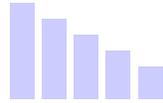
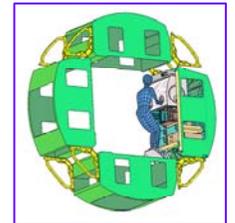
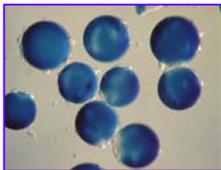


International Space Station Payloads Office CUSTOMER SATISFACTION SURVEY FINAL REPORT AND ANALYSIS OF RESULTS



Increment 5



May 2003



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EXECUTIVE SUMMARY

The International Space Station (ISS) Utilization Survey has been established by the ISS Payloads Office at NASA/Johnson Space Center in order to collect quantitatively-based feedback from ISS research users on processes and services related to the development, integration and operation of ISS research investigations. The first Survey cycle was started with Increment 5 and was completed for that Increment at the end of April 2003. The cycle will be repeated indefinitely for subsequent Increments in order to correlate Increment-to-Increment changes in feedback from ISS users with on-going ISS process improvements. The Increment 5 Survey employed a multi-part web-based questionnaire that respondents previewed prior to submitting answers during a teleconference interview with ISS Payloads Office personnel. Surveys were completed for 34 individuals from the total customer base of 35 Principal Investigators (PIs) and Payload Developers (PDs) that supported the 25 ISS research investigations active during Increment 5. Survey questions obtained PI and PD level of satisfaction ratings and other metrics associated with their experiences with the ISS Program from the point after their investigation(s) were funded and selected for flight up to their immediate post-Increment activities.

Top-level assessment of PI and PD overall satisfaction was performed using a multi-question metric based on methodologies established for the national American Customer Satisfaction Index (ACSI). Approximately 65% of all respondents considered they were overall satisfied with ISS Utilization and that their expectations had been met by the Program. Forty-four percent (44%) rated the management organization for ISS Utilization as ideal. Responses from these topic areas on a composite basis yield a score of 60 on the ACSI 0-100 index scale. This is within 1-2% of scores for comparable government organizations, but is within the bottom 10% of all ACSI scores for government and commercial organizations as a whole.

Among specific processes, products and services, the following were associated with high levels of satisfaction or approval:

- Research data obtained weighed against management effort expended
- The end-to-end process for payload integration
- Support provided by sponsoring Research Program Offices

Processes and services with low levels of satisfaction/approval included:

- Program data gathering software
- Overview and road-map information provided at the start of investigation development

Elaborative verbal comments were collected in support of all survey questions and were used to identify areas of Program strength and weaknesses not anticipated by the objective sections of the survey. The verbal comments as backed up by the quantitative responses data are the basis for several recommendations to investigate a number of possible Program problem areas that are not presently covered under existing Payloads Office process improvements efforts.

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. Impetus for developing the Survey came partly out of the successful use of a limited questionnaire-based technique to identify ISS user issues during the Payload Operations Concept and Architecture Assessment Study distributed in February 2002. Recommendations by the Standards and Policy Reduction Tiger Team within the Payloads Office for improved customer satisfaction metrics and feedback as well as JSC ISO9001 SLP4.3 customer focus requirements were also drivers of the plan. In response to these factors, the ISS Utilization Survey was planned and developed to be a central tool within a set of Payloads Office initiatives designed to apply industry-standard customer satisfaction approaches to the relationship between ISS utilization management organizations and ISS research users.

2. Survey Development

The ISS Utilization Survey was designed to methodically acquire first-hand feedback from ISS research customers, defined explicitly as Principal Investigators (PIs), Payload Developers (PDs), and individuals who perform both roles in a dual capacity (PI-PDs). The Survey is designed to be performed approximately 30 days following each ISS Increment, starting with Increment 5. The Survey has the long-term goal of correlating Increment-to-Increment changes in customer satisfaction with Program improvements and corrective actions.

This report summarizes, illustrates, and analyzes the results of the ISS Utilization Survey for Increment 5. This Increment lasted from June 7, 2002, to December 2, 2002, and was supported by crew members Valery Korzun (Rosaviakosmos), ISS Commander; Peggy Whitson (NASA), Flight Engineer/Science Officer; and Sergei Treschev (Rosaviakosmos), Flight Engineer.

Since Increment 5 was the first Increment for which the Survey was performed, the methods employed in developing the Survey will be summarized in this section.

Initial conceptual design of the Survey was based on the following requirements and guidelines:

- The Survey would seek to acquire feedback on as much of the customer end-to-end experience with ISS utilization as possible. As such, the Survey scope would start at the point after an ISS investigation is funded and selected for flight, and end at the post-flight process. This scope would cover processes and customer interfaces that extend beyond ISS Payloads line management organizations to include the NASA Research Program Offices, Payload Operations Integration Function, Payload Safety, and Payload Physical Integration at the Space Station Processing Facility. For purposes of defining the Survey scope, the processes and services of these organizations as a whole are defined as the ISS Utilization Program.
- The Survey's scope requirement should be met while at the same time avoiding duplication and overlap with customer feedback methods already in use by other NASA offices associated with ISS utilization.

- As far as possible, the Survey should be developed using customer feedback best practices established by leading customer service organizations from within both industry and government.
- The Survey structure, format, and questions should be stable, applicable, and relevant for successive Increments so as to facilitate Increment-to-Increment trend analyses.
- Survey development would be completed in time to collect feedback from Increment 5 investigators and payload developers, approximately 30 days after the end of this Increment.

In order to meet the Survey's cross-Program scope and non-duplication requirements, the ISS Payloads Office convened a Customer Satisfaction Working Group (CSWG) to coordinate Survey development. The working members of this group and the organizations they represent within the ISS Utilization Program are listed in Table 1. Coordination of CSWG activities and overall management of the Survey project was performed by Doug Sander, the NASA lead of the ISS Payloads Office Customer Support Team, and Customer Support Team contractor leads Roy Christoffersen and Roger Weiss.

Based on fact-finding conducted during initial CSWG teleconferences, it was determined that formal ISS customer survey activities were in place within the Fundamental Biology Research Program Office, the Marshall Space Flight Center's Payload Operations Integration Center, and for the larger group of NASA customers that included ISS users at Kennedy Space Center. Discussions then focused on whether the goals and objectives of these other surveys could be incorporated into the ISS Utilization Survey as a single tool. This question was resolved progressively as the Survey was developed. Ultimately, the CSWG determined that the Survey should contain questions designed to be useful to as many of the CSWG member organizations as possible. However, a complete "one size fits all" solution was determined to be impractical due to lack of complete overlap of the customer bases, and concerns that a complete cross-program Survey would be too long and suffer from an inconsistent format and structure.

CSWG member participation in the training course "Enhancing and Measuring Customer Satisfaction," instructed by Omni Tech International, facilitated incorporation of industry-based, customer feedback best practices into the Survey development process. This two-day course summarized the state-of-the-art in understanding and promoting customer satisfaction and loyalty, and covered detailed methodologies for acquiring customer feedback, including survey questionnaire development. Following the course, contact with the course instructor, Ms. Lee Rouse, was maintained as she was consulted at several critical junctures during Survey development.

In addition to expertise outside NASA, several CSWG representatives from Kennedy Space Center (KSC) had in-depth experience with customer feedback methodologies based on their development of a successful Center-wide customer satisfaction survey at KSC. Within the NASA JSC organization, Judith Sanders and Laura Mannix, both from the JSC Department of Human Resources, provided assistance with web-based survey methods and implementation of the Inquisite web-based survey software tool, which was ultimately used for deployment of the ISS Utilization Survey.

Table 1. ISS Customer Satisfaction Working Group Participants

Member	Title and Organization	Representing
Doug Sander	Customer Satisfaction Initiative Lead, ISS Payloads Office, NASA Johnson Space Center (JSC)	ISS Payloads Office, JSC
Roy Christoffersen	Microgravity Sciences Discipline Manager, SAIC, ISS Payloads Office, JSC	ISS Payloads Office, JSC
Roger Weiss	Technical Integration Specialist, SAIC, ISS Payloads Office, JSC	ISS Payloads Office, JSC
John-David Bartoe	ISS Research Manager, ISS Payloads Office, NASA JSC	ISS Payloads Office, JSC
Randy Berthold	Chief, Science Payloads Operation, NASA Ames Research Center	Fundamental Biology Research Program Office (RPO)
Todd Mullins	Mission Integration Lead, NASA Marshall Space Flight Center (MSFC)	Microgravity RPO, MSFC
Brian Quigley	Integration Manager, NASA Glenn Research Center (GRC)	Microgravity RPO, GRC
Robert Crull	Senior Systems Engineer, NASA MSFC	Space Product Development
Paul Campbell	Project Manager, Lockheed-Martin Space Operations, JSC	Human Life Sciences RPO
Chris Dunker	Acting Chief, Office of Earth Science (OES)/Office of Space Science (OSS) RPO, NASA Goddard Space Flight Center	OES/OSS RPO
Annette Sledd	Pressurized Payload Team Lead, Multi-Use Payloads Group, NASA MSFC	EXPRESS Program
Cynthia Frost	ISS Payload Operations Integration Center (POIC), NASA MSFC	POIC, MSFC
Bob Little	Payload Operations Senior Staff Engineer, ISS Payload Operations Integration Center (POIC), NASA MSFC	POIC, MSFC
Janet Letchworth	AST, Payload Processing Operations, NASA Kennedy Space Center (KSC)	KSC, Payload Operations
Michele Foster	Chief, Customer Assurance and Analysis Office, NASA KSC	KSC, Customer Assurance
Amy Asato	Customer Integration Manager, ISS Utilization Division, NASA KSC	KSC, ISS Utilization
Pat Scheurer	Lead, Customer Assurance and Analysis Office, NASA KSC	KSC, Customer Assurance
Hester Culembourg	Business Analyst, Boeing	Boeing, IPIC
Laura Mannix	Human Resources Research Assistant, Human Resources Development Branch, NASA JSC	JSC, Human Resources
Regina North	ISS Program Data Analyst, NASA JSC	JSC, ISS Program Scientist

After initial survey design discussions, the CSWG conducted a Needs Assessment Study to validate CSWG design concepts with input on survey topic areas that ISS customers considered important. CSWG members Michelle Foster and Pat Scheurer of KSC conducted needs assessment interviews using a total population of 19 Principal Investigators and Payload Developers from Increments 2 and 3. In order to cast a wide net on topic areas the interviewees might consider essential for a formal survey, they were asked to provide open-ended assessments on both the strengths and weaknesses of the ISS Program. Their transcribed responses were then analyzed using a Pareto approach, which identified intrinsic subject areas within the responses as a group and then counted the number of comments within each group. The subject areas identified and prioritized in this manner were then used as input for further survey design work. The Needs Assessment also employed a set of more specific questions pertaining to customer preferences for the survey method, timing of feedback relative to an investigation's development and operational timeline, and amount of time a customer would be willing to commit to completing a survey or participating in an interview.

Following analysis and summary of the Needs Assessment results, the ISS Payloads Office convened a two-day workshop onsite at JSC for CSWG members to resolve remaining survey design specifics and produce an initial set of draft questions. After the attendees reached consensus on the Survey outline, format, and deployment method, working groups were formed to write candidate questions. These questions were downselected on the second day of the workshop to produce a draft Survey questionnaire, and the workshop was adjourned.

Additional Survey editing and format changes following the workshop included conversion of the Survey to a web-based format, and incorporation of index questions linked to the American Customer Satisfaction Index (ACSI). The ACSI methodology was added to the survey in order to provide a nationally recognized metric that would allow customer satisfaction with ISS Utilization processes to be compared to customer satisfaction in other government and private sector organizations. Results of this exercise are discussed in Section 5.2.1 of this report.

After the Survey's release in a web-accessible version, it was beta-tested using PI and PD volunteers (from Increments 2 and 3) who took the Survey under interview conditions that represented those planned for final Survey implementation. The suggestions from these testers were incorporated into near-final Survey revisions, and the completed Survey was released to commence the Increment 5 customer feedback collection process approximately 60 days after the return of the Increment 5 crew.

3. Survey Implementation Methods

The methods selected for implementation of the ISS Utilization Survey are as follows:

- Telephone interviews are the baseline method for the collection of Survey responses from ISS customers (participants). This solution conforms to customer preferences for a feedback collection method that is user friendly and also a minimal time intrusion. An interview setting also optimizes the opportunity for collecting customer elaborative verbal comments and clarifying these comments, and any possible Survey ambiguities, in a give-and-take manner.
- The team performing the interviews comprises individuals who are knowledgeable of the ISS Program but outside of the direct ISS Payloads Office management decision-making process.

- The identity of interviewees is maintained separately from their survey responses under a need-to-know system in which release of any responses linked to interviewee identities is controlled by the interviewees themselves.
- The interviewee/respondent population comprised one individual fulfilling the PI role, and one individual fulfilling the PD role for each ISS investigation active on a given Increment. In certain cases, a person who is not the formally designated PI or PD may be selected to fulfill either role for the Survey interview. This scenario generally occurs when consultation with an investigation's management team suggests an alternate, such as a Co-Investigator, who is proportionately more knowledgeable about the investigation's direct interfaces with the ISS Utilization Program. Members of an investigation's development team may choose to participate with a PI or PD in a Survey interview, but any responses accepted from them are still considered to be sanctioned by the individual in the designated PI or PD role.
- Interviews are tape recorded with the express knowledge and permission of interviewees prior to beginning the interview. This method is done in order to facilitate accurate capture of verbal comments through post-interview transcription.
- The Survey questionnaire is designed to take 45-60 minutes to complete in a phone interview setting.
- Survey interviews are performed at the end of each Increment, and cover all investigations active on that Increment. The interviews are conducted no earlier than 30 days but not later than 60 days after crew return.
- The online Survey questionnaire is made available to the interviewees for review at the time their phone interview is scheduled at least 1 week prior to the interview. The interviewee's official Survey responses are not collected until the day of the interview when they are recorded online by the interview team.

4. Survey Question Design

A link to the complete on-line version of the ISS Utilization Survey questionnaire is provided in Appendix A. The wording of each question also accompanies the question's corresponding response data provided in later sections of the report. The questionnaire consists of both closed-ended questions based on modified Likert rating scales, and open-ended questions designed to obtain elaborative verbal comments. All closed-ended questions are followed by a comment box to record the respondent's clarifying statements regarding the basis for their numerical rating responses as well as information that may help justify and direct corrective action on a particular issue. The interview team encouraged such verbal feedback.

Based on current best practices for questionnaire design, a 1 to 5 rating scale was selected for the majority of the closed-ended questions. An exception to this scheme was made for three specialized questions in Part 1 of the survey that were linked to the American Customer Satisfaction Index and required a 1 to 10 scale. A satisfaction-based rating scale was selected for most of the questions in order to provide a common basis for cross-comparing question responses and correlating them with other data.

Anchor terms were assigned only to the end-points of the rating scales, again based on customer survey best practices that suggest that intermediate anchor terms have no beneficial effect. The

lack of intermediate anchor terms does, however, allow for more variability in how respondents mentally calibrate the scale with respect to the measured variable. In this respect, there is indeed some evidence to suggest that customers tend to disproportionately use the high scores on a scale to express satisfaction. This consideration in turn has implications for how the level of a given variable is interpreted from a numerical score.

For analysis and discussion purposes, the rating scales used in the current survey will be interpreted in a generally linear way, without consideration of response bias. In this scheme, the scale midpoint is taken as a largely neutral or undecided position, with scores of 4 and above (7 and above for ACSI questions) defining the generally satisfied range of the scale and scores of 2 and below (4 and below for ACSI) defining the generally dissatisfied range. In discussions of the response data that follow below, the frequency of responses at the scale mid-point will generally receive less attention than the response frequencies within the satisfied or dissatisfied ranges of the scale defined here.

5. Survey Results

5.1 Respondent Demographics

A complete Increment 5 investigation list with the names of the individuals interviewed in the PI and PD roles for each investigation is provided in Table 2. Interviews were performed for 34 individuals from the total customer base of 35 PIs, PDs and PI-PDs that supported the 25 investigations active on Increment 5. This total is less than twice the number of investigations because some interviewees fulfilled a dual PI-PD role, and some PIs and PDs supported more than one investigation. For each of these latter individuals, the Survey results are an amalgam of feedback for several investigations and this must be kept in mind in interpreting the results from this particular set of respondents.

Demographic information for the survey respondents was compiled from data collected on the questionnaire's Customer Information Page and from other ISS Program data sources. A numerical breakdown of the interview group into various demographic categories is provided in Table 3. This demographic information is available within the Survey database for performing correlations with the response data. In this report, response data correlations with the respondent's role as either PI, PD or PI-PD will be the primary focus.

5.2 Survey Part 1 – Cross-Program Feedback

Part 1 of the Survey takes a cross-Program approach in which participants were asked to formulate their responses by integrating across their experiences with all areas of the ISS Utilization Program relevant to the topic of a particular question. The Part 1 questions are divided among Section 1.1 – Overall Customer Satisfaction, Section 1.2 – Satisfaction with Program Processes, and Section 1.3 – Satisfaction with the Customer Support Interface. For the purposes of this report, the organization of the questions within these sections will be re-divided among a finer-scale set of topic areas that more closely relate to particular products, services, or performance aspects of the ISS Utilization Program. These topic areas are not listed in the questionnaire itself, and they do not necessarily align with the numerical order of the questions in Part 1 of the Survey.

Table 2. Increment 5 Investigation List with Customer Satisfaction Survey Participants

Investigation Name	Research Program Office	ISS Utilization Survey Interviewees / Survey Respondents	
		Principal Investigator Role	Payload Developer Role
BIOPSY - Effect of Prolonged Spaceflight on Human Skeletal Muscle	Human Life Sciences	Robert Fitts, Marquette University	David Baumann, NASA Johnson Space Center
Epstein-Barr - Space Flight-Induced Reactivation of Latent Epstein-Barr Virus	Human Life Sciences	Raymond Stowe, University of Texas Medical Branch	Mark Anderson, NASA Johnson Space Center
EVARM - Extravehicular Activity Radiation Monitoring	Human Life Sciences	Ian Thomson, Thomson & Nielsen Electronics, LTD	Michelle Kamman, NASA Johnson Space Center
Interactions - Crewmember and Crew-ground Interactions During ISS Missions	Human Life Sciences	Nick Kanas, Univ. of California San Francisco / VA Medical Center	Christian Maender, NASA Johnson Space Center
Midodrine - Test of Midodrine as a Countermeasure against Postflight Orthostatic Hypotension	Human Life Sciences	Janice Meck, NASA Johnson Space Center	David Baumann, NASA Johnson Space Center
MOBILITY - Promoting Sensorimotor Response Generalizability: A Countermeasure to Mitigate Locomotor Dysfunction After Long-Dura	Human Life Sciences	Jacob Bloomberg, NASA Johnson Space Center	Suzanne McCollum, NASA Johnson Space Center
PuFF - Effects of EVA and Long-Term Exposure to Microgravity on Pulmonary Function	Human Life Sciences	Kim Prisk, University of California San Diego	Suzanne McCollum, NASA Johnson Space Center
Renal Stone - Renal Stone Risk During Space Flight: Assessment and Countermeasure Validation	Human Life Sciences	Robert Pietryzk, NASA Johnson Space Center	Michelle Kamman, NASA Johnson Space Center
Sub-Regional Bone - Sub-regional Assessment of Bone Loss in the Axial Skeleton in Long-Term Space Flight	Human Life Sciences	Thomas Lang, University of California, SF	David Baumann, NASA Johnson Space Center
Xenon1 - Effect of Microgravity on the Peripheral Subcutaneous Veno-arteriolar Reflex in Humans	Human Life Sciences	Anders Gabrielsen, Karolinska Hospital, Sweden	Suzanne McCollum, NASA Johnson Space Center
Improved Diffraction Quality of Crystals (PCG-STES investigation)	Microgravity Research Program Office	Craig Kundrot, NASA Marshall Space Flight Center	Dan Carter, New Century Pharmaceuticals
PCG-STES - Protein Crystal Growth - Single locker Thermal Enclosure System	Microgravity Research Program Office	Dan Carter, New Century Pharmaceuticals	Dan Carter, New Century Pharmaceuticals

Investigation Name	Research Program Office	ISS Utilization Survey Interviewees / Survey Respondents	
		Principal Investigator Role	Payload Developer Role
MAMS - Microgravity Acceleration Measurement System	Microgravity Research Program Office	Richard DeLombard, NASA Glenn Research Center	Bill Foster, NASA Glenn Research Center
SAMS-II - Space Acceleration Measurement System II	Microgravity Research Program Office	Richard DeLombard, NASA Glenn Research Center	Bill Foster, NASA Glenn Research Center
PFM - Toward Understanding Pore Formation and Mobility During Controlled Directional Solidification in a Microgravity Environment	Microgravity Research Program Office	Richard Grugel, NASA Marshall Space Flight Center	Linda Jeter, NASA Marshall Space Flight Center
SUBSA - Solidification Using a Baffle in Sealed Ampoules (MSG Investigation)	Microgravity Research Program Office	Alex Ostrogorsky, Rensselaer Polytechnic Institute	Linda Jeter, NASA Marshall Space Flight Center
ADVASC - Advanced Astroculture	Space Product Development	Weijia Zhou, University of Wisconsin	Weijia Zhou, University of Wisconsin
MEPS - Microencapsulation Electrostatic Processing System	Space Product Development	Dennis Morrison, NASA Johnson Space Center	Dennis Morrison, NASA Johnson Space Center
PGPA - Plant Generic Bioprocessing Apparatus	Space Product Development	Alex Hoehn, University of Colorado	Alex Hoehn, University of Colorado
StelSys - StelSys Liver Cell Research	Space Product Development	Paul Silber / Nancy Cowger, StelSYS Inc.	Tom Goodwin, NASA Johnson Space Center
ZCG - Zeolite Crystal Growth Furnace	Space Product Development	Al Sacco, Northeastern University	Al Sacco, Northeastern University
CEO - Crew Earth Observations	Office of Space Flight Research Program Office	Kam Lulla, NASA Johnson Space Center	Sue Runco, NASA Johnson Space Center
EarthKAM - Earth Knowledge Acquired by Middle School Students	Office of Space Flight Research Program Office	Brion Au, NASA Johnson Space Center	--
EPO - Education Payload Operations	Office of Space Flight Research Program Office	<i>No formal PI</i>	Cindy McArthur, NASA Johnson Space Center
MISSE - Materials International Space Station Experiment	Office of Space Flight Research Program Office	William H. Kinard, NASA Langley Research Center	Johnnie Engelhardt, NASA Johnson Space Center

**Table 3. Increment 5 ISS Utilization Survey
Respondent Demographic Summary**

Total Investigations	25
Total Number of Principal Investigators (PIs) Payload Developers (PDs), PI-PDs	35
Total Survey Respondents	34
Role of Respondent	
Principal Investigator (PI) / Co-Investigator Only	17
Payload Developer (PD) Only	12
PI-PD Dual Role	5
<i>Total</i>	34
Research Program Office of Respondent	
Human Life Sciences	15
Microgravity	5
Office of Space Flight (Code M)	8
Space Program Development	6
Investigation Flight History	
No Previous Increment	10
Previous (Continuation)	20
Previous (Re-Flight)	4
Organization of Respondent	
NASA	21
University	10
Private Sector	3
NASA Payload Developer (PD) Support	
Had NASA PD Support	27
Did Not Have NASA PD Support	7

respondents in a given demographic category who selected either a rating value or the non-applicable response option. By design, some survey questions are restricted to certain demographic groups and so are not answered by all respondents.

- *Applicable responses*: the fraction of the total respondents in a given category who answered a given question by selecting a rating value, and not selecting “not applicable.”
- *Mean rating*: the average value of the applicable rating values selected for a given question.
- *Mean score rank in section*: Numerical ranking of the mean score for all questions in a given section of the survey that were based on a level of satisfaction rating scale.
- *Median*: in the distribution of scores, the score value above which half the values lie and below which the other half lie.

Results summaries of the numerical ratings and verbal comments for the questions within each of the defined topic areas are presented in following sections. The response data for the questions in each topic area are presented on separate pages following the summaries, using a datasheet format. Each datasheet includes the transcribed verbal comments for its question, with lines separating from each interviewee’s set of responses.

The following list provides a key explanation of terms, parameters, and graphs contained in the datasheets and the discussions that follow:

- *Demographic category*: a grouping within the interviewed population based on a particular attribute or set of criteria.
- *Number of respondents in category*: the total number of interviewed individuals within a given demographic category.
- *Response rate*: for a given question, the fraction of the total

- *Response frequency distribution (bar graph)*: shows the percentage, relative to the total number of applicable responses, of respondents who selected a given rating value for a given question.

5.2.1 Overall Satisfaction (Questions 1.1.1, 1.1.2, and 1.1.3)

A common practice in obtaining customer feedback is to perform one or more assessments that ask respondents about their satisfaction with a product or service in an overall or overarching sense. Although there is no single standard or tool for evaluating overall customer satisfaction, one of the most widely recognized standard approaches is based on methods associated with the American Customer Satisfaction Index (ACSI™) developed by the National Quality Research Center (NQRC) at the University of Michigan. The ACSI is part of a powerful multi-level metrology that when performed to its fullest extent can generate data that are both predictive of customer future behavior as well as descriptive of past behavior. Within the metrology, the ACSI itself is a single index that has been used since 1994 as the basis for a regularly published comparison of customer satisfaction for both commercial industry as well as public-sector organizations.

In the ISS Utilization Survey, questions 1.1.1-Overall Satisfaction, 1.1.2-Expectations, and 1.1.3-Ideal Organization, were included as a group to provide feedback on different dimensions of overall customer satisfaction with the ISS Utilization Program. The scores from these three questions were used as the basis for a single Overall Satisfaction Index (OSI), whose derivation approximates the ACSI for the purpose of making a first order comparison to ACSI data for other organizations.

Apart from their aggregate use for formulating the OSI, the questions are also instructive on an individual basis, since each assesses a slightly different core customer satisfaction concept. The individual score data for these questions will, therefore, be discussed prior to considering the OSI results separately.

For all interviewees, the mean and median scores for Overall Satisfaction and Expectations are within the generally satisfied/met expectations range, with approximately 70% of respondents scoring in the generally satisfied range (7 or higher) and 60% considering that the ISS Program generally met their expectations (7 or higher). Although the centroid of the scores for Overall Satisfaction and Expectations are well within the satisfied range of the scale, the score distributions are broad enough such that there are 18% and 21% sub-population respectively of individuals who are overall dissatisfied (score of 4 or less) and did not have their expectations met (score of 4 or less). For Expectations in particular, there is a bi-modal distribution of two distinct sub-populations of individuals whose expectations were either met (60%) or not met (~39%). For Ideal Organization, the response distribution as reflected in the mean and median scores is negatively shifted relative to Overall Satisfaction and Expectations. About 50% of respondents consider that the ISS Program is close or somewhat close to their ideal organizational concept, but another 50% disagree.

For the interviewee demographic sub-groups, one of the most notable features is the generally lower scores, all in the dissatisfied range (4 or less), for PI-PD dual-role individuals, as opposed to individuals who were solely a PI or PD. PIs and PDs are generally similar to one another for Overall Satisfaction and Expectations. They are different, though, in their consideration of how

close the ISS Utilization Program comes to their concept of an ideal organization, with mean and mean scores significantly lower for PDs as opposed to PIs. Even within the PI group, there appears to be a 26% dissenting group of individuals who do not agree with other PIs that the ISS Utilization Program is close to their concept of an ideal organization. PI-PD dual-role individuals are particularly negative on the Ideal Organization question (mean and median ratings ~3).

A review of the verbal comments for the questions in the Overall Satisfaction topic area indicate that customers are generally more satisfied with on-orbit performance than pre-flight. A strong theme throughout the comments is the frustration customers have with the complexity of ISS organizations and processes. Customers mention inter-Center rivalries and perceive a lack of communication between organizations within ISS. Complaints of redundant inquiries being made by many parties were also received. Interviewee statements also reflect an uncertain understanding of who is in charge of their payload’s integration.

Using the mean scores for the Overall Satisfaction, Expectations, and Ideal Organizations questions, an OSI value of 60 was calculated by converting the scores to a 0-100 scale and taking their un-weighted average. This approach is an approximation to the proprietary model-based weighting scheme that is used to for the ACSI. The OSI score is compared to selected values from the NQRC’s published ACSI scores in Table 4. This list also includes an ACSI score for NASA Glenn Research Center (GRC) obtained from a recent customer satisfaction survey conducted for outside users of GRC services (*Point of Contact: Mark Kilkenney, NASA/GRC*). The latest comprehensive listing of ACSI scores is available at www.theacsi.org. This website includes a page with a recent NQRC compilation and analysis of ACSI scores for government agencies and organizations (www.theacsi.org/government/govt-02.html).

Table 4. Comparison of Overall Satisfaction Index (OSI) to American Customer Satisfaction Index (ACSI)

ACSI Industry Rankings	Score
Amazon.com	84
Retail Industry (<i>aggregate</i>)	75
Federal Government (<i>aggregate</i>)	70
Kmart	70
NASA/Glenn Research Center	67
Internal Revenue Service (<i>tax filers</i>)	62
McDonald’s	61
ISS Utilization Program OSI	60
National Science Foundation (<i>grantees and applicants</i>)	58
Federal Aviation Agency (<i>commercial pilots</i>)	56

Reference: American Customer Satisfaction Index (ACSI) 2003
www.theacsi.org

The OSI for the ISS Utilization Program is generally within the bottom 10% of the ACSI scores for both the commercial and government sectors. Although this ranking is relative to a diverse list of organizations whose products and services stretch the limits of analogy to what the ISS

Utilization Program does, it must be considered that the ACSI methodology was specifically designed to produce an index that could compare organizations irrespective of their business models. Nevertheless, if the ACSI list is filtered for organizations that are conceivably more comparable (e.g., Glenn Research Center, National Science Foundation, and the Federal Aviation Agency), the ISS Utilization Program is more competitively ranked.

Question 1.1.1 – Comments

-
- in my experience, this is pre/post experiment only, I was very satisfied with the 3 people who helped me integrate this experiment from the NASA side; they were very good about getting me timely info
 - everything was coordinated in a good way, made it easy to get through the many tasks
-
- overall, from manifestation to flying and running experiment, biggest reason not a 10 rating is that we had many issues after manifesting getting through NASA hardware approval cycle; only area where we rate things down
 - main reason, since we were kind of unique and first experiment to get inside EVA suit, went through 2 sets of approval; we'd develop hardware and there was also the EVA Office that required approvals as well;
 - we went through many iterations; these were unexpected and added much work to our process
 - different levels within NASA, and people we worked with didn't expect all these approvals
-
- *asked for clarification on "Utilization Program" [RC clarified]*
 - very good success in getting flight, subjects, building hardware, etc.
-
- PI for CEO but also active and well-published in science community, would like to give feedback on broader level
 - overall experience is positive as PI
 - there needs to be improved communication between Payloads Office and PIs
-
- rating is lower than otherwise
 - the thing that shocked us was how hard doing things on Station has been
 - both getting to orbit and care and feeding of experiment have been more than I anticipated
 - PUFF is simple experiment, but it has taken a lot of work
-
- it was a wonderful opportunity
 - we used shorter timeline but experiment did not go as planned, wasn't what we'd hoped it would be
-
- pros and cons--
 - pro: very detailed program, integration covers almost every aspect one can think of, nothing left behind, will assure coordination of program
 - each disciplinary group is willing to work with every group, work with you, try to help you as much as they could
 - most disciplinary groups are knowledgeable, some are not, but most are
 - when the EXPRESS office handles things, they know what they are looking for
 - con: very inefficient mechanism, lot of open action
 - confusing, no clear contacts available to PDs and PIs; receive more than one call for same thing by different groups for same purpose; should merge into one group, structure is very confusing, so many OZs; problem is not JSC side, but more contract office (Boeing), then MSFC calling, then JSC calling for same stuff
-
- would like downlink times increased, more communication block times, will increase in future
 - not a lot of program data to go on
 - well into routine by Increment 5, no paperwork was needed, very easy to get our CD on board
 - reason not higher (rating) is that some unilateral decisions were made at POD and flight direction was made rather than giving us a phone call; decisions were made without consulting us
 - also, just asking question of crew took about 3 weeks because POD, TCO of LIS didn't know there was an 800 mm lens on board and took 3 weeks to find this out; this has improved recently; things are improving between beginning and end of Increment 5 as far as talking to LIS, POD, TCO.
-
- reduce the overhead products development, lack of Russian integration process, remove this problem
 - ISS people have been very responsive to every requirement submitted, made every effort to accommodate us, extremely satisfied, made sure we were not jeopardized
-
- templates are too long
 - when we came into doing experiment, we proposed shorter template, predicated on ISS being on orbit,

EIAs and PIAs are far too lengthy

- should be able to take sample up and go to work
- inordinate amount of paperwork even if it is already there, slows down template, cuts down volume of what to do in experiment

- we were very satisfied with all the work we did at KSC, excellent support

- early issues getting rack hardware up and running but worked out
- planning, testing, getting hardware down there, went well
- overall integration, payload support and using old Spacelab model to compare, to make bunch of contacts with storage, labeling, other groups of people, none of them done for payloads directly
- KSC was major interface
- becomes a burden on payload, but payload doesn't plan on making the connections and contacts and has burden on budget
- PDL concept good but lousy tool, would hope requirements would be disseminated, lots of times have to make duplicated info

- this experiment was a pre/post only *[RC: we understand how this works]*

- we have a payload coordinator for each of the HRF suite of experiments
- combination of those two things serves to make my interface with program on this type of experiment very minimal
- *[RC: Dave Bauman was coordinator?]* yes
- my experiment seemed to go very well, my coordination with my PI indicated to me things went smoothly for him; my coordination with Bauman indicated things went smoothly
- got data when we expected to, PI didn't come to me and say there are problems I am having with system
- have 2 different impressions of program: (1) with PUFF, since insulated, developing hardware, getting it ready for flight was very difficult and painful, lots of processes and requirements were not defined, so had to make up as went along
- get impression now it is improved, i.e., documents are more streamlined, requirements are defined
- have not had new experiment come in and gotten through cycle from start to flying since all this improved greatly
- clouded perception, getting things ready for flight was years ago
- still applicable, how we document top level documents up front whether through payload integration agreements or through payload tactical plan, process is confusing, not well defined; whole process needs improvement
- Program realizes there is an issue there (with process improvement)
- on Increment 3, and still an issue, lack of having a process or defined requirement for integrating hardware that goes into Russian segment

- [name omitted] point of view will be different from [name omitted]

- *[RC: We like people doing as a team, but [name omitted] response is the authoritative input here]*
- [name omitted]: entirely too much verification on PDs; we interface directly with MSG, and [name omitted] would represent MSG, so she has to deal with much stuff I don't
- my end has mass numbers of verifications
- *[RC: given you have 2 payloads that went into MSG, does that include requirements that went into MSG?]* no, mainly human factors

- upper level 57000 stuff that had to be flowed down, too much for a little low-cost glovebox experiment

- numbers of interfaces, I went into thinking only dealing with MSG, but not the case
- we can't prevent rest of program from calling PD
- MSG was circumvented a lot

- *define scope of ISS Utilization Program [RC: everything happened to your investigation after it was funded and manifested to fly on ISS]*

- two specific comments: how these middeck lockers have been handled by the teams that load them onto the Shuttle or take them off--in both cases, taking hardware off, cases where lockers have been dropped a

- bit, but liquid drops inside apparatus, liquid shock could complicate retrieval of samples
- having observed one loading procedure at KSC, impressed how many people involved in process, like military, but easy for process areas to get handed down
- another payload, EGN, flown under Russian segment, found it difficult to get temperature and pressure data from Russian module
- wanted to correlate temperatures in FGB, but hard to regulate

- nice to have my experiment requirements met, never got to ISS
- MPLM did not maintain temperature requirements, 20-40 degree requirement was not met, MPLM heaters were not turned on, went below 20 degrees, all my drugs came out of solution; this happened on Increment 5, got data that shows heaters were not turned on
- other comment: far too complex, most complicated payload integration I have experienced while working at NASA.
- too many players, have to talk to Marshall to talk to JSC, can't talk to astronaut who's going to run my experiment, spend all time trying to keep up with process; far too many people who didn't know what they were doing.
- have flown since '74, see that difficulty is program was being implemented while things were being changed in real time; first Program where all responsibility was on PD; had case where revised procedure 72 times.

- things happened fairly quickly
- time from when you write grant to time when you start to fly could be shortened
- worked at NASA from '90 to '96, then went to academic, so familiar with how Life Sciences Program works, so I'm unusual case, but know better than most PIs to get to know things to move quicker

- *asked for definition of ISS Utilization Program. [RC: clarified for him]*
- drastic budget cutbacks in Program, which came from ISS Program, not from RPO
- lack of crew time availability to run experiments
- early sciences done given us in terms of a companion microgravity environment for a while is lacking, of course PCS is a little different
- EXPRESS rack problems, resets early on, etc.

- overall processes could be better defined/streamlined

- science is not highest priority, understand ISS still being built
- it would be much better as an enhancement to EPIM as having 1 POC with highest expertise available vs. many paper pushers
- system is cumbersome and slow moving
- too few resources on launch/landing (power/mass), limited resources keep us maximizing return

- *asked about Midodrine [RC: Any and all investigations on Increment 5]*
- there is difference between my experience in Increment 5 and that involved with Baumann
- there is a big problem for intramural investigators; tried to be fit into same format as extramural investigators; because of inflexibility, I ended up doing much more paper- and busy-work required for extramural investigators, where my lab was more familiar with handing down requirements for us

- only thing handled by management was extra work on my part
- there seems to be general confusion as to experiment priorities; not sure whose fault that is; priorities seem to change to utilization when it comes to landing day vs. who has highest priority
- experiment vs. ops part of job *[need clarification]*
- scheduling was so over-subscribed; we were late in getting out data

- with my limited experience, in the middle, not sure how to put recommendations to put to broad scope

- been there since Increment 2; at top level some big disconnects, Program-level, that were fixed not at my expense
- they realized EarthKam was coming, and front office took pains to take care of it without coming back to me

-
- neat thing about being one of first payloads is fixing payloads
-
- can only comment/judge from pre- and post-flight process.
-
- to improve, when personnel changed, if someone in Program sat down and gave an overview; we lost it when Debbie left, never had that opportunity, not hearing same story from everyone, orient us the way we should operate.
-
- many areas where payload forage out answers for particular items.
 - one thing I'd like to see happen, for PIs not here, particular hard to get answers to problems, root this out
-
- things have gone well; most things are invisible; very smoothly done.
-
- *clarification needed: everything I experienced pre-, during, post-flight? [RC: Yes, very broad and integrative]*
 - everybody was excellent, support personnel was good
 - one negative aspect, crew having to change schedules a lot, we had to adjust and jump around a lot and accommodate; I was very busy, but schedule is no one's fault
 - direct supervisor of project could have been more assertive at times but all went smooth for the most part
-
- generally very satisfied
 - only slight view, sometimes too many people to deal with and don't seem to be talking to each other
 - excellent support from Dave, from ESS, from MSFC, experience went well
-
- less redundant documentation
 - information not always current, e.g., NASA websites
 - use more concrete information
 - poor scheduling
 - too much oversight on training
 - let PI and PD assume training risk for experiment
-
- we get nickel and dimed for making nit corrections not related to performance, more in formatting, etc., but drives folks to put in much time and many times over, becomes a cost driver
-
- various and different organizations request same data after we have submitted to appropriate OZ/EXPRESS representative
 - redundancy remains in overall integration process
 - science is too low in priority; the process for flying on Station is not flexible enough to be conducive to state-of-the-art science
 - communication is difficult; we are asked for rapid responses to inquiries but given insufficient data to formulate a well-thought-out response; we will also be asked for the same information by different groups
 - the questions should be coordinated and contain as much information relating to the event, situation, etc. as possible
-

Part 1. Cross-Program Feedback
Section 1.1 – Overall Satisfaction
Topic Area: Overall Satisfaction

Question 1.1.2 – Please rate the degree to which the ISS Utilization Program met your expectations.

1	2	3	4	5	6	7	8	9	10	Not Applicable																																													
Fell short										Exceeded																																													
All Interviewees						PIs Only																																																	
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Question 1.1.2 – Comments

-
- my previous contact with spaceflight experiments, although limited, gave clear indication this is problematic field, lots of contacts involved
-
- but in regard to my experiment, I was very surprised positively the way coordination of big project was handled, exceeded my expectations
-
- put in for a flight study, got it, been here since early 80s, Shuttle-Mir, had no major problems trying to get a flight experiment, also got data
-
- our expectations were exceeded with respect to interactions with ground personnel, everyone from Brian Kelly's group to Wylie support team, but executing on Station fell short
-
- basic reason for lower rating is that I think that partly as a result of coming in early, on Increment 3, we hit a lot of issues that are co-development issues, none baselined documentation
-
- I was shocked at how hard it was to do that stuff, we filled in a lot of documents and felt unclear about it; comments are based on Increment 3 and 4 but Program has learned
-
- we are in unique situation, our payload has longer history, so lots of positives since we know people who work issues, have good relationship, relatively satisfied
-
- [RC: your expectations are based in Shuttle?]* even on ISS, immersed in utilization, so situation is similar
-
- *still talking manifesting to post flight? [RC: yes]*
-
- divide into 2 areas, one during experiment, exceeded what I expected, got enormous amount of cooperation from astronauts, and making changes as we went along
-
- two, what fell short, is getting there in the first place, but once there, went well
-
- realized how complex and difficult, using MSG for first time, feels lucky how things went
-
- came in totally new, had no expectations
-
- met or exceeded expectations, thought it would be more bureaucratic and less organized, but wasn't
-
- like first question, improve overall scheduling by trying it not let change, although I know it's hard to keep to that always
-
- people excellent, but process needs some definition yet.
-
- everyone was very helpful, exceedingly
-
- impressed with professionalism with folks from LMCO; project scientist working with them was exceptional personnel; feel all expectations were met
-
- need to have different requirements for intramural investigators
-
- in past on sorties and Hab missions, system was bigger and easier to use; ISS was too cumbersome and complex to use;
-
- needed a benchmark by which to judge exceeding and benchmark, so using past integration and flight programs, e.g., SpaceHab, SpaceLab, sortie science on Shuttle
-
- frustrated by high turnover of people
-
- even PALS is one-stop shop, and majority of NASA is using, feels like it is data going into black hole, used more for personal recognition of people not efficient use of our data
-
- because of PDL, unclear lines of communication, too many redundancies, repeated directions
-
- all of requirements met for Increment 5
-
- based on EXPRESS problems up there; times down due to power shortage
-
- same reasons as previous; fell together nicely; people came together well
-
- my background led to knowing who to contact
-
- can't say was disaster, but when voiced problems, things got taken care of and we did get there
-
- my expectation was that given it was going to be more complicated, we were prepared to deal with new things but the level of detail and unnecessary stuff ended up being far out of kilter; for example, tested EMI at JSC, passed, but Marshall says we didn't pass, did not pass at MSFC, JSC apparatus was not appropriate for ISS, how can this be? Expected to have complicated things worked out before I had to use

them. Missed important things (MPLM temp) because pre-occupied with not important things.

- difficult because I didn't have any keen expectations, joined NASA in '98 so not so involved with Shuttle in order to compare/contrast ISS to Shuttle

- lots of people would say hoops/paperwork could exceed Shuttle

- crewtime was misjudged

- we were told to automate, automate, automate, because there wouldn't be much crewtime, but that wasn't the case

- we could've done more crew interactive things to lower cost, but that wasn't the case

- certain attitudes; the video downlink the horrible; XPOP for example, sometimes 4-5 hours without any video data; certain experiments were difficult to perform with that type of downlink of feedback

- the way our experiments are you need much better

- whatever timelines are, really nothing you can do about it

- we'd rather change to different attitude, etc., but we had little/no control over that

- after going through readying for flight, was expecting to get less out of it than we actually got out of it
[RC: much work up front but got more than anticipated?] yes

- speaking for team here, not just my viewpoint: we had fairly veteran team for integration, so we

expected same quality as back in Spacelab days; feels "5" since experience exactly as what we expected

- expectations were different mindset compared to Spacelab

- ISS was new paradigm, designing new hardware, duration of hardware from days to years

- expectations of design, we didn't necessarily achieve what we wanted to do

- in hindsight, doing better, especially with design

- I understand in terms of management why things are different

- my expectations of ISS are we should aspire to higher volume of research through facility than what we are getting; disappointed we are not reaching that goal and need to do a lot better for us and customers

[RC: asked follow-up, what about fact we're still in pre-assembly complete condition, doing construction, research during assembly vs. assembly complete, how does that impact your expectation and understanding?] I understand, however, most of our hardware was already there being used for CMOSS contingent already there;

- would be harder if switching things out, but if stuff is already there, just need a trained astronaut

- astronaut was bench scientist (Whitson) so learning curve was low, so personnel was aimed at how we were projecting for Increment, so not many things to surmount

- understand upmass is problem, etc., but if just sending up samples to use equipment, NASA should be taking advantage of that capability and using to max effect

- more than met our expectations

- were hoping to get better photographic coverage of units on orbit, but ISS Utilization people probably gave us as much as reasonable; every thing else we were content with

- just recently were looking to get attitudes on pointing of ISS and they were very responsive in getting that data to us in days

- see previous comments

- we were up and running and had our allotment of time

- during Increment 5 when there was a improvement from 4 to 5, the POD started reporting back to us any recorded items on the OSTPV, this was useful to know better what crew had done relative to our task requirements.

- didn't know what kind of expectations to have, all went well, expect some problems, and that's tolerable, was accommodated

- what didn't go well was uncontrollable, single event upsets that take out equipment, and had to do some rescheduling; didn't have stuff up there that would die in five minutes if didn't come back on

- I want to get this thing done, its done, something improved, its improved, but didn't give 10 because always room for improvement

Part 1. Cross-Program Feedback
Section 1.1 – Overall Satisfaction
Topic Area: Overall Satisfaction

Question 1.1.3 – How close to your ideal organization for ISS Utilization management would you rate the ISS Utilization Program?

	1	2	3	4	5	6	7	8	9	10	Not Applicable																						
	Not close at all										Very close																						
All Interviewees																																	
No. respondents in category:	34																																
Response rate:	34/34 (100.0%)																																
Applicable responses:	32/34 (94.1%)																																
Mean rating:	5.2																																
Mean score ranking in section:	NR																																
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8	0																																
9	0																																
10	0																																

Question 1.1.3 – Comments

- need clear path through system
- need PIM or EPIM to get through, someone who knows experiment very well

- interaction between various parts, science manager / project manager to individual who runs whole mission could be better

- not ideal, but happy with what I received and could think of improvements, e.g., on the whole, cleaner lines of communication

- ideal organization in my mind; I have payload, come to office, I have payload, want to fly, office would pick up and help get to point to where its flown, and I wouldn't have to fight at boards to justify cost; has gotten much better since Increment 1 but long way to go; lack of definition in current process.

- safety rules way too rigid

- can't think of anything specific needing change, but over the years some frustrations in delay back in mid-90s

- *don't understand question [RC: clarified]*
- the ideal organization is where PI knew exactly what was expected from payload development, and knew what was expected from approvals pre-flight
- from beginning to end, rated high, once flying was great

- related to inefficiency re: several disciplinary groups waiting for information, they don't let us always know, org chart improvement and relationships need improvement overall

- *[RC: clarified question at his request, are we performing to how you saw it working?]* on positive side, the Utilization management is getting better, previous experience had lack of knowledge about following procedures

- as I see it at the moment, the Program is not very science centric

- my perception of why we have Station is to do science; science takes a low priority in some of the trade-offs, understand building Station but still have be told bluntly that science is not a priority.

- despite extraordinary efforts of many in organization to enable efficient utilization, the overall structure of this Program is so complex and requires so many hoops that it is so remarkably inefficient

- don't remember having any complaints or second guessing
- lots of this stuff goes on behind the scenes

- system is getting better with new PIM assignment; still a 4 because if I were developing a new Payload, it would still confuse me about what paperwork is required, no central group to help

- rated earlier question higher because I now know system, but if I had to learn system, it would be less satisfied.

- improve configuration management, to make real, instead of just people who look at, better methods for allocation of resources, Russian integration process defined, need to react better to changes but are getting better, need to focus on customer more

- not sure I'm in good position to evaluate this totally
- the ISS Utilization Program as part of its infrastructure should have more services for exposed type of experiments, e.g., passive containers for MISSE should really be part of ISS infrastructure

- I would like to see separate groups, OZ1, OZ2, etc.; they have separate camps and don't necessarily communicate well with each other
- had attended early camps with Nygren and Suffredini, sitting in when Utilization group was trying to work out their problems
- [RC: we have new manager, that was early stage time]* I know there is long road for improvement and things have gotten better
- hard not to forget those times

- organizationally far too many intermediate steps to get to endpoint

- RPWG, PMIT, numerous interlocking organizations to go through to get to endpoint to get payload up
- then PIM, then EPIM, again interlocking and interlapping duties that should be consolidated so dealing with focal points vs. entities
- this complicates integration into vehicle differently
- each has different scope, personality, job concepts on what should be; proves to be confusing for PDs and PIs on what to do
- process should be consolidated and focused to quickly get from Point A to Point B

- a feeling sort of a thing
- generally, by working to make the processes a bit more clear
- [RC: any processes unclear?]*
- find myself drifting into payload coordinator mode, need to focus on just this experiment
- a little bit unclear to me what I needed to do as PD in system here, prepare and deliver products for ISS
- things worked OK, just remained vague on what exactly my role is

- haven't really thought about how it should be organized vs. how it is; not sure I can come up with better idea on how to organize

- too many layers in way to answer that
- hard to figure out who I'm supposed to answer to, lots of overlap, hard to know who's driving the boat sometimes

- ideally, it would be a pretty transparent process, or penetrable one; to me, especially as PI, I don't have a handle on the Program
- for example, if there was a clearinghouse website to get all questions answered, complain, etc.
- comprehensibility vs. capability

- so much need for improvement; balance new objectives of ISS versus past; when talked to Rick Nygren, things got straightened out; overall management is so complicated

- very good, but you always want some things to happen better or differently
- more streamlined situations, e.g., when grant was written, shorten time between, definition phase should have been tailored to shorten up, some things can get done sooner
- ours was a pre/post, but large lag time for academics
- hard to get funding to do something, then there's a gap in activity before development phase
- not what I consider management, but once in management phase, I was happy
- happy with HLS support (Mark Anderson)

- would like to have MCC at GRC
- *define ISS Utilization Management [RC: OZ, RPO, POIC, KSC]*
- in terms of SAMS operation, I didn't have anything to do with KSC activities; deal with POIC at MSFC for data flow, haven't worked issues with them, zero to do with JSC in getting SAMS up there

- some disconnects between OZ2 and OZ4
- Increment planning phases, unclear about roles

- doesn't feel like one organization
- at end of process, still feel lot of inter-Center squabbles, e.g., JSC vs. MSFC or JSC vs. KSC, no cohesiveness, no "One NASA" as being touted, lots of empire building, makes it difficult to build and solve problems
- create single point-of-contact, rid inter-Center squabbles, remove parallel info flows, rid intermediate paper pushers, eliminate mid layers of meaningless continuity in system but just adds to confusion, get info from PD to user
- at highest level of frustration for ISS, being outside firewalls and ISS, we struggled daily to find simple things like schedules, manifests, etc.
- we do love our jobs and using ISS

- could have fewer people involved who don't have added value
- get priorities straight

- have different requirements for intramural investigators
- better coordination with med ops

- comment to general management structure, one of few issues, in my group, have not lots of visibility to management, who did what, etc., will comment later more specifically

- we still have a problem with arranging to get adequate data from US mission control site.

- as an insider, one knows which buttons to press; for outsiders it must be overwhelming to get experiments to fly
- streamline paperwork to make things happen
- familiar with all being an insider; for outsider, daunting from beginning
- various boards and committees, very daunting

- not being in payload community but on fringes, could have used better overview and management and who did what, would have made easier to understand how everything works

- seems to be very compartmentalized.
- information flow from PIM to POD was almost non-existent, had to teach PIM and POD about the payload.

5.2.2 Customer Loyalty (Questions 1.1.6, 1.1.7, 1.1.8, 1.1.9)

Recent efforts in the field of customer assessment have focused on the concept of customer loyalty as reflecting a higher-order state of a customer's approval of a given product or service. The customer loyalty concept became necessary when studies showed that 60% to 80% of customers who claim to be satisfied or very satisfied nevertheless defect to a competing product or service. The identification of a customer as loyal, as opposed to merely satisfied, indicates there are reliable indications from a customer's feedback that such a defection is unlikely.

As applied to the relationship between the ISS Utilization Program and its customers, the concept of customer loyalty has some complex dimensions. The Survey development team considered exploring customer loyalty to be important, if only as a higher order indication of a customer's approval of their experience with the ISS Utilization Program. Questions 1.1.6 to 1.1.9 are based on two widely used types of customer loyalty questions. The first surveys an individual's likelihood to select the same product or service again, and the second asks their likelihood to recommend a given product or service. Both types of questions were adapted into questions phrased specifically for PIs (1.1.6 and 1.1.8) and PDs (1.1.7 and 1.1.9). Survey respondents who fulfilled the role of both PI and PD (PI/PD Dual Role) answered both the PI and PD versions. The results yielded separate customer loyalty feedback datasets for the PI and PD demographic groups.

Based on the response distributions for questions 1.1.6 and 1.1.7, the PI and PD groups appear to be very similar in their attitudes regarding recommending the ISS as a platform for research or as an organization in which to perform payload development. For both groups, the mean scores are marginally above the scale mid-points, with 50 to 60% of respondents scoring in the recommend range (score of 4 or higher), and 20% to 25% not likely to recommend (score of 2 or lower). On the question of whether respondents would pursue research or develop a payload on ISS again (1.1.8 and 1.1.9), PIs and PDs again appear to have similar attitudes. The mean scores are, however, higher for both groups compared to their likelihood to recommend ISS to others. For PIs, 95% of respondents indicated they would choose to pursue another ISS investigation, while for PDs, the percentage is somewhat lower, at 60%, with a small sub-group of PDs unlikely to elect to develop another payload.

The comments for each of the customer loyalty questions reflect an overall tepid state of ISS customer loyalty. Many of the respondents note that the costs in terms of time, effort, and stress of doing business with ISS are great and that new customers should be forewarned prior to undertaking an ISS investigation. It was also noted that experience with NASA prior to flying an ISS payload is an advantage that makes the challenge of dealing with ISS bureaucracy less daunting. Several customers felt that flying again would be easier for several reasons, including less work for a re-flight payload, knowing "the ropes" after their first flight, and improvements in ISS processes. Many of the customers who are indicated to have high loyalty have chosen space as their career path and are highly committed to ISS-based research, or alternatively their research requires space-based facilities and thus, they have few options.

Part 1. Cross-Program Feedback
Section 1.1 – Overall Satisfaction
Topic Area: 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?

1 2 3 4 5 Not
 Very Applicable
 unlikely
 Very
 likely

PIs and PI-PD Dual Role		PIs Only	
No. respondents in category:	22	No. respondents in category:	17
Response rate:	22/22 (100 %)	Response rate:	17/17 (100.0%)
Applicable responses:	21/22 (99%)	Applicable responses:	16/17 (94.1%)
Mean rating:	3.8	Mean rating:	3.9
Mean score ranking in section:	NR	Mean score ranking in section:	NR
Median:	4.0	Median:	4.0
<p>Detailed description: A bar chart showing the percentage distribution of ratings for 'PIs and PI-PD Dual Role'. The x-axis is 'Rating Scale' with categories 1-very unlikely, 2, 3, 4, and 5-Very likely. The y-axis is 'Percent (%)' from 0 to 100. The bars represent: 1-very unlikely (5%), 2 (14%), 3 (14%), 4 (33%), and 5-Very likely (33%).</p>	<p>Detailed description: A bar chart showing the percentage distribution of ratings for 'PIs Only'. The x-axis is 'Rating Scale' with categories 1-very unlikely, 2, 3, 4, and 5-Very likely. The y-axis is 'Percent (%)' from 0 to 100. The bars represent: 1-very unlikely (0%), 2 (13%), 3 (19%), 4 (31%), and 5-Very likely (38%).</p>		
PI-PD Dual Role Only		PDs Only	
No. respondents in category:	5	Not Applicable	
Response rate:	5/5 (100.0%)		
Applicable responses:	5/5 (100.0%)		
Mean rating:	3.2		
Mean score ranking in section:	NR		
Median:	4.0		
<p>Detailed description: A bar chart showing the percentage distribution of ratings for 'PI-PD Dual Role Only'. The x-axis is 'Rating Scale' with categories 1-very unlikely, 2, 3, 4, and 5-Very likely. The y-axis is 'Percent (%)' from 0 to 100. The bars represent: 1-very unlikely (20%), 2 (20%), 3 (0%), 4 (40%), and 5-Very likely (20%).</p>			

Question 1.1.6 – Comments

-
- it's very difficult to obtain proper funding, including for travel, working overseas, which is very difficult; not very based on the scientific approach
-
- I've done space for 20 years, I'm an enthusiast, but I would say go do it yet be forewarned, you are going to work hard to do this, it is not an easy road
-
- wasn't a great experience
 - wait is too long
 - keeping staff is difficult
 - need to eliminate astronaut time, doesn't allow you to do breakthrough science
 - breakdown in signals caused much interference and delay
- [RC: if constraints were different, would be less automated and more human observation?] yes*
- some crew went the extra mile, as on my flight
 - needed ability of non-automated observer and downlinked for us to have a look on ground
-
- look into assigning a PI a mentor, consult from more senior PIs to junior to help them
-
- very well organized experiment and got good support, maybe others had problems come up, but from pre-post view, went very well
 - if someone needed in space research, this is the place to be, at the forefront of humans in space
-
- if questions are those dealing with space biology, need to get on ISS
 - not an ideal world
 - would like to have more equipment, crew, etc., but limitations are realized
 - science folks would like faster movement with resources
-
- big proselytizer
-
- I'm a big booster of space research, a lot of work, a lot of energy, a lot of red tape, not sure colleagues would want to do.
 - not sure its for everybody; things kept getting bumped, had to go back do training; learned to put up with that; not all my colleagues; recommendation depends on person.
-
- yes would recommend but also comes package deal with strong warning that patience is necessary; may not be doable for someone who is not used to Center and being PI type
 - brand new PI who doesn't get hand-held might not get through system as easily
 - much of our experiments got 2- to 4-month duration, which was useful, but some of others' experiments might not be worth the time if not given term to run vs. sortie, Shuttle, etc.
-
- don't stake your career on this unless you have good ground-based research program going; like stock market; don't put entire effort into this one venture
-
- doesn't apply to me or us, although encouraging ESA to get a MAMS type of thing
-
- this is an area I'm fond of
 - having that background at NASA, let them know what was realistic and what wasn't
 - misnomer to some colleagues who don't understand spaceflight, some have more political (understanding)
 - there's an educational process involved
- [RC: caveat is no NASA experience?] yes, note of caution, certain research is not possible to do or difficult to do, more hardware issues that work well in ground but resources in space could differ and impact feasibility*
-
- rating based on how ISS is now; if you had novice research, they would go away in sheer disgust; if you get in there and re-organize and clean up processes, the ISS could be so fantastic that my colleagues would want to use it
-
- decrease the turnaround time
 - we here at MSFC are trying to do as much approval for toxicology and materials compatibility as possible, which is fast moving
 - timeliness is big factor, not expecting change in launch factors

- dozens of things on ground can be explored in similar timeline

- the ISS provides a unique opportunity, materials and systems, new technology, it is essential we are going to use ISS, materials and components unique to that environment

- the process is just so ponderous, don't think I would recommend
- the complexity of interaction does require a Herculean effort to make it happen, on part of PI and NASA support personnel

- the ISS at current staffing level is just not well suited as a research laboratory

- one thing discouraging for colleagues and me is number of folks that had to jump in to be involved, no clear cut direction on what to do, colleagues need "Idiot's Guide on How to Do Research on ISS"
- Payload Info Source CD has not been good enough for this

- depends on colleague and situation, how much time they have to put in effort, depends on lots of things

- strongly recommend to do this

- would recommend it, see previous comments
- would preface that with understanding that schedules don't apply, beyond investigators' control, be patient and hopefully get a good investigation

Part 1. Cross-Program Feedback
Section 1.1 – Overall Satisfaction
Topic Area: 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?

1 2 3 4 5 Not
 Very Applicable
 unlikely
 Very
 likely

PDs and PI-PD Dual Role	PIs Only																								
No. respondents in category: 34 Response rate: 17/34 (50.0%) Applicable responses: 16/34 (47.1%) Mean rating: 3.5 Mean score ranking in section: NR Median: 4.0	Not Applicable																								
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PI-PD Dual Role Only	PDs Only																								
No. respondents in category: 5 Response rate: 5/5 (100.0%) Applicable responses: 4/5 (80.0%) Mean rating: 3.0 Mean score ranking in section: NR Median: 3.0	No. respondents in category: 12 Response rate: 12/12 (100.0%) Applicable responses: 12/12 (100.0%) Mean rating: 3.7 Mean score ranking in section: NR Median: 4.0																								
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3	25																								
4	33																								
5 - Very likely	25																								

Question 1.1.7 – Comments

-
- too high, too time consuming, wouldn't want to do if I didn't have to
-
- I have an engineering student and colleagues in training, so I recommend them to aerospace Program
-
- did right in that ISS Payloads Office is obviously trying to go in a positive direction, learning from operations as they go to make things better
-
- still no real clear system yet, but as far as working with Payloads, the desire and effort is there.
-
- decrease the frustration level, find a way to decrease it; see previous comments
-
- loaded question
 - ISS is still best place to do microgravity research
 - there is a timeframe from proposing to flying, hopefully will get shorter in future
 - when someone needs microgravity, ISS is place to go
- [RC: clarifying, question more classified for PD, not PI]*
-
- still a great opportunity to be involved with Space Program and work to get onto ISS
 - paperwork and politics are still getting things wrong
-
- bureaucracy is biggest problem
 - upside is prospect for achieving scientific results from environment and facility unlike any others
-
- having a bit of trouble distinguishing between am I recommending someone else come in and
- [RC: clarifying who colleague would be]*
-
- pretty likely to recommend
 - there are things out of your control that go into this, things like budgeting hassles, procurement cycle hassles are biggest headaches and not anything that involves ISS program itself
 - sometimes PIs are not easy to deal with, cause headaches
 - generally I enjoy what I am doing, a productive and useful job
 - will be good results coming out of it
 - would be likely to recommend
-
- don't know if you guys can make my negatives go away, and recommend to anybody to do this
-
- 3 because sort of neutral
 - a couple years ago, felt "run away" but now get impression things are better, more prepared to face the amount of things to get through the process, so higher rating now
-
- [RC clarified question]*
- so many interfaces to deal with, hard to know who to deal with at different times, information asked for one place then has to go somewhere else
 - funding levels are not enough to do everything, testing, verification, training
 - high stress, lots of overtime, lot of scrutiny involved
-
- payload developer could get involved, they would learn the intricacies of what needed to get done and that might an interesting thing and benefit in the long run, even if they learned things that were not necessary.
 - better than PI, but still not that great for PDs.
 - Space Station Utilization Program is first I know that shifted all responsibility to PD.
 - could be good to get involved to find out how NASA works. Not worthless, but not highly recommended either. PD situation is different, harder than PI.
-

Part 1. Cross-Program Feedback
Section 1.1 – Overall Satisfaction
Topic Area: 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?

1 2 3 4 5 Not
 Very Applicable
 unlikely
 Very
 likely

PIs and PI-PD Dual Role		PIs Only																							
No. respondents in category:	34	No. respondents in category:	17																						
Response rate:	22/34 (64.7%)	Response rate:	17/17 (100.0%)																						
Applicable responses:	21/34 (61.8%)	Applicable responses:	16/17 (94.1%)																						
Mean rating:	4.7	Mean rating:	4.7																						
Mean score ranking in section:	NR	Mean score ranking in section:	NR																						
Median:	5.0	Median:	5.0																						
<table border="1"> <caption>Rating Scale Distribution for PIs and PI-PD Dual Role</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1- Very unlikely</td><td>0</td></tr> <tr><td>2</td><td>0</td></tr> <tr><td>3</td><td>5</td></tr> <tr><td>4</td><td>24</td></tr> <tr><td>5 - Very likely</td><td>71</td></tr> </tbody> </table>	Rating	Percent (%)	1- Very unlikely	0	2	0	3	5	4	24	5 - Very likely	71	<table border="1"> <caption>Rating Scale Distribution for PIs Only</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1- Very unlikely</td><td>0</td></tr> <tr><td>2</td><td>0</td></tr> <tr><td>3</td><td>6</td></tr> <tr><td>4</td><td>19</td></tr> <tr><td>5 - Very likely</td><td>75</td></tr> </tbody> </table>	Rating	Percent (%)	1- Very unlikely	0	2	0	3	6	4	19	5 - Very likely	75
Rating	Percent (%)																								
1- Very unlikely	0																								
2	0																								
3	5																								
4	24																								
5 - Very likely	71																								
Rating	Percent (%)																								
1- Very unlikely	0																								
2	0																								
3	6																								
4	19																								
5 - Very likely	75																								
PI-PD Dual Role Only		PDs Only																							
No. respondents in category:	5	Not Applicable																							
Response rate:	5/5 (100.0%)																								
Applicable responses:	5/5 (100.0%)																								
Mean rating:	4.6																								
Mean score ranking in section:	NR																								
Median:	5.0																								
<table border="1"> <caption>Rating Scale Distribution for PI-PD Dual Role Only</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1- Very unlikely</td><td>0</td></tr> <tr><td>2</td><td>0</td></tr> <tr><td>3</td><td>0</td></tr> <tr><td>4</td><td>40</td></tr> <tr><td>5 - Very likely</td><td>60</td></tr> </tbody> </table>	Rating	Percent (%)	1- Very unlikely	0	2	0	3	0	4	40	5 - Very likely	60													
Rating	Percent (%)																								
1- Very unlikely	0																								
2	0																								
3	0																								
4	40																								
5 - Very likely	60																								

Question 1.1.8 – Comments

-
- need the low-gravity environment because there's nothing else to replicate
-
- been one of my great life experiences
-
- I'm 60, and will retire soon, so not very applicable
-
- this is what I do
-
- ongoing Program, just need more flights
-
- my investigations that I'm trying to do now on ISS are critical to my med ops job, and can't give up in good conscience, need to try to change, but all this is not due to satisfaction but my personality
-
- life sciences is nice match in program of our science and what's going on with crew and during spaceflight and changes in physiology
- some of critical roadmaps for human physical life sciences were right in there, covering critical path, and priorities laid out
- NASA made it clear what their goal/mission was vs. being ambiguous
- provided studies and crew and mechanisms were very satisfactory
-
- I'm in unique situation, MEPS main unit is on ISS, if I can get funding to get experiments up there I will do it
- done 99% of the work, in spite of my complains I would say let's go
- start from scratch? not likely
-
- flying these type of experiments, my area, was good
- because I am a NASA person, interests are not just in specific research area but with technology also
-
- in fact we're doing it, Increment 5 almost ready, working Increment 6 now
- have follow-on investigations to Increment 5
-
- if we can learn from this experience, and can address some of the problems that occurred the first time, then we might just try it again; requirement to commit to other investigations would be dependent on training of the crew
-
- positive experience for me as PI, but some bias because I work for JSC, but if college professor, have much to know and understand in getting involved in the Program
-
- would continue
-
- lot of unsolved questions, lots of challenges, much work to pursue
-
- felt we got a lot of useful info over period of experiment
- based on that, and getting new experiment, would be worthwhile work
-
- "6" - do enjoy working with crewmembers and doing science
-
- I'm crazy, but right now there is no NRA to propose to, but if there were one I would propose to it; have served as consultant to HLS
-
-

Part 1. Cross-Program Feedback
Section 1.1 – Overall Satisfaction
Topic Area: 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?

1 2 3 4 5 Not
 Very Applicable
 unlikely
 Very
 likely

PDs and PI-PD Dual Role	PIs Only											
No. respondents in category: 34	Not Applicable											
Response rate: 16/34 (47.1%)												
Applicable responses: 15/34 (44.1%)												
Mean rating: 4.0												
Mean score ranking in section: NR												
Median: 4.5												
<table border="1"> <caption>Rating Scale Distribution for PDs and PI-PD Dual Role</caption> <thead> <tr> <th>Rating</th> <th>Percent (%)</th> </tr> </thead> <tbody> <tr> <td>1 - Very unlikely</td> <td>7</td> </tr> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>3</td> <td>33</td> </tr> <tr> <td>4</td> <td>7</td> </tr> <tr> <td>5 - Very likely</td> <td>53</td> </tr> </tbody> </table>	Rating	Percent (%)	1 - Very unlikely	7	2	0	3	33	4	7	5 - Very likely	53
Rating	Percent (%)											
1 - Very unlikely	7											
2	0											
3	33											
4	7											
5 - Very likely	53											

PI-PD Dual Role	PDs Only																								
No. respondents in category: 5	No. respondents in category: 12																								
Response rate: 5/5 (100.0%)	Response rate: 12/12 (100.0%)																								
Applicable responses: 4/5 (80.0%)	Applicable responses: 12/12 (100.0%)																								
Mean rating: 3.0	Mean rating: 4.1																								
Mean score ranking in section: NR	Mean score ranking in section: NR																								
Median: 3.0	Median: 5.0																								
<table border="1"> <caption>Rating Scale Distribution for PI-PD Dual Role</caption> <thead> <tr> <th>Rating</th> <th>Percent (%)</th> </tr> </thead> <tbody> <tr> <td>1 - Very unlikely</td> <td>25</td> </tr> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>3</td> <td>50</td> </tr> <tr> <td>4</td> <td>0</td> </tr> <tr> <td>5 - Very likely</td> <td>25</td> </tr> </tbody> </table>	Rating	Percent (%)	1 - Very unlikely	25	2	0	3	50	4	0	5 - Very likely	25	<table border="1"> <caption>Rating Scale Distribution for PDs Only</caption> <thead> <tr> <th>Rating</th> <th>Percent (%)</th> </tr> </thead> <tbody> <tr> <td>1 - Very unlikely</td> <td>8</td> </tr> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>3</td> <td>25</td> </tr> <tr> <td>4</td> <td>8</td> </tr> <tr> <td>5 - Very likely</td> <td>58</td> </tr> </tbody> </table>	Rating	Percent (%)	1 - Very unlikely	8	2	0	3	25	4	8	5 - Very likely	58
Rating	Percent (%)																								
1 - Very unlikely	25																								
2	0																								
3	50																								
4	0																								
5 - Very likely	25																								
Rating	Percent (%)																								
1 - Very unlikely	8																								
2	0																								
3	25																								
4	8																								
5 - Very likely	58																								

Question 1.1.9 – Comments

-
- see previous comments
-
- still many headaches to get PIs manifested; many PIs they do research for come in with short fuses; MISSE 5 is an example for September timeframe.
-
- the educational community at NASA and beyond was very pleased with footage from payloads
-
- very fulfilling.
-
- much effort for the data returned
-
- continuously evolving, in process of implementing lessons learned for improvement
-
- I like my job.
-
- in general, we're getting science implemented in space, so that is a good thing.
-
- I have been associated with NASA for more than 12-13 years, and have had great fun time, at same time, experienced lots of frustrations, when system gets very inefficient, frustrating; if some other opportunity much better came along, would give consideration, so #3 as 50-50
- [RC: how does this differ from previous satisfaction questions?]*
-
- I wear 2 hats, PD and PI, I know sharp difference between 2
-
- for my organization, I have group of 10-12 engineers, as PI I go to them and tell what's needed, and they do, EPIM and EXPRESS office have many frustrations
-
- as PD, start from scratch, meet expectations; are difficult but met
-
- I am developing another payload, which is ESTER, because of same positive attitude in OZ and also OC and other codes, they are trying to get things to work better.
-
- since I am BTF project scientist...
-
- for same reasons as previous comments
-
- I'd like now to try to get assigned a new experiment and try working through system for a comparison if nothing else, to see things improved as I've gotten that impression
-
- working in space industry
-
- what Program provided vs. what they did, i.e., microgravity place for payload
-
- number of process improvements to be mentioned later
-
- somebody with knowledge goes through and cuts out all unnecessary duplication and complex interaction between various NASA Centers that happens because of Center "turf"
-
- had to have empire given to MSFC, but operationally this is a nightmare; give me one week, I could justify everything that I would eliminate; if we started cleaning things up and deconvoluted the process, I would be more interested in developing a payload.
-
- we built and certified MEPS for Shuttle, took \$1.2 million to build to fly on ISS.
-
- amount of paper is so different.
-
- could pare it down re-essentially where my rating would improve.
-

5.2.3 Research Priorities and Outcomes (Questions 1.1.4 and 1.1.5)

Questions 1.1.4-Research Priorities and 1.1.5-Research Outcomes collected feedback on ISS Program priorities with respect to research and research outcomes. For Research Outcomes, respondents were asked to place the results of their research during Increment 5 in perspective against the various other tasks required of them to participating in the ISS Program. Because the Survey was conducted only shortly after the end of the Increment, which is generally too soon for investigators to fully know the quality and scope of their research results, respondents are asked to use the amount of raw data collected by their investigation as a metric.

For Research Priorities, fully 76% of all interviewees considered the ISS Program did well or very well at giving priority to research during Increment 5. The response distribution is otherwise unremarkable. For the demographic sub-groups, the mean and median scores are quite similar, but in the score distributions, there is a higher percentage of PIs (24%) relative to PDs (8%) who considered that the Program did not do well giving priority to research.

For Research Outcomes, the score distribution for all interviewees is displaced to the higher end of the scale, with a mean rating of 4.4 and fully 84% of all respondents indicating that their research outcomes, as measured by the data collected, were worth their participation in the ISS Program. Because the number of applicable responses from PDs on Research Outcomes was very low relative to PIs, most of the contribution to the overall data set is from PIs, so the PI score distribution mirrors the high mean and median and positive shift of the distribution for all interviewees.

Customer comments in this area support the numerical scores. In general, the comments reflect satisfaction with experiment outcomes particularly in light of constrained resources in the present phase of Station assembly. Customer perception of the priority given to research by the ISS Program clearly reflects the perspective of outsiders looking in. Respondents place strong importance to crew access and seem to equate crew access to science priority. Crew access is also seen as a key tool in ensuring experiment success. Many customers see the institution of a Science Officer onboard as a positive step and an improvement in the overall priority given to research.

Part 1. Cross-Program Feedback
Section 1.1 – Overall Satisfaction
Topic Area: Research Priorities and Outcomes

Question 1.1.4 – Please rate how well the ISS Program gave priority to research during the current Increment.

	1	2	3	4	5	Not Applicable												
	Not very well at all				Very well													
All Interviewees																		
No. respondents in category:						34												
Response rate:						34/34 (100.0%)												
Applicable responses:						34/34 (100.0%)												
Mean rating:						3.9												
Mean score ranking in section:						NR												
Median:						4.0												
<table border="1"> <caption>Rating Scale Distribution for All Interviewees</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1-Not very well at all</td><td>3</td></tr> <tr><td>2</td><td>15</td></tr> <tr><td>3</td><td>6</td></tr> <tr><td>4</td><td>47</td></tr> <tr><td>5-Very well</td><td>29</td></tr> </tbody> </table>							Rating	Percent (%)	1-Not very well at all	3	2	15	3	6	4	47	5-Very well	29
Rating	Percent (%)																	
1-Not very well at all	3																	
2	15																	
3	6																	
4	47																	
5-Very well	29																	
PIs Only																		
No. respondents in category:						17												
Response rate:						17/17 (100.0%)												
Applicable responses:						17/17 (100.0%)												
Mean rating:						3.7												
Mean score ranking in section:						NR												
Median:						4.0												
<table border="1"> <caption>Rating Scale Distribution for PIs Only</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1-Not very well at all</td><td>6</td></tr> <tr><td>2</td><td>18</td></tr> <tr><td>3</td><td>6</td></tr> <tr><td>4</td><td>41</td></tr> <tr><td>5-Very well</td><td>29</td></tr> </tbody> </table>							Rating	Percent (%)	1-Not very well at all	6	2	18	3	6	4	41	5-Very well	29
Rating	Percent (%)																	
1-Not very well at all	6																	
2	18																	
3	6																	
4	41																	
5-Very well	29																	
PI-PD Dual Role																		
No. respondents in category:						5												
Response rate:						5/5 (100.0%)												
Applicable responses:						5/5 (100.0%)												
Mean rating:						3.4												
Mean score ranking in section:						NR												
Median:						4.0												
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Rating	Percent (%)																	
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2	20																	
3	20																	
4	60																	
5-Very well	0																	
PDs Only																		
No. respondents in category:						12												
Response rate:						12/12 (100.0%)												
Applicable responses:						12/12 (100.0%)												
Mean rating:						4.3												
Mean score ranking in section:						NR												
Median:						4.0												
<table border="1"> <caption>Rating Scale Distribution for PDs Only</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1-Not very well at all</td><td>0</td></tr> <tr><td>2</td><td>8</td></tr> <tr><td>3</td><td>0</td></tr> <tr><td>4</td><td>50</td></tr> <tr><td>5-Very well</td><td>42</td></tr> </tbody> </table>							Rating	Percent (%)	1-Not very well at all	0	2	8	3	0	4	50	5-Very well	42
Rating	Percent (%)																	
1-Not very well at all	0																	
2	8																	
3	0																	
4	50																	
5-Very well	42																	

Question 1.1.4 – Comments

-
- don't know how it went for others, but in our case, very pleased
 - because of flexibility, we found once up there (ability) to make changes
 - got a lot of crew time
 - because crew was involved in experiment, they were really interested in doing it
-
- a little biased because PI was a crew member
 - overall the science--sometimes it should be number 1 but doesn't always go that way, sometimes falls behind other priorities, e.g., safety, but on this specific Increment, we had Science Officer on board, contributed significantly to all science
 - we were fortunate to be in more beneficial position than other Increments
-
- we requested a post-flight investigation that would occur at difficult time to do experiments, but management put in for much experiment time, was very important, very well done
 - in-flight experiment, if we were to perform, would require a different approach, but we didn't do for Increment 5 specifically, previous Increment would be lower
-
- priority given to this Increment was much better than previous ones, and even better in Increment 6
 - safety more important than research, if reasonable
-
- we did get all pictures during EVA as requested.
-
- emphasized research a lot, more than happy to give me what I needed
 - conflict between med ops and our experiment
 - sometimes conflict when science should be done and when testing should be done
-
- when you're readying research to get up, everyone knows this and gives high priority
-
- we're always impressed to fly small/insignificant payloads in comparison to those so much bigger, always given high priority or equal treatment of importance
-
- flight schedule, got everything we asked for, launch and landing
 - intensive with crew members
-
- there were times the subjects completed questionnaire, subjects did extra work at off-nominal times
 - more crew time for payloads would improve how much priority would be given to research
 - give higher priority to research [RC: *what was getting in way?*] med ops, lack of hardware, lack of funding, lack of priorities
 - need enough priorities; need med ops back out of intervention; landing day waivers
 - whole Program not be voluntary but mandatory on part of crew
-
- would've given 4, but changed scale [RC: *reason for that, talk later*]
 - protection rating
-
- we have very good interaction with crew when they are here; when here they said they want to work more, and with PDs, etc., but during training or on orbit, seems to be protection ring; hard to get closer and they take on requests and protect each other, may not feel adequate, feel crew is being presented in unrealistic world and things are filtered before getting to crew
 - not enough crew time
 - we talk to planners, etc., and it's like different world (pre-flight)
 - point of having orbiting laboratory, these people are our technicians, on ground would walk down hall and make requests, but we don't have that interaction with crew on orbit, not easy, getting crux of research is so distant and sometimes lost
 - KSC seems to be great Center that gets stuff done, payload requests, research data, problems
 - we feel JSC and MSFC don't live up to customer relations as well; KSC works well
 - MSFC and JSC put up too many protective layers, often looks like everyone threatened by JSC, and everyone must look good to JSC
 - by time it launches and we're in hands of ops, things with KSC and MSFC on console go smoother, albeit depends on personality of folks, those who care about the research/science, depends on who you get

stuck with on console

-
- we got all our in-flight requirements met
 - assigned Peggy Science Officer, more attention to science was good
-
- through some conversation with folks at JSC, established contacts that were valuable re: MER, but crew time was a wash
-
- for Increment 5, new and additional science, in particular life sciences, doubled
 - building is still ongoing and is a priority, but they gave good attention to science
-
- once we got to point we were going up, focus changed, once you get there, they went out of way to make sure we got science.
-
- crew and payload planners were very good.
-
- lot of times I felt like we were being pushed to operate on weekends, I felt some of the ISS stuff during weekends and some research stuff could be done other times
 - more emphasis was placed on Station stuff vs. science
-
- the primary need is in allocation of crew time
 - this is hard question from PI's perspective; you don't know if low priority vs. other areas
 - activating sonars at different times within apparatus, and so feedback you get is critical to having it attended
-
- did fairly well with what you had to work with
-
- they were a paying customer so raised our priority level vs. normal research customer
-
- I'm there to support researchers; if I don't have researchers, I don't have job; important for me that they get their due when it comes to ISS
 - Increment 5 was about time when more emphasis shifted to researchers
 - changed when O'Keefe made Science Officer on-board
-
- [RC: realize multi-increments make it confusing to focus on Increment 5]*
-
- not a fault of Program or funding
 - resources of ISS Program have been fairly well consumed in operation and construction of ISS, not enough attention has been given toward research
-
- it's moving up, but research is still not priority, e.g. can't get short periods of time each day to get science done, moving in right direction, but still very low compared to other things
-
- given the circumstances of Station still being built, thought they gave pretty good priority and stayed with 20% time they promised us
-
- from CEO perspective thought it went well; didn't expect them to get out of XPOP just to help our requirements.
-
- reflect that crew is limited to 3, have 1/2 a person who is dedicated to research, an unfortunately low percentage of personnel time dedicated to research, astronauts' schedule was so tightly controlled that there was little time for review; they just get in there do performance and then get on to next thing; so much research is crammed into so little time, this can result in insufficiently executed procedures
-
- we would like more feedback from crew on orbit
 - crew timeline issue, not sure if ISS Utilization issue
-
- pretty good; went out of their way to do stuff for us when they didn't have to
-
- I am familiar with my Program here, and SPD's Program, but all the researchers are doing interesting things, intending to solve the problem
-
- we clearly documented our requirements to ISS Program; in particular, our requirement for continuous power; continuous power requirement has been questioned often.
-

Question 1.1.5 – Comments

-
- had some problems, couldn't do them quickly because payloads were not rated as high as some other areas in Program
 - we took hit for others' equipment being out of commission
-
- all of our data is recorded onboard, and physically attached to samples themselves. Not available yet.
-
- if you take Increment 5, we got what we planned, but we got screwed down in definition and development, but disappointing with regard to comparison to original requirements science requirements
-
- wanted to look at EVA effects on lung, wanted to make measurements the day after EVA but timelining would not allow, only get data the day following but this is science degradation, issue is quality of data
-
- keep up the number of ends (samples)
-
- caveat, we did double blind study so don't know data yet; won't crack code until study's over; looks like quality of data is excellent
-
- we did get a lot of raw data that were very useful
 - for example, in first year of operation, we got a lot of data and we were supposed to stop experiment at that point, but expanded it, and got some more rich data in last months
-
- [RC: clarified, your raw data collected for ADVASC, separating data from scientific results]*
- [RC: based on you getting lots of data, and difficulties didn't impact]*
-
- scientific return was very good
-
- did all the experiments supposed to and maybe some extra during the Increment, and seemed to go well
-
- amount of raw data collected was very sufficient for crew Earth observations
-
- we have reservations about the results we got, even though we did get data, required big efforts to get data, the actual execution of experiment on orbit was incorrect, and this resulted in compromise of experiment data and quality of data
-
- felt that crew member took the time to get our sites as best they could, sites have cloud cover that can be difficult, percentage of what they do get is good, they are really making an effort and data are useable.
-
- varied by experiment, this was a good Increment, Renal Stone had PI on orbit, EVARM did get good data on (Increment) 5, nothing ISS could have done, it was just due to physics of situation.
-
- haven't gotten all data back, but some photos back
 - type of data we're getting from these types of exposure experiments can only be gotten from this type of investigation and ISS is the only way to do it
-
- gotten good data and characterization for PIs, especially early data to map out for PIs on what to expect
 - had an on-orbit anomaly, was mistake by crew, potentially cost us some data
 - avoidable? hard to say, probably but would take something not in system
 - communications between PDs and/or PIs through astronaut performing studies, some sort of direct communication through approved channel would be extremely helpful to ensure mistakes like we had are not made
-
- he got the data that he was looking for
-
- PI satisfied with all data he sought; all accomplishments met
-
- we've gotten pretty much everything we wanted to collect
-
- just flying my samples, my NRA is about comparing the methodology provided by NASA to best alternatives to those on ground
- [RC: do you feel you have some initial assessment from data on crystal growth?] yes*
-
- all I need are bona fide flight opportunities to do that
 - point of proposal is to compare efficacy to what NASA offers compared to what is on ground
-
- we got the data, video, and when attitude was right, we got excellent video
 - were times we had some data video dropout, but I was pretty pleased overall
-

- raw data told us that re-designed MEPS worked; looked operationally like it worked nicely
- difficulty was science return due to temperature problems
- re-designed apparatus worked, but on the other hand, we did not get as good microcap data as we wanted, but we did get some data on all 8 experiments.

- we got everything we asked for and then-some; they went the extra mile and more
- in particular there was a launch delay, we worked with these guys, and got samples down to last minute

- when allowed to use power, got data

- got everything we expected

- before Columbia, I was talking with Clarence Sams about dropping investigation entirely
- doesn't do any good to fly a rookie on ISS; if trying to compare long-term effects vs. short-term, need a veteran to fly

- although hard struggle, doesn't mean end result wasn't worth it
- "cheating," old buddy to get data sometimes makes for worthwhile endeavor
- data delivery sometimes for offline flow sluggish
- old buddy system in place can get data faster than conventional channels
- did have chance to be repeat customer and have experience to move through process and system quicker and easier, one-time might have been too difficult

- *is this for both PI and PD? [RC: yes]*
- raw data could be increased if scheduling onboard investigation runs were better; wanted Weds, but got Tues or Thurs, sometimes got on Task List and not scheduled at all unfortunately

- very grateful to have opportunity, data is precious, pleased.

- got everything they asked for
- more related to in-flight experiment?
- they were given 10 minutes on landing day, was it worth it? yes

- we just had PI (Dr. Carolyn Sumner from Houston Museum of Natural Science) to have raw footage, and she was speechless, so much better than what was expected.

- we're in education business and provide stimulus for students and they love it; I have no science that comes out, and yet the pictures are what the students appreciate very much.

- very worth the testing and experiment
- crew was supposed to be doing some notating during flight but was restrictive perhaps due to flight in some cases, recording of data in flight was not as complete as we would have liked

- due to organization at JSC and having outstanding co-investigator onsite
- at JSC, Carin(?) made sure things were well organized, consent briefings set up, astronauts brought in and coordinated testing well, data were outstanding, folks showed up on time, good facilities at Methodist
- Co-Investigator was Adrian LeBlanc

5.2.4 Program Improvements (Question 1.1.10)

If the investigation(s) that Survey respondents supported during Increment 5 were also conducted on previous increments, then the respondents were asked to compare their Increment 5 experience to previous Increments (Question 1.1.10). All respondents indicated that their Increment 5 experience was either better/much better (71%) or about the same (29% of all respondents). No respondents indicated their experience was worse or much worse. The demographic sub-groups have roughly similar mean and median scores, and score distributions. One notable difference between the PI and PD groups is that 88% of PDs responded that their experience was better or much better, whereas only 55% of PIs gave responses in this range.

The customer comments support the score distributions for this question. Most respondents observed improvement, but many tempered that comment noting there is still much room for improvement. Interestingly, it is noted that crew and other support received by the customer is personality dependent and apparently a significant driver to the quality of the customers' experience.

Part 1. Cross-Program Feedback
Section 1.1 – Overall Satisfaction
Topic Area: 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?

1	2	3	4	5	Not Applicable																								
Much worse		About the same		Much better																									
All Interviewees																													
No. respondents in category:					34																								
Response rate:					23/34 (67.6%)																								
Applicable responses:					21/34 (61.8%)																								
Mean rating:					4.0																								
Mean score ranking in section:					NR																								
Median:					4.0																								
<table border="1"> <caption>Rating Scale Distribution - All Interviewees</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1-Much worse</td><td>0</td></tr> <tr><td>2</td><td>0</td></tr> <tr><td>3-About the same</td><td>29</td></tr> <tr><td>4</td><td>38</td></tr> <tr><td>5-Much better</td><td>33</td></tr> </tbody> </table>			Rating	Percent (%)	1-Much worse	0	2	0	3-About the same	29	4	38	5-Much better	33	<table border="1"> <caption>Rating Scale Distribution - PIs Only</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1-Much worse</td><td>0</td></tr> <tr><td>2</td><td>0</td></tr> <tr><td>3-About the same</td><td>44</td></tr> <tr><td>4</td><td>33</td></tr> <tr><td>5-Much better</td><td>22</td></tr> </tbody> </table>			Rating	Percent (%)	1-Much worse	0	2	0	3-About the same	44	4	33	5-Much better	22
Rating	Percent (%)																												
1-Much worse	0																												
2	0																												
3-About the same	29																												
4	38																												
5-Much better	33																												
Rating	Percent (%)																												
1-Much worse	0																												
2	0																												
3-About the same	44																												
4	33																												
5-Much better	22																												
PI-PD Dual Role																													
No. respondents in category:					5																								
Response rate:					5/5 (100.0%)																								
Applicable responses:					4/5 (80.0%)																								
Mean rating:					4.0																								
Mean score ranking in section:					NR																								
Median:					4.0																								
<table border="1"> <caption>Rating Scale Distribution - PI-PD Dual Role</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1-Much worse</td><td>0</td></tr> <tr><td>2</td><td>0</td></tr> <tr><td>3-About the same</td><td>25</td></tr> <tr><td>4</td><td>50</td></tr> <tr><td>5-Much better</td><td>25</td></tr> </tbody> </table>			Rating	Percent (%)	1-Much worse	0	2	0	3-About the same	25	4	50	5-Much better	25	<table border="1"> <caption>Rating Scale Distribution - PDs Only</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1-Much worse</td><td>0</td></tr> <tr><td>2</td><td>0</td></tr> <tr><td>3-About the same</td><td>13</td></tr> <tr><td>4</td><td>38</td></tr> <tr><td>5-Much better</td><td>50</td></tr> </tbody> </table>			Rating	Percent (%)	1-Much worse	0	2	0	3-About the same	13	4	38	5-Much better	50
Rating	Percent (%)																												
1-Much worse	0																												
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1-Much worse	0																												
2	0																												
3-About the same	13																												
4	38																												
5-Much better	50																												

Question 1.1.10 – Comments

-
- there is still room for improvement but it is considerably better
 - primary better thing is real-time operations, the whole getting on the timeline, fighting to stay on timeline, has dropped away relative to what it was on (Increments) 3 and 4; on (Increments) 3 and 4 we had to battle to stay on timeline, LIS has to fight less.
-
- we've learned more from Increment 3 to 4; biased since PI was crewmember, the training by her of other crew was advantageous
-
- feel comfortable and confident we are getting some good and meaningful raw data to do research
 - it has improved dramatically, templates have gotten better, actual delivery dates have improved, documentation has improved, learned that some things you used to ask for you don't need so you don't ask
 - definitely better; one problem was CoFR process, got streamlined and anticipate it getting better
 - know more of context of knowing the process of what we need to do better
-
- been good on all Increments
-
- for Increment 5, it was about the same as Increment 4; in Increment 2 we had a lot of lessons learned, also in Increment 3 and these were applied at Increments 4 and 5; still had some operational quirks with POD on 4 and 5
-
- getting better every time, but not a significant better
 - they learned quick, much improved, a lot smoother.
-
- in Increment 1 with MACE 2 previous payload, system was defining to fly payloads; since then, payloads have been on-orbit, and process became better defined, but still needs much improvement.
 - a lot of growing pains, in training and integration between Marshall and JSC in early increment; there has been great improvement in process.
-
- I did not work on prior increments
 - Debbie sees system becoming smoother and working better
-
- on Increment 5, better than previous Increments; had serious problems with scheduling runs in previous Increments, and missed data that could have been gotten if better scheduling
-
- we got more knowledgeable, as did people we worked with, so easier for all those involved
 - found ways for shortcuts and make system work in our favor
 - some paperwork reduced but other added apparently from outside, someone justifying their job, still some backpedaling, etc., being pushed around
-
- a lot less painful; some of the processes were better defined
 - seems OZ is moving toward more customer-friendly attitude
 - like the contact with the MER we got going
 - my interactions are filtered by whole MSFC organization
-
- [RC: do you recommend any improvement to timescale?]* about same
- there's probably in practice a layer between Utilization Program and me that normally does not exist for average PI as it does for me
-
- crew dependent, if not Bowersox and others, would not have been as satisfactory
-
-

5.2.5 Ease of Doing Business (Questions 1.2.1 and 1.2.2)

Because much of the relationship between the ISS Utilization Program and its PI and PD customers is transactional, with elements analogous to private sector business, the Survey investigated aspects of the transactional ease of this relationship. For a top-level assessment of this concept, question 1.2.1 asked respondents to rate their satisfaction with the overall ease of doing business with the ISS Utilization Program. A second question (1.2.2) focused on number of personal contacts as another metric in this category.

Fifty-one percent (51%) of all interviewees scored in the satisfied range (4 or greater) with regard to Ease of Doing Business, with 24% in the dissatisfied range (2 or less), and 24% at the midpoint. The score distributions for the PD and PI-PD demographic groups are shifted to lower medians of 3.0 and 2.0 respectively relative to PIs (4.0).

On the question of personal contacts, 47% of all interviewees considered the number of personal contacts to be just right, but an equal number of the remaining respondents (47%) rated the number of personal contacts to be higher than desired. This distribution is mirrored in similar response sets from PIs and PDs. Answers from PI-PD dual-role individuals are shifted to higher scores, however, with 80% indicating that they interacted with too many personal contacts.

Interviewee verbal comments regarding this topic vary greatly, reflecting a variety of experiences. Respondents experienced different degrees of interaction with Program elements based on their team structures, Research Program Office, and their status as either a PI or PD. Thus, their comments range from very positive to very negative. Most voiced a preference for a minimum number of contacts in order to simplify their interface and to prevent redundant data inquiries. Comments support present Program plans for an enhanced role for the Payload Integration Manager. Several respondents expressed a desire to receive better feedback from the Payload Operations Director and other key points of contact. Some customers feel they are dealing with a “black hole” from time to time. Some customers noted a difference between NASA and contractor personnel. Contractors were observed to be more accommodating and NASA personnel less (reject requests initially versus trying to accommodate). Overall, there seems to be a weak consensus that doing business with ISS is harder than it should be.

Part 1. Cross-Program Feedback
Section 1.2 –Satisfaction with Program Processes
Topic Area: 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.

1 2 3 4 5 Not
 Very Very Very Very Very Not
 dissatisfied satisfied satisfied satisfied applicable

All Interviewees		PIs Only																									
No. respondents in category:	34	No. respondents in category:	17																								
Response rate:	34/34 (100.0%)	Response rate:	17/17 (100.0%)																								
Applicable responses:	33/34 (97.1%)	Applicable responses:	16/17 (94.1%)																								
Mean rating:	3.3	Mean rating:	3.8																								
Mean score ranking in section:	4/7	Mean score ranking in section:	3/7																								
Median:	4.0	Median:	4.0																								
<table border="1"> <caption>Rating Scale Distribution - All Interviewees</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1-Very dissatisfied</td><td>6</td></tr> <tr><td>2</td><td>18</td></tr> <tr><td>3</td><td>24</td></tr> <tr><td>4</td><td>45</td></tr> <tr><td>5-Very satisfied</td><td>6</td></tr> </tbody> </table>		Rating	Percent (%)	1-Very dissatisfied	6	2	18	3	24	4	45	5-Very satisfied	6	<table border="1"> <caption>Rating Scale Distribution - PIs Only</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1-Very dissatisfied</td><td>0</td></tr> <tr><td>2</td><td>13</td></tr> <tr><td>3</td><td>13</td></tr> <tr><td>4</td><td>63</td></tr> <tr><td>5-Very satisfied</td><td>13</td></tr> </tbody> </table>		Rating	Percent (%)	1-Very dissatisfied	0	2	13	3	13	4	63	5-Very satisfied	13
Rating	Percent (%)																										
1-Very dissatisfied	6																										
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2	13																										
3	13																										
4	63																										
5-Very satisfied	13																										
PI-PD Dual Role		PDs Only																									
No. respondents in category:	5	No. respondents in category:	12																								
Response rate:	5/5 (100.0%)	Response rate:	12/12 (100.0%)																								
Applicable responses:	5/5 (100.0%)	Applicable responses:	12/12 (100.0%)																								
Mean rating:	2.2	Mean rating:	3.1																								
Mean score ranking in section:	4/7	Mean score ranking in section:	5/7																								
Median:	2.0	Median:	3.0																								
<table border="1"> <caption>Rating Scale Distribution - PI-PD Dual Role</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1-Very dissatisfied</td><td>20</td></tr> <tr><td>2</td><td>40</td></tr> <tr><td>3</td><td>40</td></tr> <tr><td>4</td><td>0</td></tr> <tr><td>5-Very satisfied</td><td>0</td></tr> </tbody> </table>		Rating	Percent (%)	1-Very dissatisfied	20	2	40	3	40	4	0	5-Very satisfied	0	<table border="1"> <caption>Rating Scale Distribution - PDs Only</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1-Very dissatisfied</td><td>8</td></tr> <tr><td>2</td><td>17</td></tr> <tr><td>3</td><td>33</td></tr> <tr><td>4</td><td>42</td></tr> <tr><td>5-Very satisfied</td><td>0</td></tr> </tbody> </table>		Rating	Percent (%)	1-Very dissatisfied	8	2	17	3	33	4	42	5-Very satisfied	0
Rating	Percent (%)																										
1-Very dissatisfied	20																										
2	40																										
3	40																										
4	0																										
5-Very satisfied	0																										
Rating	Percent (%)																										
1-Very dissatisfied	8																										
2	17																										
3	33																										
4	42																										
5-Very satisfied	0																										

Question 1.2.1 – Comments

- see previous comments
 - awkward, cumbersome, no easy way to follow through, calling people on org charts didn't help at all
 - no continuity in program
 - we often find different groups who interpret things in different ways
-
- ongoing headache
 - coordination of scheduling and people we're dealing with, communication improvement
-
- Payload Data Library is very difficult tool to learn to use for several PIs, they would have walked away if they had to learn themselves; once used, and for multiple payloads, becomes easy, but PIs can not be asked to use PDL because it is difficult; if something were done to fix, would be a lot better.
 - [RC: *In your opinion, have you seen trending changing better or worse in PDL?*] Honestly no improvement, but his ability to manipulate to improve has been seen; still difficult database to use; (Microsoft) Word docs would be much easier to use.
 - all the different boards we have to go to fly; MISSE required 4 different ones, all autonomous to each other, going back to each
-
- dissatisfied with too many parallel discussions going on, nice to have fewer channels, e.g., conversations with Dave Baumann, had 3 of same conversations with 3 people, would be nice to boil down to one
 - cooperative relationships with Russians, not enough control there, getting Russians to deliver data back, Russia seems like big void, RSA doesn't keep tight control over things
 - [RC: *so you have immediate post flight analysis?*] not NASA's fault completely but Americans always come back, and Russians are part of Program and should come back too, but not emphasized enough
-
- "ease" is hard word, nothing is easy
 - for PDs, much overhead you have to insert into process
 - some processes were harder, CEF [change] and bench review processes in particular
 - whole PIA and PTP development process were dissatisfying
-
- still much more difficult than doing Shuttle sortie science
 - higher level of complexity with ISS; knew more expectations with Shuttle
 - as payloads come and go, more things happening on ISS, especially with resources, we are cognizant, and as much as we moan, not sure why we get scrutiny and amount of paperwork that doesn't bear out why we must undergo
 - new system is finally fine tuned, more are using, and more experienced
-
- [RC: *give some assessment overall of whether things are getting better from previous Increments*]
 - getting incrementally better, but seem quantum leaps due to this is 4th mission, feels much easier, not due to system but because we got more experienced; can build on personal relationships, this is our 25th flight from Shuttle
 - [RC: *definition of processes hasn't gotten better?*] no, it hasn't; improvement looking too rosy based on our own experience, not smarter people/process
-
- same comments, extra work involved, etc.
 - our organization did EDOMP, in the 80s we set up fast-track research program and really had smooth system, collected much data, published book; after re-org, they didn't want us doing that, then your organization was trying to tell us how to do crew pitches, how to do business, and were put in charge and our original organizers were put out of business, not consulted, our own Center management was to blame for that, was not good situation at all.
 - difficult not to have more firmness in scheduling, would be nice to have more definitive structure for making travel plans.
-
- *how does this differ from general satisfaction?* [RC: *ease of doing business more specific*]
 - difficult question due to nature of this business vs. running experiment in academia
-
- being new, it would've been helpful with familiarization to someone coming in; a bit more guidance as you come in as new person on how to do things, and appropriate points of contact, lost time trying to

navigate the system

- most of it is "I'm more educated," so I know where to go; some of the stuff not intuitive, I knew where to go to take care of it.

- this Increment has gotten better since earlier Increments, so we are on positive path to do business easier with ISS

- didn't do any business with them; satisfied

- my personal experience: some groups better than others; when I deal with contractors (Boeing, etc), they are better to deal with than NASA folks; sometimes NASA folks show arrogance, meaning rather difficult to get accommodations if you want to request a change, for example; most of time, rejection is given initially vs. wanting to accommodate you

- they don't have to reject in starting

- on other hand, contractors accommodate you, how can they help, gave me much better feeling vs. not wanting to listen what you have to say

- there were many great individual efforts, our NASA contacts were great at problem solving and working around the barrier that NASA had imposed; they know how to handle the paperwork, too.

- rating 4 for increment 5, but if I consider earlier Increments, rating would be lower, planning for Increments 7 and 8 is still not going smoothly, however.

- see previous comments, continue accessing improving other areas.

- due to team of people at JSC doing interface work, having to wrestle many of the problems, our ease of working has been very good

- semi-difficult, will try to be kind, but really is much harder than it should be

- from my perspective and role I played, how we document our top level requirements is pretty unclear in terms of PTP, PIA

- I had interpreted PIA as being our agreement from OZ as being "binding"

- don't necessarily have method of going back to promised areas of things being provided

- understood some things beyond our control, in terms of requirements being met

- I tell the Program what I need, feedback expected is how they can implement that

[gave some detailed background examples of past Increment disappointments with experiment facilitation and lack of feedback to meet expectations--hear tape for more]

- maintained my satisfaction for Increment 5

- again, with this particular experiment, I didn't have a whole lot of interaction with the Program, but there is a vague sense of unease that it is not crystal clear to me what the processes are and interfaces with Program are

- I don't interact with Utilization Program directly

[RC: you do interact with RPO, right?] yes [RC: given payload was developed by you, so we want to know how NASA supports PI spearheading]

- primary contact

- much of our contacts don't deal with your office

- to engage directly in ISS Utilization Program would be difficult; not know whom to call at MSFC

- overall satisfied; satisfaction with JSC folks very high

- dealing with ISS has international and Headquarters interaction, has some delay of getting back to local folks of getting things done and/or improved

- contractual issues were done well

- if more streamlined, situation between Headquarters and Centers would help out

- reiteration of previous comments; far too convoluted a process, too many middle people; for example, for labels on apparatus we had the label Gestapo, label has to be a certain way; we had re-flown experiment that worked in space, but we were still told we had to disassemble MEPS, but not all changes were real; first had to go through EPIM, then label guy at JSC, got agreement, had drawing changed,

finally JSC guy approved labels at the last minute at KSC right before it flew; these were labels that had worked before in space; had to re-do things due to font size.

- too many people.

- if we had more stand-up status reviews, if good questions came out, then things would have been better, need more stand-up reviews; used to think reviews were not productive, but in this case they were good.

- it's easy, I just go into the TSC and push some buttons

- I personally did not do many things, or if at all, anything

- didn't have anything to do with the different management functions

- we were told to be up there, not like we competed for funding, advocacy, etc.

- same number of interfaces and overlap

- couldn't find right person, go through much crap to find the right person, usually not the person you were told to interface with, have to go through many layers

- when finally gotten to right PD was helpful

- I think this is an area where it has been hard to deal with the Program; this includes development phase, you get multiple requests for the same information, can't answer whether this problem has changed, because multiple requests were in development phase

- based on my experiment during Increments 3, 4, and 5 and the people who supported me during this process...

[RC: bldg 37 and Suzanne?] yes and support (Alicia) at Lockheed Martin, had contact with them almost exclusively throughout process

- it's a broad statement

- went pretty well; some issues that Russians brought up, but got resolved over the months, eventually study always worked

- exact same reasons as before, process of getting approval for flight was difficult

- the lead times for science inputs make it difficult to fly new innovative science.

- redundancy still remains

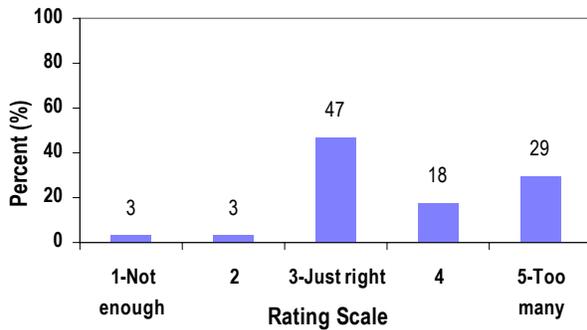
Part 1. Cross-Program Feedback
Section 1.2 –Satisfaction with Program Processes
Topic Area: Ease of Doing Business

Question 1.2.2 – What is your opinion of the number of personal contacts you interacted with in order to accomplish your ISS project?

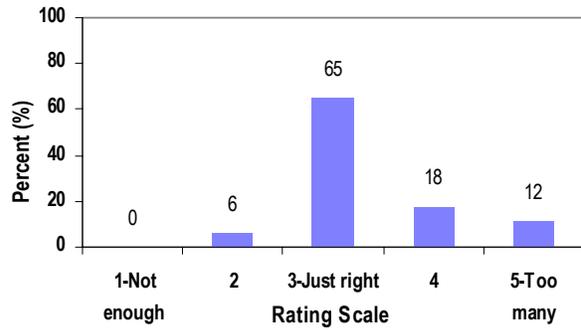
1	2	3	4	5	Not Applicable
Not enough		Just right		Too many	

All Interviewees	PIs Only
-------------------------	-----------------

No. respondents in category: 34
 Response rate: 34/34 (100.0%)
 Applicable responses: 34/34 (100.0%)
 Mean rating: 3.7
 Mean score ranking in section: NR
Median: 3.0

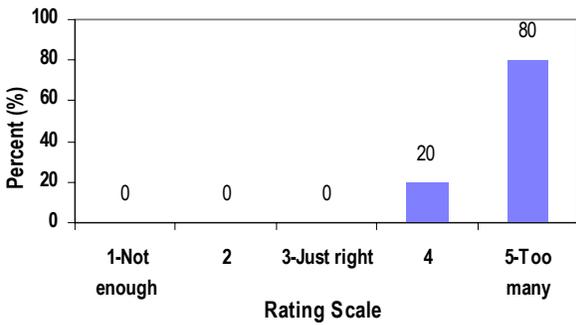


No. respondents in category: 17
 Response rate: 17/17 (100.0%)
 Applicable responses: 17/17 (100.0%)
 Mean rating: 3.4
 Mean score ranking in section: NR
Median: 3.0

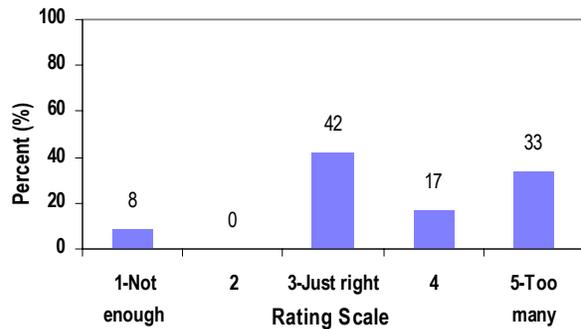


PI-PD Dual Role	PDs Only
------------------------	-----------------

No. respondents in category: 5
 Response rate: 5/5 (100.0%)
 Applicable responses: 5/5 (100.0%)
 Mean rating: 4.8
 Mean score ranking in section: NR
Median: 5.0



No. respondents in category: 12
 Response rate: 12/12 (100.0%)
 Applicable responses: 12/12 (100.0%)
 Mean rating: 3.7
 Mean score ranking in section: NR
Median: 3.5



Question 1.2.2 – Comments

-
- had 3 contacts, and a couple people from Lockheed Martin, and needed them all, and wasn't too many
-
- everybody I dealt with was just right, study went ahead, roadblocks were removed, often turned over to Michelle and she would deal with her contacts and get answers back to me, who she talked to I don't know, I had limited number of people dealt with
-
- this number was good, including manager, technical specialists and support, just right
-
- this is colored by HLS and how it does business, buffered greatly by HLS and their structure, if hadn't had that it would have been much worth, still at times too many but could have been worth
-
- not that you can't have that many people in the Program, but PD is required to interact with too many and complicates in process
 - *[RC: you would prefer single POC?]* yes
 - *[RC: do you feel single PIM/EPIM would suffice?]* might require a couple people, but find way to streamline set of actions, so one could go and do one set and come back to PIM and get things done; makes for cleaner process, most of answer sets are collected and organized smoother
 - what things make sense to be and not be clustered together
-
- we had adequate contacts and all we had when needed
-
- Increment 5 was probably about right
-
- I like upgrade PIM idea, if going back to Increment 5 should concentrate on operation part, when deal with Marshall cadre doesn't seem to be a central contact and a way to turn over info between shifts; too hard to get things through, more difficult to get questions asked and answered than it should be (from the crew).
-
- a little bit too many, Sharon and Brian Keely did things to minimize contact, people at NASA tried to insert themselves into the process, it could have been streamlines, need more of a point person approach
 - maybe some inefficiency in mechanism
 - certainly don't want too many people looking at stuff from me
 - I thought EPIM was single POC for us, and I work with him and he deals with the other stuff
 - there are other NASA folks who request same/similar stuff
-
- not worth complaining about
-
- one issue, is this civil servants, contractors?
[RC: clarified any number of people, civil servants, contractors, etc.]
 - other Increments might be too few or too many, but this Increment was just right
-
- just want to make sure all is coordinated, and negative doesn't cut it with me; I go out and touch people just to make sure they know we're coming, and the Program doesn't give me feedback so I go out and get it.
 - *[RC: would you prefer not to do pinging?]* yes, if there is an office I require support from, e.g., fyi, if I send note to POD, rarely hear anything back; would like to have more signal return; even if it doesn't come back from single office, at least POD should come back and let me know.
-
- appropriate number of points of contact
-
- didn't feel overwhelmed, interacted mainly with Suzanne and LMCO folks
 - don't feel I really ever talked to anyone personally for this experiment; was done by others on the team
 - didn't have any visibility in management structure on who to talk to, my experience as a relatively new contractor employee
-
- although I have a lot of other people I need to interact with, limiting to this study, the amount was just right.
-
- *[RC: what % would be comfortable?]* don't make me talk to anyone who doesn't add value to my effort.
 - double-sided knife; wanted one superhuman expert POC so not having to talk to 100s.
 - if we get too many contacts, it's big system, too many layers to get/go through; trying to satisfy too many requirements with too many working groups; on other hand, personal contact is necessary; near

flight we call JSC/KSC and make sure relevant areas in place, so would hate to be locked down to 1 person

- so having EPIM who could represent us to Program and field calls would help our efficiency, e.g., engineering or science consultant, often have to find hard way to discover what something meant
- new system though, new methods, more experience, so things going better
- example, for acoustics info, I give to paper pusher, but puts me back a few steps, doesn't understand what is required, etc. and delays progress/process

[they went on mute to discuss with each other]

- whole layers concept again
 - so often not sure who to be talking to
 - lead Increment scientist, MRPO level, PIM, all people working science questions, all at same time
- [RC: any of them redundant?]* all of them ask the same questions--research Increment scientist, PIM, lead Increment scientist, answering questions at least 4 times

-
- with PD doing most of the activities; stuff I've been doing last couple years has been Tiger Team
 - MER's type of function is what we do, getting data, analyzing after the fact, real-time, etc.

- it wasn't the primary contact, to get things done you had to go through layers, someone would say do test data again, had to find people who disapproved; had to do pressure testing, should have been straightforward, but ISS had not a [?] hold a payload in standard EXPRESS locker; asked for locker to test, took 7 months to test seal on MEPS, then told had to repeat by someone who didn't understand the test requirements, real issue like having standard way to hold EXPRESS locker when door is open unless is wedged still has not been resolved. Did we make it? But created a problem because astronauts had problem loading things in and out; this happened at bench review right before flight.

-
- only a couple people I deal with, but just right, management wise, Mark Anderson, ESS
 - our project also flies on Shuttle, and goes through similar objective, run by (JSC) Building 37 folks for HLS; worked out very well for us
 - we have more than 1 personal contact but just right for accomplishing things

- would like to see a bit more centralization of contacts we have to make

- we had a really good EPIM

- others have interacted with others, but we have a team set up for contact, so for me personally, just right

- needs fewer with more knowledge of requirements

- I do not sufficiently know people

- having 3 parallel conversations about same topic, not up to speed on everything

- I as PD would like to see single POC to Payloads Office, i.e., PIM; I do not like to interact/interface with those from OZ3 and OZ5 and rest of ISS community, EVA, etc. (with MISSE), so that when 1 email is sent, no complaints made that I didn't copy everyone involved.

- no problem

- we are asked the same questions through several different routes; we asked for rapid responses but were given insufficient information to formulate a rational response

5.2.6 Payload Data Library (Questions 1.2.3 and 1.2.4)

The Payload Data Library (PDL) is the major coordinating software database that the ISS Utilization Program uses to manage payload data for ISS investigations. Because PDL is a significant transaction point between the Program and its customers, the Survey contained two questions designed to assess customer satisfaction with this important software tool. The questions were designed to assess respondents' satisfaction with their own direct use of PDL (1.2.3), as well as their opinion, based on their interactions with the Program, on how effectively the Program uses the PDL data (1.2.4).

The applicable response rate for both PDL questions was 35%, significantly lower than for other Survey questions. Many Survey participants, particularly PIs, declined to give feedback on PDL because they were either completely unfamiliar with it, or at least insulated from its direct use by their support staff. For the 12 individuals who gave applicable responses, 84% of responses were at the dissatisfied end of the scale, with mean and median values that are the lowest (< 2) among all questions pertaining to satisfaction with Program processes. Although still within the dissatisfied range of the scale, satisfaction with how the Program used PDL data was somewhat higher than for direct use of PDL. Among all questions dealing with Program processes in Part 1 of the Survey, the PDL questions ranked the lowest (Direct Use) and next-to-lowest (Program Use) in mean score.

Inferences on demographic differences in the PDL response will not be made here due to the low applicable response rate for all demographic groups.

PDL comments received in these two questions echo previous unsolicited feedback as well as other surveys. Users feel PDL is a good concept poorly implemented. Comments note that PDL fails to capitalize on relational database capabilities. Data redundancy and lack of visibility to loaded data are common complaints. The customer has minimal insight into how PDL is being used, and this may account for some of the negative comments about PDL's usefulness. Experienced customers, however, note a marked improvement in the tool. Failure of Program personnel to use PDL effectively, bypassing it with email and other PC software, was commonly cited as a fault.

Question 1.2.3 – Comments

- too much info required, difficult to understand what is required
- not used by any folks we deal with
- talking to 3 or 4 crews trained, ends up not even used
- only people who use is those who developed it
- is a big money sink

- see 1.2.1 for relevant comments.
- an improvement to add, on Stage 1, we did everything in MS WORD, less configuration management, same number of people flying payloads, had no problems.
- PDL good idea on paper, not in reality, not practical.

- no basis for rating

- make it more useful, only good use was command and data handling data set
- all else was submitted directly to data set owners, that's how most of work got done, going around PDL

- we do use PDL but not directly out of this office

- horrible black hole that you dump data into and never get anything out of it; wasn't very well thought out on the input process; great for program, from PIMS/EPIMS, they can see what they need, but couldn't provide me a useful document.

- I used PDL from 1999-2000, back then it was a horrible database, but I think its been greatly improved
- my engineers told me its pretty good; might be further improvement

- CEO was grandfathered so didn't have to do PDL.

- haven't used it, no basis for rating

- for all databases we used, they are too much duplication and not enough unity between all
- they all need to be consolidated to answer all questions from everyone
- got PIA, EIA, PDL, probably 4-6 databases that need to enter data into them
- inordinate amount of manpower to enter all the data required

- I personally never used PDL; I know folks on team have used it, some say great, others don't like it; no basis for rating, did not directly use PDL

- has nothing to do with philosophy or concept on how they want it to work
- agree central database to have people grab data is needed, but just believe it was built for people yanking data out but not built for those dealing with payloads
- concept good, implementation poor; has a way to go
- [RC: sense from your team using PDL any improvement?]* getting better but only because KSC info taken out and given to KSC directly now
- two groups of utilization weren't working, KSC wasn't working, should make for two groups/databases to talk
- filling things in for PDL was supposed to understand units, asked what are you gathering here, relative to bandwidth and data flow on orbit, they still can't answer, just want data, how do you give them data when they don't understand

- had no direct use of PDL for this experiment
- *[RC: for this particular experiment, any one who would have interacted directly with PDL]* might have been, but still not real clear on what goes into PDL, and how its used, products downstream it drives, not familiar with that, our Lockheed support worked that, been meaning to have someone explain to me what that all means

- no basis for rating
- [RC: If you were insulated from using PDL, who would have used?]* lead engineer on project, called biotechnology carriers
- Clark Dardy lead

- no contact with PDL

- very disappointing, constantly changing, totally useless, people who needed information wouldn't get it, they came back to us to get numbers that were in PDL.
 - had full-time person trying to keep up with PDL, but their time was a total waste.
 - great idea, operationally is it working? No; put in place as requirement before it was validated. Big distraction.
-

- never used PDL

[1st name omitted]:

- no way to validate the data, volume calculations verifications lacking, places you have to roll up volumes, subvolumes, calculate by hand, validation from field to field should be reliable database but not, should be able to calculate fields, much overlap between areas, have to repeat areas of data input
- report output look nothing like data entered, usually formatted poorly
- should be way to enter data and submit CR and view data, but once entered, can't view
- data drops L-12, -16, -18 should let you view, but once entered, can't view again
- need to view to incorporate changes into data set
- have to submit CEFs attaching sheets with changes, all done with paper
- JSC doesn't incorporate changes efficiently
- data often wrong/inaccurate when updates are supposed to be made
- templates that request data at L-16 for payloads are unrealistic

[2nd name omitted]:

- a lot of people who are looking for info from your payload, instead of going to people who have info, they go to PDL, and see wrong info, when replanning, etc., and see presentations where data taken from PDL is now wrong/inaccurate
 - if info were correct in PDL were correct, could be more trusted
 - [name omitted] has to reconcile data all the time because its not kept up to date
 - keeping up to date would solve many problems
 - more like glorified spreadsheet, only takes one entry
-

- PDL been a fair source of frustration
 - early telecon setup experience, hailed as one-stop shop, but not that, hasn't been working well though, hasn't lived up to expectations
 - because of unique situation, writing 2 PIPs for flight, but in sortie situation, writing PIP and gearing deliverables, difference between two systems is big
 - initial hope did not get met for PDL after description
 - iURC conflicts with PDL as well for colleague
-

- don't know what it is

- no basis for rating

- not applicable but, should be a way for CEO to be included in PDL

- no basis for rating

- had to give basic information; PDL sucks; it sucks to level that we had bug in software with time-stamping and had 3 different days down in the time stream; we could have fixed bug, but would have had to re-enter data, too hard to change PDL

- baseline the data in each data set such that they are transitioned from flight to flight, increment to increment and any changes or updates are an option presented to the Payload Developer via ECR process; this will save time, which is spent uploading drawings and copying data for each flight for payloads with multiple flights.

Question 1.2.4 – Comments

- no basis for rating

- did not put data in directly, but generate data that I got asked for 6 other places, I know that some trimming is being done, however, and that should help.

- not sure as a PD I can answer this question

- we enter data in PDL and iURC based on request, but don't know how Office uses this data

[RC: some PDs had insight how data was used...]

- my understanding of question is from PD's view, do they think data had sufficient use, if so, higher rating

- if anyone reflowed the categories and items from PDL, would be useful

- no basis for rating

- I have no idea, I can't tell to this day, exactly who accesses PDL

[TB: did get questions from Program that should have been in PDL?] still can't answer

- only have limited knowledge of what types of data go into PDL

- we usually had to submit to data set owner, rather than have them extract from PDL

- [omitted names] and I have noticed that we put in our data, drawings, schematics, procedures, then get call to put in our data

- found it shocking in review for our data review, turned out they didn't have PDL log-in and couldn't / didn't review online

- if the Program is going to buy into PDL, then everyone must buy in, users, etc., if its not right then scream at us, but not when we've done our job entering data.

- see previous question's relevant answers for all same reasons

- you could do a lot with it, but sure not being done

- does this replace MER forms from years ago? *[RC: PDL contains many things, e.g., mass, technical data re: hardware]* I didn't have anything to do with that, so done with PD

- see previous comments; had many occasions where people would call for thing when information was in PDL, but they asked for data to be faxed, people who needed it

- not real familiar with PDL

- certain places are good to use, other places are not

- I know some of the data we put into PDL receives requirements from other documents well, KSC data sets, command and data handling data sets, iURC

- in area of manifests, it's a complete breakdown

- forgot name of data set, the one where you feed manifest data into

- we put it into PDL, but end up emailing an Excel spreadsheet to someone

- if MR is required, we fill out MR loader sheet, but also required to feed PDL, so make up your mind!

- once in, used moderately well; some instances where data needs to be shared between Shuttle and ISS, they need to be reading each other's databases, and that's not done well at all

- not knowing what's in there, can't comment, no basis for rating

- crews have no use, KSC has no knowledge of it

- no basis for rating

- all I see are data going in and don't know where data are getting used; quite frankly, could care less.

- obviously Program people are seeing it, and has function, but I question usefulness of using. *[RC: But you never get calls about it, wondering whether they get data?]*

- various organizations contact us requesting the same data that we have provided in PDL.

5.2.7 Payload Integration (Question 1.2.5)

The largest part of the interaction that occurs between the ISS Utilization Program and its customers is devoted to integrating the hardware and the operational requirements for an investigation's ISS payload. In order to provide an overall assessment to complement the various sub-areas of the payload integration process covered in the Survey, question 1.2.5 asked interviewees to rate their level of satisfaction with the payload integration process on an end-to-end basis.

For all respondents, an approximately normal distribution of scores was obtained with mean and median values near 4, which are the highest values among all questions in the Survey pertaining to Program processes. Reflecting this high degree of satisfaction, 60% of responses are within the satisfied range of the scale (4 or higher). Although PIs differed significantly from PDs in the number of individuals selecting 5 over 4 on the rating scale, the score distributions for these two groups are generally similar. The score distribution for the PI-PD dual-role group is notably shifted to lower values, however, indicating this group is relatively less satisfied with Payload Integration than individuals who only perform one role.

The comments received in this area do not provide any consensus view of payload integration. Several customers note that the complexity of the process and its many layers of organization make it difficult. The role of the Payload Integration Manager (PIM) is highlighted. Some customers comment that communication via the PIM will sometimes get distorted by the time it gets to the right technical person. Another customer comments that the Payload Interface Revision Notice (PIRN) process is painful—getting PIRNs approved is difficult. In general, the customers surveyed have different views of payload integration with very different levels of involvement. Many respondents do acknowledge that much of what is done is necessary and they expect the process to improve over time.

Question 1.2.5 – Comments

-
- needs to be customer friendly, not so cost intense
-
- got everything he asked for and successfully selected data
-
- a new person coming in, in some cases, I receive conflicting information on integration process; 1 person gave me point A, another person pointed me to point B
 - not just Increment 5, Debbie too mentioned conflicting info from points of contact
 - PIM was viewed as go-to person; learned better to direct question to PIM than settle self, they have greater insight into how system works, rather than me
 - lots of times phone calls come to me, and skip PIM; after trial and error, realize PIM may not be in flow, but better to involve PIM to get him/her up to speed; not everyone uses, but I try to get them to be able to help
-
- it works, we work really well, people are enthused with what we're doing; even though there are some rough spots here and there, we're able to function really well.
-
- potential conflict would be other science conflicting with ours
 - important that both PIs were brought together to discuss
-
- flight hardware ready year before flight, more tests on ground unit, not enough opportunities to change after hardware done, no hands-on experience with hardware, can't test if can't touch, make bigger amount of time to work with ground unit, hardware done well, solid work, good engineering, not enough time to change things, temperature gradient higher than designed, time is important, iterative design is less than desired, safety reviews rated material 4
-
- my payload is on ISS, and people who worked it got it there more than the process itself.
-
- coordinating crew was very well organized, getting stuff from Russians though was difficult
-
- integration was very tough, its not reflection on the PIM, we were there when the small payload integration agreement was being developed
-
- because of the planning from end to end having been difficult, it should have been an easy thing to put on, they made it harder than what it should have been.
-
- this increase from previous Increments, going in right direction,
-
- had good support from JSC, the JSC astronauts came to LaRC to make sure we were doing things right, good participation, what-if tests, various maneuvers, all went well
-
- we had most everything up there
 - once we surmounted controversy of having to re-do things we didn't have to do, we got static from ISS folks, they like long templates, where we like short templates
 - they said never come to us with 6-month template again
-
- you mean hardware turnover, stowage? *[RC: yes, and PEI aspects, hardware needing verified against IRD, etc.]*
 - Russian integration and lack of process of getting here to there, we're still in the dark in terms of what the requirements are; requirements for Station are clear, but they're for US Lab
 - if you launched hardware to station, you'd think you could verify against one set of requirements even if crossing into Russian segment
-
- we had good KSC experience, good EPIM, some of the websites are out of synch with payload development, tried to shrink down payload development, templates not always as effective
 - manifesting I don't have too many issues with
 - used to do mission evaluation request, nothing really out there like this, so what I have to do in 1 or 2 years, I have no great input
 - RPWG has very good representation to PDs
-
- there were some areas it was a bit unclear to me, especially down at KSC, how we were going to get out lab space, who was going to be doing blood draws, who was coordinating all that
 - sometimes the support issue down at KSC seems to be not real totally buttoned down
-

- isolated/insulated from this, no basis for feedback

- *end to end from start of grant proposal? [RC: no, excludes getting funding, so once hits development stage] got me up and running immediately, for Shuttle, extremely quick, same for Increment 5, first opportunity made it*

- the biggest thing is if we focus on being able to get back to core requirements; get unnecessary middle people out of the way; could be a 4 or 5 despite complexity of Station
- get rid of fiefdoms that keep people employed.

- easier than Shuttle, I think
- never heard of recertifying SAMS

- most of my [name omitted] experience is with MSG
- *[name omitted] asked if other place to talk about verification [RC: we can get into it more in other places]*
- [name omitted]: what about bench reviews, KSC and JSC
- hard to discern/partition who is more applicable
- PDL needs much improvement
- the whole PIRN business is painful; the process for getting them approved is difficult for payloads and integrators, getting PIRNS against 57000 all the time
- the way requirements flow and timeliness of changes, that flow has to be responded to, but often times haven't been levied upon payload soon enough, they can't be ignored, makes job more difficult

- previous comments roll in
- too many redundancies, some things delivered at safety office at JSC, those buying off, have redundant/parallel requirements become irritating
- they'll update documents, we think we through process, but have to go back and review and amend process again, makes for inefficiency

- we weren't actually payload hardware, more a pre- and post-study
- they had a bunch of inflexible PIs on there, and my experiment was long and drawn out, the other Investigators didn't want to be interrupted for blood draw when they were doing their experiment, including the flight surgeon
- not sure if anyone in-house could have done anything but it was a pain
- prioritization comment would help that situation, if it had been clear priority, PIs couldn't have caused that much trouble, but I can't fault in-house people for that

- somewhat painful, but we realize what you guys had to do
- most of our requirements did get met, so pretty happy there

- the weak link has been getting adequate data from our ground subjects, flight data has been very good.

- ground data collection has been the weak link.

- payload integration process for hardware went well, people knew how to integrate hardware, SpaceLab carried across, process for integrating software was mess, not as good, templates were long and inordinately rigid, forces us to not fix bugs, good on hardware, bad on software averaging out to OK

- [RC: renal stone had hardware, right?] yes, none was fixed in place, had 5 or 6 soft goods*
- happy with everything

- *please explain "end to end payload integration process" [RC: clarified, build to requirements, fill in paperwork to meet these requirements, etc.]*
- once we had approvals for hardware, it was very well done
- we did some testing here, also KSC and White Sands, all handled very well, only negative was getting to that point

- two major points: integration process often leads to PIs like me, doesn't seem to be clearly defined at times; following documentation requires more discussion and clarification, is cumbersome at times

- people didn't complain too much about it

- lots of improvement needing to be done, but getting better every day
 - improve efficiency of organization
 - each PD asks to be given organization or management chart that illustrates which group is in charge of what, that way the PD has much clearer idea, not passing through multiple loops
 - if I want to get something, I don't know who to ask, so I ask EPIM, then it gets passed, and each pass the message gets distorted
 - organization chart shows who is responsible for what technically, so if we have a question we may not have an EPIM, we still follow chain of command, to provide complete data we may need to ask many questions, e.g., labeling and color for front panel, etc., we have no idea, EPIM has no idea, then OZ didn't know; was long time delay
 - what group is technically supposed to be in charge of what would clear things up
-
- it was done so transparently, that we are satisfied; other than multiple hoops we had to jump through, we were not buried under mountains of paperwork and I think it was handled for us.
-
- the process is difficult to understand
-

5.2.8 Data and Documentation (Questions 1.2.6 and 1.2.7)

In order to fly an investigation on ISS, PIs and PDs must collect and organize data and documentation for their payload and deliver this information according to Program schedule templates. Survey participants were asked about their satisfaction with the amount of data and documentation they were required to deliver (1.2.6) as well as the schedule that the Program imposes for data delivery (1.2.7).

The satisfaction ratings from all interviewees regarding amount of data and documentation ranged across the scale, with an approximate normal distribution and mean and median scores near the scale mid-point. The broad distribution translates into roughly equal proportions of responses in the dissatisfied (33%) and satisfied (45%) ranges of the scale. The distributions of ratings from PIs and PDs have similar mean and median values, but a somewhat higher percentage of PDs (33%) indicated they were dissatisfied (score of 2 or less) compared to PIs (19%). Ratings from the PI-PD dual-role demographic group are notable for being significantly lower compared to PIs and PDs, with mean and median values in the very dissatisfied end of the scale.

Satisfaction with the schedule for data and documentation delivery was somewhat higher relative to amount of data and documentation based on the mean and median scores for all interviewees. Proportionately more respondents (66%) selected scores in the satisfied end of the scale for data delivery schedule compared to amount of data and documentation (45%). Among the demographic sub-groups, PIs had a fairly high level of satisfaction with delivery schedule. PDs and PI-PDs had similar response distributions to one another, and overall both groups were less satisfied with data delivery schedule than PIs.

The customer comments received generally express frustration with the amount of documentation and data required and with the length of the schedule template. Respondents feel there is opportunity to streamline the program documentation. Some customers were frustrated to learn there was padding in the schedule and suspected that early data inputs were not used effectively. There is not consensus, however. Other customers expressed overall satisfaction with this area.

Question 1.2.6 – Comments

- it was as expected, but had to meet safety requirements
- previous comment, PDL sounds like controversy, data in PDL is not over sufficient for integration
- how much data do they use? would be interesting to hear
- I have been involved in Spacehab, Spacelab, then ISS; appreciate most Spacelab, very straightforward and efficient; then Spacehab, and ISS, too many requests and inputs asked
- maybe Program Office does not have too much experience what they need, so they ask for everything, too much, and then try to use
- increases payload development costs
- contract office/Boeing, notices how much work there is going to be, and cost things as to what is expected

[RW: more elaborated comments/stories on tape]

- didn't have to do a whole lot but had to do a lot
 - remember going into a preliminary design meeting, 20-foot conference tables, perimeter was covered with documents, seemed too much
 - because our payload does not require too many hardware requirements or restrictions, we're not faced with too many problems here
 - always too much documentation, I do EDs and procedures, I am not sure if MSFC added anything to the training
 - part of the game, can't say its too much or too less, I understand that everyone asking for it has their reasons
 - a lot of documentation, know its necessary, but some unexpected due to EVA related activities
 - sometimes I felt the amount of data and extra documentation needed to be delivered is a lot
 - amount is too much, reason not lower is that it hasn't gotten any worse since Spacelab, we were kind of conditioned to this, knew about it coming into it
 - lot of it PIA and PTP process were overbearing and unclear as to what purpose was
 - all the extra paperwork that is required to get extramural investigator into system that one is already in, no flexibility for intramural investigator who has undergone the process
 - level of documentation we produce is bound to be more with dynamic situation with ISS, and we don't understand everything, and campaign to reduce will hopefully mitigate
 - example: fonts/sizes for labels for Shuttle was easier process, for ISS it's much too complicated and cumbersome, not comparable to safety and bigger issues, doesn't make sense
 - as data gets documented, missing feedback, doesn't know whether info makes it into department, black hole, good/bad quality?
 - you have the document required at your Center, so hard to distinguish
 - problem is all the documentation and have to keep giving everyone
 - some verification normally would be done for something
 - data vs. documentation problem
 - didn't create any data or documentation
 - overall very satisfied
 - what we had we didn't have to go through certain documents, PDR, CDR, etc., because of nature of our experiment, they recognized out of the box thinking, so realized unnecessary areas of requirements
- [RC: program was flexible?] yes*
-
- so much of it was so unnecessary; somebody with a good comprehension and experience base from Spacelab and Shuttle should re-look at requirement that are now being levied.
 - for instance, don't need to have 3D CAD drawings of knobs and switch on experiment apparatus; ludicrous requirement; had to hire people to create 3D CAD drawing
 - someone should look at these requirements and cut them; could still have requirements for science

verification.

-
- being done with old paper based system
 - eliminate some mistakes
-
- didn't seem like he needed to produce
-
- slightly dissatisfied
 - would like to see more streamlining, but if it was and I thought it was, other PDs might think it was too much
 - if verbiage was reduced, others might feel it was not a good modification
-
- going back on prior experience with earlier experiments
 - the process we had to go through to get software approved, our flight software for PUFF experiment, was rather ridiculous because at the time, requirements were still being developed; we had PI still trying develop requirements
 - took more effort and much more PI dollars to implement
 - things have probably improved and better defined
- [Ed: more elaborative detail on tape]*
-
- too much, too difficult; databases are a large part of the problem
-
- always had too much paper, but very well satisfied, don't feel we had to fill out any unnecessary documentation
-
- way too much, the level of documentation is too detailed, too specific
-
- because we were grandfathered for Increment 5, I'll put 3 on this one as well because we did documentation, but it was mostly grandfathered
-
- too much of same data asked repeatedly
 - requires too much time to design, more than design of equipment
 - tons of nits drive up cost, filling up data machine
-
- a lot at the beginning and expected, and I understand why there has to be this documentation, the rating might change if I had hardware
-
- it was the amount of documentation required to fly the payload, personally, not a whole lot more was put forth; no fluff involved at all; what was necessary; of course this is an external payload; worked through Spacehab and Spacelab, and data required was pertinent for system's process.
-
- my early payloads paperwork was pretty minimal; WOLF is a different story.
-
- fairly reasonable for our payload
 - if I had more direction from beginning on what was required; some folks mentioned form by number, or database with where to access, but just mentioned acronym
 - PIM helped with this to large degree
 - needed more orientation in documentation; would have made it easier for me
-
- less redundancy
-
-

Part 1. Cross-Program Feedback
Section 1.2 –Satisfaction with Program Processes
Topic Area: 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.

1 2 3 4 5 Not
 Very Very Applicable
 dissatisfied satisfied

All Interviewees		PIs Only																									
No. respondents in category:	34	No. respondents in category:	17																								
Response rate:	34/34 (100.0%)	Response rate:	17/17 (100.0%)																								
Applicable responses:	32/34 (94.1%)	Applicable responses:	16/17 (94.1%)																								
Mean rating:	3.6	Mean rating:	4.2																								
Mean score ranking in section:	3/7	Mean score ranking in section:	1/7																								
Median:	4.0	Median:	4.0																								
<table border="1"> <caption>Rating Scale Distribution - All Interviewees</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1-Very dissatisfied</td><td>0</td></tr> <tr><td>2</td><td>25</td></tr> <tr><td>3</td><td>9</td></tr> <tr><td>4</td><td>47</td></tr> <tr><td>5-Very satisfied</td><td>19</td></tr> </tbody> </table>		Rating	Percent (%)	1-Very dissatisfied	0	2	25	3	9	4	47	5-Very satisfied	19	<table border="1"> <caption>Rating Scale Distribution - PIs Only</caption> <thead> <tr><th>Rating</th><th>Percent (%)</th></tr> </thead> <tbody> <tr><td>1-Very dissatisfied</td><td>0</td></tr> <tr><td>2</td><td>6</td></tr> <tr><td>3</td><td>0</td></tr> <tr><td>4</td><td>63</td></tr> <tr><td>5-Very satisfied</td><td>31</td></tr> </tbody> </table>		Rating	Percent (%)	1-Very dissatisfied	0	2	6	3	0	4	63	5-Very satisfied	31
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PI-PD Dual Role		PDs Only																									
No. respondents in category:	5	No. respondents in category:	12																								
Response rate:	5/5 (100.0%)	Response rate:	12/12 (100.0%)																								
Applicable responses:	5/5 (100.0%)	Applicable responses:	11/12 (91.7%)																								
Mean rating:	2.6	Mean rating:	3.3																								
Mean score ranking in section:	2/7	Mean score ranking in section:	3/7																								
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4	20																										
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Rating	Percent (%)																										
1-Very dissatisfied	0																										
2	27																										
3	27																										
4	36																										
5-Very satisfied	9																										

Question 1.2.7 – Comments

-
- schedule does not always reflect current launch dates, etc.
-
- exactly where it needs to be; I understand why documentation needs to be delivered when required.
-
- sometimes there would be some last minute requests, but can't complain, not many
-
- if I had had overview, would have been improved rating
 - Debbie actually did paperwork for EPO 5, but would've helped me coming in if PIM had told us what we needed, etc.
 - could use over and over for each Increment
-
- didn't have a problem with it; even on 4, they had some slips; was a 2-way process.
-
- crew briefing on short notice; timing on some things were short notice
-
- went over backwards for us, allowed to deliver documentation and hardware late in schedule
-
- same reason; standard investigators from outside world, when looking at experiment, think up one day, dream up requirements and bring to table
 - when NASA told going to fly experiment 18 months in advance, they go into cardiac arrest, unable to conceive it would take that long to get all together
 - if we had 8-10 months templates to work with, our credibility and agency's credibility level would go way up
-
- the template dates published, we sometimes try to meet, but usually don't, so what is better template, who knows if we'll ever get back to realistic template
 - been hard working these experiments in Increments to know what true schedule when you look at template and realize its lacking, so not sure you can ever live up to these schedules
-
- has really improved, not too far out of bed now
 - early stage things, early MI testing, etc., e.g., 3-yr development cycle was too far, but it has gotten better
 - later increments will move to right hopefully
-
- one of the complaints I have with overall Station development process program is that we have to go back so far ahead of time to get things ready; I understand why that is, but it is an area we need to improve as time goes on
-
- we have light load samples, consistent with rapid pace, the later we can submit our data the better, but doing quite well in that area now
-
- there were things put in place that schedules were made up to give someone else pushing time to re-evaluated when this was not necessary; be ready to fly 1 year before and then sit on your thumbs; but turnaround times were pretty good; schedule could be much more realistic; a lot things asked for way in advance of where it should have been; more like a 2 than a 3; but turnaround times were good; why were submission dates pushed so far up when it wasn't necessary?
-
- seemed very reasonable; our experiment is different from most
 - we go 6 months to pre flight, +/- some months for post flight that we detail about samples and what data meant
-
- no basis for rating
-
- templates are totally unreasonable
 - two perspectives: stowage is wanted way before hardware deals given, for verification is asked for late and don't look at week before COFR; if data submitted early for verification, it gets lost
 - we don't have a lot of experience with early submittal
-
- recognize program has done things to shift it to right, but recently I was flagged red for specific submittals too early; frustrating to find padding in schedule
 - PMIT reviews often caused frustration for not being green at reviews
 - much meant for brand new payloads, need so much overhead between times?
 - incompatibility between groups and panels requiring things, no group is talking to another to come up with timescale to synchronize
-

- seems to be an area that has been improved

- we analyze our data only after all of our Increments are finished; NASA has been very good about allowing me to defer data reporting on required reports; don't have to answer final questions; requirements have been flexible in allowing deferred responses.

- never had any problem with meeting those deliverable dates

- no problem delivering

- answered by HLS buffering of PIAs, generic comment templates are too long, too far in advance, too long to orbit

- in general there was good and timely info they got to me so I had time to prepare

- generally we had enough notice on things we had to do
- not from experience but from talking and hearing others during course of process
- schedule was tight and they insisted on deadline, but we understand why.

- because we were working backwards, we were scheduled then had to do paperwork that should have been due 2 years ago, it is fair as far as schedule goes, but there has to be some quicker ways to condense the documentation and get it in, but from a CEO perspective; because I was grandfathered, I am going to put a 3.
- paperwork was easier because a lot of equipment is ISS Systems, overall documentation process wasn't representative, there but nevertheless there is no process for simpler payloads that us GFE

- required schedule is fine, but template schedule is way out of bed, after negotiations things improved or were more reasonable

- same inputs are required too early to permit the flexibility necessary to support innovative research

5.2.9 Program Review Processes (Questions 1.2.8 and 1.2.9)

Formal technical and programmatic reviews are major milestones in the development and integration of the payload for an ISS investigation. Although the level of participation in these reviews tends to be somewhat different for PIs than PDs, both are impacted by the need to prepare review materials and assure that review requirements are met prior to flight. Question 1.2.8 obtained feedback on the number of review meetings that Survey participants were required to support, while question 1.2.9 covered satisfaction with all other general aspects of reviews.

For all interviewees, 81% indicated that the number of formal review meetings was just right, with the 19% remaining responses evenly distributed above and below this midpoint. This result reflects strong agreement on the “just right” response within and between the PI (100% just right) and PD (82% just right) sub-populations. For PI-PDs, however, opinions are more or less spread across the scale.

The satisfaction ratings from all interviewees for ISS formal review processes in general are well centered in the satisfied range of the scale (60% of applicable responses are 4 or higher), with only 13% of responses in the dissatisfied range. This result mirrors contributing response distributions from the PI and PD sub-groups that are distributed similarly within the satisfied range. The mean and median scores for the PI-PD dual-role respondents are somewhat lower than for PIs and PDs, and are centered on the scale mid-point.

Customer comments about the Program Review process are generally positive to neutral. In many cases, the customers note that the formal meetings were beneficial and useful. Several negative comments indicate Program personnel support was inadequate, including lack of adequate support for payload Preliminary Design Reviews and Critical Design Reviews.

Part 1. Cross-Program Feedback
Section 1.2 –Satisfaction with Program Processes
Topic Area: 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?

1 2 3 4 5 Not
 Not Just Too Applicable
 enough right many

All Interviewees	PIs Only																								
No. respondents in category: 34	No. respondents in category: 17																								
Response rate: 34/34 (100.0%)	Response rate: 17/17 (100.0%)																								
Applicable responses: 32/34 (94.1%)	Applicable responses: 16/17 (94.1%)																								
Mean rating: 3.0	Mean rating: 3.0																								
Mean score ranking in section: NR	Mean score ranking in section: NR																								
Median: 3.0	Median: 3.0																								
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PI-PD Dual Role	PDs Only																								
No. respondents in category: 5	No. respondents in category: 12																								
Response rate: 5/5 (100.0%)	Response rate: 12/12 (100.0%)																								
Applicable responses: 5/5 (100.0%)	Applicable responses: 11/12 (91.7%)																								
Mean rating: 2.8	Mean rating: 3.1																								
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Question 1.2.8 – Comments

-
- though it was good, had ERR, PDR, CDR, I am fan of review process, it is tried and true, I find the formalization helps clarify my thoughts
-
- my management team may have gone to too many, a lot I didn't go to, or was able to comment on electronically; didn't hear from others that their were too many though
-
- early in the game there were too many, but in this Increment it was just right
 - CEO payload is distinct and unique to others, may not be applicable to other discipline areas
-
- I had no problem with meetings I went to, not many things I went to I felt my time was wasted
 - had a lot of formal review meetings, many local, but if had to travel would have been more difficult
 - *asked for clarification [RC: good example is preliminary design review, critical design review, cases where meeting is held to review science]* only participated in a few of these meetings, actually only 1 -- *[RC: this question focuses on number]* was not there for all of them, was available on phone, did not have to travel all the way to JSC, which was convenient not to travel, but for number of meetings, just right
 - some we have nice representation; thought of paperwork amount, could be overwhelming
 - quite a few we have to attend, could pare down some
-
- no basis for rating
 - out of box thinking, there were many but truncated; minimal number was phenomenal
 - were not enough, because we found that they were helpful; every time we had one we made a lot of progress; more formal reviews more often would be constructive.
 - as a PI in this program, I did not have to attend any, PI's time better served elsewhere
 - I didn't have to support any
 - didn't feel overburdened in formal meetings, even though some came at wrong time
 - small number of them, 2-3 we had to participate in, JSC people covered us in all the rest, so we did what was necessary, and satisfied with extent of our participation
 - do what you have to do
- costs me extra \$\$ from contract workforce and government workforce to prepare presentations
[RC: any redundancies?] PSRP, materials meetings, that have been flown before and have documentation for material flown before should be dispensed with, should have single data point/database for realizing its been flown, either ok or not ok
-
- too many informal, not enough formal, too much is done by e-mail,
 - we had few briefings that describe out payload at face-to-face at Regents Park, with people from KSC and MSFC, after that it was just Rod Lofton IPM. We took our briefings and presented as a whole
 - we were atypical in that our timeline was accelerated, we didn't do as many of these, we did 1 by phone
 - not too many review meetings at all
 - mainly CDRs, safety groups are very good to work with
 - most of the formal review meetings before flown didn't involve me, I was just feeding information to contacts Carin and Dave; just right, they realized in Shuttle program they might have overdone it, so made some nice adjustments for ISS
 - again, we need one single location where we go to be told payload can fly, not so many boards and working groups; get told you are on the manifest by one group; too many decision points.
 - Project Scientist and Project Manager lifted my burden; not many, just some crew briefings, necessary though
 - small very simple payload, only had about 2 reviews.
 - don't normally go to that many; based on my experience and talking to Debbie, we only go to 1 review
 - given it was a pre- and post-flight experiment, didn't have as many meetings as in-flight experiment
 - not involved in any formal meetings
-
-

Part 1. Cross-Program Feedback
Section 1.2 –Satisfaction with Program Processes
Topic Area: Program Review Processes

Question 1.2.9 – Please rate your level of satisfaction with the ISS Utilization Program's formal review processes in general.

1 2 3 4 5 Not
 Very Very Applicable
 dissatisfied satisfied

All Interviewees		PIs Only																									
No. respondents in category:	34	No. respondents in category:	17																								
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Question 1.2.9 – Comments

- awkward, too long of a preparation, safety people are good
- not like we're customer, end up with perfect documents, getting it done is about 60% of cost of everything

- almost like there were none, because early payload, did paperwork and got through system; as PD, wheels were greased ahead of time.
- still did a COFR, though.

- only because we had to go through 4 or 5 organizations to get OKd, and in any one, had to work serially with others.
- needs single point to be told where on Increment, etc.

- flagged any problem areas and allowed me to deal with them
- [RC: any scheduling and travel coordination problems?]* no, not at all
- generally worked out for me, some flexibility, briefings to be coordinated, depended on crew, bought nonrefundable air tickets, some things changed by a few days, but that's all part of it, these sorts of things aren't always concrete and depends on crew schedule, things come up, not a problem

- I like fewer meetings and nothing painful about them

- kind of bothersome, modified COFR process, went from LTA to COFR, let them sit a while, when not modified for a while, Centers and offices can modify to meet milestones when they come up
- COFR did throw in some requirements that we didn't necessarily meet, had to do with ops, so when we shipped for Spacelab, was more relevant to cadre
- we had a lot of open items for ISS, tried to meet requirements coming into COFR when they were imposed earlier, changes really do affect things, as long as they stick to what they imposed
- could modify launch package assessment process better

- no basis for rating, did not participate

- wasn't seeking a voice I didn't have

- very satisfied
- we did the presentations/reviews, then they went back
- things moved very quickly, so part of that review process, after our document requirements were given, they expedited very nicely

- no basis for rating; no direct experience

- review processes in general were necessary but tended to be complex because it was an opportunity for middle management to stand up and be counted; had people summarizing things who did not know technical detail; things set up along organizational chart lines; not organized by who knew the technical details; heard this, saw this from other payloads as well; PD gave charts to manager who didn't really know what was going on; did find ISS management listed, but orchestration could be improved.

- COFR process and number of times to go through open work is more than once per week is very painful
- bench reviews, having horrible time with payloads when they want additional sample; support for every flight when hardware changed is difficult not worthwhile
- mainly with scopes of bench reviews, reflights, additional samples and COFR process,
- as a good thing, for PSRP, they have been very cooperative as to determining when they should have review for reflights, and when things are just built, etc.

- number was fine, but during CoFRs, OZ's willingness to accept open work, don't seem to want to put into COFR statement

- *[RC: things you have to do and things OZ has to do, so you feel OZ somehow falls short on what they have to do?]* yes, they fail to live up to their responsibility on what they claim

- don't know; didn't really participate

- we were required to attend for EPO 5 but not required to present before safety folks, but later changed, when hardware changed, caught us by surprise, we're usually passive

- needed more input on expectations by committee for presenting
- people who conducted did what they were supposed to do
- buffered by fact that review to HLS somewhat dissatisfied, number of folks that didn't show at PDR and CDR, who should have been there
- here was inadequate support provided to those reviews, all players should be at PDR and CDR, particularly Payload Display Review Panel, which was not good.
- has issue with CBT, our design was good but didn't fit the template mandated by Display Review Panel, should have happened earlier
- on the whole pretty clear

- asked for examples of formal reviews [*RC: PDRs, CDRs, etc.*] felt they were conducted efficiently and were worthwhile

[RC clarified efficiency, conduct of process]

- make more efficient by organizers of meetings separate into different categories so each PI can attend to his/her discussion specifically and not others

- before meeting, maybe host of meeting needs to clearly understand subject, so don't begin understanding payload issues at very time of meeting, cuts down on meeting time

- at few meetings I went to, people not clear, i.e., PSRP chair, and should be more prepared in subject matter

- they helped us out a lot with that, well managed and efficient

- thought they were trying as far as doing face-to-face; they try to ferret out things that would be show stoppers for other payloads; can't speak to formal review for safety, but reviews for planning were good.

- did think they were well run

- ambivalent about this; more time consuming than it should be

- too much process in getting to where you want to go

- in our situation, formal reviews, including visual inspections, we feel program did very well; in all cases, crew came to LaRC to look over hardware, and its a boost to have them here for all who work on the hardware

5.2.10 NASA Research Program Office Support (Question 1.3.1)

All Increment 5 investigations were sponsored and supported by a NASA Research Program Office (RPO, see Table 1). This support is an intrinsic part of the ISS Utilization Program, and survey participants were reminded to integrate RPO support into their assessments for Part 1 of the Survey. In addition, because RPO services and processes define a major part of the interface between the ISS Utilization Program and its customers, questions specifically dedicated to this topic were built into Part 1 and Part 2 of the questionnaire.

In Survey Part 1, question 1.3.1 asked survey participants to rate their level of satisfaction with their RPO support. A full 89% of all interviewees gave responses in the satisfied range, with 72% responding that they were very satisfied, and only 10% in the dissatisfied range. Mean and median scores are the highest among all survey questions pertaining to satisfaction with interfaces for customer support. This high level of satisfaction is mirrored in the PI responses, and also generally in the PD responses, although this group had a dissenting 22% of respondents in the dissatisfied range. A 25% very-dissatisfied sub-group was likewise evident in the PI-PD responses, which otherwise were in the satisfied range.

Customer comments reflect the unique experience each customer has with his/her RPO. Most of the customers note a positive experience. One customer had a very negative experience due to some RPO re-organization. One theme in the comments is concern about redundant layers of management and the degraded communication back to the customer as a result.

Question 1.3.1 – Comments

- Alicia and Ara did good job for us, but all three were very helpful to us

- HLS has and maintained a fairly focused point of contact, only had to deal with focus group, this made our life easier, the other thing that they did right is they knew our experiment, feel like we have Co-Investigator sitting on ground in Houston

- difficult for me to say; if this is the only project I had, would be very dissatisfied, but have other things so pretty satisfied
- talk to other PIs, might be same way, since I am at MSFC I get better idea on what happens behind the scenes, what most PIs see is tip of the iceberg

- need to increase frequency of communication with PI

- MRPO right?
- unnecessary layers [*RC: MRPO as a whole is unnecessary?*] yes
- felt like lots of times they were answering for us with wrong answers
- I'm not sure the communication was very good between our MRPO and Level 2 and Level 3
- RPWG activity, feedback from there, what they're doing, is poor, what they do is not cleaned up

- very dissatisfied; issues are in spite of much 1-on-1; an awful lot of stuff went on in latter stages without our team being privy to it.
- we were never privy to budget decisions at MSFC
- also insisted we couldn't develop at JSC; had to partner with Texas A&M, made decision without consulting me.
- very little insight for exposure for last year and half to my POC at SPD; only seen him once in 1 year and half.
- people helping with day to day were doing a good job; they don't want to talk to someone except at someone at a University; shouldn't have decisions being made by CEF to pull MEPS off orbit without consulting with me.
- CEF was run around us; SPD is a dismal failure.
- we were told to be up there, they were supportive, they didn't say maybe you won't go up

- pretty outstanding; we went right on
- talking with other PIs who had NASA projects, they were flabbergasted how fast we were able to maneuver
- due to our requirements, etc., with HLS, been outstanding

- getting ancillary data (temperature, pressure in module), could have been done better

- I was happy was how HLS supported experiment; they pretty much handled all my requirements; once I defined my experiment and what was needed, my RPO took it from there; that's why as an independent PD, I let RPO do everything

- they were real good when it came to manifesting, well-defined
- very poor in keeping us abreast of requirement changes and priorities laid out, not exactly sure of what was breakdown
- needs to be area to be reworked, functionality wise

- conflict of interest question, she represents RPO

- we had to scrounge for other levels of \$ after an early-on Program...
[RC: you were part of Code M, not just with funding but also with project management support and manifesting?] yes
[RW: changed rating from 2 to 5 following clarification in deviating from funding issue]

- combination of SPD and MRPO management at same time, redundant management!
- had to be negotiations for flight allocations slots, etc.
- SPD was better supporting than MRPO
- honestly and earnestly in furthering the cause as quickly as they could, with lion's share they tried to do their best

- they gave it the college try, Willie Williams did his best and Terry Hols did a good job and we were well supported on that end.

- this is rating of support from Brian Kelley's office, he and his office's support was the most positive part of the experience for us

- they are very accommodating although they need to get approval from NASA as to whether they are very accommodating
- always try to fight for us, scientifically speaking, willing to help us solve the problems

- excellent, they did a really good job with all help; HLS was very helpful, made sure crew comments made back to Investigation team

- everyone did excellent job supporting it

- great support from Dave and Carin, when something came up, could always call someone, and get help, Dave Santos an outstanding help

- much support from RPO, try to respond quickly, good at SPD level

- personnel worked with us at every point, was very supportive and fought many battles for us.

- they understand the payload, supported it completely.

- *based on data collection? [RC: yes]*
- our baseline data collection was pretty straightforward and confined to (JSC) Building 36 there
- supporting people always had things operating, shipping went well, those working with us did good job
- on occasion, person in charge wasn't always in contact

- lines of communication between Code M, related to our payload, were always kept in the loop; whether we had say, we always had expectations and needs communicated virtually daily by Code M

- good management, good direction

- staff has been excellent, cooperative and very helpful.

- [RC: clarified human life sciences since she didn't know]*
- I've been headed by Hacko(?), not sure of who RPO is and how they related to my investigation

- SPD benefit, favored lots of money, couldn't attend onsite meetings and they did for us

- I am the RPO

5.2.11 PIM/EPIM Services (Questions 1.3.2 and 1.3.3)

Depending on an investigation's physical accommodations on ISS and other factors, payload integration is coordinated in many cases by either a Payload Integration Manager (PIM) or an EXPRESS Payload Integration Manager (EPIM). These individuals are a key management interface between ISS payload integration processes and an investigation's PD and payload development team, and also, in some cases, the PI and investigation team.

For those investigations supported by either PIM or EPIM services, the interviewees were asked to rate their satisfaction with these services in questions 1.3.2 (PIM) or 1.3.3 (EPIM) as appropriate. The lower responses rates for both questions, relative to other survey questions, is partly a function of the number of Increment 5 investigations that were supported by these services. It also reflects the reluctance of some interviewees to give applicable responses because they were relatively insulated from interaction with their PIM or EPIM.

For PIM services, the 2 PIs who gave applicable scores had responses in the satisfied range. The remaining responses, from PDs, roughly had a wide bi-modal split, with 38% of PDs very satisfied and 25% very dissatisfied.

Responses regarding EPIM services were provided only by PDs and PI-PDs, with both groups giving responses mostly in the satisfied range.

Generally, the verbal comments received on PIM/EPIM services are positive. Individual PIM performance is obviously a key factor in the experience of the customer. PIM turnover was commonly noted as a negative. PIM knowledge of processes and requirements appears to be a key driver in customer satisfaction. Current actions in place to set PIM service standards and improve training already address weaknesses noted in the Survey responses and verbal comments.

Question 1.3.2 – Comments

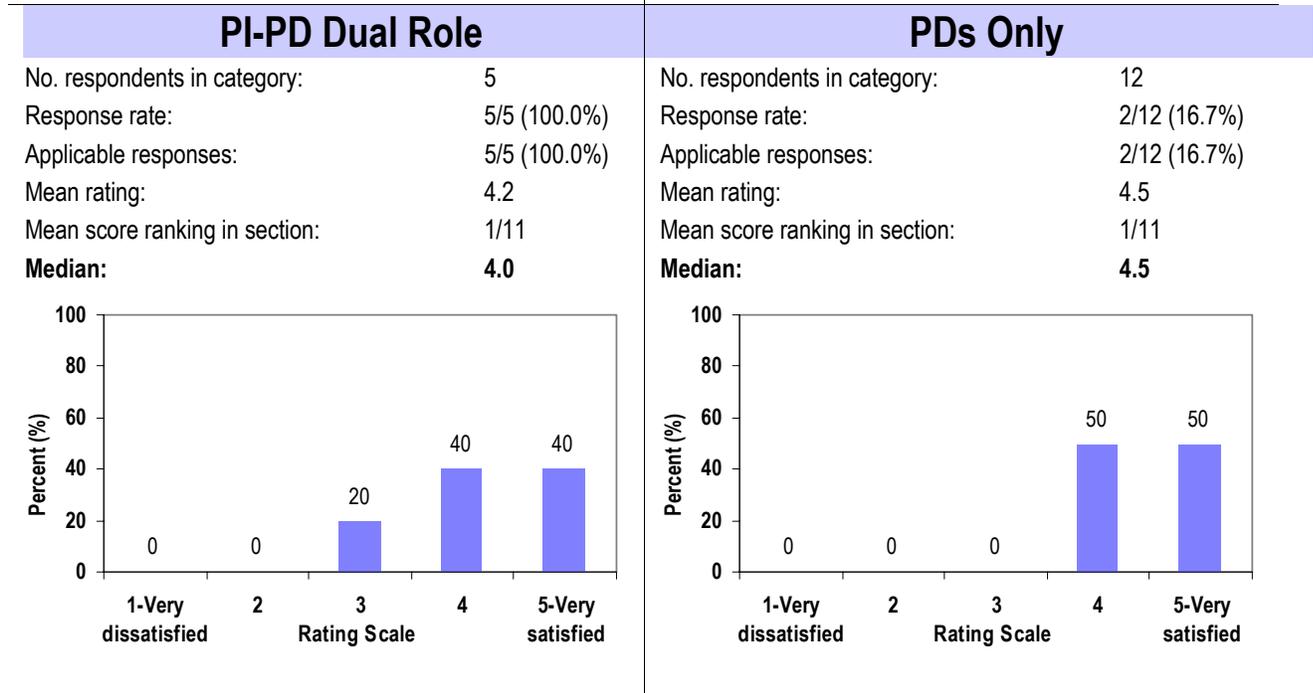
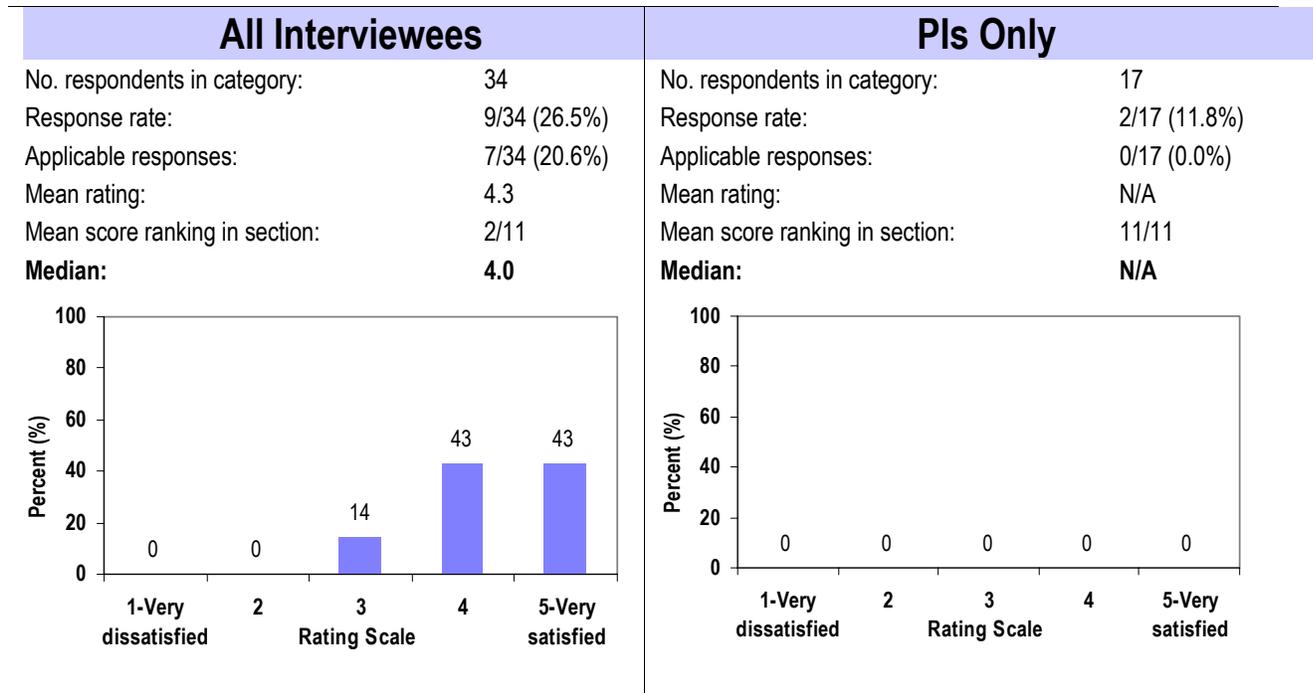
-
- Dave? [RC: no, a lower level function maybe transparent] don't know who it is; no rating then
-
- I don't think we could have gotten better support from Mr. Miley; he was very proactive and took care of many things before they came up and gave us clarification; documentation was verified, and he supported fully.
-
- RPO was interface with PIM, and I never interfaced with PIM on basis of this experiment
-
- [RC: Were you helped by a PIM?] no
 - [name omitted] more applicable, [name omitted] did mostly MSG
 - mainly my experience to date, I get lots of questions daily, here is list of questions they want answers to; 20% are usually helpful, but data they don't provide and we have to look up; multiple input data are from other places
 - when asking for help, little or no response; don't know how to respond because they don't know the answer; then layering takes place, going to PIM so she goes to next layer, and it gets cumbersome, much gets circumvented, will often have to justify data that has been collected
 - not seeming like much of a service is provided
-
- could have used 1 PIM for all of HLS
 - turnover of PIMs was unacceptable, probably had 5 within last year; as a result, constantly getting new PIMs, that is not useful; HLS is at JSC, role of PIM, we have less contact
 - [RC: would you not need PIM if given consistent person?] yes, if he/she had work issues
-
- doesn't remember ever dealing with PIM
-
- for us and Teaching From Space Office, don't know if we could be doing without PIM; she kept us on track, PIM is person we call for any questions, and whom we should rely on for single POC
 - we're small payload with PIM but high maintenance when it comes to PIM
-
- might get confused by titles
 - [RC: this role might have been transparent, i.e., HRF people interacted but you didn't; I suggest N/A]. OK, N/A.
-
- initially was a 3, as we got to Increment 5, went to a 5; PIMs learned as Increment progressed; had much knowledge from Shuttle, and ISS ignored all that knowledge; ISS PIM essentially ignored Shuttle PIM information
-
- does not know who PIM is or what PIM does.
-
- early on worked with couple of PIMs, were generally helpful
-
- PIM was Michelle? [RC: no, she was your PD, at next level helping Michelle was PIM to help filling out payload data] Do you know who? [RC: No, would have been a contractor]
-
- because not only did DMM work with us to fill out small payload integration agreement, she worked the meetings, she represented us well.
-
- haven't seem to figure out what their job is, never been clearly defined, we have a set of expectations they are not meeting, and they have experiment. we are not meeting, we get questions from them and tell them that is something the program should define to us, they can't explain why they need data, they just need it, they are looking for data from us that we think the program should provide, and we have gone through quite a few PIMs,
-
- high turnover contributes to negative rating.
-
- Bob Miley extremely pleased and satisfied with his support
 - [RC: what do you think of Bob's performance] not only does he respond with inputs or when we ask certain things, he stays on top of all changes, and informs us of all changes and developments, he takes real interest in experiments and looking out for our interest
-
- we've had about 5 in last couple years
 - [RC: more than one per investigation?] no, always had 1 for HRF

- there has been some turnover in PIMs
 - an issue, so much turnover, than one has not been efficient in one particular area
 - can see from Program side why you need POC for internal organization
 - *[RC: of those you've had, anything stand out positive or negative?]*from HRF perspective, most effective way to be a good PIM for us is to be involved in the things you need to be and stay out of our way else wise
 - we are unique among PDs, being local, large, whole team, we have POC for all things Program has, and so not too efficient to go through PIM but for little things, agendas, PIAs, etc., it's helpful
-
-

Part 1. Cross-Program Feedback
Section 1.3 –Satisfaction with your Customer Support Interface
Topic Area: PIM/EPIM Services

Question 1.3.3 – Please rate your level of satisfaction with the services provided by the EXPRESS Payload Integration Manager (EPIM) assigned to your Investigation.

1 2 3 4 5 Not
Very **Very** **Not**
dissatisfied **satisfied** **Applicable**



Question 1.3.3 – Comments

- no basis for judgment

- our EPIM went well above his responsibilities to make sure he kept eye out for us
- always nice when you can call an integration contact part of project

- based on what their task was, did relatively good job
- go back to my global comments, don't want to nitpick, rather look at global picture
- consolidate process and contacts and funnel all through them

- don't have basis for a rating.

- he is good, although nobody is perfect, probably does not know details or results all the time, and answer is a bit confusing, he handles more than one payload and impossible to understand all issues, but he is pretty good

- feeling they worked for Program, not for me
- discussions with EPIM, she would present Program's position, quote payload's requirements

- satisfied with EPIM, now he can represent PI as well as PD at meetings
- but Boeing is forcing him to leave, so next increment we will have to train someone new

- EPIM did a good job; generally tried to do a good job; helps a lot, advised on things needed to be done over.

- Mike Ogles was priceless!

5.2.12 Crew Interface: Training and On-Orbit (Questions 1.3.4 and 1.3.9)

ISS investigation requirements in the area of crew training and communication to the crew on-orbit are supported by a number of interface functions provided by the ISS Utilization Program. Two questions were included in the survey to assess customer satisfaction with Program support in these two areas.

Question 1.3.4 asked survey participants to rate their satisfaction with the support the ISS Utilization Program provided in the area of crew training. The mean and median ratings for responses to this question from all interviewees were solidly in the satisfied range of the scale, with 64% of respondents scoring a 4 or higher. The number of individuals selecting the highest rating of very satisfied is notable at 36%. The distribution of responses from all interviewees mirror similar distribution shapes, means, and medians for the PI and PD demographic sub-groups. For both groups the number of dissenting (dissatisfied) responses was small at 9% (1 PI) and 11% (1 PD) respectively. For the PI-PD subgroup, responses are clustered at both the satisfied (60%) and dissatisfied (40%) ends of the scale.

Question 1.3.9 asked respondents to rate their level of satisfaction with their investigation's interface to the ISS crew on-orbit. The response results for all interviewees show a possible slight split between a 40% highly satisfied group, and a group of approximately 50% of respondents that is marginally within the dissatisfied range of the scale. This split is reflective of, and similarly reproduced by, both the PI and PD demographic sub-groups. The bi-modal distribution is not evident, however, in the PI-PD responses, which are continuously distributed from the scale mid-point into the satisfied range of the scale.

Customer comments in this area emphasize that access to the crew is a major driver in customer satisfaction for investigations using crew support. Crew training generated a number of comments to the effect that the Program over-controls crew training and adds non-valued-added steps in the process. Some customers are frustrated that their previous crew training experience is not considered and used to tailor the process. Schedule instability was also noted as a problem, the crew schedule being given priority over the customer's schedule. Many customers noted positive experiences with crew training. Access to the crew on-orbit is crucial to customers requiring crew support on-orbit. A number of comments note that mistakes could have been prevented with a short direct conversation with the crew and that a lot of customer time is wasted because of all the filters between crew and customer. The customers desire the crew to act as their lab technicians and be available to technical discussion as events warrant. Several comments voiced frustration with the NASA culture that heavily controls access to the astronauts.

Question 1.3.4 – Comments

- no basis for rating

- PD function to train
- *[RC: were you insulated from training crew?]* no, not what I said, but we didn't have capacity to train
- ISS Utilization Program did not provide opportunity to train crew, the ASCANs, what effect they have on the environment
- *[RC: so this sounds like program didn't allow you to perform function desired?]* OK, then very dissatisfied; something we need to do and had done in past, crew are supposed to be trained to do experiments, part of that is teaching ASCANS what to do
- Program didn't provide that crew training opportunity to come down and teach ASCANs about this or that, hope you don't tell Program to change this since it would be cause for lots more paperwork and work

- for years there have been med ops before flight, we tag on with many of those, so new crew training; not like a special hardware one has to learn or questionnaires to fill out

- pros: when we got to hands-on train with crew, the training coordinator did a good job, that was good; difficult was from start the way crew procedures (were conducted) was absurd, handled by idiots
- MEPS procedures, first training rehearsal, and ASCAN had 10 or 12 people at training but could not talk to ASCAN in advance, had to re-configure conference for training dry run to have 10 people at MSFC listening but no one could talk; why were they listening in on phone, supposed to be silent?
- got things by working directly with training coordinator at JSC; people dreamt up this convoluted process to help training, they think they are helping but are not; I myself had to get special training to brief the crew; I have been training astronauts since '74, and I had to get authorization; should go back to where training coordinators talked directly to PDs; but was some opportunity for re-current training.

- all hoops to jump through to get to crew
- there's all kinds of things you have to do to get to actual crewmember to have something done to/with your experiment; I understand the hoops but too many, don't recommend ridding some
- need some to get to crewmember to effect changes or applications
- once gotten to crew, not enough time spent with them; feel like they've forgotten once they have gotten to appropriate experiment

- HLS does own crew training

- very supported by MSFC people; made things clear, deadlines, then had to interface with JSC crew training, was made to feel like not part of process and treated as well
- another example of inter-Center tension
- requirements change from MSFC to JSC, have to do extra work

- in general, support excellent, except for vagaries of schedule have been difficult at times, training is in continual flux, have to change travel plans.

- is crew training involving MSFC crew training group that spends time here? *[RC: Yes]*
- in my opinion, extra amounts of work to getting ready for dry runs, approvals, for training that slows process down

- we fall into odd category, but receive much support from MSFC and JSC on how to navigate to do that
- more expectations on crew training would have helped others quite a bit
- but kind and understanding they were to help out and get us through

- crew wasn't trained, only subjects

- carried out by experimental scientists or whoever set up science
- requirements to train crew set up well; requirements to test crew, went well
- crew was available when needed but schedule changed a lot
- getting on schedule is key, once there it is automatic.

- we were a non-standard payload, and utilization got us into NBL and training and hurdles for each of the process so we didn't have to work that.

- worst part of ZCG experience; let PI accept responsibility

- crew members treated like G-d, like technicians; problem with culture and agency

- guys went down and said the crew was receptive, when it came to running my experiment, whatever tools and instructions seem to do good job

- the people who supported us in that really did their homework
- we did dummy crew training run at JSC before real crew, those supporting us got to train crews as well
- weren't required to train every crew member, the support crew was able to do this
- well-trained crew in ISS carried out experiment without hitch at all

- I did the crew training and my ESS helped but had to go through PTDR with MSFC, didn't find beneficial, not good use of my time, dealing with non-scientists, more concerned they were with just duration, how long things would take

- *asked for clarification [RC: certain amount you and Sue Runco did yourselves, telling them what features they needed to follow, may have been some other crew training as direct or indirect support from JSC, that portion we want rated]*
- people who do that training do a good job

- we had more help than we wanted, I thought process was at time quite poor in that we were group that had flown, we had trained Spacelab crews but we got no credit from MSFC on our past experience, payload training dry runs was not value added and plain bloody stupid, other side of coin is that LMCO is training people knew experiment did superb job of training, so have bi-modal response, MSFC bad, JSC LMCO good; had Marshall training hanging around didn't help me and didn't do anything, Gwen and I could have done our training on our own

- had lots of crew training; handled by contract office, and specific person we know working toward our favor, improved our experience, scheduling time, come to our facility to learn our payloads here instead of having to go there; during Spacelab, Spacehab and Shuttle, nobody came here to learn

- we did participate in crew training, and they were there when astronaut as there and we were able to talk with her, and there was one other session closer to flight that we had to missed, but would have like another additional training session, and so did NASA personnel.
- for crew training, this would have to be not applicable, for 1-6 we were considered systems and there was no accounted payloads crew training, because we were accounted under ISS Systems

- have good working relationship with them, one area still problem is keeping dates and scheduling, dates don't hold, probably not easy for ISS program to fix, but should minimize

- crew training in past has been varied; this crew training, we had short schedule, astronaut was willing to spend extra time for it; we requested 10 hours for Peggy, cut us back to 4
- with the difficulty she had, would that have been ameliorated by original time requested *[RC: had crew merit but contingent upon what training was given?]* mitigating parameter
- have to train crews as close to their launch dates as possible
- Peggy had span of 60 days prior to launch for training

- crews came here and looked at hardware early on, gave us suggestions, all people in simulations went very well; we were very comfortable and they knew what we needed and prepared very well

- sometimes they make the crew inaccessible, more than what you want
- sometimes getting outside of crew training part is beneficial
- sometimes our time is used well sometimes not

- one negative, MSFC supports out training sessions and coordination, back to PUFF experiment, having to do dry run payload training for each session and certifying members and crew was annoying
- you understand reason for requirement but ended up costing us \$\$ to have our investigators support that and didn't add value, although I understand why Program does it that way

- no basis for rating

- as PI, don't really know what training crew receives *[RC: who would be POC?]* Clark Dardy, various MSFC scientists
- PIs have no idea what crew training is given

Question 1.3.9 – Comments

-
- through staff at JSC who didn't have direct interaction but interfaced via emails, went very well
-
- we had no contact with crew on orbit
-
- I don't have a problem with talking directly to crew, never been in situation, but can't comment on that
 - I do think that the system over filters comments from investigation, in things like USOS, tried to put in chit-chatty in formal messages; personally this was useful but gets filtered randomly, some filtering some not, there were times when needed to talk to crew and could not; haven't been able to get words up; sometimes payload communications gets stuff up, sometimes they don't.
-
- all interface went through JSC, not clear I had any interface with crew, never talked to crew directly, got done what we needed to get done, talking with crew was all done through JSC
 - our experiment doesn't require any interaction with crew to perform it; just install and putting it up
 - little crew interaction for photos and deployment
 - were a little disappointed in photos returned but nothing to do with crews doing it, difficult for EVA crews to take detailed photos
-
- easily dissatisfied with process
 - need some mechanized device where some PD or PI can speak directly to astronaut
 - told by offices that capability has been made available to some, true for STS but not for ISS
[RC: feel you really needed to talk to crew but couldn't?] this mission had we been able to do preparative discussion with astronaut, mistake would have been avoidable
 - if I spoke to her 10 minutes or less, and I was on console, mistake would not have been made
-
- had to use a back door to get to the PI on orbit, we are very restricted, and understand the reason, a lot of people send e-mail to crew, seem to have paths that we don't , there were times needed to communicate crew but couldn't.
-
- we were able to sit on console, which was a terrific opportunity; would have been nice to have more consistent video feed, couldn't count on that.
-
- we had small barricades that existed with POD, with flight director, who would insert themselves, and this has gotten better since Increment 5.
-
- we have been accommodated for; the crew even volunteered something we didn't ask: crew time
 - we know crew time is very precious, and maybe it wasn't their interest level, but crew was good about working with payloads, want to do more than flipping switch
[RC: was sys and mechanisms set up for you to communicate to crew sufficient? this is what we are rating, not performance of crew, you may wish to change your rating]- not sure how to answer, only times we needed crew was training and ops
[RC: we are talking crew ops on orbit, any time you needed direct interface and something prohibited this from happening?] yes, we were told we could not talk directly to crew but had to go through console, so if part of general policy, was sufficient for me, but wish we could have had direct contact to improve quality of communication
 - couldn't talk directly to Peggy, had to pass message to console folks at MSFC; they passed on message; not something we really wanted, so console asked for everything in writing again, more specifically
-
- if this is considered policy, then this is constraining
[RC: what rating?] 3
-
- *meaning PIs who get to talk to crew on orbit?* *[RC: yes, you may have instructions to give, etc.]*
 - *electronic messages sent up?* *[RC: any kinds of messages, console, electronic, voice, etc.]*
 - need more on-orbit crew communications, especially when they are doing investigations for us
[RC: any time you needed quick communication with crew, and couldn't?] yes, true.
-
- I talked to Peggy via email, voicemail, PFCs, home, etc.; can't ask for anything more than that.
-
- very poorly, but improving with Increment 6, because crew is requiring it, since crew is customer in NASA's eyes.
 - was difficult to get requests and commands up, once gotten very much a disconnect
-

- has TreK station, too long to set up TreK at University.

- we have our requirements in place and our only interface to crew is to have them take pictures; folks at MSFC ensured they were taking those pictures as asked.

- really satisfied; we can send messages up to crew through the organization.

- very very happy; when we see video footage, which is what we had hoped to get, we got more than we expected, every requirement was exceeded in our expectations, we were kept well informed, easy part was getting on orbit, could not have been happier

- this experiment required very little crew interface on orbit
- if I had needed interface, would have been there to help

- don't have access to the crew in space directly, wish I did
- in my study, issues come up where it would be helpful to talk to the crew directly to get subjective.

- sometimes if not emergency, lag time between implementing can be very long, depending on shift for console person, if not buddy to help facilitate
- quite often because of animosity between centers, MSFC has to go overboard when they represent requests to JSC, we might come in with good request, so we have to go overboard with justification
- would be nice if crew, for each PI, an astronaut would schedule talk with PI for 15 minutes as part of their outreach to community and world
- those people are our technicians, so having 1-on-1 contact could be integral in working with research

- in general for this Increment, POD and POIC were pretty responsive to our requests
- past Increments, sometimes their filtering was a bit too strict, but it improved on 5, yet some problems with Increment 6

- we could've saved hours and hours if we could have spoken to him ourselves, or if messages were relayed in timely fashion; would've been easier if had interface to crew; can see two sides of coin
- a lot of times things don't get related to crew from us in a timely fashion
- sometimes questions we can ask
- setting up MSG has asked lots of questions but answers weren't always on target

- worked very well, because when it came to flight operations, people trying to do their best to accomplish things, crew did outstanding job.
- suggest improvement: I was mortified that somebody has set up a different communication system that does to MSFC POC that does not go to JSC mission control; crew indicates things on laptop that does go to POC but not to Customer Support room at JSC; Marshall had displays that JSC did not; Marshall should not have exclusivity to have things that JSC does not; anything Marshall has we should have; this is duplication and absurd.

- something [*respondent name omitted*] would better answer
- there were times we got good things, other times couldn't get, like hammer test on ARIS, good rapport and such; other times was not as good

- we don't need crew interface or need to be talking to them as PIs

- my investigation did not interface with crew on orbit

- we don't talk to crew directly, we speak to CapComs, but it has gone well with all experiments for operations

- we had a hard drive software booting error, we didn't have access to crew to do troubleshooting, was covered by crew time
- as Investigator and hierarchy determine your access to crew, make sure crew time is not overused; I would like to see more
- in Spacelab missions you weren't going to get access, but they were well-scripted and you had PIs talking directly to them
- same philosophy of scripting has been moved over to ISS, but not as effective; they're on for 3-months, in their off-time they like to fiddle, would be nice to communicate with us

[RC: local hot button of corrective action by OZ, anytime you couldn't talk to crew?] with our hard-drive error, we could have stepped through problem and brought back HD immediately, but instead had to be brought down, then up, then command, and it booted, but lag-time and lack of access made for more complex fix

5.2.13 Change Requests (Question 1.3.5)

The ISS Utilization Program performs a variety of tasks to disposition and process changes to the baselined requirements and agreements for an ISS investigation. For change requests that originate from the investigation's PI or PD, the efficiency, timeliness, flexibility and other aspects of the decision-making associated with the change are significant drivers for customer satisfaction.

Question 1.3.5 asked for survey respondents to rate their satisfaction with how the ISS Utilization Program handled change requests that were initiated by ISS investigations. The distribution of responses for all interviewees reflects contributions from very similar underlying score distributions for PIs and PDs that are quite narrowly restricted within the mid-point to satisfied range of the scale. The PD and PI-PD subgroups each have single outliers of 1 very dissatisfied respondent, otherwise PIs, PDs and PI-PDs can be said to share very similar levels of high satisfaction with how the Program responded to change requests.

Customer comments in this area are mostly neutral to positive. It appears that most changes are processed to the satisfaction of the customer.

Part 1. Cross-Program Feedback
Section 1.3 –Satisfaction with your Customer Support Interface
Topic Area: 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.

1 2 3 4 5 Not
 Very Very Applicable
 dissatisfied satisfied

All Interviewees		PIs Only																									
No. respondents in category:	34	No. respondents in category:	17																								
Response rate:	34/34 (100.0%)	Response rate:	17/17 (100.0%)																								
Applicable responses:	19/34 (55.9%)	Applicable responses:	7/17 (41.2%)																								
Mean rating:	3.7	Mean rating:	4.1																								
Mean score ranking in section:	6/11	Mean score ranking in section:	4/11																								
Median:	4.0	Median:	4.0																								
<table border="1"> <caption>Satisfaction Data for All Interviewees</caption> <thead> <tr> <th>Rating</th> <th>Percent (%)</th> </tr> </thead> <tbody> <tr> <td>1-Very dissatisfied</td> <td>11</td> </tr> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>3</td> <td>16</td> </tr> <tr> <td>4</td> <td>53</td> </tr> <tr> <td>5-Very satisfied</td> <td>21</td> </tr> </tbody> </table>		Rating	Percent (%)	1-Very dissatisfied	11	2	0	3	16	4	53	5-Very satisfied	21	<table border="1"> <caption>Satisfaction Data for PIs Only</caption> <thead> <tr> <th>Rating</th> <th>Percent (%)</th> </tr> </thead> <tbody> <tr> <td>1-Very dissatisfied</td> <td>0</td> </tr> <tr> <td>2</td> <td>0</td> </tr> <tr> <td>3</td> <td>14</td> </tr> <tr> <td>4</td> <td>57</td> </tr> <tr> <td>5-Very satisfied</td> <td>29</td> </tr> </tbody> </table>		Rating	Percent (%)	1-Very dissatisfied	0	2	0	3	14	4	57	5-Very satisfied	29
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PI-PD Dual Role		PDs Only																									
No. respondents in category:	5	No. respondents in category:	12																								
Response rate:	5/5 (100.0%)	Response rate:	12/12 (100.0%)																								
Applicable responses:	4/5 (80.0%)	Applicable responses:	8/12 (66.7%)																								
Mean rating:	3.0	Mean rating:	3.8																								
Mean score ranking in section:	5/11	Mean score ranking in section:	7/11																								
Median:	3.5	Median:	4.0																								
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Question 1.3.5 – Comments

-
- what we had happen a couple times, asked for changes, this hardware is very simple, bolt gets cranked for certain adjustments; when we asked for the bolts to get cranked, we got it done, but didn't know if it would happen, and it got done, but rather hard to know how flexible crew timeline was, hidden process, make request and unknown how change is processed
 - not aware if CRs are turned down if reason is given
-
- my requirements did not change
-
- we didn't have too many problems with processing a CR, driven by EPIM
 - some times they dragged and takes some patience but I've been happy with that
-
- we didn't really have any
- [RC: no CEFs?] no*
-
- I don't think from our initial...trying to think if changes were made...
 - a few of the experimental requirements worked into system
-
- change request process is low on my scale, that's getting request processed; implementing the change would be higher; configuration management seems to be "loose," we put a CR in, it gets changed without coordinating with PD
-
- we didn't have change per se, only changes were during real-time ops to incorporate extra sites and it worked fairly well, back to communications in MSFC structure there.
-
- during development we did make changes, the Wylie team did panic and adapted and during the operation we had to make a change; watching video saw something that was not correct and they were able to help us out, but based on overall, it still merits a 3.
-
- over the 3 years of course, we made many changes, EPIM handled pretty well, they seem to understand why we change, sometimes on NASA side, they tended to be arrogant because they heard about it
 - sometimes discussed possibilities with EPIM, NASA heard about it, they called and said you cannot do that change because there was science requirement affecting change
-
- I don't think our requirements changed, we did have software change that was rejected, our operations requirements have been static
-
- what kind of scope?
- [RC: very broad, development, hardware, communication with crew]*
-
- we would like to see more crewtime for CEO, has always been issue debated, crewtime been an issue for different codes
 - if we have an episodic event and there is not enough crewtime, our data may not be covered
- [RC: if there were any instances you went to Program with and show concern for change...]*
-
- so this is how they responded? *[RC: yes]*
-
- I don't think we had any changes to science or integration, more based on schedule changes
-
- we did have change toward end of program, was very satisfied with getting it changed, getting approvals
 - no changes at all for 3 increments
-
- went pretty well
-
- no major changes, only minor and they were well-attended to
-
- whenever we had to change, had to deal with awkwardness, not easy to do, time consuming and complicated to get through, correct changes, spit back we don't like this or that, lots of man-hours spent on efforts shouldn't have to be spent
 - person dependent
-
- our requirements didn't change, once we were approved in system, all flowed well.
-
- with the changes, people respond real quickly to understanding and accommodating the change.
-
- we didn't make any changes, did what we proposed pre- and post-flight
-

- had identical requirements from beginning

- I don't believe for this experiment we had any changes.

- nothing changed significantly from beginning
- small changes in their own experiment logistics, not programmatic

- real-time ops people were perfect
- on orbit, weren't very good for changing things
- CR process ran into political infighting not based on objectivity or flexibility not stuck on paper process or personal gain

- didn't have any changes

- CEF process a little difficult to navigate through
- not clear what criteria OZ uses to accept a CEF
- real-time ops changes about same rating

- does this include timeline changes, schedule changes, etc.? *[RW: Yes, I'd consider this relevant, but more so we need 2 MLEs instead of 1 MLE, or more crew time, etc.]*
- there is more of a manifest change this talks about, and how it works
- getting problem getting unilateral things, samples not always coordinated with Research Program
- JSC puts in changes for us with bad data
- when you look at actual requirements for actual investigation, and from where Linda sits, not a big deal
- our operating times are so similar, a lot lower than what we were told
- crew time probably had not enough
- perhaps more non-applicable to me
- MSG supplied MW with data, so my requirements didn't change
- *[RC: fair to put down non-applicable; PIRNS] every one we survived, I think we'll give that a 5*
- PIRN process is pretty transparent

- had decent experience with change due to electrical connections at Cape. Got good consideration in general.

- I don't think there were any changes to our requirements, pretty straightforward

- didn't have any science requirements

5.2.14 Communication with Support Personnel (Question 1.3.6)

For large technical programs, such as ISS Utilization, the attributes of an organization's communication with its customers are a key driver to customer satisfaction. Question 1.3.6 performed an assessment of how the ISS Utilization Program handled communication with its customers. For all interviewees, responses were solidly in the satisfied range of the scale, with only 6% of respondents scoring a 2 or below. The response distributions from PIs and PDs are similar to each other and to the response population as a whole, with the data set for both PIs and PDs reflecting a high level of satisfaction with communication flow. By comparison, the mean and median scores for PI-PDs are shifted one full scale point lower than for PIs and PDs, indicating that this group is measurably less satisfied with communication flow.

Comments were generally positive about direct communication with Program personnel. First time PIs desire more communication, and note they could have benefited from mentorship. Several PIs noted that their communication with the Program was limited, making them feel to be somewhat in the dark. One customer emphasized the importance of handover between shifts and the Payload Operations Integration Center, and suggested an empowered central point of contact for this activity. Off-nominal situations were noted to increase the communication flow to an intolerable level for the customer.

Question 1.3.6 – Comments

-
- sometimes too many contacts, see previous comments
-
- bit of lack of communication, process is many years long, how did we get in situation where furnace was, room for improvements in, mentorship would be important, procedures, first time PI does not know what to expect, room for improvement
-
- difficult to find right person to answer question correctly
-
- blessed with very kind and patient people to helping us get educational payloads flying
-
- flow gets back to avenue of improvement for all areas between experimental scientists to me to person who oversees experiment to person who oversees science
-
- it seems to be a very flat organization; if there's trouble, talking to the boss gets things done. [RC: *meaning upper level is very accessible?*] Yes, that's true.
-
- Mr. Miley kept us very well informed. Mr. Hols from RPO kept us very well informed as well.
-
- everybody, if you had a chance to talk to them, they were good. The people were good. It is more the processes.
-
- is this talking on-orbit ops? [RC: *Yes, all*]
-
- any kind of a hitch can cause overload
-
- most of time if things are going, its tolerable, what you expect, people want data updates, etc., but if there is an anomaly/glitch, the scrutiny is unallowable, painful
-
- most of the time I don't think it's bad, it's tolerable
-
- happy with IPIM and lead increment scientist for HLS
-
- would improve in area of PIM
-
- I heard from them every day; communicated overly well
-
- some groups are outstanding
-
- communication flow obsolete if used PDL
-
- communication must be forced, not very speedy
-
- some cumbersome to track down
-
- good communication with Suzanne and LMCO folks
-
- never really talked to anyone personally; felt like I had no direct connection.
-
- would have preferred to have had more two-way communication.
-
- satisfied more because I don't remember anything bad about it
-
- had constant communication, weekly telecom during critical phases, now monthly
-
- marked down from 5 since too many emails, needed answers a bit too quickly, but overall excellent
-
- [RC: *includes Michelle and down*] excellent, very satisfied with everyone working on this study
-
- communication with PIs is important and needs to be more frequent
-
- performance all over the map, times when excellent, times when it fell apart or didn't happen, no bimodality, even for HLS
-
- communication flow is proportional to efficiency to mechanism
-
- my past comments reflect this
-
- communicating through-put was good and proactive
-
- caveat that I still think improvements could be made at MSFC in ops area; see earlier suggestion about having a more central point of contract and they have authority to make sure things are carried out and assure things are transferred between shifts in a more timely and better manner.
-
- sometimes good, sometimes not so good, goes back to previous comments, some areas too many contacts, manifesting had too many, some we still haven't figured out who to talk to on trash processing
-
- office to office? [RC: *yes, example, you tell manager and hope he tells subordinate*] too many people
-
- nothing comes to mind as true showstopper
-
- we felt like we were always plugged in, never overburdened by communications
-

- in Increment 5, we were having EXPRESS rack telecons where we'd get that flow of info, but they've since been discontinued

- trying to think what communication I had with ISS Program, and it was pretty much none

[RC: HLS counts]

- I was very satisfied in that case, within HLS program

- communicating landing time, return of payloads, late load, our spec is a requirement we unload within 4 hrs of STS landing, getting word out to PIs to be there to catch samples (at KSC or MSFC) was not optimal at times

- talking with you folks, George, James, about things in general, not necessarily SAMS things, just general communication with you answering phones, etc. was good

- been outstanding, very clear notes

- more information needs to be provided initially when the experiment team is asked for a quick response to ISS questions.

5.2.15 Information Sources (Questions 1.3.7, 1.3.8, 1.3.10, and 1.3.11)

The Survey investigated several aspects of how well the ISS Utilization Program supported customers with respect to their need for various types of information. In one approach to this issue, Survey participants were asked to rate their satisfaction with the ease of locating necessary information (1.3.7) and also accessing information once it is located (1.3.8). The questions did not restrict or specify the type of information being referred to in order to provide a generalized assessment.

For all interviewees, the satisfaction ratings for ease of locating necessary information ranged across the scale, with a mean score slightly above the mid-point, and a median of 4, which is well within the satisfied range. Because the distribution is fairly broad there was a significant 19% tail of all interviewees within the dissatisfied range (score less than 2), but this is still less than half of the 51% of satisfied respondents. The responses distributions for the PI and PD demographic groups show some differences. Although both distributions have essentially normal characteristics (the mean and median values match within each distribution), the mean and median scores for PDs are shifted a whole scale point lower than for PIs. This translates into 25% of PDs within the dissatisfied range as opposed to only 6 % of PIs. The responses from PI-PDs show a bi-modal split, with 60% (3 respondents) in the dissatisfied range, and 40% (2 respondents) in the satisfied range.

Satisfaction with accessing information was generally higher for all groups compared to locating information. For all interviewees, as well as the two main sub-populations of PIs and PDs, there are an approximate 80 to 90% of respondents who selected scores in the satisfied range, with only minor outliers in the dissatisfied range. PI-PDs showed evidence of being divided into satisfied and dissatisfied groups of approximately equal size.

On more specific topics related to information, respondents were asked to rate their satisfaction with any educational/orientational information received from the Program at the outset of their project (question 1.3.10). The question supported ISS Payloads Office objectives related to improving informational products or services provided to PIs and PDs in the early stages of payload development. The responses from all interviewees showed a classically normal distribution with 25% of respondents scoring in the satisfied range and 35% dissatisfied. Mean and median scores were the lowest among all questions pertaining to satisfaction with customer support interfaces. The score distribution for all respondents mirrors very similar distributions in all of the contributing demographic sub-groups, indicating a similar low level of satisfaction on this question for PIs, PDs and PI-PDs.

Because NASA and the ISS Utilization Program have placed increasing emphasis on distributing information through electronic means, question 1.3.11 asked for feedback on the usefulness of information released through electronic media, including websites and CD-ROMs. The responses to this question from all interviewees are predominantly within the satisfied range of the scale (54%), with only 12% in the dissatisfied range. The response data for PIs and PDs are similarly distributed, with ~60% of responses in the satisfied range. For PI-PDs there was a single very dissatisfied response, with the rest either at the mid-point or within the satisfied range of the

scale. Additionally, when asked, the majority of customers had neither heard of or received the ISS Payload Information Source CD, yet expressed this CD would be something they would liked to have received.

Customer comments uniformly recommend further centralization of information sources, particular web-based sites. User-friendly navigation through information sources was also noted as needing improvement. Customer comments were negative about orientational material available to them at the beginning of their integration. Increment 5 customers did not have access to the ISS Payload Information Source CD-ROM early in their integration, so it did not affect their opinion significantly. Customers note frustration with firewall security and only being allowed access to some websites. The Program Automated Library System (PALS) received mixed reviews; some customers appreciate it but other customers found it troublesome. The Six-Sigma action now in place to develop a central website portal for customers (payload developers) is consistent with, and responsive to, the Survey comments in this area.

Question 1.3.7 – Comments

-
- if I had a problem, would ask engineer or scientist; didn't go to any ISS location for getting information
 - since CEO came out early, we have lots of documentation; don't go to ISS for information often, might have to do a little work, but is OK
 - I remember trying to find pictures of hardware, went right to engineer, this goes back to question, if I had any questions, I'd know whom to call, my results were contingent upon use of my team
-
- locating info was pretty good, asking for it, the support group was pretty good at finding it
-
- *what kind of information, related to experiment? [RC: some examples are--I need to know if ISS can do this, or whether labs have this type of med equipment, etc.]* my database was managed by Alicia; if I had problems, I'd ask her
-
- pretty good websites; could go to web vs. calling PIM when needing info
 - everyone's got their own website it seems, needs centralization
 - some of Lesa Roe's things being done now are going to be very helpful
-
- very simple, called Bob Miley (PIM), so we had no problems
 - this particular aspect of doing business, if having gone through this before, you learn what documents (to seek) and to whom to talk; if you're first-time user, you have trouble locating which documents are important and with whom to speak
 - just because for PALS you have to know the document number or some work in title before you can find it, I guess there could be a real improvement; in Increment 5, I didn't know if there was a central document (repository) to see all the other documents that were needed, or if I should have been looking for a document tree of some type
 - unless you know what you are looking for, it is hard to locate a document
-
- we relied on our various individuals to get us information and we quickly got an answer or the information was supplied to us; if someone didn't have the information, they would get it for us, we got this from our payload developer
 - wish I could give 3.5 because most of the information I can get from IDD that is considered as bible, but if you look at the document, and I started handling in 1999, there were many empty spots there; they had no clue what they put in, over time, blanks got filled in, but some info is not specific enough, e.g., labeling, we had many problems with this
 - bar coding, every piece must be bar coded; good intentions, but always feasible
 - for veteran PD, would rate 4, but for freshman, they might ask me questions, but they would get lost in system, information is important but difficult to find
-
- if I needed information, I'd go to Dave or Carin; one Increment Scientist was Lock Pooja(?), anything I needed I called her and enjoyed working with her much
 - impossible; learned to do things sometimes, then they disappear
 - very difficult to do, not a lot of improvement in this area
-
- specifications of hardware were affected by contractor not measuring specifications as expected, access (getting) to ground unit was a problem, PI has experience and would like to get to ground unit, engineers don't think like PI
 - there is some Boeing documentation that needs to be released like NASA documentation so everyone has access to see and use, but just Boeing could not get privy.
 - sometimes you don't know what to ask for, and have to poke around web pages, etc. until you find; no master list anywhere it seems; that may be a function of PIM, they could offer some of that information
-
- [RC gave clarification]*
 - this didn't occur very often; probably there could be databases about what is on the ISS in actuality and develop greater satisfaction
-
- if we had overview of what info was needed
 - we were more reactive than proactive because of that lack of extra insight
-

- have had difficulty and problems locating info in PALS, found it cumbersome and hard to locate information

- Suzanne was main POC, and was very helpful

- spent much time tracking down info for group; inability to get to libraries and stuck outside of firewalls was very frustrating; had to request things by email transfers; when exporting issue came to, became counterintuitive; PALS and PILS were a monster at not finding information; goes through many websites to find information

- heard of EPIM one-stop shop for getting access to necessary information

- export control issue has drop-off line, and link no longer accessible, no one to call, literally hit brick wall and start from ground zero

- great if One NASA would result in consolidated databases that you don't have to look around for other databases

- never had a communication problem; never had to locate any info, was all given to me, had access to info where needed; people tried very hard, it was requirement that was screwed up, not the people

- PALS is so hard to use, finding documents, determining right version of document

- it's all out there somewhere; had to go to many websites to find out schedule information, JSC, PMIT, manifest groups

- number of layers and places you have to go to see document, many places you have to be are wrong

- got to have login/password, approved for accounts, etc., finally when done

- *[respondent name omitted]* trying to get timelines, 3-4 databases, not always the most current information; don't know which is latest

- definitely not named according to what data is available, not self-explanatory

- got requirements documents, based our MEPS development on these, but requirements were changed in real time, had people who could tell us what really was happening; people should have known about changes, but we had to find it ourselves, support people didn't know where it was.

- password changes on PDL were a problem.

[RC clarified meaning of locating] we've had those discussions with ESM and ESS

- trying to find out how things were progressing on ISS, looking to add some science, might require more hardware

we want to bring frozen samples back, but on Shuttle no capability, so science is limited, so getting that relevant info has been easy through our NASA interfaces

- *define information [RC: you're doing work, and need to decide X to help SAMS, where can I get objective info]*

- difficult to get access to JSC based info in systems, e.g., MUSE data, operational data, what was operating when, etc.; this has again quickly become unique SAMS thing where some fluid combustion test or another etc. didn't matter

- we had different kind of info needed than conventional science experiment

- since we were remote, breaking down JSC wall, access to JEDI timeline for ISS was difficult to get

- asked people but not satisfied, would have preferred ways to locate by myself

- to improve, centralize the access of the so-called necessary info, e.g., one homepage and broadcast a message that it is out there

- thinking of support activities at KSC, was not clear to me how we went about obtaining those services

- the RPO worked that with ISS and with whomever it needed to be worked with, and in that vein, worked OK, but I was a little bit concerned that I didn't understand how it would work, and I spent some time with my fingers crossed hoping things would come out OK

- that comment aimed more toward my interface with my RPO

- a central web site with links to all related sites would be useful; this could contain links to websites that would be of value to the scientists (i.e., station altitudes, accelerations, dockings, etc.)

Question 1.3.8 – Comments

-
- once you know where to find, easy to get.
-
- you have to go through different boards to get Boeing to get it released; if in PALS or other accessibles like NASA documents, would give 5 rating.
-
- not very satisfactory, even once found, takes time and money
 - use concrete examples
-
- any information needed would have to go to PALS
-
- once you can find info, typically perfect
 - sometimes instrumentation is bumpy to download
 - manifests to print thinks it is for JSC, etc., getting to local level can be difficult.
-
- once I found it, it was OK
-
- if I had any problem, just a call and people would point out the correct location
-
- at this point, as time goes on, we need to know what's there, than can access; we don't get enough feedback on how to access these plentiful things
-
- a different problem, been evolving, this getting worse not better; JSC is pretty much moving to everything on the web, trouble is firewall, this can't be under emphasized for someone outside the firewall; got emails with links you could access because you are outside the firewall, network security is running rough shod over entire Program, network secure nobody can (access) us, documentation on web got updated but didn't tell anybody, but they would change information, in the meantime they changed the document and didn't tell us,
-
- certain things could be hard to access, but not always
-
- usually, it was documentation we were looking for, and support staff was very timely sending it up
-
- everything I needed I got, any questions I had were answered
-
- once found, easy to access
-
- same comments as before, see previous comments
-
- that's not difficult, once you know your SSP number, you can read it on your screen and enable downloading and printing.
-
- re: databases, not that easy, moderately difficult
-
- same situation
-
- usually when we can find it, we can download well, multi-platforms
[RC: other ways of accessing?] we try to do everything electronically, PALS is a pretty good tool
-
- I don't remember any instance of having located info that I could not access, thinking PALS
-
- repository of info that is web-based, all went pretty smoothly
-
- when it's web-based access, I'm very satisfied, but I rely on human access quite a bit
-
- as per previous question's comments
 - locating was easier than accessing due to being outside of JSC walls
 - to make better, having met some MER folks, makes it better
 - we realized we're unique and different payload from everyone else, so Program would have to jump through major hoops to accommodate, but that's extreme, maybe education or handholding might warrant that
-
- in my experience, essentially same as previous question, no problems with that
-
- had to find somebody who would get information for us, information that should have been timely was not available to us, for example, interface requirements for payload seal at back of MEPS; temperature profile for MPLM was not received until the last week of January, but asked for it right after our mission; took 7 months to get the data, somebody had it; where was the temperature sensor relative to my experiment? being asked for power profile

for our EXPRESS rack location but still don't have it; been going through EPIM for that information; asked for information at Mission Control, they said they had it but still don't have it; RPO has not tried to help us find the data; right now it is difficult to get data we know is there.

- mainly regarding on-orbit payloads...

- some of this is MSFC, some JSC

- once it is located, doesn't take much to access always

- lots of times you have get passwords, etc., can be painful at times, but realize it is necessary

Question 1.3.10 – Comments

-
- didn't get any, I was guinea pig investigator, mine was first program approved for engineering
 - neutral
-
- had meetings on regular basis; not done very well
-
- Debbie was not here, was not what I received
 - expected someone to come in and orient us, step by step, and bring up to speed, could have communicated this to PIs and educators
 - could have facilitated some of that given some criteria on how to ask more
-
- don't remember receiving much pertinent info about the Program; can't remember
 - at the outset, was floundering looking to get stuff; key is PIMs, they understand the process more now.
 - tremendous improvements made.
-
- knew system well enough, was not needed
 - don't think we have very good 1-stop shopping place for all boards, reviews, etc.
 - for Investigator, give general outline of all the committees along with short description of what panels do, he never received
-
- is/was OK; sometime didn't know things because Program didn't know things; had to learn with Program.
-
- I didn't receive any of the information; with my ISS experience, didn't feel it was necessary to ask for this info anyway.
-
- don't remember anything or if I got something
-
- we flew blind; this is tempered by knowledge we were early in the Program, we know this is new, not dissatisfied very because my expectations was low.
-
- didn't receive any formal education or orientation; entered Program with no prior insight into the Program
 - would have liked more information, but nobody seemed to know what to give
-
- didn't get any, would've been helpful if we had gotten something, heard a lot of information was sent to new PIs, but we were early in game, but I believe it has been corrected, and would've liked to have received
-
- I don't remember any orientation, just remember growing into it from Shuttle-Mir
 - this is a learn-on-the-job, if there was any orientation/education, I didn't know about it
-
- at beginning of the investigation, we were invited to many meetings and received stacks of papers with introductory information that was very good
-
- was useful but took up much time to go through
-
- we got enough info, was good
-
- didn't receive any, if I were (flying) a new payload that would not be OK, but because I've been around I didn't feel I needed any particularly by Increment 5
-
- we didn't get any information, but might have been nice to get more information
-
- I wasn't a novice when this happened, would have to go back to first mission 7A.1, could say not a lot of information
-
- no how-to guide;
- [RC: got payload info source CD?] no*
-
- being a NASA Center and evolution/development of ISS, we were well satisfied and understood everything we needed from Program set out to develop our experiment
 - unfair question for SAMS because much in parallel from past for development, we didn't have a lot of stuff, still designing
 - (idea of a) Payload Info Source CD is great but nothing SAMS related and should be, good for new PD, what ISS can offer you beyond what you can develop yourself
-

- when I personally started working on HRF, ISS was established, and came on team, and wasn't sent anything but not of fault of Program, but learned from team members

- don't remember getting any info

[RC: being you didn't receive any, how do you feel about this?]

- if I look at my RPO as extension of ISS Program, we have document for work instructions and development of experiments that were like orientational information, so it was very good

- if I could include my RPO, then I'd give a 4, but from OZ, never saw info on payload development and manifesting process; in that respect I'd be somewhat dissatisfied that that information does not exist or conveyed to PDs

[RC: you can include RPO] in that case, I was very satisfied with that information from RPO, and from Station itself, I didn't get anything; could be improved upon a bit

- I don't recall anything like that, getting any packet of material

- fine with me, but an analogy, NSF has project and has actual packet of info they send potential PIs describing the Program with the anticipation that the PIs will travel; might be helpful to get new PIs something that is put together like that

- don't recall ever being sent anything

- partially helpful, received the ISS User's Guide

- aware it's available now but on a high level, not as deep as would've liked

- got very little information up front that told me what we were up against

- we were early in the game as a rear-breather; isn't fair to fault program because we were early.

- anticipated it would be more difficult; turned out documentation was miniscule at beginning; payload integration tracking log that clearly didn't apply, but I had to justify that it did not apply to me, even though it was obvious it did not.

- don't remember receiving anything like that; been working on SAMS for ISS for a long time

[RC: satisfied you didn't get anything?]

- for attitudes, axes, definitions, it was ok

- I don't remember, since I don't know if applicable to MSG, getting any educational/orientational information at all; any information I needed, I went to MSG for it

- could have reallocated our funds if we wanted to benefit

[RC: clarified and reinterpreted question; they misunderstood]

- we got some materials, attended a PWIG and some people we interacted with, but not able to do regularly

- some ongoing teleconferences attended

- we were supposed to be on 6A, ended up on 2A.1

- some emails about real time ops with presentations

- did get the ISS Payloads Info Source CD but didn't review

- wasn't here for outset of project

Question 1.3.11 – Comments

-
- never got the Payload Info Source CD, but got post-flight reports
-
- not dealt with this very much, but have CD of post-flight reports
 - did not receive ISS Payload Info Source CD
-
- did not get any CD-ROMs; website that is there seems to be good, but can't get to half of them
 - lot of information and useful material, but in my personal opinion, the way it is organized and presented, could use more organization
-
- had not used any
-
- did not get CD Payload Info Source
-
- there is an HRF website that talks about equipment that is available to HRF experiments on orbit, and things like that; could be better information conveyed as to the services and support provided through HRF HLS RPO
 - did not get ISS Payload Info Source CD; would love to have one
-
- some of the electronic reference material can be improved
 - websites, more centralization, human spaceflight site; I go there for almost everything, would be good for Utilization to have similar setup
-
- we used their websites periodically, no use of CD-ROMs, and we do get time histories and orientations and pointing maneuvers and characteristics, satisfied with what we perceived
-
- haven't used much
-
- did not get copy of Payload Information Source CD
-
- didn't use it or need it, not an impact to us
-
- did not receive Payload Information Source CD
-
- I used the websites and the PALS library all the time; very very useful; good to have that good information
-
- If Boeing info was available to those resources would be much more helpful.
-
- Once you know where they're at, then can go from site to site to get what's needed.
-
- *[RC: work on giving people better rollup where things are?]* yes, in 57000 documentation, you get a list of all the pertinent documents; if you had an informal list of organizational tree, pages, data available on web pages that might make searches for this stuff a whole lot easier.
-
- never received any CD-ROMs personally, but only ISS Post Flight Research Reports came to Debbie Brown
 - never got to Payload Info Source CD
 - have used some websites
-
- never really had to use anything other than websites
-
- haven't used and didn't know much about it; Program could communicate more of what we have and how to get to it
-
- websites and CDs getting better
 - too many locations, difficult to know where to start; could use some navigational aids
 - some internal documentation still not accessible, but JSC is doing slightly better job at making accessible, especially post-9/11 for public access
 - Ames is still difficult
-
- can usually find everything I need
 - in PALS, finding KSC or JSC document, PALS only offered ISS
 - can't get to data from single location; all out there, hard to find
-
- didn't get any CD-ROMs, haven't used website lately
 - got ISS reference manual from web
 - *does this include MUSE subsystem data? [RC: get from website, then yes]*
-

- for most part, we didn't use those
- did not see/receive ISS Payload Info Source CD

- some of generic information that was provided could have been better, but in general it rates a 3; training tapes were useless; attempts were being made but unsatisfactory

- I don't use them, not sure they're out there, nothing sent to me
- more educational than research useful
- reflects lack of use vs. I use and have specific critiques, but not aware of availability of electronic products

- didn't recall seeing the ISS Payloads Info Source CD, but may have; did get post-reports CD, but websites have been very helpful and kept well updated

- websites were good
- did not get ISS Payload Info Source CD, but got Post-Flight Reports

- see prior comments, saw little info come through
- haven't gotten Payload Info Source CD

- an as-flown timeline, web-based would be extremely useful in data interpretation

5.3 Survey Part 2 – Feedback on Specific Management / Functional Areas

The objective of Part 2 of the questionnaire was to obtain feedback on specific management areas within the ISS Utilization Program in such a way as these areas could be cross-compared according to different customer satisfaction metrics. In selecting and defining the management areas to be evaluated, consideration was given to how customers conceptualized and "experienced" the Program organization, as opposed to how the Program looked on its organizational charts. Although this approach had the potential downside of convoluting eventual assignment of corrective action, the survey and interview process became more productive by being clearer for the interviewees. It was also recognized that no matter how the management areas were defined, not every PI, PD or PI-PD would be experienced with every area, depending on how their direct programmatic and technical support was structured. Part 2, therefore, had an option page preceding the question set for each management area that explained the area's scope and function, and allowed respondents to skip the question set if they felt their knowledge was insufficient to form a basis for judgment (see Appendix A).

The management/functional areas surveyed in Part 2 of the questionnaire are:

- **NASA Payload Development** - the performance of payload development tasks for an ISS investigation by a team provided or managed by NASA. If NASA performed payload development for an investigation, a Survey objective was to obtain feedback on NASA's performance from the PI and possibly also the PD if the latter had no apparent conflict of interest.
- **Research Program Office (RPO) Project Management** – Management and oversight support performed for various aspects of an ISS investigation by personnel within the RPO sponsoring that investigation. In particular, this support includes oversight of payload development. Respondents were asked to consider any RPO support related to payload tactical planning and manifesting under the next area below.
- **Research Planning and Integration** – Management functions that support flight manifesting for ISS investigations through the activities of the Research Planning Working Group (RPWG) sponsored by the ISS Payloads Office. This area includes RPO representation of investigation manifesting requirements to the RPWG.
- **Mission Integration** – Functions that manage and integrate NASA ISS flight, stage, and Increment activities. This area includes products and services of the Payload Mission Integration Team, Payload Tactical Planning, Payload Integration Manager services, and the payload Certification of Flight Readiness implementation plan.
- **Payload Engineering Integration** – Performs management tasks designed to assure that payload hardware and software are engineered to operate compatibly with hardware and software for other payloads, and with vehicle hardware and software. This element includes development and management of interface requirements and payload verification against these requirements.
- **Operations Integration** – Performs planning and integration of the operational procedures for ISS investigation payloads. This function includes Increment Research Team support for operations execution preparations.

- **Real-Time Payload Operations** – Includes coordination of actual on-orbit payload operations through the activities within the Payload Operations Integration Center at Marshall Space Flight Center and the Increment Research Team and Lead Increment Scientist in the ISS Payloads Office at JSC.
- **Payload Safety** - Includes the support activities of the Payload Safety Engineer assigned to each ISS payload, and conduct of safety reviews and safety decision-making by the Payload Safety Review Panel.
- **Payload Physical Integration** – Management and support of all tasks required to physically integrate investigation hardware at the Space Station Processing Facility at Kennedy Space Center prior to launch.

In order to obtain information that would facilitate cross-comparison of customer satisfaction for the above areas, Survey respondents were asked to rate their satisfaction with a set of product and service points-of-interaction that the areas had more or less in common. Such a cross-comparison was considered to be a useful management tool for prioritizing changes and improvements to Program processes in the near term, and tracking the effects of these changes on customer satisfaction in the long term.

For each management area, survey respondents were asked to rate their level of satisfaction on a 1 (very dissatisfied) to 5 (very satisfied) scale with the following product and service points-of-interaction:

Services: guidance, clarification and support tasks provided to the respondent’s investigation(s).

Processes: timelines, schedules, templates and Program plans the respondent’s investigation was expected to follow.

People: interpersonal attributes of personnel within the management area.

Hardware Tools: hardware provided to support an investigation’s tasks.

Software Tools: software provided to support an investigation’s tasks.

Documents: written documentation provided to support an investigation.

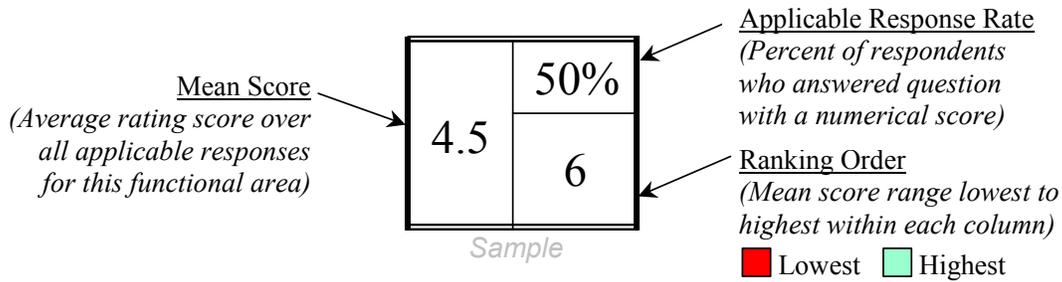
Deliverables: the requirements for data and documentation delivery from the survey respondent.

For some management areas, certain products and services were not relevant and were not included in the question set, see Appendix A.

5.3.1 Survey Part 2 Results - Management Area Satisfaction Cross-Comparison

An important product envisioned for the Part 2 response data was a cross-comparison of the defined management areas on the basis of their satisfaction mean scores for all relevant points-of-interaction. Such a tabular cross-comparison is shown in Table 5, and is based on the entire population of Survey respondents. Table 5 is designed to facilitate comparing management areas to one another column-wise within a single product or service category, with the highest and lowest scores for the management areas within each column being highlighted.

Table 5. Satisfaction with Specific Management Areas – Mean Score Cross Comparison



MANAGEMENT AREAS	Services		Processes		People		Hardware Tools		Software Tools		Documents		Deliverables	
NASA Payload Development	4.4	50% 1	4.3	47% 3	4.7	50% 2	4.4	15% 2	3.8	15% 3	4.0	44% 5	4.3	44% 2
NASA RPO Project Management	4.3	59% 2	4.3	56% 3	4.7	59% 2	5.0	9% *	5.0	6% *	4.2	35% 3	4.4	53% 1
Research Planning & Integration	4.1	50% 3	3.7	50% 5	4.4	53% 4	--	--	--	--	3.6	41% 7	3.7	41% 5
Mission Integration	3.8	56% 4	3.6	56% 6	3.9	56% 6	--	--	--	--	3.7	47% 6	3.7	50% 5
Payload Engineering Integration	3.7	41% 5	3.4	41% 7	4.1	41% 5	4.5	11% *	--	--	3.6	41% 7	3.6	41% 6
Operations Integration	3.6	47% 6	3.4	47% 7	4.1	47% 5	--	--	3.1	30% 5	3.6	35% 7	3.8	44% 4
Real-Time Payload Operations	4.1	70% 3	3.9	70% 4	4.5	70% 3	--	--	3.2	50% 4	4.1	50% 4	4.1	59% 3
Payload Safety	4.3	50% 2	4.5	47% 1	4.7	47% 2	--	--	3.9	20% 2	4.4	44% 2	4.3	50% 2
Payload Physical Integration	4.4	50% 1	4.4	50% 2	4.8	44% 1	4.6	35% 1	4.6	24% 1	4.4	38% 1	4.3	41% 1

* Not ranked; applicable response rate considered too low. (See Section 5.3.1 for further explanation.)

Since, as previously noted, respondents had the option of not providing responses for management areas with which they were not familiar, the variability of the applicable response rate (% of survey participants making an applicable response) was higher for Part 2 questions than for Part 1. In order to help take this variability into account in comparing the Table 5 data, the table lists the applicable response rate adjacent to the question mean scores. The majority of questions had response rates in the range of 30 to 50%. Questions with response rates below 15% were considered as having too few responses to be included in the mean score rankings.

The concentrations of low and high mean scores in Table 5 are predominantly within the following management areas:

- Mission Integration - lowest score for People, next-to-lowest scores for Processes, Documents and Deliverables.
- Payload Engineering Integration - tie for lowest for Processes and Documents, lowest for Deliverables, next-to-lowest for Services and People.
- Operations Integration – lowest score for Services, Processes, Software Tools and Documents, next-to-lowest for People.
- Payload Safety – highest score for Processes, next-to-highest for all other relevant areas.
- Payload Physical Integration – next-to-highest for Processes, highest score for all other relevant areas except Processes, next.

With regard to the management areas with lower scores, an important analytical point is that the *absolute values of the scores for these areas are still all above 3, the mid-point for the rating scale*. Thus, none of these management areas can be said to have scored in the dissatisfied range, and all are either neutral or within the satisfied range.

The more detailed picture of the management area scoring for each product and service point-of-interaction can be obtained from a review of the Part 2 score distributions plots and customer verbal comments provided in Appendix B.

5.4 Survey Part 3 – Open Ended Feedback

The discrete, focused feedback collected by the closed-end questions in the first two parts of the survey was supplemented by an opportunity for respondents to elaborate with thematically-directed verbal comments in Part 3 of the questionnaire. Experience with the Needs Assessment study during the Survey design process had demonstrated the value of allowing respondents an unconstrained opportunity to freely direct feedback toward Program issues that they considered important, as opposed to those the Program considered important. The Needs Assessments had also shown, however, that verbal comments needed some constraint in order to be efficient and productive. To enable this opportunity, the topic areas of Program Strengths and Program Weaknesses that had been used successfully for the Needs Assessment were also used in Part 3 of the Survey. A third topic devoted to Lessons Learned was also added. Part 3 closed with a final comments section designed to collect verbal feedback on any uncategorized subject the respondent might have wanted to discuss or might have forgotten to mention during previous parts of the Survey.

5.4.1 Program Strengths and Weaknesses

Interviewees were asked 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 itself, and answers outside this scope were obtained. The interviewee team did, however, remind respondents not to neglect the ISS Utilization Program in their comments given that it was the primary scope of the Survey.

The answers to the questions were transcribed and compiled after all interviews were completed. Two members of the interview team and a third individual not present during the interviews, who did not know the respondent identities, performed a Pareto-type analysis that identified intrinsic subject areas within the comments as a group and then counted the number of comments within each area. Graphs of the results (Figures 1 and 2), and transcriptions of the comments on which they were based are provided on separate pages at the end of this section.

In discussing Program Strengths (Figure 1), interviewees mentioned the dedication and performance of ISS support staff (People), and the unique capabilities of ISS as an orbiting laboratory (Research Capability) approximately twice as often as other topics. Program process improvements and the emphasis placed on these improvements by ISS management was the third most discussed topic. This topic was also prevalent in comments made in other parts of the Survey.

The total number and diversity of comments for Program Weaknesses exceeded that for Program Strengths by roughly a factor of 2 (Figure 2). The comments also tended to be much more detailed, with references to specific Program processes, requirements or management areas. The amount of crew time for research and the associated topic of crew size were mentioned most often.

Figure 1. Open-Ended Feedback – Major Strengths

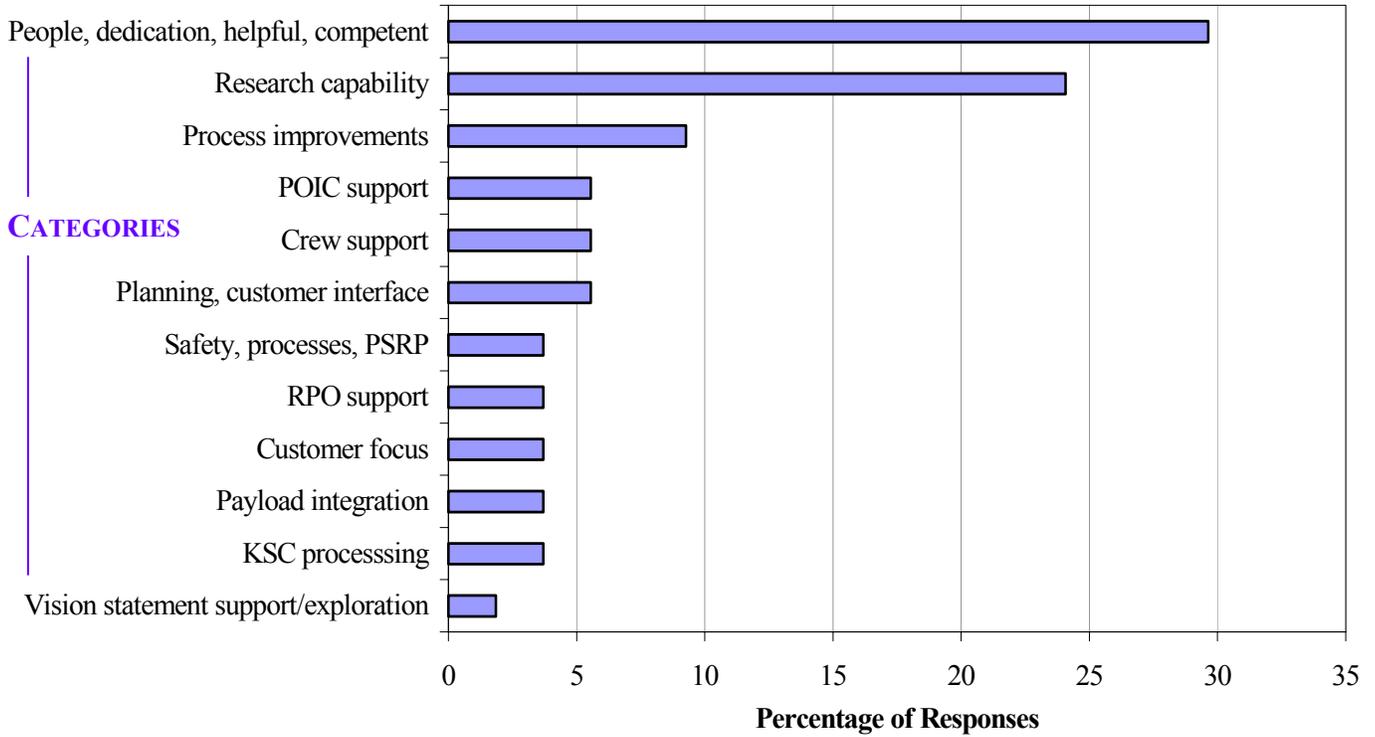
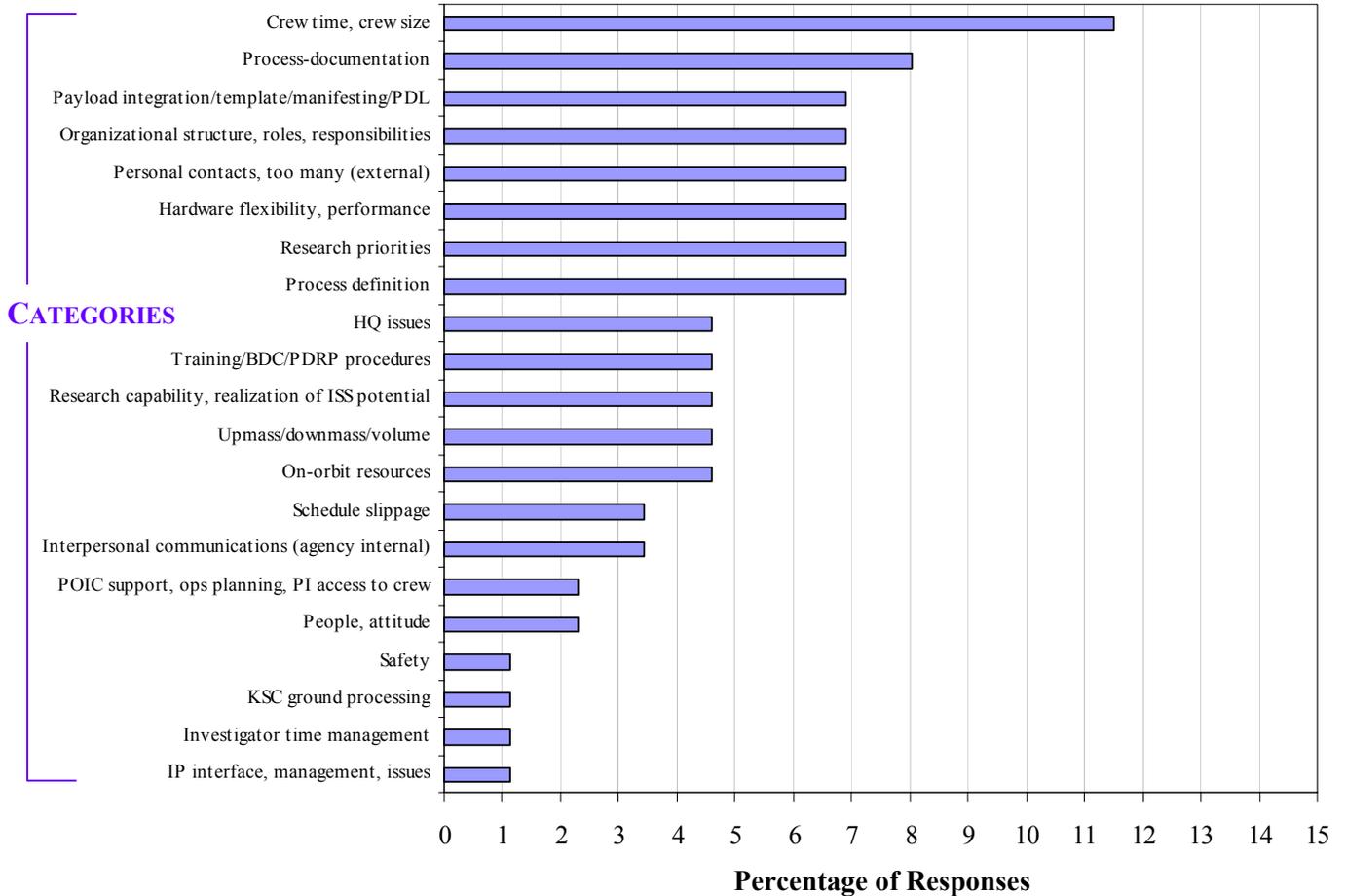


Figure 2. Open-Ended Feedback – Major Weaknesses



Program Major Strengths - Comments

- in a positive way, it's a very unique science platform not available on Earth, provides you with tool you cannot get on the ground, and talking multidisciplinary, physics, biomedicine, chemistry
 - when we compare to earlier, gives you opportunity to imitate long-term effects of microgravity, compared to short-term experiments with microgravity
 - goal or intention to be able to fly more advanced science would be enhanced getting onto environment on ISS
 - based on people I work with, they were very well informed how this program was built up, and how as educator you should approach it, there was aim for clear structure, which made it easier
 - as a European, I am happy the ISS is a worldwide laboratory, important to keep up, even though US is main contributor, but on other side, be able to contribute
-
- able to do experiments that had not been done before, always a positive, not repeating a previous experiment, and ability to carry out experiments on unique environment like ISS
 - [RC: in terms of support?]* people at JSC were excellent, much more than expected going into Program, they really work to get us through roadblocks along the way in getting us to flight
 - often overlooked, as PI you just want your exp flown and get bogged down, and along the way you have problems/roadblocks and think you may not get there, but they keep you assured
-
- people, we had a great time to get off ground, integration, pre- and post-flight, people were really dedicated to doing the experiment, from Increment 3 on
-
- from CEO perspective, the nature of the platform itself, the orbit ISS flies are complimentary to other robotic observations of earth, so it provides us some unique vantage point for earth observation
 - ability to use ISS as test-bed for digital and imaging technologies, and advance new technologies on what can be used on orbit
 - organization in place to talk to PI to provide feedback and planning for PIs for each Increment
 - for utilization, getting benefit of utilization on orbit, maximizing hardware and viewing opportunities
-
- you have unique experimental laboratory
-
- a lot of it is quite strong, major strength is the planning, things are thought through, PIs are included in idea-sharing, given opportunity to get handle on program
 - like the people involved, from Lockheed Martin to JSC, people make up good part of the process, Dave, Mel Hooter(?), strong commitment to manned space exploration, real pride and commitment to that, high degree of professionalism, get sense they are proud to be involved with organization, high caliber of persons
 - my studies were well organized, crew brought in on time, IRBs improved, scheduling was good
-
- only game in town, has potential, not being utilized
-
- the people of ISS Utilization Program are the people, only reason that it does work is that people are willing to go the extra mile and make it work, must fight over in-flexible
 - Program is learning, Increment 6 better than earlier increments, Program is becoming more science centric as things move
 - a lot get done because the crew does it, they make sure things happen, the filtering of contacts from PI to crew is a problem, somewhat more direct un-filtered access would be better
 - the Program suffered from a long gestation period where ISS and OZ existed for a time before Station existed and had time to think up process
-

- pros and cons--
- pro: very detailed program, integration covers almost every aspect one can think of, nothing left behind, will assure coordination of program
- each disciplinary group is willing to work with every group, work with you, try to help you as much as they could
- most disciplinary groups are knowledgeable, some are not but most are; when the EXPRESS Office handles things, they know what they are looking for

- a major strength is that NASA personnel involved are professional and enthusiastic, the dedication is without peer and the technology is just unparalleled meaning that ISS allows us to do things that can't be done on ground; would not have spent the same money if could have done it on the ground.

- I think the strength is in the people who are maintaining a positive attitude despite many hurdles, we may end up learning lessons same ones that Shuttle learned; the actual people who (do the) are work are the strength, a lot of positive people who are being persistent at finding better ways to do things.

- they are trying to improve process, making efforts to change and adapt,

- Program's potential for discovery of processes and/or medical benefits to be realized is huge
- things that have to be worked out are processes, procedures, encumbrances to successfully conducting good science, no doubt things remarkable will come to fruition
- work bumps out of this, I understand ISS not finished, assembly and doing research, etc.
- that has to do with people that can get up and do research, but they shouldn't be expected to do in black box and we do that, seal them off when we aren't able to communicate with them and access them to steer them on doing good science
- [RC: KSC, Utilization, etc., rolled up, what is assessment of our strengths?]* processing at KSC, attitude there is in virtually every case is CAN DO, and it hasn't change since '91 when I began; if you need I will get it, and we will fly, and get experiment done; not attitude here
- logistics part here, past all the political harangue of getting manifested, etc., then things come together eventually, but getting to that point is difficult

- ability to provide long-term micro-gravity platform to do research on, in our eyes anyway
- large benefit at the end of the Program will be the research, the only thing that will last
- [RC: offices, POIC, etc?]* EPIMs and PIMs, obviously I think payload safety is very strong part, KSC processing team, not sure how that will change in future, civil servant service is important, comfortable customer focus is important and you see that at KSC, they focus on safety; that could be strength in Utilization group, comfortable customer focus
- facilities have same problem as payloads, some forget that research is main thrust and without it, vehicle is "piece of junk"
- customer focus by Lesa Roe is a good thing

- having started off with doing LDEF, which was a treasure trove of items for space exposure, you have to look at space environments to get logistics of everything, so ISS proved to be beneficial in that order

- folks in POIC that do planning, timeline, scheduling, they have done an outstanding job; managed to make things done we were worried about, been our advocates

- they get the job done

Program Major Weaknesses - Comments

- communication and what's being done now [survey] is major effort to cover those issues, our Program is major fortress unto itself

- limited number of crewmembers on orbit for doing research, nothing we can do about that

- limited transportation to and from ISS, and resources within ISS are consumed to building and getting ISS developed so not enough opportunities for us doing exposure for experiments on outside are very limited

- not enough launch vehicles to get to ISS
- right now, not enough crew time to do research, all ties back to crew return vehicle, when it would be deployed, so limiting crew to 3 or now 2 is a problem
- generic design of some facilities, no real system look at how facilities and rack should be built, so sharing hardware is difficult
- would be nice to have more generic outlets on every rack that everything could plug into, more beneficial
- standard lab like here on Earth vs. everything designing to own needs, makes things less flexible
- as progress moves, needing to maintain facility, we're trying to do some things that maintain

- front part of organization, entry is virtually impossible, like getting over Berlin Wall
- told "NO, can't do it," half the time they don't know for sure, first answer is every question is no, but it should be "we shall try to make it happen"
- attitude is BAD and needs to be a lot better

- see previous comments

- lack of process flow or relevant process flow; too many times people concerned with the process rather than getting to the end result.
- get rid of documentation that no one refers to, multiple inputs required of payload and this doesn't get used by people, not sure our small payloads agreement content was ever looked at by anyone except the PIM and myself, would get questions to me when information was in Small Payload Integration Agreement.
- for a new payload coming in, it is overwhelming as far as what you need to do, hopefully the new empowered PIM will help on this.
- I think, again, if you have too many people at Ops Center, then people miss talking to one another; LIS doesn't talk to POD for example. need assume astronauts and cosmonauts are thinking people, just give them enough information to know what to do, but there is a balance on how procedures should be written for the crew.

- facilities are extremely limited, the availability of personnel as well, unfortunate for us, because we needed crew time, preference in future to have more automated experiments, under funded, 3 crew is half size needed, ISS suffers from same sort of bureaucrat plodding that every other government agency has.
- in frequencies of flight to and from ISS is a problem, experiment done in few days and waited months to get to ground.
- concerned about equipment not being suited to long term performance and this limits the science you can do up there; can't do assessments in orbit, have to preserve and bring back and this is limiting, but doing our typical ground analysis on orbit doesn't seem practical at current technology.

- con: very inefficient mechanism, lot of open action

- confusing, no clear contacts available to PDs and PIs; receive more than one call for same thing by different groups for same purpose, should merge into one group, structure is very confusing, so many OZs, problem is not JSC side, but more contract office (Boeing), then MSFC calling, then JSC calling for same stuff

- Ku is hopeless on Station, coverage is miserable, can go 4 hours with no Ku, that's terrible
- templates are too long, found bugs in software on Increment 3 that did not fixed until Increment 6, because of software template

Problems

- PDL is inflexible
- early increments schedules changed all the time, 5 is better
- training and baseline data schedule changed all the time, problem for us not at JSC
- interferes with requirements for teaching, but this has improved to a considerable
- on-board training working group and the PDRP were a travesty, they don't communicate, they are intrusive, had late requirements, they poorly communicated your requirements, slow and late an ineffective, required things right away but took months to review
- usability tests were pointless
- time to orbit is too long
- there is room for improvement

I don't know if PDRP has improved

- need to improve communications in PD and PI side; has increased on Increment 6
 - documents streamlined
 - attitude improvement
-

- too many lines of communication, too many people to talk to, talking about same thing, try to narrow down

- not close enough management of foreign component, why didn't those people come back, would help to make more clear, what's run via ESA, what's run via NASA

- keeping the schedule, things keep slipping a lot, not necessarily bad, other things come up, if you have a stringent schedule or experiment that has certain timelines or shelf lives, then you may have problem, and they do account for some of this, late loads, etc., but other things arise

- got the impression the whole overall group is dedicated to facilitating your science

- from Utilization view, increased communication with PIs is necessary

- science training is lowest priority for crewmember, but should be closer to flight, usually, it is 3-6 months pre-flight; need CDs of us training, CBTs, so crew can review training again

- perception that crew, not just from NASA but also CSA, did not have much time to do experiments, but in fact, crew was asking for more work, so you had tended to make experiments a lot simpler than necessary, could probably get more data if crew time was available, passing on that perception inhibits how you see Station and how experiments are going to be run

- in terms of science, of course there is reduced number of crew members, which will limit time available to do science

- if you call us an investigator, you need to fund hardware yourself, if it is different from what is on ISS or what needs to go into space, would have been difficult to provide

- in management, I cannot see any direct weaknesses; institution of science, number of committees, always will create some bureaucratic...not quite always smooth

- all the acronyms

- redundancy-duplicity

5.4.2 Lessons Learned

The interviewees were asked to provide verbal summaries of their lessons learned. Lessons learned were defined as application of successful methods to deal with a problem, mishaps that occurred for which the causes were determined later, or the identification of a design, process or design that could reduce or eliminate the possibility of a problem or failure. The transcribed comments from the Lessons Learned section of the Survey are provided on separate pages at the end of this section.

The majority of lessons learned by the Increment 5 customers are related to coping with the current ISS integration and operations environments. The comments are particularly relevant to future customers. As one customer commented, “[it] gets better once you know the shortcuts.” A number of lessons learned summarized by the interviewees reprise comments made earlier on specific questions in the Survey.

A review of the comments in this section, as well as other comments in the Survey that had a lessons-learned theme, resulted in the following lessons learned being noted by the ISS Payloads Office customer support team. These lessons learned are linked to numbered recommendations of the Customer Support Team provided in section 6.0 of this report.

Investigator Working Group (Recommendation I5-12)

Customer found this useful, was able to gain insight by sharing ideas with fellow customers. ISS Program (ISSP) should expand and improve this activity. Flow customer lessons learned collected by this survey back into Investigator Working Group agendas.

Off-nominal Operations (Recommendation I5-13)

SUBSA suffered an on-orbit anomaly. The investigation’s small operations team was distracted by the large amount of scrutiny and attention they received during this occurrence. They underestimated the amount of manpower it would take to manage on-orbit operations, particularly in planning. ISSP should review guidance given to potential customers with regard to operations support requirements and include guidance for off-nominal operations.

Russian Payload Integration (Recommendation I5-14)

The lesson learned is that payload integration with Russia is difficult. ISSP needs to clarify and streamline this process to improve customer satisfaction. Recommend sharing Increment 5 Customer Satisfaction Survey Report with the Russian Space Agency.

Interface Definition Document (IDD) (Recommendation I5-15)

The customers value the IDD, considering it their bible for engineering integration. A customer notes that some sections are misleading. ISSP should review the IDD (with customers) and revise sections as required.

Lessons Learned – Comments

- investigations are much longer, important to bring video signal to location where PI is important, putting Trek on campus took 4-5 months, why so long? But University more to blame, hard to get NASA to talk to University, lack of communication, don't underestimate time to get Trek installed on a university campus.

- regarding hardware, not enough opportunity for "using and testing;" lesson learned: give more time for using and testing of ground hardware, using PI because he/she has hands-on experience.

- regarding safety: Safety Panel is not familiar with all areas of research, PI can be better judge of safety; NASA should have somebody outside of NASA to; loss of month due to cracked ampoule was "unjustified", had glovebox, materials were benign, only danger was small piece of glass, too long to decided to continue after broken ampoule, overly conservative reaction to SUBSA failure, lots of time wasted; could have done more work if reaction to failure hadn't been so overly cautious, NASA should have consulted on outside expertise. Furnace temperature was safe, but astronauts couldn't touch it, appeared overly cautious to PI, concerns for safety were not justified

- one thing learned between MISSEs 1-2, 3-4, now 5, you have to go to particular organizations first. Example: configuration management first, but didn't know from outset; as we go further in system, know where to go first.

- sequence of organizations; if we could have 1 POC or 1 organization to have them tell you you're on, that would help; biggest lesson.

- all things after Increments 1 & 2 already put in later Increments, and we knew they'd change.

[RC: software glitch, missing payload improvement question]

1: Important to have bugs worked out in terms of integration between NASA centers, Johnson and Marshall.

2: Much of knowledge gained procedurally during Shuttle-Mir was not known or carried to ISS.

3. Scheduling process involving Investigators needs improvements; things were inconvenient; human life sciences research needs higher priority.

4. Priority for doing research in space needs to be higher.

- one thing had on Increments not on Spacelab is Investigator working group (IWG) meetings, informative on what other experiments is on other flights, interaction, etc.; useful and practical to interact between experiments and bouncing ideas off others; should have IWGs for each increment or few increments

- the PIMs are learning, big one; ISS PIMs are now like Shuttle PIMs who took you through; when first started with ISS, did not happen and was frustrated

- in Ops, to create a useful set of procedures, there almost needs to be requirements that state here is how procedures should be written; along with that you need to understand and get feel for how crew works, passing on information is difficult; procedures should be broken into 10-15 minute blocks with no stopping point; if crew needs to stop, they need to know that and timelines should incorporate this type of break

- everybody writes in utopian sense, where payload is going to be set up by crew without interruption; this does not happen; you're riding inside bubble with expectations for things to happen in certain way, and they just don't

- for future PDs, educate them on how real world is, list of bullets, procedures should be kept short in groups, breaks between groups to jump out of activity then come back to it

- keeping flexibility and simple in procedures

- I'm up to 40 pages of procedures for ISS; Shuttle was only about 8 pages
- access to crew on ISS not as easy as access to crew on Shuttle
- I've categorized ISS as being more strategic environment, where Shuttle is more tactical; we could talk to payloads and they got word up to crew; ISS payloads couldn't do that as easily, and I understand that difficulty, not wanting to bother ISS crew
- getting compendium of websites and data they're providing, would assist PDs greatly, for new PDs especially, getting access and finding is frustrating

- positive: communication between scientists, support scientists, engineer, coordinator between those people, it's important to establish a relationship with those people...did it and it was positive
- negative: knowing a little more about other experiments, more makeup of the mission trying to know
- scientist in charge of entire Increment, should be able to identify interferences early on
- knowing KSC facility helps to run things smoother, quicker, more efficiently

- everything went smoothly from EPO 5; we had very positive experience from that payload
- found lessons learned and positives did not carry over to EPO 8; our corporate knowledge didn't carry over to next payload; very small things made it difficult for us
- saw different expectations transfer
- thought from EPO 5 had system under control
- very different requirements from EPO 8 led to some confusion and difficulty
- examples: not sure if due to change in personnel, but we were being asked for more specific things, e.g., labels, were told to ask for them where they were more transparent before; didn't know suddenly how process worked; on Increment 5, it "just happened"
- had to choose design, go to databases and order, but didn't have access or authority on these things
- different requirements for us from EPO 5 to 8
- positive change: don't have to do PSRP anymore, but did on EPO 5
- saw some changes in getting manifested
- no showstoppers, but being new, made it a bit of a different transition for us
- questions we got prior to this we were getting, e.g., where do you want it shipped? where is it going? Debbie indicated those were questions not normally handled, someone was making decisions elsewhere
- these were educational payloads, people were making allowances for us previously, now they got a bit less easy and less streamlined
- numerous meetings, phone calls, etc., to track down process, only to realize we didn't have authorization on handling certain aspects
- hard for us to judge whether it was program change or personnel change in trying to make process better in general

- only one for Interactions, based on overall experiment experience, not getting scheduled, and only on task list, took much pounding of POIC team to get scheduled; had to be heavily persistent
- just a general experience going through early on
- scheduling of experiment has improved greatly, so need of constant communication is not nearly as much required as previously

- nothing extra from areas already mentioned
- petition Congressman before starting; we need money

- given circumstances probably best you'll get
-
- gets better once you know the shortcuts
 - learned lessons the hard way to make better
 - ask for help! then it works, people are very helpful in face of frightening unfriendly system; developing personal interactions makes for positive results
 - for ISS, have to be proactive; many functions the old way, JSC-style PIMS pushed to PD level, forces you to be more proactive
 - have number of people to work the system organically and correctly; didn't know this coming into system; tried operating same as in middeck Shuttle days
 - when you start to notice JSC vs. MSFC discrepancies, back out; not PD's place to be in midst of that, so let them fight it out
 - PD needs to be resilient, hang up on people, we've been threatened to get kicked off system and we beat it by calling them on it
-
- we submitted our lessons learned already [*RC: we're trying to combine our efforts*]
 - for earlier Increments went to PCB and PMIT, this Increment 5 seems to have gone into black hole; [*RC: apologized because of new transition*]
 - use of Internet Voice system program has now gone away from this technology that wasn't ready, wasn't high quality for voice loops
 - bench review process, lack of process, recommend OZ works to get documented process in place
 - as flown hardware manifests, current 57057 doesn't require this, and OZ is trying to put them out, but riddled with errors, recommend that 57057 is updated with the requirement that PD submit as-flown manifest
-
- SAMS has been very successful
 - biggest problems have been operational from EXPRESS rack crashing and compromising data [*RC: how did you overcome and fix?*] I didn't fix the problems, the PD did
 - establishing contact with MER room and establishing personal contacts would be helpful to get things done; particular to what we do
 - scientist needing help from a certain person is important
-
- we underestimated the amount of manpower it was going to take for on-orbit operations; heard things weren't going to be like Shuttle, because Shuttle was 14-16 days 24/7; ISS was to be smaller teams and not around the clock
 - the whole planning part of it was underestimated
 - we assumed things like once/week ops, 8-12 hrs/week for ops; not like that at all, whole big planning for ops alone; you're spending much time planning when you will be operating
 - we worked to death for SUBSA
 - we staffed for non-anomalous situations; when it didn't turn out that way we worked everyone to bone
 - we also underestimated amount of scrutiny we were to receive, but maybe was naive
 - amount of attention when you work on ISS is a lot, its kind of hard to deal with that and be part of a small team, somewhat distracting
-
- just being manifested on Increment 5, went very smoothly
 - problems that occurred, e.g., Shuttle launch delay, no way to prevent
 - one thing we did, had originally timepoint L-2 at KSC dropped many years ago, they wanted to move back to L-3, but we wanted different, yet their schedules are well set, and we follow...not a major problem

- we're now moving the program to Russia, so having to fly to Russia to collect baseline samples, but that was unforeseen due to new events
- everything fell right into place, but won't probably happen to all of them

- if I were starting this experiment over again, lesson I learned from this one is to somehow develop a better understanding of my interface with med ops because as mentioned, we made some assumptions going in and med ops changed some of the tests they ran, and they're looking to economize; a lot of things we believed that would be provided turned out not provided, and cost us not insignificant amount of money to back that; so find out more how med ops does things and count on support from them and assess what I will have to live up to, pay for, etc.
- with regards to this experiment, no not exactly; it's difficult to plan these things, we're so far out, even with relatively few experiments we crammed onto Increment 5 as soon as we got OK from HQ to develop, still there are things beyond the control of my experiment, beyond control of NASA; one thing we looked at for ISS, things go up from Russia and come down here, or vice versa; that changed and changed again temporarily; whether I have to do Russian support has major impacts on my experiment, and I don't know how that translates into lessons learned

- while costly to do, very beneficial to do ground experiments that anticipate deviations from plan, procedure or timeline, e.g., delay launch, ascent/descent flight, when hardware is activated or deactivated on-orbit
- its a tradeoff...designing robustness takes much effort for ground experiments

- during Increment 3, we submitted lessons learned to OZ that got consolidated and published
[RC: this process shall augment and supplement that possibly replace, but what about Increment 5?]
- not sure about Increment 5, but for Increment 6, for payloads that need to use ISS provided support equipment (handrail anchors, equipment anchors, etc.), then you need to request from Program ahead of time and launch in own allocation
- we did what we thought what we needed to do to be accommodated but weren't always accommodated
- in Increment 3, for payloads that need to know status, crew calldown, or way of getting data, might've been on schedule, but crew used Onboard Short Term Plan, crew can click showing they've done it, so can see whether something was accomplished.
- if you don't need to be in Russian segment, don't plan on it; if it can be accommodated in US Lab, then that is where to go

- at a loss as how to respond, our experience was what we expected it to be...
[RC: clarified] sage advice I'd give would be to make sure initial good contacts are made within ISS program, probably most difficult for someone lacking experience because you're really dependent on direct guidance from individuals to steer you within program

- we've dumped lessons learned after each mission/Increment
- get good working relationship with EPIM and Payload Safety Engineer, then can cross any problem
[RC: on-orbit advice?] always anticipated you're going to have more time than allotted, strange things happen; Increments get extended, so if you have opportunity to fly extra sample, do; worse thing they can tell you is "no."
- PDL, etc. as mentioned earlier

- I have whole presentation made for Lesa Roe specifically on this
- 1: redundancy and database entry must stop, consolidate it, compact so PD has minimal number of entries to make

2: organizations know where to get it and can easily retrieve

3: cuts down on personnel time on both sides

- PDs know how long it takes to do job, don't argue with PIs, etc., give PDs credit for knowing how long it takes to train crew

- communications, I understand you can't let every novice speak to crew and certain protocols have to be followed, but given those assumptions, should be able to have trust and confidence they can pick someone to talk to crew that impacts guidance and advice to the crew directly

- we have certain organization set up that lets them talk to crew, they are 2-3 persons removed from knowing how to communicate to crew re: experiment; let PIs, PDs talk to crew about the experiment, we should be working like colleagues, they on orbit and we on ground

- go back to submitted lessons learned, Russian integration process has to be smoothed

- working backwards from CEO operations standpoint, the task list is working; for future imaging payloads, this might not be the case; we think the PODs and LIS have learned to not assume that they know what PD or payload would be decided in certain circumstances; now they know to contact us on things they previously would have made a unilateral decision on; there needs to be a way to have turnover of information within POIC, between LIS, POD or Flight Director; CEO was, in general, such an easy thing; can't think of too many lessons learned, easier communication with crew would be a good thing; doesn't have to be direct, just easier.

- looking back our experiment would have benefit from mock-ups prior to flight, what happened during flight, protocol was not performed as intended, perhaps review the protocol closer to launch, or maybe having a more concise version of the schematic rather than written procedures to go over with the astronaut prior to flight would have been helpful; future would be better to have automated experiments.

1: crew always offered more than Program office offered to PI; to conduct experiments, crew wants to do more, we are always told that crew time is very minimal very precious don't ask for this or that, but when we hear from POIC, we hear crew asks what more can we (crew) do for them (PIs)

2: IDD, is a bible, there are some sections in IDD are a little misleading, but need to review that section again

3: don't be afraid to ask or make a request; whatever you read from IDD, you cannot do this or that, if there is a need for science success, please use a voice, make a request from Program office to make success, they may be willing to accommodate these requests

[RW: had elaborated on stories regarding waiver, muffler, air flow, colleague trying to get waiver] as long as no danger is posed to crew or vehicle, not sure why requirements are so harsh, but if science has higher priority, just ask

summarized other document:

- designed for the constraints that existed,

- ESS is a great thing, HLS ESS did a great job and is valuable

- things you think are trivial take a long time, took 9 months cause people keep changing things

- from remote ops we were trailblazer, IVODS has to run on separate machine,

- network security is problem

- Ku is hopeless on Station, coverage is miserable, can go 4 hours with no Ku, that's terrible, have to design around Ku problems

- reasonable expectation to have internet connection to our experiment,

- PTDR complete waste of time and money

- problem with operations continuity,

- had co-development issues, were forced on us retroactively

- need to communicate and improve, on both sides, PDs and PIs to program on what's needed
- need to understand what Program needs
- scrub documentation, reduce
- better have much money and time and talk on phone long hours to understand

- major lesson I learned, you request much more as a human research subject investigator, my advice to future investigators, think of every variable you might need for investigator, and include all in plans, even those maybe more remotely significant, and cover that all up front
- NASA is not too bureaucratic in that, but with human research subject investigation, asking for as much as you can and as early as you can, then you will have everything you need up front, rather than struggle later
- [RC: any glitches, problems, how they were overcome?]* no, didn't really have any major problems, only thing that came up was Columbia, there NASA made right strategic decision, where there will be Soyuzes and Progresses for launches and returns vs. using Russians for actually doing the research
- obstacles existed but data importance were prioritized, good communications lent to sorting that out
- conference calls, where all Investigators came together and sort out problems, e.g., changing in one investigation and how it will affect others, turns into a big phone session; not sure that's the most effective way to doing that; maybe should be a review where Investigator does self, and sorts out what changes are needed and sent to others Investigators to review and have time to go over. With everyone at one time and issues all thrown out, not too effective; might not get what consequence is with one change over the other.
- for each Investigator, list out here are our requirements by email, sent around and shared, so everyone has time to ferret out what is important, flagged and separate call with those relevant personnel to sort out
- focus issues with experiments, interacting, Investigators primarily involved, having adequate time to ponder circumstances.

- be patient; things have snags, things don't get scheduled all the time when you want
- doesn't intend to be fault or purpose of anyone
- things get done
- have good team around you
- do a lot of early planning

- we in CEO hold our own post-Increment debrief discussion when crew returns, that provides forum for generating hardware, software, technical operations lessons learned; we have unique issue to discuss, e.g., list of targets sent to photograph and only got portion back, we discuss why vs. bringing up at general debrief
- we discuss with crew each and every operational aspect of feedback solicited during mission; makes for better communication on future operations

- awareness of hardware volume, pre-planning issue, the smaller their package, the more likely they are to get onto a mission
- active communications, we had weekly meetings, and continue, team communications, ESE, program manager, all the way down line, avoids problems, some are 15 minutes some and hour, all are beneficial
- awareness of limited shelf-life of items, especially in area of schedule delays
- sampling and data sharing in terms of other investigations

- Investigators at last training session, proficiency training might be months before launch
 - for life sciences, Investigators should check into other studies, especially if taking meds
 - make pitch to make investigation personal, get understanding of crewmembers, get them involved
 - in last 2 missions, crew was tired seeing flight procedures, they really liked 1-page summary, cover page on what is most important
 - scientists want the data, all the other stuff is fluff
-
- most lessons learned in 2 areas:
 - on flight, on science side, we could in fact do more on ISS than expected, and weren't completely prepared, and got to do more experiments than expected, in terms of future users, good for them to know that crew is often more flexible than you think they are, so design experiments to make changes in flight, you are initially given impression from NASA that in designing experiment, will be difficult to make changes in flight
 - have absolutely clear definition of hardware before starting development of hw and testing
-
- very difficult to summarize
 - number of contacts/persons involved with PI, communication between PI, NASA support, etc., should be reduced to as few people as possible, makes a lot easier
 - documentation, filling it out, most scientists are not used to thinking in engineering or management sorts, filling out numerous tables in documentation can sometimes be very difficult, but in my experience, I got good support, so right things got filled into the right places
 - keep things simple
-

5.4.3 General Comments

A final comments section was provided in Part 3 of the Survey in order for 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.

- interview took too long

- I would guess Dave experienced more frustration than we did, I think everyone works hard to get everything done and possible

- help; system is broke, experience not pleasant

- no, you've been very tolerant

- the PI, which we deal with closely and I know station does too, but Utilization does, much of them dedicate their lives to this research, we need to streamline integration/operation process to get them in and out of system smoothly

- not sure how, but takes huge effort between PDs and Utilization group, this is the long path to getting their science, would like quicker return on that research

- recap, real belief, we believe passive containers to fly things like MISSE and same as on Mir, should be picked up on ISS infrastructure, so anyone coming on board, here's a low-cost way to take on exposed elements in space environment

- from PI perspective, didn't see many, we haven't done as good a job on our end

- soliciting those and disseminating that data would be more beneficial from our end

- tricky to disseminate, e.g., email to set up interview

- redundancy-duplicity

5.5 Survey Part 4 – Satisfaction with the ISS Utilization Survey Interview and Survey Questionnaire

As a final question, interviewees were asked to rate their level of satisfaction with how the Survey interview was conducted, and to rate their satisfaction with the design and content of the Survey questionnaire. Fully 95% of respondents indicated they were satisfied with how the interview was conducted (82% very satisfied), with none dissatisfied, and 90% of respondents indicated they were satisfied with the design of the questionnaire, with 6% dissatisfied.

Interviewees were uniformly positive with the interview format of the survey. They indicated that the interviewers were instrumental in clarifying the thrust of many of the questions, and in helping them to clarify their responses. Interviewees were also gratified that the Program was conducting the Survey and stated that they looked forward to seeing the results.

6. ISS Payloads Office Customer Support Team Recommendations

Based largely on review of the transcribed verbal comments from the Increment 5 interviewees, the ISS Payloads Office Customer Support Team has produced the following set of recommendations for consideration by ISS management.

Number	Title	Description	OPR
I5-1	Facility Payload Roles & Responsibilities	Roles and responsibilities for ISS science facilities' sub-rack integration and operations teams should be reviewed to insure a clear, simple interface to the customer is maintained. Redundancy with other Program support organizations should be reconciled.	OZ2/RIOs
I5-2	MPLM Temperature Constraints	<p>Comment: <i>"...MPLM did not maintain temperature requirement, 20-40 degree requirement was not met, MPLM heaters were not turned on, went below 20 degrees, all my drugs came out of solution, this happened on Increment 5, got data showing heaters were not turned on."</i></p> <p>Conduct an investigation of this incident. Clarify what MPLM temperature constraints are, what actually happened on this flight (UF-2) and bring forward corrective actions as necessary.</p>	OZ3
I5-3	Testing Facilities Compatibility	<p>Comment: <i>"...tested EMI at JSC, passed, but Marshall says we didn't pass, did not pass at MSFC, JSC apparatus was not appropriate for ISS, how can this be? Expected to have complicated things worked out before I had to use them."</i></p> <p>Conduct an investigation of this incident. Determine whether testing equipment was or was not compatible. Insure all testing requirements and facilities are reviewed to prevent future incidents. Bring forward corrective actions as required.</p>	OZ3

Number	Title	Description	OPR
I5-4	On-orbit Experiment Execution Error	<p>Comment: <i>"...we have reservations about the results we got, even though we did get data, required big efforts to get data, the actual execution of experiment on orbit was incorrect, and this resulted in compromise of experiment data and quality of data."</i></p> <p>Fully investigate this incident and draw lessons learned with corrective actions as required.</p>	FPD
I5-5	Data Requirement Need Date Rationale	The customer comments received generally express frustration with the amount of documentation and data required and with the length of the schedule template. Improve customer education in this area. Provide customers with more comprehensive rationale for data requirements and their need dates.	OZ2
I5-6	Crew Training Scheduling Instability	Customer satisfaction can be improved with improved access to the crew. Review policies regarding crew training scheduling, determine whether crew payload training with customers can be made a "hard point" in the crew training schedule to minimize customer inconvenience.	OZ1/POI
I5-7	Customer Access to On-orbit Crew	Review crew on-orbit communications policies. Determine impacts of allowing greater direct communication between customer and crew (via voice and email), allow greater, more spontaneous access to crew to improve customer satisfaction.	OZ1/POI
I5-8	Change Request Approval Criteria	Review all change request processes and ensure approval criteria is specified, documented, and communicated to the customer in advance.	OZ2
I5-9	Information Security Customer Roadblocks	Review information security architecture from a customer perspective to determine where the "brick walls" lie between the customer and Program information sources. Take corrective action as necessary to provide hassle-free access to information.	OZ1/POIC
I5-10	Documentation Roadmap for Customers	Review design of Payload Developers' Web Portal to ensure user navigation provides clear map of Program documentation and simple path to access it. Ensure existence of web portal is widely advertised up to and including direct email	OZ2

Number	Title	Description	OPR
		announcements to individual customers. Ensure PALS follow-on system (schedule, scope, instructions for use) is included in customer training.	
I5-11	Starter Kit for Customers	In addition to “Road Show,” develop and routinely distribute information packets to prospective ISS customers as a starter kit in addition to web-based resources.	OZ2
I5-12	Investigator Working Group (IWG)	Customer found this useful, was able to gain insight by sharing ideas with fellow customers. ISS Program (ISSP) should expand and improve this activity. Flow customer lessons learned collected by this Survey back into IWG agendas.	RIOs
I5-13	Off-nominal Operations Support Planning	SUBSA suffered an on-orbit anomaly. Their small operations team was distracted by the large amount of scrutiny and attention they received during this occurrence. They underestimated the amount of manpower it would take to manage on-orbit operations, particularly in planning. ISSP should review guidance given to potential customers with regard to operations support requirements and include guidance for off-nominal operations.	OZ2/POI
I5-14	Russian Payload Integration	The lesson learned is that payload integration with Russia is difficult. ISSP needs to clarify and streamline this process to improve customer satisfaction. Recommend sharing Increment 5 Customer Satisfaction Survey Report with the Russian Space Agency.	OZ1/OZ2
I5-15	Interface Definition Document (IDD)	The customers value the IDD considering it their bible for engineering integration. A customer notes that some sections are misleading. ISSP should review the IDD (with customers) and revise sections as required.	OZ3

Appendix A – ISS Utilization Survey On-Line Questionnaire

The web-accessible version of the ISS Utilization Survey for Increment 5 as issued to all interviewees can be viewed online at:

<http://www.inquisiteasp.com/cgi-bin/qwebcorporate.dll?478UXS>

Appendix B – Survey Part 2 Response Data

Part 2. Feedback on Specific Management / Functional Areas

Please rate your level of satisfaction with: **SERVICES** (guidance, clarification and support tasks provided to your project)

1 2 3 4 5 Not
Very Very Applicable
dissatisfied satisfied

All Interviewees

NASA Payload Development	RPO Project Management	Research Planning & Integration																																				
<table border="1"> <caption>NASA Payload Development Data</caption> <thead> <tr> <th>Rating Scale</th> <th>Percent (%)</th> </tr> </thead> <tbody> <tr><td>1</td><td>0</td></tr> <tr><td>2</td><td>12</td></tr> <tr><td>3</td><td>0</td></tr> <tr><td>4</td><td>29</td></tr> <tr><td>5</td><td>59</td></tr> </tbody> </table>	Rating Scale	Percent (%)	1	0	2	12	3	0	4	29	5	59	<table border="1"> <caption>RPO Project Management Data</caption> <thead> <tr> <th>Rating Scale</th> <th>Percent (%)</th> </tr> </thead> <tbody> <tr><td>1</td><td>0</td></tr> <tr><td>2</td><td>10</td></tr> <tr><td>3</td><td>5</td></tr> <tr><td>4</td><td>35</td></tr> <tr><td>5</td><td>50</td></tr> </tbody> </table>	Rating Scale	Percent (%)	1	0	2	10	3	5	4	35	5	50	<table border="1"> <caption>Research Planning & Integration Data</caption> <thead> <tr> <th>Rating Scale</th> <th>Percent (%)</th> </tr> </thead> <tbody> <tr><td>1</td><td>0</td></tr> <tr><td>2</td><td>6</td></tr> <tr><td>3</td><td>18</td></tr> <tr><td>4</td><td>41</td></tr> <tr><td>5</td><td>35</td></tr> </tbody> </table>	Rating Scale	Percent (%)	1	0	2	6	3	18	4	41	5	35
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Services -- Comments

NASA Payload Development:

- very little guidance was given on adapting to ground experiments to spaceflight.

NASA RPO Project Management:

- define what they were supposed to be doing for us
- problem here is while office existed, we were very satisfied on everything they did, but early in Program they were abolished
- [RC: then Code M, right?] they took us in but we had no money so no resources; we had complex history, our real complaint is that we were left almost without a sponsor, had we not been NASA organization, i.e. private or university, we'd probably not been able to carry out experiment

Mission Integration:

- lack of clear priorities among experiments; clarification and guidance was poor because they had it poor
- they need to provide more clarification on things, guidance too, e.g., COFR, it is very confusing stuff, but down road becomes more specific; Export Control too is very complex, what should go to Russians and what shouldn't

Payload Engineering Integration:

- Not always industry standards being used.
- a lot of overhead, 25% requirements reduction should be helpful, depends on which ones they are in terms of affecting my ratings

Operations Integration:

- tried to make point that clarification and guidance need to be more specific and clear to minimize the unnecessary work

Real-Time Payload Operations:

- we wish we could've interacted directly with crew
- some room for improvement in services, but getting better as we speak, thinking that the POD and LIS did let us know when sleep periods and dockings were going to affect our operations; I'm assuming we got the crew time we asked for
- we knew what we wanted done
- there's too much restriction and limitation with crew on-board

Payload Safety:

- toxicology folks provided good information to read, I had to seek out, once gotten, explained well in approach; in materials compatibility, didn't see any documentation for how that's being done ; on two occasions, the middeck locker were dropped, in unloading I believe

Payload Physical Integration:

- if new processes are developed, should be communicated to ALL PDs so that we can impact.
- launch scrub scenarios (once they have occurred) could be communicated to PD teams in a better fashion; sometimes, we learn more from media than KSC; otherwise, all other services are exceptional. KSC Integration Team very customer oriented.
- historically we were always happy with KSC support.
- KSC is no-nonsense start-up operation center. Go out of way to make things work; using shortcuts and not official system can get what you want.

Part 2. Feedback on Specific Management / Functional Areas

Please rate your level of satisfaction with: PROCESSES (timelines, schedules, templates and Program plans your project was expected to follow)

1 2 3 4 5 Not
 Very Very Not
 dissatisfied satisfied Applicable

All Interviewees

NASA Payload Development	RPO Project Management	Research Planning & Integration																																				
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Processes -- Comments

2.2 NASA RPO Project Management:

- used to provide us processes that no longer are provided.
- same things I vented about before. schedules and templates were not realistic; even though we needed not to meet it, we were required, no flexibility.

2.3 Research Planning & Integration:

- put us under some fairly heavy pressure considering what they asked, I thought it was unnecessary

2.4 Mission Integration:

- once you get past arguing and databases and all the stuff and get into doing it, gets easy once you get past that point
- improve PMIT meeting itself; not useful for PDs, too much time reviewing schedules, and not issues payloads share in general.
- *timeline on landing day is relevant?* [RC: yes]
- constant sense of urgency; initiate changes without coordination, then we have to submit correction on something they erred upon; constant redirection; with our pre-post experiment, we only have a short thing given to management rubber stamp, no cargo, stowage, etc., we sidestep much of that; missions grounded on Shuttle flight, but Russian were impending realities.

2.5 Payload Engineering Integration:

- comments based on earlier; lack of processes, lack of guidance, schedules, and templates for Russian integration; very much clouding my judgment.
- behind schedules
- we had 2 sets of requirements, 1 for ISS, 1 for EVA office. that's where we had greatest difficulty, satisfying both, timelines were different, requirements often came in too late because they were new, and made it hard to handle that, would have been good to get those requirements before starting to build the payload
- they say they want things early, and when they get it too early they complain.

2.6 Operations Integration:

- timelines still a little confusing as to whether we are on it or off it, lack of coordination across that process
- procedure development was important for us did not go cleanly, Program did this very poorly, templates are too long, whole procedure process was horrible, went round in decreasing circles
- OOS comes out fairly late and hard to determine if we'll have all of our requirements in OOS timeline; prefer if it came out earlier prior to flight.
- timelines still a little confusing as to whether we are on it or off it, lack of coordination across that process
- once you get past hurts and hoops and into the flow, and have manifest, things flow smooth from PMIT and to the Increment scientists, it goes well
- we tagged onto many of med ops, weren't doing anything out of the box people were unfamiliar with

2.7 Real-Time Payload Operations:

- streamlining OCRs and processes would be helpful
- get mostly everything, but did have problem when we lost access to RICO and JEDI page; did

have some security issues, and couldn't get back on for a while and caused some concern with getting schedule info

- things are expected too far in advance. Before hardware and when we could write our procedures.
- another example of program template, safety group is willing to work with us, don't need safety packages as early as program implies; realistic dates are more palatable.
- scatter on processes, some are good some are not, processes are inconsistent, at times amazing conflicts, other times smooth,
- likelihood of getting CR approved was uncertain and how it was to get disapprovals resolved was uncertain, wasn't done badly, but who know how system worked
- lower ratings because whole process of getting data and commanding cumbersome and inefficient for those whom we're trying to get data (MSFC); we end up teaching them things, which is wrong.

2.8 Payload Safety:

- the process they adhered to is restrictive
- they required OCRs for substantial reasons.
- couldn't get any better
- had very good processes, very helpful, willing and wanting to help develop payload.
- tasks are very trivial (inspection, etc.)
- they have a prescribed job to do, but would get more done if streamlined
- this is one area that hasn't really changed, more stuff dumped to payloads vs. Spacelab, integrated and gave rollup info to Mission Manager who took entire safety package and went to Payload Safety Panel to get approved; now at JSC have to go to PSRP, now that we have middeck experiments; even with GAS cans went to PSRP, ended up defending self

2.9 Payload Physical Integration:

- on more recent increments, the new requirements for pre-bench reviews that have come up have yet to be defined, kind of impacts us,
- bench review process not defined well; add different reviews during each Increment; seems undefined, not clear, consistent.
- on average/on par, my difficulties with processing in day end when I get to KSC
- in general, I felt I was pretty satisfied but always room for improvement. I can't really think of anything offhand in specific.

People -- Comments

2.1 NASA Payload Development

- They did an outstanding job for us with minimal consumption of our time and energy
- Payload development personnel were terrific, the hardware had been used many time in orbit could have been more flexible, the ARCTIC worked fine for us
- I think we had a really good team that put the science first.
- small team, everyone did their job well

2.2 NASA RPO Project Management:

- Keith Robinson great, if willing to work, then things got done
- bent over backwards, interfaced well with Program
- RPO support was very good, only problem was parity with other departments; these ratings are for Brian Kelley's office at JSC.
- swell team working together, nobody bothered me to do their job
- excellent support, sit through all meetings, etc., Keith Robinson, Bob Krull, etc.; as external PD, couldn't do without them.
- designated Project Management had not contact with us; awkwardness of having to go through CSC, but guts of things are here at JSC.

2.3 Research Planning & Integration:

- consistency in LISs would be helpful, couple of people to do LIS function and their qualifications and capabilities vary, would like more consistency

2.4 Mission Integration:

- they probably should have been more genuine in working on the customer side.
- people are demanding deliverables for flights a year from now, but those 6 months from now, can't find requirements for them and how to provide; same urgency for flights a year from then; depending on whom you asked, would get different answers.

2.5 Payload Engineering Integration:

- much of my impression of PEI is through EPIM, so hence the consistency
- hardware developers and engineers here at MSFC, all very satisfied
- treated us as customer.
- some have no clue, varied levels of expertise; couldn't provide as much data to us as wished, they were overburdened, questions took forever to answer, sluggish response time; smarter if you had one group working everything vs. having different requirements, different groups

2.6 Operations Integration:

- were some misunderstanding and miscommunications with people, software is N/A because we didn't have an HOSC account
- people all over the map, some good some horrible
- very successful contact with all the people we worked with
- based my ratings on the overall easiness of mutual communication and general discussion about the planning of data collections sessions, was all handled in a good way
- we had special case where we used radioactive isotope, had special paperwork and setup of teams, including radiation office at JSC, which provided good support in making it happen, and use of this isotope was very important
- all went well when time to do this, so very satisfied

- 4s because I have a great person (Davis) with whom I work who buffers all those things above; doing on own would make for different rating.

2.7 Real-Time Payload Operations:

- extremely well organized for console experience, they did their job superbly
- support of science in all the missions received.
- very satisfied and effective team working on this experiment
- based on fact that during very early beta, high degree of communications and efficiency of team in making experiment work
- latter part of Increment 5 was better, earlier; had a Payload Integration Engineer tell me I should have person manning consoles 24 hours per day and argued with me, having no science basis for saying what he did, early on had bad experience
- some were great some not. Some involved in real-time ops went above and beyond call of duty to monitor our payloads and mitigate our malfunctions, tried real hard. Some were not trained with experience and solving problems.
- turnover issues can be mitigated by good training plan.
- based on me at TSC doing real-time ops.

2.8 Payload Safety:

- my safety engineer was new, and learning as we went along
- dealt with payload safety engineer mainly, not the panel; engineer took care all the documents and deliverables.
- they have tough job and not real popular, but they did a good job and made some good compromises, very satisfied all in all

2.9 Payload Physical Integration:

- very warm, nice, give you 24-hour number, assign lots of people in case you need something
- accidentally ripped handles off
- when we went down, they were just beginning to use hardware and software tools, so much troubleshooting took place
- they bent over backwards to accommodate.
- on other hand, got great support at hangar and mechanical utilization branch; people seem to have customer service figured out.
- given bureaucracy they were in, people did a good job after some initial problems.
- [RW: if you had services and processes, were there not people you had to interface with to see through?] this Program is being flown under Shuttle and ISS, different people do different work, I'm trying to remember if any of these vague things were involved with Increment 5, I never went to KSC, never interfaced directly with any people at KSC, but putting experiment together and meeting these blood draws and urine samples at KSC, there were sometimes when it was not clear to me, and not seem clear to my PI team going down there to do that, who was providing some of the hardware, kits for urine collections, some of these things changed; blood draws we want to piggyback onto med ops blood draws when possible, their requirements changed, so we had to figure out how to get our blood draws; I didn't really interface with KSC folks in getting those things done (when requirements changed), my people did, but as far as services and processes didn't go too carefully well, because ground rules changed in midst of overall process and we had to scramble in process to get things done we didn't foresee we had to.
- we had very good luck working with them

Hardware Tools -- Comments

2.1 NASA Payload Development

- not able to do ground experiments in some of the hardware prior to flight.
- hardware and software still being provided; I was pleased with it

2.2 NASA RPO Project Management:

- handrail hardware, some EVA things
- used laptops for PUFF

2.5 Payload Engineering Integration:

- part of our standard hardware developed within Program

2.7 Real-Time Payload Operations:

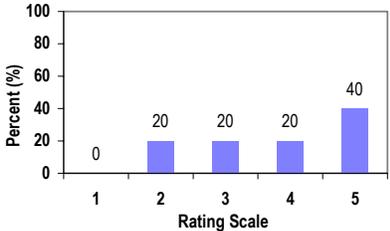
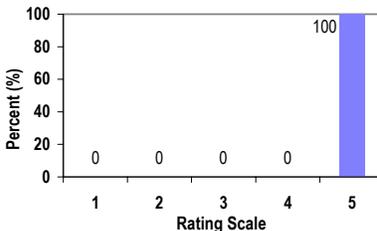
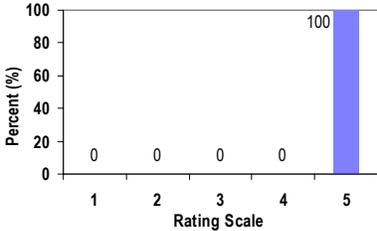
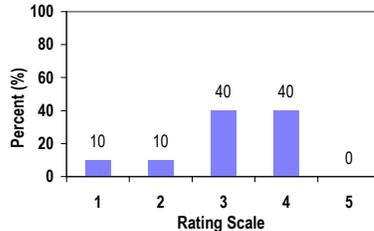
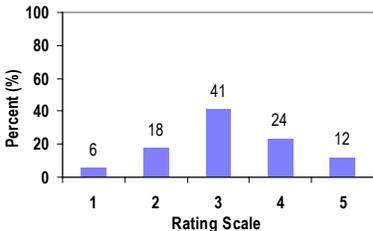
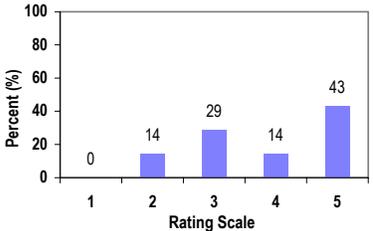
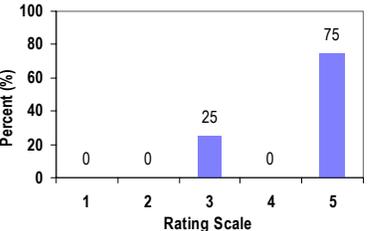
- my team knew how to conduct apparatus and in conjunction with MSG team

2.9 Payload Physical Integration:

- used to get PC and Internet, then told we had to supply our own equipment because ODIN had to cut costs.

Part 2. Feedback on Specific Management / Functional Areas

Please rate your level of satisfaction with: SOFTWARE TOOLS (software provided to support your project tasks)

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<p>Applicable responses: 17/34 (50.0%) Mean rating: 3.2</p>	<p>Applicable responses: 7/34 (20.6%) Mean rating: 3.9</p>	<p>Applicable responses: 8/34 (23.5%) Mean rating: 4.5</p>																																				

Software Tools -- Comments

2.1 NASA Payload Development:

- we get temperature spreadsheet, makes more manageable.
- software was moving target that caused problems

2.2 NASA RPO Project Management:

- used HRF common software, worked great

2.5 Payload Engineering Integration:

- verification not always updated.

2.6 Operations Integration:

- regarding manual procedure viewer, hasn't been the most useful tool; been issues crashing, problems during training, couldn't have it available, so couldn't train crew using computer simulating on-flight. Had some issues with procedures and reviews.
- simulations work, tools we're using GRC/PSC work across network and slows speed, don't work as quickly as down in MSFC
- didn't have any software tools, no help with formatting procedures, software could have helped, delivered procedures so many times I lost count

2.7 Real-Time Payload Operations:

- we use telescience support stuff, this software rates a 2, used IVODS, it works well with 1 exception, the time it takes to switch talk loops, it takes too long, takes 10-15, web mirage system also rates a 2, very little documentation don't have any deliverables
- improved
- don't work well, includes Trek, Commanding, heard that's best they can do so I can accept, but would be nice to have an interface be more user-friendly and make sure it is valid command
- would be nice to have more access to crew to perform troubleshooting, and of course, SAMS is not big science thing, but researchers would like to talk to crew regarding their research and obviously this is important for more hands-on experiments
- had some access problems with some of the databases during Increment 5.
- checking for OCRs, menus, and other areas are clumsy
- DMS system more down than up.
- some of software systems are bulky and slow

2.8 Payload Safety:

- not a lot to learn but can track once in website

2.9 Payload Physical Integration:

- PDL hard to use
- ODIN made us go through all virus checking with our own equipment, etc., was not very helpful.

Part 2. Feedback on Specific Management / Functional Areas

Please rate your level of satisfaction with: DOCUMENTS (written documentation provided to support your project)

1 2 3 4 5 Not
 Very Very Applicable
 dissatisfied satisfied

All Interviewees

NASA Payload Development	RPO Project Management	Research Planning & Integration																																				
<table border="1"> <caption>NASA Payload Development Data</caption> <tr><th>Rating Scale</th><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><th>Percent (%)</th><td>0</td><td>7</td><td>27</td><td>27</td><td>40</td></tr> </table>	Rating Scale	1	2	3	4	5	Percent (%)	0	7	27	27	40	<table border="1"> <caption>RPO Project Management Data</caption> <tr><th>Rating Scale</th><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><th>Percent (%)</th><td>0</td><td>8</td><td>17</td><td>25</td><td>50</td></tr> </table>	Rating Scale	1	2	3	4	5	Percent (%)	0	8	17	25	50	<table border="1"> <caption>Research Planning & Integration Data</caption> <tr><th>Rating Scale</th><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr><th>Percent (%)</th><td>0</td><td>21</td><td>36</td><td>7</td><td>36</td></tr> </table>	Rating Scale	1	2	3	4	5	Percent (%)	0	21	36	7	36
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Mission Integration	Payload Engineering Integration	Operations Integration																																				
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Applicable responses: 16/34 (47.1%) Mean rating: 3.7	Applicable responses: 14/34 (41.2%) Mean rating: 3.6	Applicable responses: 12/34 (35.3%) Mean rating: 3.6																																				
Real-Time Payload Operations	Payload Safety	Payload Physical Integration																																				
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Documents -- Comments

2.1 NASA Payload Development:

- some hard to understand
- had one project plan, no real internal interface

2.2 NASA RPO Project Management:

- we're given somewhat a different timeline, so no pertinent docs.

2.3 Research Planning & Integration:

- too many requests
- doesn't capture everything we'd want to communicate; which forum is driving the boat, etc.
- some wasn't very clear, so had to pore through it
- dissatisfied due to urgency.
- most did not apply to us at all.

2.4 Mission Integration:

- no documentation associated with processes at JSC that I could find; when first started, looked for manifesting process, only thing I could do was sit on telecon and ask questions and sketch out; no document was referable; candidate payloads in planning process, for descent and ascent; many payloads on ISS are candidates for descent, but way/process they are candidates entail much paperwork; should already be pre-certified to come down, not rely on stowage requirements every time when already submitted.
- amount of time to process PVP, ICD is too long, ridiculous
- MSFC team went well, everything they did to integrate, went well, nothing was behind schedule based on what they did

2.5 Payload Engineering Integration:

- ICD and PVP combination should lead to improvement, but right now it is cumbersome.
- doing twice the paperwork for no good reason; doubling on PIRNs.

2.6 Operations Integration:

- Payload Ops Handbook difficult to define responsibilities, especially LIS, they might have good feeling of what they do but we don't

2.7 Real-Time Payload Operations:

- didn't have to fill out documents or deliverables

2.8 Payload Safety:

- same as in services

2.9 Payload Physical Integration:

- on PID, minimal amounts compared to integration, more safety sheets
- waited around a bit but all very satisfied or what I knew about it
- part of what we were supposed to put our requirements in for stowing things, and fact that this data set is not used, was very frustrating; also had case where we had requirement to de-stow some samples on landing day, and they ended up being stowed in place not accessible on landing day, we were able to work around it, Program responded, but that stuff shouldn't happen; we have a defined way of how we should get things up and down and we should be assured our defined requirements are met; that issue has been dealt with by Program.

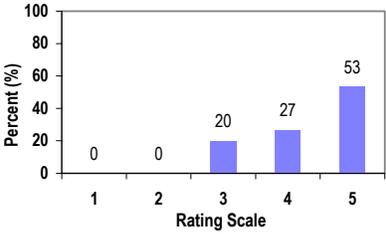
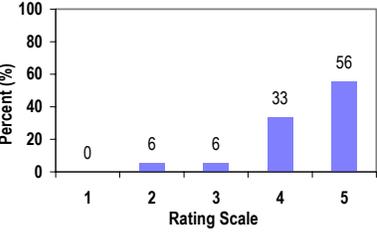
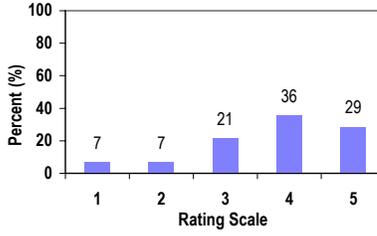
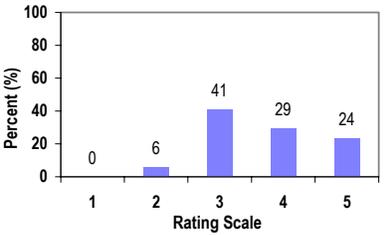
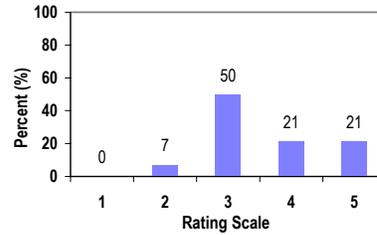
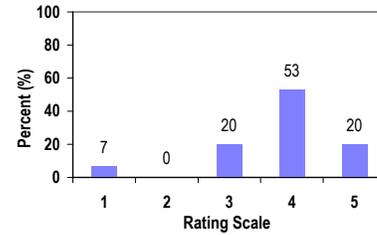
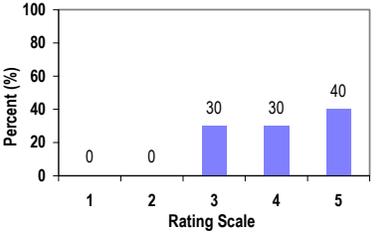
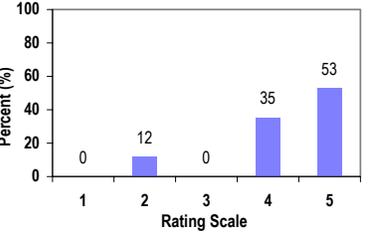
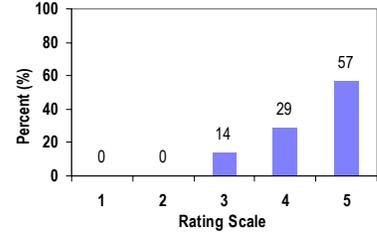
Is this getting stuff onboard and back? [RC: yes, both]

Part 2. Feedback on Specific Management / Functional Areas

Please rate your level of satisfaction with: DELIVERABLES (the requirements for data and documentation delivery from you)

1 2 3 4 5 Not
 Very Applicable
 dissatisfied Very
 satisfied

All Interviewees

NASA Payload Development	RPO Project Management	Research Planning & Integration
		
Applicable responses: 15/34 (44.1%) Mean rating: 4.3	Applicable responses: 18/34 (52.9%) Mean rating: 4.4	Applicable responses: 14/34 (41.2%) Mean rating: 3.7
Mission Integration	Payload Engineering Integration	Operations Integration
		
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Real-Time Payload Operations	Payload Safety	Payload Physical Integration
		
Applicable responses: 20/34 (58.8%) Mean rating: 4.1	Applicable responses: 17/34 (50.0%) Mean rating: 4.3	Applicable responses: 14/34 (41.2%) Mean rating: 4.4

Deliverables -- Comments

2.1 NASA Payload Development:

- some had to request minor clarifications, never got angry with anything
- had to deliver all test specimens for MISSE, and very satisfied
- you do what you do to make sure everything was documented, would be nice if there was less, but understand what was needed and why.
- templates are too long, good mockups,

2.2 NASA RPO Project Management:

- only interacted with RPO during manifest and CoFR
- we did get letter in timely fashion when having to submit COFR
- other than that, somewhat absent to any info they provided to us
- we were way outside of all templates and deliverables were negligible

2.3 Research Planning & Integration:

- feel we could have gotten more help but was a short template and didn't have much time to mess around
- from RPO standpoint, don't get good idea what their requirements are, definition, don't seem to be getting to interact why and how priorities are set, how something gets on one flight and not next, we are in dark in this area
- gave same ratings as previous, feel like they're similar enough; generally knew what was expected of me, filled it in, sent it.
- NASA was very supportive in getting me right sample size, getting on right Increments, scheduling was well done
- only issue, those coming down in Soyuz, won't come back to Houston exactly when I wanted, so coordination with Russians could have been better; could take superhuman powers because the Russians are hard to deal with.
- half the time not coordinated well; times when they wanted us to drop everything and submit papers, and our paperwork was not as sufficient.
- a lot of time asked for things late in the game, didn't get enough warning that things were coming; couldn't always support RPWG, didn't get fair warning.
- when our things go to working group, where they manifest our science missions, overall been very happy with them; got right into queue.

2.4 Mission Integration:

- CoFR was managed by RPO because of how they task listed us, it worked
- weren't very complicated to fill out, and didn't come back to us
- same comments about PIA and PTP; we had to provide data for requirements, but they 2.4 often times weren't met, wonder why we had to do in first place.
- they want information from flights without prioritization.

2.5 Payload Engineering Integration:

- sometimes reports were too many required.
- ICDs and verification plans not maintained well.
- we submit verification data and 4 months later when a week before COFR, additional data were required. Changes went from closed to open.
- don't get feedback that says its adequate, you can close back; you get we need more info on something too close to COFR.

- one particular person who cant seem to read the reports, if they ever want a close-out, we have telecon, and explain and go thru and its all there in B&W, even have had to re-word a CFC.

2.7 Real-Time Payload Operations:

- asked for rationale
- in this area we felt what we did for interfaces and activities was adequate, didn't do anything unnecessary or uncomfortable
- barely something to notice.
- most of time, relevant document; not clear who is final recipient; comes to end user of final data; could be more hand-holding or facilitating to relevant sub-discipline at JSC.
- I had some small interaction within my RPO, but largely something I do not interface with.

2.8 Payload Safety:

- making electronic would have been easier
- they have their act together, PIs don't see whole Safety picture, but some things are submitted for additional info
- these guys have advantage, just added ISS safety to STS requirements
- we did have to make some changes in safety items, and we felt they were reasonable on what they had to do.

Cover Image Captions



Astronaut Peggy Whitson floats near the Microgravity Science Glovebox (MSG) following its installation in the ISS Destiny laboratory on research mission Expedition Five. The MSG, built by the European Space Agency in collaboration with the Microgravity Sciences and Applications Department at NASA's Marshall Space Flight Center, is a sealed container with built-in gloves that make it possible for crews to safely do more hands-on science experiments involving fluids, flames, particles and fumes. Whitson is the first ISS astronaut also to be the lead scientist for an ISS experiment. Her life sciences experiment studies how living in space affects kidney stone formation.



Soybean plants growing in the Advanced Astroculture experiment aboard the ISS. DuPont is partnering with NASA and the Wisconsin Center for Space Automation and Robotics (WCSAR) at the University of Wisconsin-Madison to grow soybeans aboard the International Space Station to find out if they have improved oil, protein, carbohydrates or secondary metabolites that could benefit farmers and consumers.



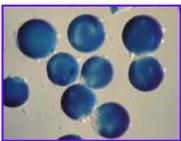
One of the first materials science experiments on ISS - the Solidification Using a Baffle in Sealed Ampoules (SUBSA) — was conducted during Expedition Five inside the Microgravity Science Glovebox. The MSG's sealed work environment makes it an ideal place for the furnace that will be used to melt semiconductor crystals. Dr. Aleksandar Ostrogorsky, a materials scientist from the Rensselaer Polytechnic Institute, Troy, N.Y., and the principal investigator for SUBSA, uses the gloves to examine an ampoule like the ones used for his experiment inside the glovebox's work area. The SUBSA experiment is managed by NASA's Marshall Space Flight Center.



View of a full Moon photographed by one of the crewmembers aboard the ISS.



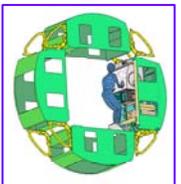
Cosmonaut Valery G. Korzun, Expedition Five mission commander, checks a plant growth experiment in the Zvezda Service Module on the ISS.



Liver cells like these were the subject of new research conducted aboard the ISS as part of Expedition Five.



Using a handheld digital camera as part of the ongoing Crew Earth Observations research program aboard the ISS, crew members took this photo June 7, 2002, of wildfires in the hills north and northwest of Los Angeles. Visible in the picture are the Channel Islands and southern Central Valley of California.



This cut-away of the cylindrical Destiny laboratory module on the ISS shows how the Microgravity Science Glovebox fits inside. Racks that hold science experiments are positioned all around the outside of the cylindrical module. Four racks, including the glovebox, are located around the circumference of this section of the orbiting laboratory.



Astronaut Peggy Whitson, Expedition Five science officer and flight engineer, retrieves an experiment cartridge for the Zeolite Crystal Growth experiment in Destiny laboratory on the ISS.



This digital still camera's picture, taken from the ISS on September 22, 2002, shows the central eye of Hurricane Isidore. The eye became less defined as the hurricane stalled and weakened over the Yucatan Peninsula near Merida.



On Earth when scientists melt metals, bubbles that form in the molten material can rise to the surface, pop and disappear. In microgravity — the near-weightless environment created as ISS orbits Earth, the lighter bubbles do not rise and disappear. Prior space experiments have shown that bubbles often become trapped in the final metal or crystal sample - similar to the bubbles trapped in this sample. In the solid, these bubbles, or porosity, are defects that diminish both the material's strength and usefulness. The Pore Formation and Mobility Investigation melted samples of a transparent modeling material, succinonitrile and succinonitrile water mixtures, shown here in an ampoule being examined by Dr. Richard Grugel, the principal investigator for the experiment at NASA's Marshall Space Flight Center. As the samples are processed in space, Grugel would be able to observe how bubbles form in the samples and study their movements and interactions.

