments – We have been undergoing a kind of process improvement activity to try to improve our documentation requirements and update our documentation requirements so I think I can expect to see that get a little bit better. I think that's probably in our RPO where the most room for improvement probably lies.

Section 2.3 – Research Planning and Integration

Please rate your level of satisfaction with the various services and support provided by Research Planning and Integration

Section 2.3 - *Comments from Increment 7* (click left link to return to corresponding datasheet)
– This portion of interview lost due to equipment malfunction
– No interaction.
– No interaction.
– I've been kept informed on that and I've received the various information from *{name}*. Services 4, processes 4, people 5, documents and deliverables 4.
{ - No
– We don't know anything about that.
{} – Again services, I know it worked very well with RPO and supported our group where needed through the LIS and for planning, so services, very satisfied on that; for *{our investigation}* again the process was very easy. It was Increment 7, Lewis & Clark change. It very quickly went through LIS and our PWG agreed and things went well so very satisfied; people, all of them are willing to listen, the *{name}* and *{name}* and the ones that share that. *{name}* listens when he's there; documentation, I didn't have to do any. That was all submitted by our RPO so NA; deliverables NA.

Section 2.3 - *Comments from Increment 8* (click left link to return to corresponding datasheet)
Services rating: 1 Processes rating: 1 People rating: 1 Documents rating: 1 Deliverables rating: 1 1. Exception is crew training - which was excellent. That rating would be a 5, not a 1. 2. Not given scientific freedom to do best experiment.
– 2 – Services 4 and that's not including the RPWG meetings because I don't attend those telecons. {my PD} Mark does that but looking at specific items you have listed under there crew training, etc. He does the development of ascent and de-ascent manifest and I'm trying to think about comments that he's made about that too and incorporate that. I kind of listen in to some of the stuff that he has to say there and I would probably say a 4. He doesn't seem to be too dissatisfied. I've had a good experience. Processes that seems to be pretty thorough. 1 – The schedules are not consistent and we don't get them early enough in the process, often we don't. 2 – So that would be a 2 on Processes. 1 – And the schedules are not consistent from flight to flight which is kind of a big deal too. 2 – When you say People are you speaking specifically about the RPWG people? {interviewer} – Yes, for example, there are a number of people there but the people that are included are for example, the RPWG right now is managed by *{name}* (2 – Yes) in the payloads office. The Lead Increment Scientist for I8, *{name}*, would have been involved to some degree. 2 – I would say that's a 5. We had experience with both of those people, very good experience. They were always checking things out with us, confirming getting our opinion. It seemed like a very good working relationship. {interviewer} – There's a question there about documents and here I'm at a disadvantage. We put it in there just to cover that particular base. I don't know if there were a lot of documents involved with managing this area or not. 1 – We don't get any documents. {interviewer} – Ok, let's do NA. And then also, I don't know if you have any hard deliverables.

2 – We do have to deliver things with manifesting and I think that's gone pretty well and then also to the LIS we have to do daily summaries and weekly summaries depending on when our operations are. I'd say a 5 for Deliverables.

– I would give those all 5. And I'm specifically thinking about what I assume that this group is, we were asked what our minimum data of need be and why and we had a little discussion about that and it seemed to go very well. We had some nuances that we needed to explain to them that they didn't understand at first but when they understood it they took our needs into account and planned it. On some of these questions I'm a little bit confused as to how to answer because some of our subjects who are ground subjects are in some of these various offices too and so I had interactions with them based on that in trying to get their support for filling out the questionnaire and not for just getting the crew to do it. I'm thinking about those kinds of things.
{interviewer} – You want to kind of integrate your overall experience between those different points of contact.
- Basically everyone is very supportive. Maybe this should go somewhere in the overall section and not here.
- {interviewer} – That's ok. I'll capture your comments and if it's applicable to this group, this management function, then that's fine.
- I guess it's not really to this one.

– Services 5; Processes 5; Personnel great, 5; Documents 5. All 5s.

– No experience

– The PI team didn't directly interact with this group as much as, of course, our ESS *{name}* did and I think the biggest driver on 8 is, you know of course, we had to split up our upmass and that was successfully accomplished and so we got what we needed up and we got what we needed down so I think from that perspective manifest and time lined we were all right.
- I'm not sure we're directly applicable.
- {interviewer} – {interviewer}, what do you think?
- {interviewer} – Not applicable.
- {interviewer} – Wave off that table please. We'll just put in a bunch of NA's on there.

– 5, 5, 5, 5, 5.

- No

– I had put a 2 on the services and processes; it's just cumbersome; the people I put a 4 they're fine to work with; the documentation I put a 1, I don't know where it is or they don't have any. {interviewer} – were deliverables relevant there at all for your manifesting stuff?
- Other than the fact that we had to keep doing the same thing over and over again; the fact that we had to deliver a CEF every time.

– I'll put yes but I'm not sure all of the topics will be applicable. What kind of documents and deliverables will be in this group?
{interviewer} – It could mention any of the manifests for example. They came out with an ascent to descent manifest that talked about perhaps upmass or a particular investigation being included, what kind of upmass and crew training was involved and then requirements that you had to fill in that pertained to that possibly. I need x amount of crew time, I need x amount of upmass.
- Ok, I understand now. It was hard to get a grasp on what exactly it was. The people that I was in contact with about crew time and everything, I'd be very satisfied with that. I don't know about documents. Personally I didn't.
- {interviewer} – Did they provide any kind of guidance or clarification or support during your project?
- The LIS?
- {interviewer} – It could be the LIS. It could be the research working program itself.
- Ok, put a 5 for services.
- {interviewer} – We talked before about time lines and schedules and templates that you were expected to

follow.
- Put a 3 for that one.
- {interviewer} – People, you mentioned a 5.
- People 5 and documents and deliverables, I'm still not quite sure what exactly those would be. The written documentation written by us?
- {interviewer} – Well actually this was written by the program that was provided to you supporting your project. Again, let me just go back some and see what examples they actually cited there. Ascent and descent manifest. The payload tactical planning, the IDRD.
- That would be a not applicable to me.
- {interviewer} – Any deliverables that you had to provide to the program regarding requirements?
- Such as verifications and procedures?
- {interviewer} – Yeah, it could be that. It could be, again the amount of crew training, crew time.
- Put a 5 for that one.

– I put a 5 on all of those because it's basically transparent at this point. For Increment 8 it was just so easy. It just happened.

– 1 – I think I'd give all of those categories a 4.
{interviewer} – Do you concur ok, 2?
2 – Yes.

- No

– Everything is a 5 except Services and People, I would rate a 4. Under Services, I was somewhat disappointed with the real-time support, the operations support.
{interviewer} – Remember we'll have a dedicated question dealing with that downstream from here. So if it's really pertaining to hard real-time ops stuff from your LIS, for example, then let's rate it. Just make a few comments and if we repeat them later on, that's ok.
- All right. I thought the RPWG process was great and I did have some problems with the LIS support.
- {interviewer} – Specifically what?
- There were a couple of times early on that the LIS went directly to one of our researchers for some questions. I would say early there was a little bit of sorting out process of who we wanted the LIS to talk with versus who the LIS maybe initially went to for questions, and we did get that sorted out. It took a couple of missteps before we got that sorted out. Then there were a couple of times that I felt that perhaps {the LIS} previous experience as a crew member maybe skewed her leaning towards more of a crew member response to a couple of things and less of a science response.

{interviewer} – Understood and that traces back to some of your initial comments at the beginning of the interview, obviously.

Section 2.4 – Mission Integration

Please rate your level of satisfaction with the various services and support provided by Mission Integration

Section 2.4 - *Comments from Increment 7* (click left link to return to corresponding datasheet)

– Services were excellent. Increment 7 had to go through re-validation of hardware and other stuff, so we had a lot of questions going back and forth to make sure the paperwork was all taken care of. Everything is reasonable. Templates have been scrutinized enough now that they are extremely reasonable, not impossible, to get done. People are good folks – everybody cares that you get through the process so that you are able to fly and accomplish your mission. Once you go through the process and look for those {documents & deliverables} for future increments, because of the nature of *{our investigation}*. It's like clockwork – it just happens.

– No comments.

– Thanks to *{name}*.

– To be completed by *{name}*

– We had a good relationship. Services 4, processes 4, people 5, documents 4, deliverables 4.

– I think with anything that involved the PIM, we were very satisfied so I think down the line we could give that a 5. He is actually the key to us getting *{any of our investigation}* onboard. We're very dependent on him because we don't do this often enough and things change enough that he is really the person that I pick up a phone and call if I have any questions and he makes me feel very comfortable that no question is too small, no piece of paperwork is unreasonable for him to offer to support. He's very, very valuable.

{ - No

– {interviewer} – select no.

{} – Again we had very little integration; however, the services that we did like the iURCs and the IVRD and X3 type stuff and X5, very satisfied; processes, again I'll put very satisfied because it's easy. We're in a mode where it's just copy, paste and modify type thing on a very simple basis; people, great, very satisfied; documents, I always wish there was less written documentation but again it was easy because it was cut and paste so very satisfied; deliverables, again it's cookie cutter stuff so for Increment 7, very satisfied.

Section 2.4 - *Comments from Increment 8* (click left link to return to corresponding datasheet)

Services rating: 1
Processes rating: 1
People rating: 1
Documents rating: 1
Deliverables rating: 1

Exception is PIM who would be a 5 on all. The mission integration team was horrible. We were required to do documents at handover. We made multiple loadings on hardware. Support software was sent to both ends. We got to JSC and were presented with paperwork we had never seen before with staff that didn't understand. It was all inappropriate.

– {interviewer} – That's managed by the OZ2 subcode in the Payloads Office. It includes the payload mission integration team but it also includes your PIM. The PIMs work, the Boeing PIMs work for *{name}* in OZ2. So if you sort of integrate over your experience with Mission Integration including your PIM if you could give us some responses to the question table, please.

- 5 for Services; 5 for Processes; 5 for People, I don't think we had documentation. Is this the unique things?
- {interviewer} – This would have been things like Payloads Integration Agreements and that kind of stuff.
- Then, very satisfied.

- {interviewer} – Let me ask you a specific question here. They had revamped the Payload Integration Templates some months ago. I don't know if that was something that you had seen.
- I haven't seen the revised templates.
- {interviewer} – Let's go to the last question in the table about deliverables. Is that a relevant question in this case or not?
- You know I always have to ask for a specific example. So for example he needed documentation when we shipped things to Russia like export type things so we worked together on those kinds of things and he requested data from us. Would that be what we're talking about here?
- {interviewer} – Yes, you can fold that into considering a response.

Ok, we were very satisfied. Just a comment – Our PIM is excellent and he's very, very good And you know one thing that he does and I want to add this comment. I would think this is true of any payload that the PIM really is, he or she, is that person who helps you integrate into the system and that's what *{name}* does for us is that if we have a question or concern he's the right person to go to help us know how to word that or who to approach with that and that's beyond the paperwork situation. I think he is the person to assist us with fitting into the system and working the system on a personal level and on a program level. He definitely does that for us as well.

– Services 5; Processes 5; People 5; Documents 4; Deliverables 5.

– 1 – Services. That's going to be a 5. Processes – I think from this group of people that's a 5 also because they worked very hard with us to figure out the schedule. People definitely 5. Documents – that's a 5. Our PIM worked hard to track down the documents that we needed and get them to us and she did good job doing that.

2 – But were the documents themselves?

1 – Well, I don't know.

2 – I think this is rating the documents.

1 – But it says written documentation provided to support your project. So which one? Can you clarify that?

{interviewer} – Yes. I catch your conversation. What you're saying is you wanted to rate how well the PIM supported you with getting the documents.

1 – Is that what you want?

{interviewer} - I would go the other way and rate the documents themselves. The act of the PIM getting you the documents; that's rolled into how well the PIM is supporting you. But the documents themselves are another issue. The PIM could be great at getting you the documents on time and organizing them for you and then you try to read the documents and they might be incomprehensible, so that's what I would say. To the extent that you can remember what the documents are like, rate it on that basis.

1 – Most of them were very straightforward. Let's split the difference there and say 3.

{interviewer} – What about any other data and deliverables?

1 – A 4.

– Who are the people that downloaded the video and sent me pictures? We had pictures sent after each run, still pictures and also a download of the video. Who was that?

{interviewer} – That would have been more in the imagery area. That wouldn't have really included the payload mission integration team.

- I didn't interact with these people.
- {interviewer} – What about your PIM? You had support from *{name}* that you mentioned, right?
- Yes. 5 all the way down for *{name}*. He kept me constantly in the loop as soon as possible and provided all information in a timely fashion. He was on top of everything.

– Not familiar

– 5 all the way down.

- No

– {interviewer} – OZ2, that includes the PMIT and that includes the PIM. This is going to be interesting because we have two components of this one of which I think you got good support from and another that

we could suggest maybe you didn't get good support from. So we're going to have to split the difference here. Let's go through it and do the best we can and then I would like to collect some other comments, but if you could rate the services you got from your PMIT and your PIM rolled into one and give us a number, please.
- I think it would be a 4
Lack of documents.
{interviewer} – Let's get some comments here just to clarify some things because what we had you had some interaction with *{name}* and he's part of the PMIT and then you had *{name}*. Just expand on this a little bit; we had the previous comments about the issue where you didn't get the feedback from *{name}* that you wanted or the PMIT that you wanted on your suggested template, right?
- We also had trouble with the CHIT process; we tried to get *{name}* to go through the CHIT process before we went through the PSRP to try to eliminate that potentially infinite loop and that was unsuccessful.

– I've had interaction with the PIM but not as much as 2 of my other teammates, but I probably have enough to rate. Put a 5 for services, 3 for processes, 5 for people, 5 for documents and 5 for deliverables.

- NA

– 1 – All 4s.

– I didn't talk a lot with *{name}* but when I did it was very nice. He was very helpful in talking to me about certain things but it wasn't a whole lot. Ok, I'll give it a 5 for Services and People and the rest of them I'll click NA.

– I'm going to say, the first three – Services a 3; Processes 4; People a 5; Documents and Deliverables a 5. I felt that the PMIT processes and activities I was pretty happy with but there were sometimes that I felt like the PIM support was somewhat lacking.
{interviewer} – But you've already mentioned that efforts are being made to address that.
- Yes.

Section 2.5 – Payload Engineering Integration

Please rate your level of satisfaction with the various services and support provided by Mission Integration

Section 2.5 - *Comments from Increment 7* (click left link to return to corresponding datasheet)

– We went from a small pressurized payload to a sub-rack payload and I had to get the payload acoustically tested. And the camera is on-board already and the crew is using it. I just happened to work for the same company that owned the equipment and they took me and set up the equipment and did a test on it. On an unaffiliated payload, that would not have happened, and I would have had to pay for that. With *{name}*'s help we were able to get through the documents. Deliverables – I don't believe I should have been held responsible for some of the data I had to come up with.

– No comments.

– To be completed by *{name}*

{ - NA

{ - No

– {interviewer} – select no for that as well.

– In the PIA, I went through that and the only applicable verification items were relative to safety which were covered with safety.
{interviewer} – Then select no and we'll skip it.

Section 2.5 - *Comments from Increment 8* (click left link to return to corresponding datasheet)

Services rating: 5
Processes rating: 5
People rating: 5
Hardware Tools rating: 5
Software Tools rating: 5
Documents rating: 5
Deliverables rating: 5
This was done by *{name}* and they did a superb job.

– {interviewer} – This has to do largely with your payload hardware, the interface requirements for getting the payload hardware up there and so forth. The *{Payload hardware}* have been flying for a while. They were put up there some time ago, isn't that right?
1 – The payload that's up there right now went up on 13P.
{interviewer} – So that's within Increment 8.
1 – Yes.
{interviewer} – Ok, so if you can evaluate things on that basis, that is what engineering integration tasks had to be done to get those *{payload hardware}* flown and give us some feedback on that basis so we can do this area.
1 – We flew the *{payload hardware}* as a small payload so the PE and I were kind of rolled into that, so it was a little bit different than when we do a rack payload.
{interviewer} – Ok, I got it. So on that basis do you think it's worth rating this area or not?
1 – Yes, we worked with that group.
{interviewer} – Ok, then let's do it. Again, the theme is the same.
1 – Services 5; Processes 5; People they did a good job 5; Hardware Tools NA; Software Tools NA; Documents NA; Deliverables 5 – we didn't have any problems with that. It went very smoothly. Did you hear her question?
{interviewer} – I'm sorry, I missed it.
2 – We had some problems with stowage and foam.

1 - This is the first time that I can recall, since I've been here anyway, that we asked JSC to provide our stowage containers. We usually make them ourselves if we use them. So, is there anyplace to?
{interviewer} – Let's do that here. Just give me some comments on stowage right here and that's as good a place as any to talk about issues. We'll put that in as a comment.
2 – When I think of the stowage group, I think of the people that are responsible for tracking everything that's on the station and all of that and I think they do a great job considering the complexity of it. But this was the people on the ground specifically getting that stowage container built.
1 – I mean it was a foam box covered with Nomax and had I known it would have been so much trouble to deal with them, I would have built it myself. It would have taken me 2 hours instead of days and days of going back and forth. By the time that we were offered this service, which was supposed to help us, it was supposed to help us, it was one less thing that we would have to do. We would not have to build our own stowage container, and at this point we had already submitted a lot of the documentation, especially on the Russian side, so we had pictures of the stowage container and so we thought, ok they're going to help us. They're going to build this foam box for us. Ok, that'll save us a few hours, cool. Well, it was awful.
{interviewer} – Did you have a point of contact on that in the payloads office?
1 – We most certainly did and his name is *{name}* . And he's a nice enough guy. I don't have anything personally against him, but I'll tell you what. Difficult is the only word that would describe that. To get a foam box built. That was the most ridiculous thing I think I've ever been through in my life.
{interviewer} – Just having *{name}* name. It's not having anything against him personally, it just helps us understand what part of the program this flows into.
2 – There were actually, and related to that, I remember when I was down at JSC for crew training, people were going back and forth also about how to label this foam box. Nobody seemed to really know what to do with it and how to make sure that it was properly cared for once it reached the station.
1 – Yeah, there's a double standard there. If they build it for us it doesn't count in our upmass and they don't have to label it. So we've got a box up there with a post-it on it for all I know.
2 – That is stupid.
1 – Yeah, that's exactly what it is. And yet if we build it then it's properly labeled. You can look at it and see what it is and it counts as part of our upmass so that makes no sense. It's a double standard and it makes no sense and it make it difficult. I mean what good is a box up there if you don't know what's in it and you can't keep track of it.
2 – That's changed.
1 – Good.
2 – We just did *{follow-on investigation}* training and we discussed that exact issue and the conflict there.
1 – But has it changed program-wide or did it just because you said, "I want labels on it".
2 – It's internal. They realized it was an issue and a problem so they are working to change that because I think we helped them to see that that was a problem.

– I don't think we did any of that.

- No

– That word document with the macros was considered a payload and it had to be scrutinized by all kinds of configuration management people if that's what?
{interviewer} – Are you talking about the IDDs? I'm not sure which one you're talking about.
- The software people had to scrutinize this to make sure that this word document was not going to corrupt the on-board computers and we went through a bunch of hurdles with them, but it all went very well. Is that what this is?
- {interviewer} – Yes, you can touch upon that. There's certain documentation that you would have had to have gone through just on a routine basis as part of your requirements that is necessary as part of the integration process. So, why don't we click yes and see if there's anything relevant and if it's not you can mark it NA.
- 5, 5, 5, NA, NA, NA, 5.

- No

- NA

– Put yes. Services a 5, processes 4, 5 for people, 5 for hardware, NA for software, we don't have any of that. Would this include the data downlink and all of that? Like if we use like DIMS to get images? Or is this just more of the integration area?
{interviewer} – It's more the integration support area.
- So NA. Documents 5 and deliverables 5.

- NA

- NA

Section 2.6 – Operations Integration

Please rate your level of satisfaction with the various services and support provided by Operations Integration

Section 2.6 - *Comments from Increment 7* (click left link to return to corresponding datasheet)

– Ops Integration flows very smoothly. The folks who build the IURC inputs or call the irk inputs to build the OOS are professional to no end. Michelle Barnett is excellent. They work well with you and explain when the deadlines for basic and final OOS or your iURC inputs need to be promoted so they can go to work and build the timeline. Same thing from the LISs, when you get close to your operations they are your advocate and they take their job seriously. That is one of the unique things about *{our investigation}* – they are used to me now. They actually do a lot of the work for me.

– I do not think this rates this very well. This does not have anything that shows when you're trying to get into the use, or you're doing outlying planning, that we have any feedback to drive the planning. We put in we'd like to have an hour of crew time to do this, but we do not have any drive. The planners work very hard to get everything into the activities, but we have very limited tie into this. My ratings look good here but I don't think that states that we are optimizing the actual operations planning.

– N/A

– The people from POIC and the LIS, *{name}*, acted above and beyond our expectations. They were very flexible, very accommodating, and they truly have the science payload and PI interest as their priority. We were very happy with the support groups.

– Services 4, processes 4, people 5, software tools not applicable, hardware tools not applicable, documents 4, deliverables from us, I'm not sure, a 4.

– This would actually be when we began these discussions and had to go back, is that correct? When we began to?
{interviewer} – This is not conducting the operations of *{your investigation}*. This is whatever you had to do to plan the operations including crew procedures and that kind of thing.
- And this would be any redo that we had to do during the increment, correct?
- {interviewer} – No because if it was during the increment then that's real time ops and that comes next. This is anything for planning your operations in advance.
- All right. I think we were very satisfied with that. I would say software tools were really not applicable.
- {interviewer} – So you're giving us very satisfied down the line for services, processes, people, software tools is not applicable. Documents?
- Any documents that we needed I think were taken care of or helped us developed so yes we were good with that and very satisfied and the requirements very reasonable, so very satisfied with that.

{ - No

– {interviewer} – This has to do with preparing the procedures and your requirements for doing the operations, not executing the operations but preparing them and Laura did mention about the procedures and some issues there. If this is an area that you had some interaction with which we could get some feedback on it. I'll leave it up to you folks.
1 – We had a lot of involvement with operations.
{interviewer} – On the questionnaire we've divided OPS into two areas. There are real time ops and then there's ops integration, which is preparing your ops. So this particular area has to do with preparing to do your operations and then real time operations are next.
1 – Is that the DCP? Is it like the discussion that takes place an hour before the DCPs when they go around?
{interviewer} – No this would be more substantially in advance before you're actually operating up there. You're submitting requirements.
1 – No, we're transparent.
{interviewer} – Let's select no for that.

– Yes. I'm going to let J talk.

- For service I gave it a 2 because every time I handed in a product they told me that something else was required and you had to go to this meeting or I had to do this other thing (RC – that's interesting). Well, it was interesting because they were trying to treat this as a regular payload when I was supposed to be fast track and it got fouled up. For the processes a 3, the timeline and schedules and stuff they didn't have a clear template to my liking anyway; people, I've worked with the people for quite a while and I've never had any problem with them so I'd give that a 4; there were no hardware tools; yes, software because we had the MPV and the OCR process PIM and all of those other software that we did use, a 4; no documents; no deliverables.

{} – Services, again services went well as far as the operations team, so very satisfied; processes, I'll put very satisfied. Again, we're so cookie cutter that things are streamlined and go right through. People know who we are so it makes it simpler; people, they're great. We've had no problem with the people at Marshall; software tools, I'm going to put NA because our Hask account, we didn't have a Hask account at that time and the LIS and the PODs would write our OCRs if we had any so I'm going to put NA for software tools; documents, we didn't really have any documents for operations integration. IURC is more a mission integration. I guess I don't know what documents that would be for operations integration other than the daily or the planning, the short term planning messages. Well, I'll put very satisfied just because the documents that are out there that if we did have a question. Never mind, I'll put NA. I didn't really have to use any of the documents for operations integration; deliverables, I'll put 4 just because we're restricted to a very specific time but that's mostly because it has to be worked through the system so I'll just put a 4 on that.

Section 2.6 - *Comments from Increment 8* (click left link to return to corresponding datasheet)

Services rating: 1
Processes rating: 1
People rating: 1
Software Tools rating: 1
Documents rating: 1
Deliverables rating: 1

We could have done this with multiple previous flights and felt we had a small contribution we could make; however, we were excluded on this occasion.

– {interviewer} – On that page there's just a paragraph that sort of lists what we mean by Operations Integration. This was preparing to do your ops, not executing but just preparing it. You would have had some interaction maybe with your LIS and you had to put in requirements to something called the OOS and so forth. Do you still feel that this is a relevant thing for you to discuss for Increment 8?

- No, I mean we certainly had to do the requirements to the OOS. This would include things like IURC, those kinds of things?
- {interviewer} – That's correct.
- Since we do all of that and get great service, ok I'll go ahead and rate that. I hate to repeat but very satisfied for Services, 5; Processes 5; People 5, Software Tools NA; I think we're very satisfied for the Documents; I think we're very satisfied with the Deliverables. These folks, at least in our opinion, did a great job for us during Increment 8, excellent job helping us to get our requirements taken care of and also to respond to the constraints that we suddenly found with the lack of video tapes and scheduling and looking at how crew members do this and changing from 3 to 2 people to get this stuff done.
- {interviewer} – You said something that caught my interest. You said "lack of video tapes". What was that about?

What happened and we saw this start during 7 is that because of the limited resources on board as far as DVD tapes, we did two kinds of operations during Increment 8. We did one that actually dealt with hardware which were called *{investigation name}* and then we did some additional activities that don't require upmass and they're also referred to as *{investigation name}* and go through the same process, and

so what we had to do was recognizing that we probably didn't have enough videos on board to film both the hardware and non-hardware activities, what it took was a relook at how we could do those non-hardware ones and so what we realized is that we would need to do those as a live downlink and that would be the way we would get the video. It's kind of a complicated plan that came into play. And I think a learning process for everybody but great response from folks as we worked through that.

– Services 5; Processes 5; People 5, Software Tools NA; Documents 4; Deliverables NA.

– Services a 5; Processes a 5; People – they're excellent, a 5; No Software tools; Documents and Deliverables, a 5. Again, they're a super team. They will do my work for me to make sure that I'm taken care of. It's customer service at its best.

– As I know understand, this would be largely C #2# what you dealt with?
2 – Yes.
{interviewer} – So on the OPS side what we do is we divide it into two parts. There's what we call Ops integration which is preparing things to do OPS, putting in your OPS requirements. It also deals with developing procedures and so forth and then we do real-time operations separately.
2 – Ok, thinking back on the OOS and that whole process. Services 5; Processes 4 because it's a little bumpy. The way that I get information on when things are due, schedules, timelines, etc. is a little big bumpy. It's not a smooth, it's not like I have one person who's my point of contact that I know I'm going to get this from. I mean I do have that person but I don't think it's her job to do it and she's our SIM engineer, *{name}*. She makes sure that I get everything that I need which seems a little odd. It shouldn't have to be her. People 5; Software Tools is NA unless we're including iURC.
{interviewer} – Actually, we are.
2 – So, iURC is pretty useful and a fairly easy tool to use. I had to learn how to use it a long time ago and it goes through a lot of changes frequently, but because I had a good relationship with our point of contact for iURC it was easy for me to catch on, so I think in general the iURC is pretty useful. I'll say 5.
{interviewer} – Are any documents relevant here?
2 – Only the ones I get produced from iURC. The OOS I get sent the OOS, so there are a couple and I think even documents in general are good. Deliverables, satisfied with that, that's me giving them my input. That seems to go pretty smoothly.
{interviewer} – So on the last two is it a 5 or 4?
2 – 5. The only 4 I would give is to the Processes because it seems to be still a little bit bumpy

– Services 5; Processes 4; People 5; the rest is NA.

– {interviewer} – Again we're talking about any of the planners at Marshall, the payloads operations and integrations center pre. This is pre-flight when you had to submit any kind of requirements for your crew time and any other operations plans that you had prior to flight.

- I think I answered that with the previous one when they were making plans about scheduling us. I think that was while they were already in flight. I know we had to plan for telemetry that we wouldn't have ordinarily done if there had been a shuttle to bring the data done. We like to keep it confidential by bringing it down directly. I'm not sure if it was this group that was involved in that.
- {interviewer} – Actually yes. I think this would be applicable. You can take them into consideration if you want to go to the matrix table. Had you interacted with the folks at Marshall space flight center?
- Yes.
- {interviewer} – Ok, that's fine.
- And we also have a lot of subjects there who are ground subjects, so I'm not really thinking about that as well. Well, for this section I guess I should think about that. Basically we were very satisfied with all those things to the extent that they're applicable. I'm not sure they're all completely applicable.
- {interviewer} – If you don't think so, that's fine. Just let me know.
- Why don't we just put 5 on everything. I can make an argument for each of those.
- {interviewer} – Including software tools?
- Software tools, well our software tools were used to create the data and then had to be telemetry'd down and CDs had to be provided to us.

- {interviewer} – But did they provide the, did the program provide?
- No, they didn't provide any.
- {interviewer} – Then that would be not applicable. Any comments you would like to add there?
- No.

– No software tools, but 5 on everything else.

- No

– NA

– I don't remember having direct interaction with them. I think it was handled by *{my PD}* and PIM so I don't have a basis for that.

– I'll give you a 5 on Services; Processes 5 – I'm happy about that; People – they were good 4; Software Tools NA; Documents – we uploaded a cue card for the astronaut crew members and things like that. I'm pretty satisfied, a 4 on that one; Deliverables – my experimental team took care of those but they didn't whine too much so let me give you a 4 on that one as well.

– The process was 2; the ECR process was really long and there's already so many people in the queue before you get there that you're driven, you know you're looking at 8 weeks to turn around; when we were supposed to get something done in 3 months and somebody tells you there's a 4 week backlog in front of you and it will take 4 weeks for you to get through the process.
{interviewer} – The tricky bit about this is that when we designed the questionnaire we divided OPS into 2 parts; there was the getting ready to do OPS part and then there was the actual execution and so operations integration is the getting ready to do OPS part, you know building your procedures, putting in your ops requirements and how your requests for ops requirements were handled and that kind of thing. If you don't feel that this first area is relevant, then we'll skip it and go on to real time ops. What do you think?
1 – We went through the process for the timeline and for the crew procedures development and I think it's relevant; I think their processes, they also suffered from a lack of decisive tailoring for a no up mass payload and they did the same thing that the PMITs did, they didn't respond to the definition of process that we put out on the table and then pretty late in the game enforced all of their normal processes and it bore a significant impact to our schedule. I thought the services were a 4; the processes were a 2; the people were a 5, you know they were very polite in enforcing their stuff; and the tools and documents NA; documentation they supplied if you consider them to be like part of the OBT and that kind of stuff that was very satisfied with that, a 5. The procedures had in them what I expected them to have in them; I just didn't like the process.

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– 5 for services, 4 for processes, people 5, software tools NA, documents written by the POIC? Like the

POH, payloads operations handbook. Is it specifically for our project or in general like all of their information and web sites and everything?
{interviewer} – That can be included. It's anything that they provided that supported development of the BCAT-3 that was applicable to you.
- I'd say that would be a 5. Deliverables put a 5 for that one.

– Services – very satisfied a 5. Processes 5; People 5; Software Tools 4; Documents NA; Deliverables 5.
2 – MSG would help investigate but a lot of times once they're on orbit then the payload developer will work directly with the POIC. We'll still involve MSG.

– Everything is a 5 except for Software Tools and that's NA because I didn't have to do anything with any of the software tools. It was probably done for me. For instance, putting hours in the OOS, the RPO does that and then upgrading the iURC, they just transferred it on their own and said is it the same as last time? I go yes, that's it. So again it's sort of transparent at this point. We haven't had any changes.

– 2 – We'd probably give 5s to that.
{interviewer} – Do you concur 1?
1 – Yes. You know I always think in terms of the processes. You know we have some room for improvement. In terms of guidance, clarification I'd give it a 5. Maybe for processes I'd give a 4 because I think there's room for improvement still. People I give a 5. Software Tools – there may be a little bit more room for improvement. I give them a 4. Written documentation to support your project, I'd say a 4. Deliverables, a 5.

– Services 5; Processes 5; People 5; Software Tools NA; Documentation NA; Deliverables 5. Basically this was the LIS.
{interviewer} – And her support is going to be relevant in the next area.

– Services 3; Processes 4; People 4; Software Tools NA; Documents 4; Deliverables 4. I was basically ok with this aspect, except for the services which I thought, and I'm thinking generally along the lines of real-time POD support, that I felt like could definitely have been improved. One thing that I remember and that my team felt like was a problem, we had some discussion about it during the increment. There was a POIWG face-to-face before the increment. We went down there with the intent in going to the POIWG was to present our science to the POD support folks and kind of familiarize them with our science and we were disappointed at the turnout to that splinter meeting and we did raise that as a concern with POD management later on. In fact, not that's relevant to I8, but the I9 guys said that their POIWG face-to-face went much better as far as attendance and interaction in that area, but that was something that we felt like the Marshall POD support was maybe not as familiar with our suite of experiments and our activities as they should have been and that contributed to some problems that we had.

Section 2.7 – Real-Time Payload Operations

Please rate your level of satisfaction with the various services and support provided by Real-Time Payload Operations

Section 2.7 - *Comments from Increment 7* (click left link to return to corresponding datasheet)

– Tremendous advocates. Once you get that far in the process they want to make sure that you have every chance for success that you can have, and they work for it.

– I feel that the Program matured between Increment 6 & Increment 7 changeover from a standpoint of what we could do for Ops. And some of this is because of supporting MSG and the experiments in MSG. I know they felt hand tied. We ran into the same things but not to the same degree, because we are a much simpler payload. The support stuff went completely down, while obviously the processes and tools were still in place and I feel those were still good, but we just did not get the same kind of support that we did in Increment 6. There was definitely degradation in support there.

– We had good cooperation during flight sessions. They were always kind to us and solve all the situations that could arise onboard.

– Support was truly extraordinary. It would be great if it was like that always, as it was in this increment.

– Services 4, processes 4, people 5, software tools not applicable, documents 4, deliverables 4.

– I mean there was some good, some not so good and there was some really good. I'm going to give it a 3.
{interviewer} – What about the processes that are set up at the POIC for running ops? What do you think of those?
- The time line schedules and program plans?
- {interviewer} – Or, doing OCRs. How they run things at the POIC?
- I think those were reasonable, and in general they were in principal accommodating. I think the people we spoke to were probably under constraints given to them by someone else, but we followed the procedures and things basically work out, so I'll give that a 4.
- {interviewer} – What about the people?
- I think the people are all good. I give that a 4 too.
- {interviewer} – Were there any software tools involved?
- I think maybe the software for the experiment and the software that went along with the glove box.
- {interviewer} – Let's put NA for that one. Did the POIC or the OPS folks have any documents, forms, templates, things you needed to fill out?
- I didn't fill out anything like that.
- {interviewer} – Ok, NA. And let's do NA for deliverables.
- Ok.

– I think the service is outstanding from Marshall, very satisfied. I think our timeline schedules were fine. I would mark down just a bit here to 3. Software tools not applicable. I think our documents were, these would be documents that were done outside of our office, is that correct? Written documentation written to support your project.
{interviewer} – Right. If in the course of operating during the increment, they handed you a document, say a form that you had to fill out or something like that.
- Ok and I think there were no problems with that. We were very satisfied. And the requirements for data that's just basically looking. I guess my question is because we faced some challenges as far as actually finally getting this done, that would be more appropriate in the comment area to talk about that? ({interviewer} – sure, that's what I would say) And the deliverables, once again I think everything was pretty reasonable for that. I think our challenge came was that when we had questions from a crew member that we saw that people within the ISS Utilization Program began to challenge the education value and we had a number of meetings. I think I talked a little bit about, where we had a debate whether this would even be conducted during payload time, was it more appropriate during PAO time. Our belief was that we were a payload and that our time should remain in tact. At that point we began a process of redoing the procedures

and not only did I feel that it needed approval from the crew member, but we had a number of people from the ISS Utilization Program weighing the procedures not so much from a procedural, in a procedural context, but I thought judging the education merit and that is where our concern comes in. Is that an appropriate group of people to be doing that and is that the appropriate time to do that? Certainly we're well aware that a crew member's concern might mean that you needed to re-look at something, but we felt that perhaps folks who were not really educators were weighing in on whether this should be done or whether there was any value in it being done and we viewed that as our role that we were the education office and that would be our decision. We would not have flown it if we didn't feel that. So certainly some discussions that all go back to that central issue. Is the ISS Utilization Program really the appropriate office to judge the education value of *{our investigation}*.

– I would rate the first 3 a 5, software tools not applicable, documentation is not applicable in this case, deliverables is not applicable.

{ - No

– {interviewer} – I think this is an area we can talk about. So select yes and you'll see a question table that's more or less identical to the one you saw previously.
1 – Who are the people that would be involved in the real time ops? Tom and the flight director and POD, all of those people?
{interviewer} – That's right and the Payload Operations Director at Huntsville.
1 – Yeah, the POD.
{interviewer} – Yeah, the POD and also, however, *{name}* is also involved in that.
1 – He was the POD. No, he was the LIS.
{interviewer} – But it includes the POD, all the procedures and stuff at Huntsville and then also the LIS. So that gives you a picture and if you could just think about that for a minute and come back with some rating numbers for me that would be great. Thanks.
1 – I notice that this real time includes the data and documentation from me during the real time during the ops or like my point that it's not over until we analyze the data.
{interviewer} – All of that stuff. That's why I think this is an important area.
1 – So we're basically satisfied with the deliverables. So the part of real time that we're most dissatisfied with is getting the data. In terms of the guidance and support that we got during the real time thing, I think was very good.
3 – That's when we made all of our great discoveries on how to interface.
1 – So we're very satisfied. So 5 for services. And we understood the time lines. The real time is a professional show. It's incredibly well managed. There's so much support. So 5 for services and processes. The personnel were exemplary.
{interviewer} – So I'm going to give a 5 for the people.
1 – Yes. We were in awe of this process when we got into it. The software, that's the IVODs and that sort of thing?
{interviewer} – Yeah, you can throw that in.
1 – Well the IVODs during led so that I don't think we can. It was fixed up. We have a specific comment for the software. I'll say 1 for the software. The Huntsville office didn't want to test the real thing, didn't want to do the test on IVODs of the space to ground loop.
2 – Right before the crew conference.
1 – They wanted to test a bunch of things but they weren't willing to do the test of everything before we needed it. Just like for the procedures we expect that things are going to fail with a certain frequency and we want everything to be tested before it has to be used.
2 – That was when we first got the IVOD.
{interviewer} – Yeah, this is real time ops. For documents what would you give as a rating? For documents that you had to deal with for doing real time ops?
3 – Did we get written documents?
{interviewer} – It may not be applicable.

2 – That's like what we're supposed to say and the phrases we're supposed to use when we talk to the crew member.
3 – Those were fine. I think that's a 5 also.
{interviewer} – What about deliverables?
3 – That's where we had the problems.
1 – We were very dissatisfied because we couldn't get what we needed in order to turn around our deliverables.
2 – Would that also include Josh the high bandwidth downlink issue?
1 – Well, we finally solved that.
2 – But not this increment.
1 – And we have a specific recommendation that the bandwidth options be published and made available to the investigators so they understand how to request specific pieces of data and at what resolution. It took for ever to get that information.
{interviewer} – Ok, give us a rating.
1 – A 1.

– Yes. I thought real time went very smooth so for services, a 4; processes was also a 4; people is a 4; software is a 4; document and deliverables are both NA.
{interviewer} – Well, I've got to say that's intriguing that there's a different between the ops prep and the actual ops.
- Well they have a process and they follow it. There's little time to negotiate when somebody's saying, "ok, Ed wants to know this" you tell them or you don't and it's not like, "well you know you've got 3 weeks before you operate and I need another set of these". A different mentality completely.
- Interesting. It's just that {interviewer} and I have been doing this survey for, you know, this is our third cycle and usually the ops prep stuff is relatively, the feedback is usually plain vanilla on that area. It's not that special, but you gave us something different so we're going to have to scratch our heads about that.
- You know a lot of people that do the ops prep don't do real time ops. I think I'm one of the few, F and I, because most of the people that I talk to at PODS that do the pre-ops they don't sit for their payloads. They either do one or the other.
- L – well you have a lot of experience because you support Image G you have a lot of on orbit ops support.
- J – But I've done a lot of procedure development also so I have been working both sides.

{} – Services, very satisfied; process, again very smooth for us. We're just cookie cutters; people we worked with were great; software tools NA; ({interviewer} – people you had a 5?) I had 5 for the first 3, for services, processes, people. Software tools I put NA because we really didn't have to use any; documents, NA we really didn't have to use any documentation for real time ops; deliverables a 4.

Section 2.7 - *Comments from Increment 8* (click left link to return to corresponding datasheet)

– {interviewer} – So for example, you were sitting on console when Mike Foale was doing the experiment, right?
- Yes, we had our unit running in parallel and we were following what he was doing, but of course we were not receiving data while he was performing the experiment. The experiment has been saved on hard disk because this was the normal procedure and then to forward it to us at the end of the increment the hard disk. But, of course, the other approach was also to receive data via electronic data via mail and this was what we received just the day after, I think, a few hours after.
- {interviewer} – Ok, so I think those activities are relevant to this area and there may have been some other things you were supported to get real time operations done so if you think about those things, look at the questions and give me some ratings, please.
- Ok. Services 5; Processes – there were no changes in the plans so a 5; People 5; Software Tools NA; Documents NA – we did not have to provide any documents; Deliverables NA.

– Services a 5; Processes a 5; People a 5; No software tools, Documents a 5; Deliverables a 5. To handle real-time and their operational change requests basically on the fly is a very streamlined process and it's easy to follow and the people will work it for you.

– Services 5; Processes 5; People 5; Software Tools 5; Documents NA; Deliverables NA. I can't remember if this is applicable to Increment 8 or it's just a continuous thing or just something recent, but on occasion I get emails from somebody but I don't know who this somebody is because it comes from LIS or it comes from POIC or it comes from MROPC or XYZ or somebody so I never know who I'm responding to, or how many people I'm responding to. Or what I'm responding to.
{interviewer} – You have a poor grasp of the operational structure behind operations.
- That's probably accurate.
{interviewer} – That's what I'm putting in as a comment. We'll also pull that off the tape.

Services rating: 5
Processes rating: 5
People rating: 5
Software Tools rating: 5
Documents rating: 5
Deliverables rating: 5

Real-time load superb. Mike Foale did an excellent job and so did the staff supporting him

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– Services very satisfied; Processes very satisfied; People very satisfied; NA for Software; I'm not sure for real-time operations, unless you can provide more insight, that we actually ever had to do any written documentation. {interviewer} – let's do NA.
- Once again for real time deliverables I'm not sure that that really applies.
- {interviewer} – Let's do NA.
I would tell you that the folks at Marshall and the POIC have been outstanding in their support for us on console during operations and in preparing us to go on. It's been excellent

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– 2 – Yes, I have a basis. I would say because I have good people that I've known for a while and I know who to call, the Services I would say are a 5. Processes, sometimes some of the stuff can get a little bit tedious but basically it's good so I'm going to say a 4 on that. Again, it's because some of it seems a little tedious but that's ok. People are definitely a 5. Again, I think it's because we've known each other for a long time. Software Tools, I'm assuming that would include stuff like PIMS and doing OCRs and To Do lists and all of that, but also I think that should include probably our commanding software. Is that true? ({interviewer} – Yes). Yes, it has to fit in here so I'm going to say that's probably overall it's a 3 because right now our receipt of data and issuing command are done in two different ways on two separate computers and it's not a very efficient way to do it. But I know that they're trying to get all of that done through the same type of interface and eventually that will become a 5 and I have no doubt because I know people are working hard on that. Documents – NA. Deliverables I think is a 5 also.

– Rating is a 5 for Services/Processes/People and not applicable for Software and Documents. That was documents that they wrote?
{interviewer} – Right, that was provided.
- Yeah, I remember looking over some of the procedures that were going to be used that they wrote and those were fine so I'll say very satisfied. I don't think we delivered anything so not applicable for that.
- {interviewer} – Any comments to that section?
- No.

– This is my favorite part. Didn't do anything with software. Everything else was great. It was a very exciting experience and the people who worked on it, they were awfully cheerful for 2 or 3 in the morning. I mean they were there and people who didn't, other people from Marshall who really didn't have to be there but were part of the team, Melody Biddeford and other people on the team came by just to be part of it and kind of root for us and so that was really fun.

- No

– On the people for the real time, who are we evaluating?
{interviewer} – I would say it includes. It's integrative. It does include the Lead Increment Scientist but it also includes the POIC individuals like the POD and so forth.

On services we gave them a 4; process a 5; people a 3; software tools NA; documents a 5 and deliverables a 5. See previous comments.

– Services 5; Processes 3; People 3; Software Tools 3 because that goes back to the comment about data interaction; Documents 5; Deliverables NA. In my comment I'm going to say we got very excellent support from the HLS team and from our own experimental team during operations, but there were times when I felt the people who were responsible for transmitting data to the crew prevented the transmission of meaningful information to our subject, and they didn't seem to have an understanding or weren't willing to develop an understanding of why we wanted to communicate that information.
{interviewer} – Again, I usually don't do this but in your case I'll make an exception and basically that this is all supposed to be confidential, but I can tell you that I've heard this before.
- Yes, and there seems to be a very authoritarian atmosphere the further you go up the line and I can understand why it is, but I just need to say that it is. It seems to be undue deference to the crew member at the expense of the experiment.

– This is the scheduling. Yes, I do have a basis. 4, 5. This is the group, I believe, where this misinformation keeps getting circulated so I don't know how to respond to your, a 3. NA, NA, NA.

– 5 for Services; Processes 4. Much of this may be out of your control; however, we had our experimental timeline moved multiple times. Some of that was experiment unique requirements. I mean we needed a certain amount of KNUF band together and I understand you can't figure that out until just before the time. We did have it moved around a couple of times for, I guess, maintenance or operational requirements on Station. Again, that's somewhat challenging. I had to change my flight 4000 times and when I'm trying to run a hospital system and be a surgeon that was challenging so I'd still; most of it is out of your control but it was just frustrating. Again, the People were spectacular. I'll give you a 5 on that one. I don't know of any software specific. Documentation a little redundant and a little overdone, but I'll give you a 4 on that one. Deliverables weren't overbearing so I'll give you a 5 on that.
({interviewer} – bring {interviewer} up to speed for numbers. {interviewer} said Documentation was a 5, but on tape I heard a 4.

– People thought this payload was out-of-scope for normal OCR processes.
And I think they were probably right; I just wish they had told me earlier.

– Services a 5; same for the processes, 5 for people, software tools NA and NA for documents and deliverables. My experience has been a very good one since we only gave phone support but we have a direct line with the Marshall center so we were knowing what was happening while our payload was used by the crew so we have a sort of real-time link. So even though we didn't have the possibility to speak to the crew, but we knew at any moment what he was doing with our payload, so it was easy for us to understand what was happening and it was a good feeling.

– Services would be a 5 for sure. Processes a 5, people 5, software – this is where I would include the downlinking and everything, right?
{interviewer} – Right.
- It's not really software. It's like programs, I guess. Would that be included?
- {interviewer} – Yes.
- Put a 3 for software. I'll explain what I mean in a second. Put a 5 for documents and deliverables as well. The real time payloads operation Cadre was very helpful whether we needed something or whether we were trying to get information up to the crew or anything, they would always do their best in getting it. They gave us like when they needed to buy and everything like well in order to get it up to them before operations we have to have it by so and so time. I liked how they set up the timelines and the schedules. Short term plans and everything, that was good. The people were great. They're always friendly natured. I'm going to put the DIMS into this. Do you know what that is?
- {interviewer} – Data management?
- Yes, imagery. It's a program that they put the photographs on. Our only data was photographs of the samples that we had. So pretty much that was our way to get things. It was kind of confusing at first as to how it was going to work because it took a while to get the images and everything because they had to

come down and then they had to transfer it over and then we had to get it and then we had to update the files in order for the PIs to see them and all that. We're trying to figure out an easier way to do it, whether or not we can FTP it somehow or just dump it somewhere, I don't know. I wasn't involved too much with the actual conversations but I knew it was going on. That's probably why we didn't rate it as high just because there was so much involved of just getting a file. And each file, it was like on a web site. At one time we had up to 159 photographs come down at a time and each file had to be opened, then saved and updated so that the PIs could see it and then saved again so we could archive it. That process took a while. We were contemplating on whether or not there would be a better way, say just dump it all in one so you could just copy and paste everything and save that. Do you know what I mean?

- {interviewer} – Yes. Did the process ever smooth out?
- It got to a point where we were like, "no". We basically had to download every one individually and that took a while like up to a couple of minutes a photograph. But by the time it was over, I mean, we got to the point where we understood the process enough to just like do it automatically and know exactly, but there still, I think, could have been an easier way. I'm not sure if it was just something from the beginning where we were like "oh we can use this" or if it was. Because we tried to get it where we could download it here but it never worked out correctly because of something. I'm not sure what it was.
- {interviewer} – But this was all associated with the DIMS system?
- Yes. We were trying to maybe not use DIMS but I'm not sure why we couldn't. It was probably just the way it was being downloaded or downlinked. Like I said, I knew the loop existed but I wasn't exactly in the loop on the conversation.
- {interviewer} – Great feedback. That's very helpful. Anything else there?
- I don't know if this is where I would say that we actually had to do a couple of extra runs of our experiment just because the focusing procedures on our photographs are actually relatively, if you know what you're looking for, it's easy and if you've done it before it's easy, but I don't think we had any extra photo sessions in Increment 8 to tell you the truth. I'm sorry I'm kind of mentioning these two increments together because we ran throughout both of them. So nothing else on Increment 8, sorry.

– All 5s.

2 – Everybody I've ever spoken with was very helpful and when I had to contact POD a couple of times to get information to the crew member they were very helpful in getting it to him on time and they wanted to make sure that the procedure was done quickly.

3 – They were absolutely terrific and however that could be transmitted to them to let them know that they were and we really appreciated it.

2 – We weren't sure of the protocol and how to get the information to them or up to the crew member because we weren't able to do it the way we knew we supposed to do it. It was ok.

– Services 5; Processes 5; People 5; Software Tools 5; Documents NA; Deliverables 5.

1 – Software Tools, I guess that goes back to when we speaking about the PIMs system. I think you said that's not really considered Software Tools so that might be NA on this one.

2 – I was wondering about that. I guess like you said NA, but I think we've been pretty happy with the OCR tool, that's Tim's right?

1 – Yes, that's Tim's.

{interviewer} – Then give it a rating.

2 – There's the on orbit time line. What is that thing called?

1 – That's the OSTPB.

2 – That's really nice. A 5. For us, document and delivery for Increment 8 pretty much amounted to putting in our request to run which I guess is OCRs, CEFs, and payload anomaly reports are essentially all we had to do. Since we're being recorded, there's a good point to make. Increment 8, like we were saying, was a lot better. We know like on Increment 5 when we did the SUBSA investigation and started out with the PFMI investigation there was a point when we sat console that we would get peppered with calls not just on the loop, it wouldn't just be POIC it would be all sorts of people would call us on the telephones and it got to be very busy to answer to all of these different people and if we had an anomaly we would have a lot of

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questions. We finally took the habit if we had an anomaly and if we were in a safe state, we would have people leave the room and go caucus in a conference room so we wouldn't have to answer all of these questions so we could sit down for about 30 minutes and figure out how to proceed and then we'd come back. That's Increment 5 stuff I'm feeding you, but with Increment 8 they seemed to be better about not calling the white phones. We didn't get nearly the volume of calls we did on Increment 5, so that may be a little bit too much but the point is there seemed to be a little bit less pressure so that we could actually work out solutions without having to answer the phone every two minutes.

– I put a 5 on all of those. The real time ops team at Marshall and even if we have to deal with PEP com or whomever here is very supportive of CEO so we have a good working relationship with them and we haven't had any problems. Other than we're not quite sure why they don't pass on the question, but they're very supportive of us. They try working with us.

– 1 – I would give them a 5 all the way down because I think they really have put together some really good processes that are efficient and looking since our first mission on 7A.1 over several increments, I think that they've really done an outstanding job

2 – I agree that they have changed for the better and the individuals that are involved are very committed and very supportive and we've had help, again, beyond what we expected.

– Services 5; Processes 5; People 5; Software Tools NA; Documentation 5; Deliverables 5. That experience has just been fantastic. They really bent over backwards to get us the science. *{name}*, in particular, has really been the lead force in getting us what we've gotten so far. I really have no higher ratings for those guys than what I can give them on the survey.

– I'm looking at this from the standpoint that I was able to multiplex myself a little bit and pull up a little file of lessons learned that we submitted to the program on this that I think will help me a little bit in rating this one. Again, the software tools I don't have enough familiarity with those to give them a rating. I've plugged in NA for that one. Everything else but Services I gave a 4 and Services I gave a 3. There were several times early in the increment during off-nominal situations where we were not – decisions were made on our experiments without our guys being contacted for their input first or when we did give them input we felt like it wasn't correctly implemented. There was one time we had a philosophical difference with the program, I guess, on an activity. There was one time that a maintenance or a service activity had gotten cancelled and freed up a bunch of time and I'm looking at my lessons learned but it doesn't tell me exactly what that was, but I don't know if it had something to do with that, with the window that had the leak that they were working on or there was an EVA schedule that got postponed or something like that and a big block of time came available. We had wanted to submit some things that could be done with that and only at that time did we find out that the only candidate for activities would be things that were on the task list, and that was by no means clear to us prior to that time, or we might have added some things to the task list and also we felt that was a bad way of doing business because there are some activities that we had that were not, we felt, task listable but things that could have been done with just a short amount of planning and the ability for us to be there and give some support. I guess task list kind of says that they can just do it absolutely whenever and they don't need us to be there or anything like. We had some activities that we felt were mature and ready to go and could have been done, but we couldn't get them done. We felt like we lost some opportunity to do some science in a several hour block of time that just kind of got freed up and we felt like the program gave the crew busy work. Obviously that opinion was not shared with everyone.

Section 2.8 – Payload Safety

Please rate your level of satisfaction with the various services and support provided by the Payload Safety Management Area.

Section 2.8 - *Comments from Increment 7* (click left link to return to corresponding datasheet)
– Payload Safety review was done out of Board. All re-flight so I sent them a letter, they asked a few questions and that was it. It is a straight forward process. Getting things through the safety process is not difficult if things are done right.
– No comments.
– It was a quite small, simple payload and we didn't have to attend the safety reviews so the safety process was quite smooth.
{ - NA
– I think for services probably a 4; I think we're pretty satisfied with the processes; for the people 3. {interviewer} – What number was it for processes? - I'm sorry. 5 for the processes, 3 for the people, software tools not applicable; documents I would say very satisfied and I'll comment on that later and the deliverables were very satisfied. One of the things as far as the documents. Of course final Soyuz generated a number of other documents. Once again the PIM stepped in and really assisted us with any documents that needed to be done that were a result of a different vehicle. I think once again it goes back to the payload safety and in presenting at these review meetings that our expectation would be that we go in and we only talk about safety of the individual hardware item as opposed to necessarily having to discuss why we have chosen that particular item or the education value to fly.
{ - No
– No.
– Yes. I want to make sure we're clear on this because there are two sides to the safety, the direct support that we had to the project the safety engineer that supported ISSI here at Marshall and then the safety engineer supporting on the PSRP side, so are you looking for both? {interviewer} – Yeah I would have to say both. That's a good question. Let's roll them together. This is one of the tricky bits about doing this process is you have to integrate over your experiences when you give these ratings and different things are folded in so I would have to say, well let me ask a question. La, the payload safety engineer you had at Marshall, what part of the program is he provided from? La – He's part of the Safety Mission Assurance organization here at Marshall. {interviewer} – But that's sort of outside of what we would call the space station utilization program. La – He's (tape cut out) safety mission assurance but assigned to this organization as far as supporting these projects. {interviewer} – I know what to do. What we do is that we don't factor him in. I'm going to ask you folks to give rating based on your payload safety engineer from Johnson and the PSRP. L – That would be much clearer. Ok, thank you for that clarification. On services we put a 3. Our payload safety engineer for the PSRP he worked more directly with our payload safety engineer here. I've only spoken with him a couple of times but I know he did try to work as issues came up. The biggest problem we have in the safety area is that I believe OZ in trying to implement this expedited process (tape cut out) by from the PSRP that they were going to have an expedited safety review so there was reluctance to review these in a very expedient manner so that was the biggest hurdle and there was some confusion too because, like I said, we were using hardware that had been through a different safety review process for station hardware than through the PSRP so we were asked by certain members on the panel for data that was difficult to find or had already been through a safety review panel but their panel so that added into some of the grades that would tend to go more towards the dissatisfied but services we put 3 because that really talks, I think, towards the effort that our payload safety engineer on the PSRP did try to make to try to work things through. He was sort of in an untenable situation because he was trying to work in a timely

fashion but was hitting resistance on his end from the actual panel members. The processes, like I said I'd give that a 2 leaning towards 1 because like I said we were told it would be signed out of board in 2 weeks and it was ultimately signed out of board but not without a great deal of pain and within the regular time table, 6 weeks. People 3; software tools are NA, documents NA, deliverables I guess it was because we were asked for data, can you get this, can you get this, after the fact. It complicated things. And we wanted to make sure a note was added that this does not reflect the support that the ISSI received from the Marshall payload safety engineer. He really did an outstanding job trying to pull the package together and working that.
{interviewer} – What was your rating?
L – 2.

Section 2.8 - *Comments from Increment 8* (click left link to return to corresponding datasheet)

Services rating: 1
Processes rating: 1
People rating: 1
Hardware Tools rating: 1
Software Tools rating: 1
Documents rating: 1
Deliverables rating: 1

Safety issues and we kept being asked for additional information and we didn't know what the issues were. Same problem with junior point of contact. Unidirectional flow of information.

– Let me just ask you, should I deal specifically with the hardware or should I talk about process here?
{interviewer} – Processes.
- Where we went to. This would be like the Payload Safety Review?
- {interviewer} – Yes.
- All right.
- {interviewer} – But again, even though I sort of opened it up that you can include kind of what happened with Increment 7, I guess I'd have to say that if for Increment 8 you had no really formal dealings with Safety then maybe we shouldn't be answering these questions. I have to be a little bit careful here.
- You know the difficulty is that this is the same payload but because of flights it's split. We went through one safety review with the items but we flew them on different vehicles. The expectation was that they would have all gone up together, they would have all been operated during one increment and so I just want to clarify that. And we'll do the same thing when we look at Increment 9. We did one safety review for this entire payload but operations took place in different increments.
- {interviewer} – That's very clear. I understand what you're saying there and what I think you're saying is that you did the safety reviews once and that was done back during Increment 7.
- Actually prior to 7.
- {interviewer} – So in Increment 8, you didn't go to the PSRP or have dealings with them during the Increment 8 timeframe, is that correct?
- Perfect, exactly right.
- {interviewer} – Ok, there's a little bit of a judgment call on my part and I'm going to say NA on all of these and we're going to skip safety this time. And hopefully we have your comments and so that will explain to us when we go back to your results about why we elected to put not applicable. Because basically you already rated that process once and it's confusing if you rate it twice.
- Right and I don't want to go over a point when it's been said once.
- {interviewer} – Right, it's not necessary.

– 1 – Yes, we definitely have a basis for rating that. Services 5; Processes 5; People 5; Software Tools NA; Documents 5 – they were very helpful with the Russian side of the house there; Deliverables 5.

– I have a basis for rating this area. Services – well I guess I distinguish *{name}* at Marshall. He was our safety contact. I'll just give overall Services a 3; Processes 2; the people I directly worked with were a 5; no

software; I didn't have to write anything. I just got to see the documents so I'll say 2. They seemed a bit excessive; Deliverables – I was satisfied. I didn't have to do very much, a 5. The team at Marshall was very reasonable and was basically maybe they were the good cop in terms of just trying to deal with the structure and they worked very hard to get requirements pushed through that were supposed to be a sixty day review. It seemed that Houston had a tough time or wasn't very willing to recognize the fact that this was supposed to be a cheap, fast, simple experiment. It was not part of a normal integration which was a complicated experiment which had long lead times and so it was very frustrating to keep getting teleconferences, mostly with hearing them discuss what they had to do about the problem. It seemed to me the idea of squirting honey into water just didn't require such a complicated process. It seemed as if we had a procurement process for building an aircraft carrier being used to buy a stapler. As I say, I'm saying it from the bottom up because I don't have a full appreciation of what has to be done in terms of assuring a safe mission, but had someone told me anonymously or off the record that astronauts can do what they want to do but we can't ask astronauts to do some things. The best example was watching, who did the first Saturday morning science on Increment 6, I think?

{interviewer} – Don Pettit.

- We got a lot of ideas from watching him do these fluid experiments but we could never ask him to do exactly those fluid experiments. We wanted to use a crew drinking bag to handle the water and Mike Foale saw our directions and he said, "This is not a good way to do it. I'm not going to do it this way. I'm going to use my crew drinking bag". So we said, "Go right ahead, but we knew from the beginning that was the best way to do it, but we couldn't ask him to do it. He was a good enough scientist and astronaut to see that this was a better way to do it and he volunteered it as a crew thing. So, there was sort of this idea that we can't ask them to do things that we know are even the best and safest way to do it, but fortunately he was able to interact with us in real time and say, "How about I do it this way? I think it's going to be a lot better". But that was sort of frustrating. There was a frustration from Marshall too that they knew we couldn't ask them to do certain things and I really didn't understand why that was.
- {interviewer} – Very good feedback.

- No

– We had all 5's except for software tools which was NA. We thought that the people who helped out and responded with the hardware failure in the safety community did a real good job.

{interviewer} – I'm going to ask a point of clarification because you guys had mentioned about having to justify things and safety is one of the things that can get rolled up in there. I've talked to people who've said I had to justify things to safety, but it wasn't safety that was the issue; it was other things.

- It was *{name}*.
- Let me clarify from the PI side sort of what we saw. I saw, for example, as we went into 8 we started having the whole program has had up mass down mass constraint, etc. From an investigator's standpoint I had an ESS that was looking everywhere he could to keep that experiment on board and keep it working and that was pretty much his attitude. It's like, ok if we do this, this and this we can meet the constraints of what we have and you know, I'll look at old hardware and what the lifetime is on it and if we swap this piece with that piece then you know, we've got good stuff and we can continue to press on. Above those folks, what we got was, "well, the Russians don't want to do that" and not so much that "we've negotiated with this and that's a problem" as "we don't want to ask". And that to me is not acceptable because having worked a lot through both of these systems you'll frequently get a "this is not possible". What that means is we want you to ask, we want you to talk and negotiate and work with us and some of the feedback we would get as it went up was, "oh, we just decided not to ask for that because". You know the impression I got from that was because it was inconvenient.
- Or in some cases, we had asked for a hardware inventory which was going to help us try to figure what we did or didn't have available that we could use in old hardware for the next increment. And we were told that "no it wasn't worth doing". And from a program perspective I don't understand that. If you're trying to do science.
- And those were 8 OPS to go forward but still they were things that were denied during 8 OPS.

– We covered it in the critical design review that if we used paper documents, there's the potential for paper cuts and if a person really wrote an awful lot they could get carpal tunnel syndrome on the computer. It's the safest project ever done in orbit and it's the lowest tech project. I don't know, I don't think that I have basis.

– Tell me about this one.
{interviewer} – In particular.
- We didn't have anything that we flew I don't think.
- {interviewer} – But I have to say you mentioned about payload safety.
- I had to go thru the safety review panel.
- {interviewer} – And that's what you're rating here.
- Ok.
- {interviewer} – A lot of this has to do with the so called PSRP (Payload Safety Review Panel). You're also assigned a payload safety engineer. I don't know if you dealt with him or not but that's also rolled into this.
- I did not, but I heard the term.
- {interviewer} – All right so thinking about that, give us some feedback, please.

Let me give you a 3 on the Services; again I was very time compressed on my side and not NASA I'll give you a 2 on that; I'm going to give you a 2 on People; I have no idea on Software Tools; I'm going to give a 2 on the Documents because I thought they were somewhat overwhelming; and Deliverables a 3. Again this was just related to the meeting. I understand their importance of safety review and I didn't want my software to explode the Station computer and all of that. On the other hand we spent very little time discussing things like that and more time, in my opinion, off-task.

- I knew where all of their documentation was; there was significant confusion over what type of package we were supposed to deliver, so even though the documents were there, I would give them a 2 because it was hard to discern which thing was applicable and the deliverables, the requirements for what we had to deliver I gave a 1. The turnover was, again, from a prioritization standpoint if we were supposed to something that was supposed to be optimistically done in 3 months then you wouldn't want to turn over personnel in the middle of that and they chose us to do personnel turnover on, and again the standardization of the informal review; when we had that turnover we had already gone through and incorporated comments from the first point of contact; the second point of contact came in and he gave us comments and we incorporated those comments then he put the book out for review and sent back to us the comments from that review so we incorporate those; so now we've delivered the package three times now; we get those comments incorporated and then he comes back and says that some of the people didn't respond to his review and he thought they were important enough that he was going to go solicit their comments; I thought that was a breakdown; either they need to respond or they need to get out of the way; you don't need to be worried about somebody that just decided that you weren't important enough for today, we had to go through a 4th iteration of our document after he went through discussing the comments with those people and those comments we got that 4th time around then were not in line with responses we actually got from the PSRP formal review so we had to iterate a 5th time to get through the first review so all of that and then the thing we were talking about before when you have to go from one increment to the next and nothing has changed that we had to revise our package versus other people just putting in a memo; the thing with the CHIT process and having to get permission to use things twice and one guy doesn't acknowledge the other guy's process, all of that; that was the most painful thing of the whole experience.

– We did have an anomaly on orbit if you want to me see if I can comment on that somehow.
{interviewer} – Sure.
- But it was actually all taken care of. They know.
- {interviewer} – But you worked it out with someone?
- I didn't personally so I don't have probably enough to rate them.
- {interviewer} – I'll tell you what. There's an area coming up on lessons learned and maybe you can make your comment there. So we'll put no and go to the next one.

– {interviewer} – Did you have to manage any Payload Safety issues for Increment 8?
1 – Yes, we did. With the cable, didn't we deal with the safety people then?
2 – Yes. I'm trying to think. We ran 3 samples and we had good science out of 2 of them. We had an anomaly with our gear system that we mentioned and we also had an anomaly with a cable. One of the connections was loose and we had to reconnect the cable and tape it up. We had to interact with Payload Safety on assuring them that we were safe with what we wanted to do, which is good. That's appropriate to interact with them and make sure there's not some kind of gotcha that's going to hurt the crew.
{interviewer} – So it sounds like you've got some basis for giving me feedback on this area.
1 – Services 5; Processes 1 – maybe that's NA in terms of timelines and schedules. We had to provide them information but it wasn't that type.
2 – I think we let them come over and since we were going through the repair procedure for the gear system, Raymond Moore one of the POIC safety guys came over and we showed him what we wanted to do. We showed other safety folks, but maybe that's not a process.
1 – People 5.
2 – Software NA.
1 – Deliverables – we had to deliver the PARs to them.
2 – Deliverables, probably a very satisfied. We've kind of gotten used to the process. Deliverables a 5.
{interviewer} – So which one was NA? Documents or Deliverables?
2 – We put Software NA. We were talking about Documents. We're kind of debating because we know there's a standard safety document but they've been delivered to us well before we launched. We didn't see anything really new in terms of documentation so maybe NA. Deliverables we put 5.

- No

Section 2.9 – Payload Physical Integration

Please rate your level of satisfaction with the various services and support provided

Section 2.9 - *Comments from Increment 7* (click left link to return to corresponding datasheet)

– We didn't have to manage shipping the material from KSC to Russia. We prepared some paper, but the transfer was executed together with HRF stuff.

– This activity has been conducted by the project manager and not by myself.

– I'll give services a 4; processes a 4; 5 for people; I don't think we had any hardware so not applicable; software tools not applicable; documents a 4 and deliverables a 4. Certainly not that I'm dissatisfied but I think what we saw was a learning curve for the utilization office because I think that people were not exactly sure of the process and so in some cases we ended up having to redo things a couple of times just as everybody was on to get things shipped to Russia, you know, everything done to get it up on the Soyuz. The next time we did this and as we looked to the other parts of the payload it was much smoother because everybody knew what needed to be done but for was kind of a little challenging for everybody, I think.

{ - No

– No.

{ - No

Section 2.9 - *Comments from Increment 8* (click left link to return to corresponding datasheet)

Services rating: 1
Processes rating: 1
People rating: 1
Hardware Tools rating: 1
Software Tools rating: 1
Documents rating: 1
Deliverables rating: 1

Integration in Colorado was overseen by personnel from Ames. NASA personnel were provided to provide oversight, but resulted in huge stresses. The brevity of their availability put very severe time constraints on the safety of loading.

– We didn't actually integrate but we did do testing of prototypes on the ground and that was working with Marshall. And there was also support from a contractor for the CGBA, *{name}*. So we interacted with them. I didn't interact with them face-to-face but they did make a trip out to Marshall and I interacted with them a lot in telecons. Services, very satisfied; Processes 5; Personnel 5, Hardware 5; Software NA; Documents 5; Deliverables 5. And I want to especially compliment our Project Scientist, *{name}*, who did a lot of experiments and just testing things out and figuring out how to do this and the whole Marshall team, Julie Ogle and *{name}* and the other people in terms of dealing with the operation. And also who was supporting with the use of their CGBA. Well, actually it doesn't count for this increment, we didn't use it. They still were involved in some discussions, but that's our next increment. And *{names}* , well they were overall great, but *{name}* was directly involved in the integration.

– Services 5; Processes – I got good support for all the materials and everything 5; People 5; Hardware Tools NA; Software Tools NA; Documents NA; Deliverables 5.

- No

– None.

– I don't know. Let me tell you. We flew a CD with experiment unique software so there were some steps that had to be taken to make sure the software was compatible and things like that. Those guys did a nice job. I don't know where that goes.

{interviewer} – Well, you caught me there. I know where it goes and we've already skipped over it. It technically should be Payload Engineering Integration because that also includes software.

- Is there something way at the end where I could give a couple of comments because those guys did a nice job.
- {interviewer} – Absolutely.
- We threw a couple of curve balls at them and they hit them.

{interviewer} – Let's do that. But other than that it's not relevant for you because this is mainly pertaining to taking big pieces of hardware to KSC where you work on it for 2 weeks to get it flying. So let's skip this.

– skipped.

– We didn't have any testing before it was shipped or anything besides the safety aspects of it.

{interviewer} – What about support personnel?

- No, I don't have enough interaction to do this.

- NA

- No

Please rate the extent to which your investigation was directly affected by the Columbia mishap.

Question CM – *Comments from Increment 7* (click left link to return to corresponding datasheet)

– Limited up mass has hindered upgrades of hardware and software. Impact could be cessation of activities until we resume flight.

– One of our science requirements is to get landing day data. Right now we are only getting data on R+1 and so that does have a science impact on what we are doing, in addition to the logistical issues of collecting data in Russia.

– It has affected our up and down mass. Since the crew has been reduced from 3 to 2 has affected the amount of crew time we have, the amount of science that we are able to support. Obviously, the station build-out not progressing and we are not able to do any more vehicle characterizations and the amount of time on our hardware is really starting to get up there and there is no way to refresh the hardware. It has not been good.

– Only affected by delaying the launch. But in the end we got things resolved anyway.

– I was highly affected. It reduced the number of crew and caused delays in getting the crew back for post flight measurements, but I can't complain with how the organization responded. I really can't. I know that a lot of the people I work with knew the crew, and despite all that they were right on top of it, and I thought the organization had a lot of details to worry about and a lot of conflicting priorities and I thought that those were handled fairly. I was highly affected by it, but I don't complain about anything. They dealt with this the way you deal with any problem. You arrange phone conferences, you ask the parties involved how it affects them and what they need and you balance all the needs. I thought that was done reasonably. Their were multiple phone conferences with the lead increment scientist and some of the lead Lockheed science management people, *{our PD}* was there and a bunch of the PI's were gotten together on the phone and basically put their requirements down. They encouraged us to discuss with one another any ways to accommodate each other in our requirements so that everybody's needs were met. The people I dealt with were fine. I like the way that *{our PD}* kept prompting me for information. She was very persistent about getting to me with requests for information about my needs. *{Our PD}* works for Lockheed and she was very diligent. She did a very good job.

– This investigation was born precisely because of the accident. We had other investigations in the *{supporting payload name}* sequence involving live human cells and it was not possible to fly them because of the changes. And, of course, everything was pushed back and there were some aspects that had come up in some of the science concept review that needed to be addressed and had to do with some of the operations that needed to be optimized and some of the fluid dynamics related to the station auto-body reactors that we use so we came up with an approach using cell analogs, that had low up mass, no down mass, exclusively on board training, modular experiments that could be time-lined as necessary and that were independent and very flexible operations. So this whole concept of *{our investigation}* was engendered by the circumstances.

– A 5. For *{our investigation}*, we're not able to get our R+ zero data from the crew members.

– The consequence was the fact that we were scheduled to fly just after the first flight after the Columbia so we were scheduled to fly on STS-114 so, of course, it has been stopped but then we had the opportunity offered by you to fly with the Progress to ISS. So we have lost something because due to this shift. We lost the pre-flight baseline data collection. One of our 3 foreseen baseline data collections and we lost one flight session of our 3 foreseen because the astronaut, Ed Lu was in the ISS before our payload reached the end so we had a total of 2 flight sessions instead of 3. But all of this has been compensated by you allowing us to continue the experiment execution during Increment 8 with Mike Foale so what we lost we gained after. {interviewer} – Interesting, very helpful comment. Thank you. You let us know how it was affected. But you need to give us a rating though on a scale of 1 to 5.
- Let's say it was a little bit affected because we decreased the number of sessions but on the other side looking to your attitude to give us a compensation declaration, I should say 4.

– {interviewer} – What I'll say about this is that we're not necessarily looking for whether it was

negatively or positively affected, though you can put that into your comments. It's more the degree of the affect.
- This was highly affected. The soldering experiment wouldn't exist and in all likelihood we wouldn't be getting the extra runs we're getting with *{our investigation}*. A 5.

– I think I would say we were highly affected. We had planned to fly the payload. As you know *{our investigation}* consisted of a number of different items that we were planning to fly in one large group. It then became split and it went up piecemeal. On a positive note we were excited and happy and certainly willing to have it split in order to get it on orbit. I think that that probably did to some degree and perhaps very visibly to some people, maybe diminish the education value or just the clear education value because items that we were planning to have sent up together were split based on weight and size and that changed a bit how we were going to do it. I think it was perhaps caused us to readjust our expectations for getting, in our case, our data, our video back. We expected to be able to get that to our PIs in one swoop and get everything out and we're doing that piecemeal as well. However, I don't think that overall that our requirements have not been met. I think it just has caused us to have to re-look at how we were going to take what we got from the payload and use it effectively and so what we've gotten is that we've seen crew members bring them out again and use them in different education events. So I think we've seen probably far more positives from the Columbia accident that we would have ever expected as far as *{our investigation}*. First of all getting to fly, seeing the payload stay up a little bit longer and crew members bring it out and use it over and over again. But certainly from our standpoint we had to change how we did business in the office. We certainly are pretty inexperienced when it comes to the payload process and, of course, then to start the Soyuz and the progress process was challenging there for a while. I think we probably had to work harder, not that everybody else in your program didn't, but for us it certainly made us work a little bit more than our expectations. But all in all it's been a good experience.

– I need to ask a clarification. I assume you're going to keep all of this confidential. I don't mind if your tape recorder is on, but are you talking about this in a negative or positive way?
{interviewer} – It's either negative or positive. This question is asking more about the degree of the effect rather than the direction of the effect.
- Because after Columbia, as a matter of fact, various components in the program have realized the lead increment time and so on have emerged as one of the important things to do so that some science can be done on station since there is not too much other hardware that can be lifted up to station right now.
- {interviewer} – And you are not the only payload and not the only PI we've talked to that had that result, i.e., they had an investigation that was well suited to fill in in this post Columbia environment so what we generally do when we talk about this question is first of all {interviewer} types in the fact that the effect for you was essentially, for lack of a better word, positive and we're not afraid to put that in.
- Because we don't want to make it look like we were happy about the accident.
- {interviewer} – No, that's fine. We've talked to a lot of PIs and PDs and we all understand what is meant by that. So now if you're thinking about the degree of the effect, not necessarily the direction of it, so give us a rating.
- I would say 4 because the crew has been more interested in the crew ops as a result of this unfortunate mishap and they have been taking extra pains to do a good job on orbit photography so I would say 4.

– It prolonged our studies. To get our minimum number of crew we had to go another increment. (Tape messed up)

– It was certainly affected. I'd say a 4. I've been sort of giving the comments all along. The biggest effect was that some of our tests were delayed post flight into time slots that are not optimal. The second one was we had trouble especially with 6, not this increment so much, but with shipping of samples.
{interviewer} – Let me just clarify something. You think the sample shipping issue got better?
- Yeah, I think it got better because they recognized the problem and had a translator with us at the airport so we didn't have as big a hassle. I think the biggest problem with our data is that some of our tests are delayed into time slots that are not optimal; you know they differed from what was baselined so it affected the quality of those tests from the point of view of data interpretation. I think the second thing to say is that

it reduced the crew number and therefore the potential for actual subjects so it's made it more difficult to get a necessary number of subjects. And related to that, although I suspect that it's well known they were having trouble with their treadmill. That would have been fixed had there not been an accident. The fact that the treadmill was only running in passive mode is a big problem to the countermeasures. I don't know if that has an impact on our experiment. I don't know as much about it as I should but as far as I know it's only running in a passive mode. The crew has to push it as opposed to a treadmill motor which I think is broken.

– 1 – 5, highly affected. Positively. We wouldn't have had our investigation. I'm not sure how we would have handled this investigation. We were in the midst of training Mike Foale for a different increment to do a repeat of our Increment 4 experiment and this gave us the opportunity to really get into the guts of science at NASA and really understand how to make suggestions to improve things. So I would in a funny way say highly positively effective. We're not meaning any dishonor or anything, that's the reality.

– It was highly affected because 1) *{our investigation}* was proposed. *{The PI}* has done work in this materials area and obviously it was something he was interested in, but he put this proposal together. Proposals were solicited to fill in this time during the Shuttle stand down so certainly we were ? of that and I guess to even get to the point we were certainly affected because we wouldn't be here I guess. We had the opportunity to do this experiment because of the Shuttle stand down and they were wanting to actually do more science because of, try to propose things to do in this Shuttle stand down time that didn't require up mass. 2) And the other thing I think too is one of the reasons that the safety process was so difficult is (tape screwed up) perhaps the PSRP was reacting to some of the things that were coming out in terms of we're not going to rush things through and I understand that. It would have been good if we had known that up front that we're going to go through the normal process for signing out your package and that would have been fine, you know, to know that up front so I think the safety process effect was affected by the Columbia mishap.

{} – I would say high affected because it very much affected the amount of time that the crews had on board because of the up mass and down mass and actually it made more time for CEO type activities. We're a task listed item and so it opened up a lot of time for our payload.

– I would probably give that a 4 and I would say that the biggest impact is now having to process blood samples, take blood samples over in Russia and export them to Russia rather than exporting them from the US.

Question CM – *Comments from Increment 8* (click left link to return to corresponding datasheet)

– It has been affected, of course, because we had to produce additional documentation in order to fly to be uploaded for Increment 7 with the Soyuz. But from the other side we had the affect that due to the absence of Shuttle flights in the meantime, our hardware is still in the station so it has not been brought to the earth so it is still on board and we are now planning to have additional use in future increments.
{interviewer} – Really? So it's an interesting topic in that the tragedy of the Columbia has had some negative consequences and also in some strange way a positive, but obviously it seems like the amount of the affect is significant so why don't you look at the rating scale and suggest a number, please.

- Rating is a 4.
- {interviewer} – And the direction is both positive and negative.

– Highly affected, a 5.
{interviewer} – In the comments I'd like to just calibrate that, what direction negative or positive?

- Negative. The lack of upmass has stalled my hardware upgrade so I'm literally taking desperate measures to maintain the equipment that we've got onboard. I'm the only user of it, of those particular models, the cameras especially.
- {interviewer} – I'll confess I don't know too much about *{your investigation}* . You point the camera, right?
- Once the crew aims it, it points nadir. There's no aiming.

- {interviewer} – Oh, there's no aiming. Ok, I didn't know if it had some kind of an actuator.
- No, they set it up point S nadir and that's how we look.
- {interviewer} – So you just know what targets are coming under the ground track.
- Yes, we've got tools that we provide to the students so that they can determine when the camera is going to be passing, where it is and when it's going to be passing over that target. It's targets of opportunity. We can't target any specific sites.

– Highly affected. With no payloads going up, we had the opportunity to rerun samples which we probably may or may not have had if fresh stuff and fresh people were coming to the station.
{interviewer} – So to some extent you'd say it was highly affected but the affect was largely positive?
- I would never say positive. I would prefer the Columbia did not happen.
- {interviewer} – Right. Was largely beneficial?
- It wasn't beneficial. It was a consequence.

{interviewer} – I'm just going to say, with no payloads going up we had the opportunity to rerun samples. And that's a significant affect on your investigation.

– Rating a 5. Forced transition from Space Shuttle.

– A 5. As I just mentioned we were due to fly, We separated into different increments. I think that we did feel an impact on our outcome because our expectations were that we would have flown these items together and we had to do demonstrations in some cases separately as opposed to doing them using multiple hardware items. An example would be that we had a Wright Flyer on board that we used during Increment 7. Our hope would have been, we did Balsa wood airplanes during Increment 8, that that Wright Flyer would have been part of that because it would have all been timelined together, but we split it up. We certainly didn't lose a lot of value but I think we lost some and certainly our whole process was a little different.

– Highly affected. One of our requirements is R zero data because we're not getting that right now. And, of course, being out in Russia.

– 2 – It was definitely affected because we were then forced to use a different launch vehicle and that process of using a different launch vehicle was very tough, as Shari explained, very cumbersome, difficult. I mean people were new, we understood it sounds like a whole new game, you know we've got to get used to this, we've got to work with the Russians so we understood. It was just difficult, so yeah I think we were highly affected by that. Direct affect.
{interviewer} – And the affect was largely negative.
2 – I would say so.
{interviewer} – There are cases where the affect for some investigations has actually been advantageous.
2 – You know what, that's a good point. In the respect that we had to now find a different launch vehicle and that was difficult, then that's a negative affect. On the other hand, how likely is it that *{our investigation}* would have been launched on the Shuttle, we don't know because I think NASA Ames wasn't pushing it very hard when the shuttles were flying regularly or they were having trouble getting *{our investigation}* manifested, so in a way it had a positive affect because now suddenly with priorities having to shift at NASA Ames, this is what I saw from the outside anyway. I'm not sure that it's right, but they had to shift priorities because some of the larger experiments couldn't go up on a Progress or couldn't be accommodated so they had to pull up all of these older, smaller experiments that had been put on hold and bring them to the forefront. So it could have had a positive affect. *{Our investigation}* may not have flown if this hadn't happened.
{interviewer} – Right.
2 – So it's kind of both.
{interviewer} – That's fine.
2- If you're an optimist and you always look at the positive side of things and even that we were forced to use the Progress vehicle, now we've got that experience and we know how to do it so maybe that's a positive too.

– Tell me more about the intent of this question.

{interviewer} – You know obviously the program changed dramatically after we lost Columbia and operations for payloads on Station had to adapt and change to respond to that. This question sort of has two parts in that we're trying to access on the rating scale we're trying to figure out the degree of the affect. It's possible that the affect was beneficial.

- Yes, I was going to say that from the question I'm getting the sense that you're trying to measure the adverse affect, but under these adverse conditions Earth Obs was one of the activities the crew members wanted to continue because they had the hardware, they had the know-how, they had the training and they could actually increase the output of this payload more than anyone else.
- {interviewer} – I know and I'm going to, in future surveys, change the rating scale on this, but I know exactly how to handle this. What I would like for you to do is rate it on the basis of the level of the affect, whether it was positive or negative, doesn't matter. I just want to access the level of the affect and then in your comments we'll just record whether it was.

I would say highly affected, a 4. My comment is that it resulted in more attention being paid to my payload and also the crew members freeing up some additional time and resources to do this payload work more than others. So it's positive in that sense.

– I'll say a 5 because we would have had more subjects. We ended up having 2 subjects instead of 3 and also because our data had to be telemetry'd down rather than brought down on the shuttle which potentially could have made the subjects feel less comfortable about us maintaining their privacy so it may have affected the quality of our data. We'll never have any way of knowing for sure.

{interviewer} – Anything else?

- The data are encrypted so we're not very worried about that.

– High affected. It wouldn't have existed without it. It's an opportunity that came about because of it. In one regard it came out because of lack of things for the crew to do. At least I got a sense that the safety process people were really going to make sure they crossed every t and dotted every I in response to that so that no matter how seemingly innocuous the process they were going to follow the procedure completely. Which from my perception, that wasn't the fault of those individuals because I'm sure there was a directive to really be extra cautious. higher ups who came up with the idea of 0 upmass experiments and not recognize that if you're going to go through all of the same procedures as if we're flying a major flight investigation it was not going to be 0 cost or low time. And since we had to go through all of the same procedures, it seemed – it didn't take that much of my time and I enjoyed doing it, but it took a lot of NASA time which I think wasn't well thought out about how this could be done.

{interviewer} – You didn't see it as an efficient process as it could have been?

- No, I think the people had the idea in saying look we've got this accident and the crew is not going to have that many experiments coming up there let's give them something easy to do, but they didn't think it out any further, well how is that actually going to be translated down by the actual NASA process and nobody thought it through.

– I would say it was affected. A 3 because it affected the fact that we have to fight to get the crew members back from Russia and we don't get our BDC as quickly after they land and we had even considered doing BDC up there and fortunately it wasn't possible. It was affected. There was a lot of workaround going on and we were able to accommodate the Americans pretty well, but the Russians have been difficult. So if they're over there, it's seems hard to get them back.

{interviewer} – So, the affect is largely not beneficial.

- Right, it's negative. It didn't have any positive affect at all.

– For 8 specifically, it wasn't a big deal. I would say 3. Overall, of course, it's had a huge impact because it made the difference between us not flying on 7 and not flying on 9 and not flying on 10. So it's definitely had a huge impact to our future OPS and 7 for instance.

- I think it's real important to capture that in the comments because otherwise, you know, we weren't on 7 so you didn't get an eval of that on 7 so you're only getting an eval of that when we actually get to fly but the impact of Columbia has been with the up and down mass constraint this experiment doesn't fly sometimes and that is an enormous impact on the PI team.

– I would say we were highly affected by it because we had no hardware for this subject, but the subject was excellent in the way he improvised using existing on orbit equipment.
{interviewer} – That was true for 8, as well as for? Because the mishap happened during 6.
- But we were not able to get upmass for our subject 8's equipment.
- {interviewer} – I guess I didn't realize that.
- And we're still living that right now, actually. For 10.
- {interviewer} – So to some extent the on orbit experiment was improvised?
- That's correct.
- {interviewer} – I'm sorry, I didn't realize that. Anything more you'd like to add?

No, but we did appreciate the spirit of improvisation from our crew member, as I mentioned.

– 5, highly affected. It was escalated because of it.

– I'm a 5 on this one.
{interviewer} – In what direction, positive or negative?
- Both. I called the CODE U and said, look we will modify our experiments. It will not impact our scientific deliverables. We can do it with 0 upmass which was not what we were planning on doing and we can do it in a compressed timeline. So my entire experimental team worked sort of around the clock to do this and NASA did not change the budget at all to reflect this and again NASA did not change their timeline. So my perception, again, was my experimental team was working around the clock on weekends and all that. NASA was 9 to 5 two days a week on processing all of this new information that we delivered. So that was a little bit frustrating. On the good side, hey we got up on Increment 8 and did a nice job and once we were finally operational, it was great.
- {interviewer} – Ok, I have to admit since I came late, I'm a little curious. {interviewer}, what his rating for the amount of research data he got versus the pain on that question about his data? Can you remember? {interviewer} – I can go back.
- The juice to squeeze ratio is what you're asking.
- {interviewer} – Yes, the juice to squeeze ratio. I'm just curious since I came late. It's an important question.
- I think we covered that pretty well early on and that there were a couple of missed opportunities, I think, but overall we were pretty satisfied.
- {interviewer} – Ok, I was just curious about that. Anything more about the Columbia affects?

No.

– We were highly effective because we were a direct result of that mishap; it was solicited due to up mass constraints; by the time we had wrested with the ISS process the opportunity for crew time which was the genesis of this project had disappeared.

– I would say a 3 because it was affected only for a delay of the flight, but we had anyway the possibility to fly and to have our payload used by the crew member so it was not greatly affected, only delayed.

– I'll say it was affected because they didn't have a lot of experiments for the crew to do because it wasn't the Shuttle wasn't going up as much, I guess, for they asked for fast track experiments so I guess it would be affected. Probably a 5. It wouldn't exist if that didn't happen, I'm sure. But other than that, I couldn't tell from internally. I'm sure that safety, of course. Like I said this was my first one so I'm not sure how exactly everybody was treating safety beforehand, but they always had in safety in mind, of course, the space shuttle itself.

– 3 – This investigation probably would not have proceeded.
{interviewer} – Yes, I understand that and that's true for a number of investigations flying on 8. I understand what *{your investigation}* was all about. You saw an affect about the bubbles and it was an investigation of opportunity as I understand it. But I have to get a number from you.
- I'd say it was highly affected.

{interviewer} – Ok, I'm going to put a 5 and I'm going to put your comments about the fact that *{your investigation}* wouldn't have happened if it hadn't been for the Columbia mishap.

– Highly affected. It ended in Russia. It was a bad effect in the sense that we had to broaden out our

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requirements for getting people in for their post-flight measurements but it probably wasn't bad enough to affect the science, but just the same it was something we didn't even include ? It kind of forced us to make some tradeoffs, doing things in Russia versus waiting a little bit longer and doing them here. What I felt was that doing the scanning in Russia there would be absolutely no quality control.
{interviewer} – I remember that you mentioned that the last time too.
- I figured I'd rather compromise on the side of getting the folks back here and waiting a little longer. You know the bone doesn't come screaming back.

– 2 – We were kind of debating, maybe a 2. And a general thought was that due to the Columbia mishap and the grounding of the fleet, we haven't been able to get our samples down and our scientist has been waiting for the samples.
{interviewer} – Yes, he told me about that. I've talked to Richard.
2 – Ok, I'm sorry, we were putting on a hat for *{another investigation}* too. *{Other investigation's PI}* has not been able to get his samples. Oh wait a minute, he did get those. I'm sorry. Yeah, we eventually got those back. It was *{present investigation's PI}* that hasn't gotten his. But you talked to *{your PI}* already?
{interviewer} – Yeah, but I know that he's waiting to get his samples now.
2 – And actually by not getting the samples back he has been able to reprocess them on orbit so that's good. The negative for him is that he hasn't gotten his video tapes back, so one answer is that we haven't been able to get *{our PI's}* video tapes back. However, like you said it benefited us that there's fewer experiments up there so *{our investigation}* can run longer especially *{our PI}* can reprocess his samples so whenever they have time for us we're ready to do more science for *{our investigation}* So, (1) do you think a 2?
1 – Yes.

– I put a 4 because we were affected but we were actually affected in a positive way in that because of the up and down mass issue, you know the constraint, there actually has been more time to conduct earth observations so we received probably a larger number of images if it hadn't occurred so I guess if you can get anything positive out of it, that's positive.

– {interviewer} – I happen to know and understand that *{your investigation}* would not have existed if it hadn't been for Columbia because basically this was an experiment that was developed to respond to the new environment left in the wake of Columbia. Isn't that true?
- 1/2 - That is correct.
- {interviewer} – It's kind of a moot question to ask. Let's get a number anyway.
- 1 – Well, because based on these results it could have a tremendous impact, certainly on the way we conduct future experiments.
- 2 – But if we consider the fact that the Columbia tragedy was really the change in vehicles that engendered *{our investigation}* , I guess that it would categorize it as highly affected.
- {interviewer} – Right, highly affected. {interviewer} will make a note and it will be on the tape what I just said, basically that the entire genesis of this particular investigation is an outflow of the aftermath of Columbia.

2 – That's correct.

– I think it was highly affected, a 5. Our investigation would not have happened without Columbia.
{interviewer} – Note – *{your investigation}* was one of those investigations whose very existence was owed to the fact that we had to improvise up there in order to get science done. It's so-called low upmass investigation.
- It's like 2 kilograms. Ours was among the lowest so I think that's why we got up.

– {interviewer} – Let me clarify a little bit. For this topic, there are sort of two factors. There's the degree of the affect and the direction of the affects. The question is just asking you to rate the degree of the affect and then in your comments I'd like for you to include whether the direction was negative or positive. And let's restrict this to the chromosome experiment because we know the answer if it were all of the other investigations. Let's just keep it to *{your investigation}* for this.
- I would say for the *{investigation name}* I would give it a 3. I think there was some affect in that it would

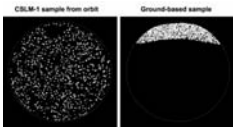
have been a lot easier to ship our blood samples from the US over to Germany had we been doing business that way. We were forced to have to work that ESA to provide courier support to get those blood samples through Russian customs and over to the investigator. It worked out pretty well, but that was something that we would not have had to do if we were still launching and landing in the US.

Cover Image Captions

The Expedition 7 crew of the International Space Station (ISS) had a great seat from which to observe tropical storm Claudette as she turned into a hurricane and came ashore with high winds and heavy rains that drenched their Houston home base and other Texas areas. This digital image was recorded at 13:26:54 GMT, July 15, 2003.

Photographed by an Expedition 7 crewmember onboard the International Space Station, this image shows the limb of the Earth at the bottom transitioning into the orange-colored troposphere, the lowest and most dense portion of the Earth's atmosphere. The troposphere ends abruptly at the tropopause, which appears in the image as the sharp boundary between the orange- and blue-colored atmosphere. The silvery-blue noctilucent clouds extend far above the Earth's troposphere. The sliver of the setting moon is visible at upper right.

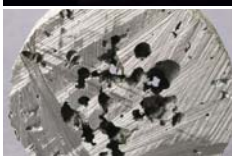
October 25, 2003 - European Space Agency (ESA) astronaut Pedro Duque of Spain watches a water bubble float between him and the camera, showing his reflection (reversed), on the International Space Station.



Coarsening samples: Gravity causes tin particles to quickly sediment to the top of the chamber during ground experiments, right. For the same experiment conducted on the Space Shuttle, the particles remain evenly dispersed, left. Researchers designing new materials will use similar data collected during upcoming experiments aboard the ISS. Materials science and fluid physics experiments are carried out safely inside the Microgravity Science Glovebox - a Space Station facility managed by NASA's Marshall Space Flight Center in Huntsville, Ala.

This photo showing the Manicouagan Reservoir in Quebec, Canada, and a partial view of a solar array panel was taken by an Expedition 7 crewmember onboard the ISS. This observation was made on August 17, 2003, by Expedition Seven crew members aboard Space Station as part of the ongoing Crew Earth Observation experiment.

Aurora Australis, seen from ISS on June 12, 2003: On June 2, Earth entered a high-speed solar wind stream. Its source: a coronal hole on the sun. Solar wind gusts shook Earth's magnetic field and sparked bright auroras for days. ISS was over the Indian Ocean, southwest of Australia, on June 3, when Expedition 7 science officer Ed Lu looked out the window and saw these Southern Lights--aurora australis. He grabbed his digital camera and took a rapid-fire sequence of images.



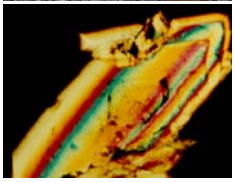
A metal sample is pockmarked with defects caused by bubbles trapped inside the sample as it was melted and solidified. The Pore Formation and Mobility Investigation would melt samples of a transparent modeling material inside a furnace on the ISS. Dr. Richard Grugel, a scientist at NASA's Marshall Space Flight Center in Huntsville, AL., will observe the interactions and movements of bubbles as the samples are processed in space.

Photograph of Bangladesh and India, as seen by the International Space Station Expedition Four crew on February 10, 2002, as part of the EarthKAM (Earth Knowledge Acquired by Middle school students) experiment. EarthKAM is a NASA education program that enables thousands of students to photograph and examine Earth from a space crew's perspective. EarthKAM photography continued during Expedition Eight

View of a bubble formed as a result of a Zeolite Crystal Growth (ZCG) experiment in the Destiny laboratory on ISS on December 14, 2002. A Space Station drill was used to mix 12 Zeolite samples in clear tubes. Scientists on the ground watching on TV noticed bubbles in the samples. ZCG continued during Expedition Eight.

Astronaut Mike Foale, left, Expedition 8 mission commander and NASA science officer, and cosmonaut Alexander Kaleri, flight engineer, pose for a snapshot in the Destiny Laboratory. They served as test subjects for several experiments during their six-month stay aboard the International Space Station that will help to better understand the effects of weightlessness on the human body.

Shown is an image of an experiment tray for the Protein Crystal Growth Single Thermal Enclosure System (PCG-STES) experiment. Nine trays are in one cylinder, and there are six cylinders in each PCG-STES unit. Each well in the tray holds a drop of protein solution and precipitant mixed together where the crystal grows. PCG-STES continued during the International Space Station's Expedition Eight.



Micrograph of calcium carbonate crystal (calcite variety) found in a kidney stone. Calcium-containing stones are the most common type of kidney stones occurring in humans. The Renal Stone Risk During Space Flight experiment continued upon the International Space Station during Expedition Eight.