International Space Station Research Institute (ISSRI)

Statement of Work

DRAFT

For External Review

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PREFACE

This document contains the statement of work for the products and services associated with the International Space Station Research Institute (ISSRI) contract. These requirements include staff research, participation in the Office of Biological and Physical Research (OBPR) research solicitation and selection process, management of the OBPR research prioritization process, management of the evaluation of all commercial proposals, development of the International Space Station (ISS) roadmap, management of the "front door" customer interface and customer feedback, and development and execution of an outreach program. Additional requirements for generation of concept studies, management of Guest Investigator programs, and management of research archives will be called up by task orders. This statement of work is under configuration control by the Office of Biological and Physical Research.

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INTRODUCTION

The goal of this procurement is to establish the International Space Station (ISS) Research Institute (ISSRI) as a research leader to achieve and sustain research progress while providing intellectual leadership to the diverse user communities. The U.S. ISS utilization program involves extensive coordination of users from academia, industry, and government. The ISSRI responsibilities are limited to ISS utilization, ISS sortie payloads, and associated ground components, and do not extend to the ISS vehicle systems or vehicle operations. The ISSRI will support ISS Utilization for all National Aeronautics and Space Administration (NASA) Enterprises as defined in the Statement of Work (SOW). The ISSRI will not have an official interface with ISS International Partners.

The purpose of the ISSRI is to facilitate research planning, coordination, and advocacy for optimizing utilization of the ISS by the U.S. Science, Technology, and Commercial (S/T/C) communities. The ISSRI contractor is expected to foster and extend S/T/C research community interest and support for NASA research programs and ISS utilization, in particular. The ISSRI will develop the constituencies for use of U.S. ISS research facilities in alignment with NASA strategic objectives.

As part of its research leadership role, the ISSRI will be a strong advocate for ISS research utilization to NASA, to the user community, and to the public while recognizing ISS access and resource constraints. The ISSRI will provide an active, centralized voice for the diverse ISS user community and advocate for the community to the ISS program and NASA. ISS user feedback will be actively solicited, evaluated, and developed into process improvements.

Core Section

Implementation of the following CORE Work Breakdown Structure (WBS) elements will be initiated by a Contracting Officer's letter. Unless otherwise indicated, the Core work will engage all the NASA ISS user enterprises.

A. Institutional Management

A.1 Management of the Institute

(a) The ISSRI shall provide services required to accomplish the objectives and outcomes as detailed in this contract. The ISSRI shall comply with all terms and conditions in this contract.

(b) The ISSRI shall develop and provide Workforce Reports, in accordance with Data Requirements Description (DRD)-A.1b, outlining geographical workforce breakdown and workforce on-site at a NASA facility.

(c) The ISSRI shall develop, provide, maintain, and implement a Management Plan in accordance with DRD-A.1c. The plan shall include an organization chart and describe the ISSRI management structure that fully and optimally integrates all related plans and systems, including those of major subcontractors and vendors. The plan shall address the ISSRI management of all systems, functions, and data requirements described in this SOW. The plan shall include a section describing Key Personnel Roles and Responsibilities. The plan shall include the Staff Research Implementation Plan. The plan shall include a description of ISSRI external interfaces.

(d) The ISSRI shall develop and maintain a WBS and WBS Dictionary containing and defining all task elements contained in this SOW and in accordance with the requirements defined in DRD-A.1d. The WBS shall follow the numbering and nomenclature of this SOW. The ISSRI may expand the WBS in Attachment XXX to indicate the level at which the work will be accomplished. The contract WBS shall serve as the framework for ISSRI contract planning, budgeting, financial reporting, cost performance reporting, schedule resource loading, and schedule status reporting to the Contract Officer's Technical Representative (COTR). Major elements of work provided by subcontractors shall also be identified in the contract WBS.

A.2 Performance

A.2.1 Management Reports

(a) The ISSRI shall establish, implement, and maintain a financial reporting system in accordance with the NASA Federal Acquisition Regulation (FAR) Supplement (NFS) 18-52.204-71 and NASA Procedures and Guidelines (NPG) 9501.2D. The ISSRI shall submit a Financial Management Report containing financial information for core contract activities and for each Indefinite Delivery, Indefinite Quantity (IDIQ) Order in accordance with DRD-A.2.1a.

(b) The ISSRI shall develop and provide a monthly performance report detailing technical performance, research performance, schedule performance, and cost summation.

(c) The ISSRI shall develop and provide an annual performance report detailing technical performance, research performance, schedule performance, and cost summation.

A.2.2 Management Reviews

The ISSRI shall support monthly and quarterly Performance Management Reviews (PMRs) with NASA in accordance with DRD-A.2.2.

A.2.3 Regulatory Compliance

A.2.3.1 Industrial Safety

The ISSRI shall develop, update, and implement the Industrial Safety Plan in accordance with DRD-A.2.3.1. The ISSRI shall comply with NASA Center regulations when using NASA facilities, including submission of incident reports (NASA Forms 1627A and 1627B).

A.2.3.2 Export Control

The ISSRI shall develop and provide an Export Control Plan in accordance with DRD-A.2.3.2. The ISSRI shall comply with all U.S. Export Control Laws and Regulations, including International Traffic in Arms Regulations (ITAR), 22 Code of Federal Regulations (CFR) Parts 120-130, and the Export Administration Regulations (EAR), 15 CFR Parts 730-774, in the performance of this contract.

The ISSRI shall identify, categorize, and track all export commodities including, but not limited to Internet web pages, software, technologies, Scientific and Technical Information (S&TI), available documentation, specifications, drawings, hardware, and deemed exports.

A.3 Support to National Aeronautics and Space Administration (NASA) and International Space Station (ISS) Internal and External Boards, Panels, and Reviews

(a) The ISSRI shall represent assigned functional areas, other than Guest Investigator (GI) project-specific functions, at NASA, ISS, and external review boards and panels. These groups include, but are not limited to, the NASA Advisory Council and Enterprise Committees and Subcommittees. ISSRI attendance at boards and panels may require concurrence of the COTR. The ISSRI shall provide reviews, assessments, and recommendations in resolution of issues.

(b) The ISSRI shall prepare and present various topics, such as technical, cost, and schedule status and responses to external inquiries, as directed by NASA.

B. Research

NASA recognizes the importance of an active research element within the overall scope of ISSRI activities. Funding for ISSRI staff research may originate from NASA or

other funding sources through open competitive research solicitations, from industrial or commercial partners, or from ISSRI discretionary funds.

The ISSRI research staff is expected to compete for research funding from NASA and other sources by preparing and submitting proposals to research announcements with independent merit review. It is recognized that the fundamental charter of the ISSRI relates to the scientific utilization of the ISS and staff research activities shall be aligned with NASA research objectives.

B.1 Staff Research Plan

The ISSRI shall develop, update, and implement a plan for the conduct of research by members of its research staff in accordance with DRD-B.1. This plan shall take into consideration the NASA estimation that it is reasonable to allow the research staff, on average, fifty percent of their collective time to engage in research. The stated value of fifty percent pertains to all research activities, including those resulting from peer-reviewed submissions, commercial or industrial collaborations, and any ISSRI or NASA discretionary programs that might be available. The stated average value of fifty percent shall include, but is not limited to time required to perform all aspects of the research activity, if awarded, including:

(a) Preparation and submission of research proposals;
(b) Background literature reviews;
(c) Laboratory activities, related calculations, data analysis, modeling, or theoretical development;
(d) Experiment definition, development, and implementation;
(e) Financial tracking and reporting;
(f) Oversight of or interaction with respective collaborators or co-investigators, if required;
(g) Attendance at related conferences, workshops, and professional meetings, unless the ISSRI Director specifically requests and funds such participation as it relates to the broader ISSRI mission;
(h) Other activities directly relating to the dissemination of research results; and
(i) Publication of research papers.

The balance of research staff time shall be spent in performance of the remaining SOW WBS elements. The ISSRI shall submit reports monthly in accordance with DRD A.2.2, describing all research conducted by the ISSRI staff.

B.2 Director’s Discretionary Research Fund

The ISSRI Director’s Discretionary Research Fund shall be used to perform research at the discretion of the ISSRI Director. This discretionary research shall be used for the advancement of NASA research objectives.

The staff may engage in research activities arising from discretionary programs, pursuant to the limitation that a total of fifty percent, on average, of their time is available

for all research. In all cases, the extent and focus of all staff research activities must be conducted commensurate with the oversight and approval of the ISSRI Director. The ISSRI shall submit reports monthly in accordance with DRD–A.2.2 describing the uses of, and products generated from, the Director's Discretionary Research Fund.

C. Management Systems

C.1 Configuration Management

The ISSRI shall implement a hardware and software Configuration Management (CM) Program for overall administration of this contract that meets the intent of Military Standard (MIL-STD)-973. This CM Program shall also provide the flexibility to implement CM for individual Orders. The program shall provide the following: (1) configuration identification, (2) configuration control, (3) configuration status accounting, and (4) configuration verification and internal audits. The ISSRI shall generate and deliver a Configuration Management Plan (CMP) in accordance with DRD-C.1, which defines the ISSRI CM program and methods for implementation of the contract requirements. The ISSRI shall provide the workforce, facilities, and materials required to implement the CM program requirements, including the generation, updates, and maintenance of all documentation.

The CM system for the ISSRI shall be required to maintain the configuration of the Guest Investigator (GI) hardware and software systems, and associated documentation. The CM system shall support modifications and repair to the GI flight and ground systems and maintain configuration of this hardware and software during and after these modifications and repair. These flight and ground systems will be developed by multiple field centers and will be provided to the ISSRI along with the field center developed data package. The implementation associated with GI Program configuration management is in section K.3.4.

C.1.1 Configuration Management Audits

The Government reserves the right to audit the ISSRI CM program for the contract. The ISSRI shall:

(a) Provide logistical support for periodic audits of the ISSRI CM System,
(b) Provide requested information to auditors,
(c) Interface with auditors, and
(d) Respond to audit findings.

C.2 Risk Management

The ISSRI shall establish, document, update, and implement a risk management process to increase program/project goal accomplishment. A Risk Management Plan shall be submitted in accordance with DRD-C.2. The Risk Management Plan shall provide specific information on how the ISSRI shall implement the risk management process and how risk items will be documented and communicated to NASA.

As part of the risk management process, the ISSRI shall develop a prioritized list of potential risks for each ISSRI program/project (not to include staff research). In addition, the risk analysis and risk tracking reports will be provided throughout the life cycle of each program/project in the Risk Management Plan. The ISSRI shall notify NASA of issues that pose a potential risk to safety, cost, schedule, and performance of deliverable end items.

C.3 Information Technology Security System

The ISSRI shall develop, update, and implement an Information Technology Security Plan in accordance with DRD-C.3.

The FAR requirement NFS 1852.204-76, Security Requirements for Unclassified Information Technology Resources shall apply to all ISSRI employees, subcontractors, and GIs using computers that will access NASA computer networks. Additionally, this FAR clause applies to all computer databases, archives, and websites to be created and maintained by the ISSRI under this contract.

C.4 Schedule Management

The ISSRI shall develop, submit, and maintain detailed master schedules. The master schedule shall contain schedule data for the total scope of work for each Order or other NASA defined grouping of work at a level of detail to allow for discrete progress measurement and overall project visibility in accordance with DRD-C.4. The master schedules shall summarize the top-level milestones and activities, indicate their changes from the baseline, and include their forecasted dates. Additional status shall be provided as requested by NASA.

C.5 Inventory Control

The ISSRI shall develop, update, and implement a Government Property Management Plan in accordance with DRD-C.5. The ISSRI shall establish, implement, and maintain an inventory control system to track and control all Government-furnished and ISSRI-acquired property. The ISSRI shall comply with the Government property clauses specified elsewhere in the contract. The ISSRI shall prepare and maintain a report identifying and listing all Government furnished property provided for use by the ISSRI in the performance of contracted effort, and for which the ISSRI has been given physical custody.

D. Strategic Planning

In all activities associated with strategic planning of research by NASA, the ISSRI shall exercise due diligence to ensure the absence of conflicts of interest in their participation.

D.1 Analysis on ISS Utilization

The ISSRI shall coordinate, develop, and focus the ISS S/T/C community recommendations in support of the NASA strategic planning process. The ISSRI shall

prepare and deliver an annual analysis of completed and projected ISS S/T/C utilization, in accordance with DRD-D.1, to a NASA management team comprised of, at a minimum, ISS User Enterprises. The analysis shall include: 1) a comparison of planned and actual utilization, and 2) recommendations for future ISS research directions, capabilities, utilization optimization, and improvements in productivity, efficiency, and impact on NASA strategic goals and objectives. The ISSRI shall provide briefings on the analysis to the NASA Advisory Council, and NASA enterprise advisory committees, as directed by NASA.

D.2 ISS Utilization Roadmap and Strategy

During the last year of the anticipated three-year development of research strategic roadmaps, the ISSRI shall partner with NASA to develop a utilization roadmap and strategy for ISS utilization to facilitate the completion of those research objectives that require the ISS. The ISSRI shall integrate across NASA research discipline, commercial, and technology roadmaps to provide a coordinated approach to achieve the ISS-related milestones in the NASA roadmaps and strategies. The ISSRI shall deliver the ISS Utilization Roadmap and Strategy in accordance with DRD-D.2, to a NASA management team comprised of, at a minimum, ISS User Enterprises. The ISSRI shall provide briefings to the NASA Advisory Council, and NASA enterprise advisory committees, as directed by NASA.

E. Customer Support

E.1 Customer Support Interface

In line with its role of facilitating utilization of the ISS, the ISSRI shall establish and maintain a customer support interface for the S/T/C research communities, including a staffed help desk. This support shall provide a point of entry for obtaining information regarding ISS capabilities and research opportunities.

The ISSRI shall stay current with NASA S/T/C research programs and opportunities related to ISS utilization and shall be knowledgeable about ISS related NASA flight research platforms and ground-based facilities. Knowledge of NASA research areas, including key organizing research thrusts, and the mechanics of the proposal submission and review processes shall be required.

The ISSRI shall respond to questions regarding existing ISS facilities and utilization processes, subrack hardware and associated capabilities, attached payload facilities and associated capabilities, and provide points of contact should additional information be required.

The ISSRI shall consolidate, update, and maintain a Customer Support Interface Information Source in accordance with DRD-E.1a, and in coordination with the NASA user enterprises, ISS program, and NASA Centers. The ISSRI shall keep a record of all inquiries (date, substance, disposition) and publish statistics about these inquiries in accordance with DRD-E.1b.

E.2 Customer Feedback and Assessments

The ISSRI shall assume responsibility for the customer feedback process, with results to be compiled and submitted to NASA in accordance with DRD-E.2. Statistical data obtained in previous ISS Payloads Office surveying activities shall be incorporated into the analysis of ISSRI administered surveys.

Customer feedback reports and analysis shall be posted on the Internet. The ISSRI shall keep a record of all unsolicited feedback (date, substance, disposition) and provide statistics in addition to the formal assessment.

F. Office of Biological and Physical Research (OBPR) Science and Technology Solicitation and Selection

In all activities associated with solicitation and selection of research by NASA, the ISSRI shall exercise due diligence to ensure the absence of conflicts of interest in their participation.

F.1 Development and Announcement of Research Opportunities

F.1.1 Data Package to Support NASA Research Announcement (NRA) Development

The ISSRI shall collaborate with OBPR to develop effective research programs to advance OBPR strategic objectives and optimize ISS utilization to meet these objectives. Through active engagement with the research community and participation in the OBPR strategic planning process, the ISSRI shall provide recommendations for research content of OBPR solicitations for proposals. The ISSRI shall encourage multi-disciplinary and/or previously unidentified research approaches to address OBPR strategic research objectives. In collaboration with sponsoring OBPR Division Directors, the ISSRI shall prepare data packages for use by OBPR in the development of solicitations for research proposals in accordance with DRD-F.1.1.

The ISSRI shall review ISS utilization solicitation documents for content and clarity to assist OBPR to maximize community responsiveness. The ISSRI shall facilitate S/T/C research community awareness of OBPR solicitations.

F.1.2 Development of Pre-solicitation Workshops/Conferences

The ISSRI shall partner with OBPR with regards to science and technology pre-solicitation workshops/conferences. The purpose of these forums is to educate potential new investigators about and expand their participation in OBPR programs and solicit information from the S/T/C community to be used by OBPR in the design of research solicitations. As directed by NASA, the ISSRI shall support, contribute, conduct, or participate in these workshops/conferences.

F.2 Evaluation of Submitted Proposals

F.2.1 Peer Panel Membership as Selected

The ISSRI shall identify potential independent peer panel members to OBPR upon request. ISSRI shall provide staff as independent peer review panelists, as invited by NASA.

F.2.2 Participation in Development of a Selection Recommendation Package

ISSRI shall provide staff to observe peer panel meetings and monitor results. The ISSRI observer shall work with the relevant OBPR Enterprise Scientist to develop a research selection recommendation based on peer panel results and a detailed understanding of ISS research, strategic goals, prior accomplishments, ISS constraints, and ISS timelines. The OBPR Enterprise Scientist will develop and present the final recommendation to the NASA selecting official.

F.2.3 Participation in Technical/Engineering Feasibility Assessments

ISSRI shall participate with OBPR in performing technical/engineering feasibility assessments of flight experiments proposed to be implemented on ISS, as assigned.

F.3 Identification of Data and Samples Suitable for Archiving

At the conclusion of the selection process, the ISSRI shall evaluate proposals selected by OBPR and submit a report that identifies anticipated data products and available flight samples to be archived, and project data archive requirements in accordance with DRD-F.3.

F.4 Identification of Education and Outreach Potential

At the conclusion of the selection process, the ISSRI shall evaluate proposals selected by OBPR and submit a report that identifies planned and potential Education and Outreach activities, products, schedules, and audiences in accordance with DRD-F.4.

G. Research Partnerships

The ISS related research and entrepreneurial activities for the OBPR Research Partnership Program are developed and managed by the Space Product Development (SPD) Division. In addition, the NASA Field Centers and commercial partners develop and manage commercial Space Act Agreements. These two types of flight agreements constitute the categories of commercial research. Commercial program hardware is managed by the partnership customer or by their designated representative, such as one of the Research Partnership Centers (RPCs). The proprietary nature of applicable fiscal and intellectual property activities of the partnerships shall be protected by the ISSRI.

G.1 New Concept Development

The ISSRI shall assist the private sector through discussion of early concept development for new commercial initiatives to refine initial research concepts proposed by the private sector and identify technical and business considerations associated with flight opportunities or resource commitments.

G.2 Merit Evaluation

The ISSRI shall establish, lead, manage, and sustain an independent Merit Evaluation Board with an evaluation process that shall receive, control, analyze, recommend the selection of, and document the merit of all commercial flight research, entrepreneurial, and Space Act Agreement proposals for ISS activities.

The Board shall review ISS commercial research flight proposals, including Space Act Agreements, received from the RPCs, entrepreneurial partners, and NASA Centers. The Board shall provide recommendations for approval or disapproval to the sponsoring NASA organization. The sponsoring NASA organization will inform proposers and center representatives of the final disposition.

A member of the ISSRI shall chair the Board. The SPD Division Director, or a designated representative, shall serve in an ex-officio position as Executive Secretary. The voting membership of the Board shall be comprised of non-NASA representatives and will include subject matter experts selected based upon the specific nature of the business and technical research content considerations of the offered proposals. The ISSRI shall exercise due diligence in executing the Merit Evaluation Board processes to ensure the absence of conflicts of interest and the protection of commercial intellectual property and confidential business information provided within the proposals. The ISSRI may request NASA expertise to provide information to the Board as part of the evaluation process.

The ISSRI shall regularly convene the Board to review proposals submitted for consideration. Annually, the Board shall review approved commercial research payloads that have not yet flown to ensure that the basis for selection remains current and not changed by circumstances such as changing corporate direction or merger with another company that results in research redirection. The annual review is not a re-evaluation of the initial proposal, but an assurance that the basis for selection remains current.

A subcommittee of the Board shall evaluate all commercial proposals where the ISSRI is a partner. This subcommittee shall be chaired by the ex-officio NASA member. The subcommittee membership shall be comprised of the non-ISSRI members of the Board, supplemented as necessary. The process and evaluation criteria shall remain the same as the full Board.

The ISSRI shall periodically identify, through announcements by Fedbizopps and other sources, requests for commercial research flight proposals to the ISS. These solicitations will be aligned with ISS flight opportunities to ensure consistency between solicited flight proposals and the ISS payload capacity. The ISSRI shall receive all commercial research flight proposals for the ISS, whether through the Research Partnership Center program or proposed NASA-sponsored flight agreement proposals; establish and maintain control management of the proposals; and obtain supporting data to analyze the proposals. The ISSRI shall analyze, evaluate, and rate all of the proposals

based upon a set of criteria and associated weighting considerations jointly developed with and approved by NASA. The present criteria consist of payload development evaluation metrics, commercial selection criteria, and other criteria considered within the research prioritization process. The Board shall make recommendations of evaluation criteria to NASA. Based upon the evaluation and scoring of the proposals, the ISSRI shall formulate and prioritize selection recommendations for flight.

After the completion of the findings, the Board shall provide a report, in accordance with DRD-G.2. This report shall outline the process, the committee membership composition, the score and rationale, recommendations, and other information that allows NASA to understand the evaluations in accordance with the established process, selection criteria, and context of the NASA strategic objectives.

G.3 Partnerships

The ISSRI shall establish and maintain a strategic partnership with the network of NASA RPCs and industry to strengthen, optimize, and advance existing and future ISS commercial research programs. The ISSRI relationship with the RPCs shall optimize existing capabilities; industry, academic, and government leadership opportunities; research resources; and outreach opportunities. The ISSRI shall be a catalyst for the establishment of partnerships linking the commercial and science research sectors. Joint research projects, researcher exchange programs, use of commercial research "best practices," collaboration on long-range planning analyses, and other joint initiatives, may further strengthen this strategic relationship.

The ISSRI shall seek to increase the awareness and opportunities for potential small business users in performing innovative ISS commercial activities.

G.4 Market Development Analysis

The ISSRI shall identify existing and emerging technologies and products that may benefit from insights gained in the environment of space. The ISSRI shall identify the potential evolution of consumer requirements and needs in order to determine the most productive links between fundamental science challenges and commercial sector thrusts in the near-, mid-, and long-term timeframes. The ISSRI shall assess opportunities within the Research Partnerships program of OBPR that would have a positive impact in addressing the Agency research and technology requirements. The ISSRI shall provide the results of the assessment in accordance with DRD-G.4 and for use in the strategic planning process.

H. OBPR Research Prioritization

H.1 Evaluation

Once research has been selected, funded, and approved for flight by NASA and the ISSRI for GI Programs, flight research to be recommended for ISS utilization will be identified by the sponsoring organization. To ensure a balanced research program with optimal research output, the OBPR Research Prioritization Process shall be managed by

the ISSRI to determine the priority of research across disciplines. The ISS Program Scientist will be responsible for overseeing the ISSRI implementation of the prioritization process.

The OBPR Research Prioritization Process (reference TBD) will apply the following decision criteria to each proposed flight experiment: 1) strategic value of the research, 2) impact and quantity of questions to be answered, 3) terrestrial application, 4) urgency of the research, 5) flight platform required, 6) readiness risk, and 7) vehicle resources required. The process will calculate a Research Return Priority Rating using weighting factors, and any other unique factors that should be considered, developed by the ISS Program Scientist, NASA, and the ISSRI. The NASA Headquarters (HQ) approving body will use these ratings to prioritize investigations. To ensure an unbiased evaluation of the flight research with regard to decision criteria 1- 4, the ISSRI shall establish an external panel to annually evaluate each investigation according to the established criteria. Panel members will be selected based on their experience in multi-factorial decisions and managing broad reaching strategic plans, akin to Research Directors and Deans of research schools or institutions, with no current direct involvement with NASA. The ISSRI shall coordinate with NASA to identify expertise to evaluate decision criteria 5 - 7.

The information required to evaluate each investigation will be obtained from the Principal Investigator (PI), the Guest Investigator (GI), and the sponsoring organizations, and provided to the ISSRI in the form of an evaluation package. The evaluation and rating of the investigations by the evaluation panels shall be facilitated by the ISSRI and will include providing instructions, distributing evaluation packages, coordinating meetings, and guiding evaluation panels through the process. The ISSRI shall provide the results prepared in accordance with DRD-H.1 to the ISS Program Scientist. The prioritized list of investigations is advanced to the ISS Payloads Office (OZ) and the OBPR Mission Integration Division (UM) to identify the investigations that can be accommodated within the available ISS resources. The ISS Program Scientist will present the approved prioritized list of investigations to the OBPR Enterprise Program Management Council (EPMC).

In partnership with the OBPR EPMC, the ISSRI shall participate in the review of the recommended prioritized list of investigations. The ISSRI shall represent the S/T/C community to the EPMC in the review of the OBPR prioritization list. Once vetted, the prioritized list of investigations will be advanced to the ISS Payloads Office (OZ) and the OBPR Mission Integration Division (UM) for final determination of accommodation and manifesting.

H.2 Prioritization Alignment with Strategic Objectives

The ISSRI shall perform an assessment of the prioritized list of investigations to verify that the list is aligned with the strategic goals and objectives for OBPR research as delineated in the OBPR Strategy and Roadmap and the ISS Utilization Roadmap. The results shall be provided to the ISS Program Scientist for the prioritization presentation to

the OBPR EPMC. The ISSRI shall produce the strategic alignment assessments in accordance with DRD-H.2.

I. Educational Outreach and Public Outreach (EO/PO)

NASA seeks to increase national awareness of human spaceflight, space research, and their benefits, including knowledge and applications that improve the quality of life on Earth. NASA has also increased its commitment to national educational goals, with a focus on inspiring and motivating students to pursue careers in science, technology, engineering and mathematics. The ISSRI shall lead all EO/PO related to ISS utilization. ISSRI EO/PO shall be fully integrated with OBPR EO/PO, NASA Office of Education, and EO/PO of other NASA Enterprises.

The ISSRI EO/PO focus shall be on activities that reach national audiences. ISSRI EO/PO target audiences are the domestic S/T/C community, educators and students, media, and the general public. ISSRI EO/PO efforts shall include minority, underrepresented, and non-traditional audiences. ISSRI EO/PO efforts shall be conducted using methods suitable for the targeted audience.

I.1 Cross-Cutting EO/PO Requirements

The ISSRI shall respond to queries and requests for information from the public. The ISSRI shall respond to requests for speakers to present ISS utilization content. The ISSRI shall establish partnerships with external domestic organizations to support EO/PO goals.

I.1.1 International Space Station Research Institute (ISSRI) EO/PO Annual Plan and Annual Report

The ISSRI shall develop and deliver to NASA the ISSRI EO/PO Annual Plan in accordance with DRD-I.1.1a and an EO/PO Annual Report in accordance with DRD-I.1.1b.

I.1.2 EO/PO Repository, Inventory, and Distribution

The ISSRI shall establish and maintain a repository of all ISSRI EO/PO materials developed by the ISSRI for external audiences, including exhibits and mock-ups, and samples of other available ISS utilization-related outreach materials. The ISSRI shall maintain an accessible on the Internet, user-friendly inventory of all such items. The ISSRI shall be responsible for the distribution of items and maintaining accuracy of materials. The ISSRI, in consultation with NASA, shall determine when to make use of existing NASA distribution mechanisms, including those of the NASA Office of Education.

I.1.3 ISS Research Results/Benefits Reference

The ISSRI shall develop, maintain, and make available on the web, a comprehensive ISS Research Results/Benefits Reference to 1) provide all ISSRI EO/PO audiences comprehensive, high quality and compelling information regarding ISS

utilization results and benefits and 2) be used in the development of diverse EO/PO products.

I.1.4 Support to Payload Developers and NASA Centers

The ISSRI shall provide ISS utilization EO/PO support to the ISS Program Scientist, NASA Centers, ISSRI GI project offices, and ISS payload developers. Examples of this support include, but are not limited to, developing standard methods and formats for capturing useful ISS utilization information; collecting ISS utilization information and disseminating that information to external audiences, as requested; and collaborating with NASA Centers and ISS payload flight project offices in outreach activities and products.

I.1.5 Regulations, Policies, and Procedures

ISSRI EO/PO shall be consistent with NASA strategic plans and OBPR research and outreach plans and goals. ISSRI EO/PO activities and products shall conform to all applicable Federal and NASA regulations and policies. Printed documents shall conform to publication regulations issued by the Government Printing Office (GPO). The ISSRI shall interact directly with the NASA printing organization to coordinate final product development and dissemination. ISSRI multimedia and media products shall conform to applicable NASA format and content standards. Web sites shall be accessible in accordance with Section 508 of the Rehabilitation Act.

The ISSRI shall provide for NASA approval advance copies of formal EO/PO products to be released to external audiences in accordance with the approved procedures (DRD-I.1.1a).

NASA is in the process of defining the ISS brand and policy, which will create a standard image of the ISS that will be incorporated in all ISS activities and products. When established, all ISSRI EO/PO activities and products shall be consistent with the ISS brand policy and maintain its integrity.

I.1.6 Consolidated Web Site

Information to be published by the ISSRI on the web shall be published on a consolidated web site that includes the ISSRI-provided web site and links with the NASA web portal, as further defined in Sections I.2.1a, I.3.3a, and I.4.2a. In designing the consolidated web site, the ISSRI shall take into consideration the needs of ISSRI audiences, the desire for innovation, and integration with the NASA web portal.

I.1.7 Communication Studies

The ISSRI shall perform strategic communication studies (e.g., surveys, audience analyses, media analyses, focus groups) required for EO/PO planning and evaluation.

I.1.8 Communications to NASA Personnel

The ISSRI shall disseminate ISS utilization information, primarily using existing NASA communication mechanisms, such as NASA Headquarters and Field Center newsletters,.

I.2 ISS User Outreach

The ISSRI shall communicate ISS S/T/C utilization information, opportunities within access and resource constraints, results, and benefits to potential and experienced ISS users. The focus of user outreach shall be on members of academic institutions and institutes, industry, non-governmental organizations, and federal, state and local government agencies. These outreach efforts shall emphasize reaching S/T/C audiences through their venues (e.g., professional, scientific, and trade association meetings and publications). The ISSRI shall:

(a) Promote the use of the ISS for scientific, engineering, and commercial research. The ISSRI shall promote mechanisms for ISS use, including NRAs and Announcements of Opportunity (AOs), Research Partnership Centers, and Entrepreneurial Offers. This activity shall be aligned with projected access and capacity/resource utilization models.

(b) Facilitate communication between industry and NASA staff to help bring to NASA commercial technologies with potential to support ISS utilization needs.

(c) Communicate ISS research information and the availability of the ISSRI and other pertinent NASA archives, including results and benefits to S/T/C communities.

(d) Develop activities and products that enhance communication and collaboration among ISS researchers.

(e) Promote ISS research-derived knowledge and technologies for space and Earth application.

I.2.1 Multimedia

The ISSRI shall translate ISS utilization content into user outreach activities and products, such as publications, brochures, web sites, graphics, imagery, videos, visualization/animation, exhibits, and memorabilia. The ISSRI shall create a similar design standard for a set or series of ISS utilization user outreach products, balanced with the need to tailor products for a given audience.

I.2.2 Internet Sites

Information for the science and technical user communities shall be published by the ISSRI via the Internet. This information is not required to be published via the NASA web portal. However, if such information is to be published via the NASA web portal, it shall be submitted to NASA through the NASA portal content management system in accordance with NASA.gov Editorial Guidelines. ISSRI shall develop, update, and maintain a web-based catalogue of user outreach products. The ISSRI shall make electronic products accessible via the Internet.

I.2.3 Meetings

The ISSRI shall develop, manage, facilitate, attend, and promote ISS utilization-related user outreach meetings including symposia, workshops, colloquia, seminars, conferences and distance learning and related events. ISSRI EO/PO staff may also attend and exhibit at non-ISSRI user outreach events.

I.3 Public Outreach and Media Communications

The ISSRI shall develop and manage a multi-faceted public outreach and media communications effort to increase public science literacy and awareness of ISS research and benefits, using effective methodology and scientifically accurate information in easily understandable language.

I.3.1 Public Outreach

The ISSRI shall engage the public in ISS research, results, and their benefits, through such avenues as public programs, community outreach, mass media, and the Internet. The ISSRI is encouraged to use innovative, effective approaches and communication channels to reach the public.

The ISSRI, working with NASA and ISS researchers, shall develop and implement approaches for public involvement with ISS utilization while ensuring such involvement does not adversely impact ISS research, operations, or objectives.

I.3.2 Media Communications

The ISSRI shall gather and distribute information on ISS research to target audiences through an integrated suite of multimedia news products using media outlets, including, but not limited to, science, business, trade, entertainment, national, regional, and local.

The ISSRI, working with NASA Office of Public Affairs (PAO) and the NASA user enterprises, shall develop, update, and implement media events such as news conferences, tours, workshops, roundtable discussions, satellite media tours, and other activities as a means to interest the news media in ISS research and communicate complex scientific and technical information. NASA PAO and the NASA user enterprises will review and approve media products and activities prior to completion or release.

The ISSRI shall provide data and reports to NASA, in accordance with DRD-I.3.2, indicating the degree of media coverage of ISS research, particularly as a result of ISSRI activities.

I.3.3 Multimedia

The ISSRI shall translate ISS utilization content into public and media outreach activities and products, such as publications, brochures, web sites, media packages, graphics, imagery, videos, visualization/animation, exhibits, and memorabilia. The ISSRI shall create a similar design standard for a set or series of ISS utilization public

and media outreach products, balanced with the need to tailor products for a given audience.

I.3.4 Internet Sites

All on-line material created by the ISSRI and intended for use by the general public shall be submitted through the NASA Portal Content Management System for publishing via the NASA web portal. ISSRI shall develop, update, and maintain a web-based catalogue of public and media outreach products. The ISSRI shall make electronic products accessible via the Internet.

I.3.5 Meetings

The ISSRI shall develop, manage, facilitate, attend, and promote ISS utilization-related public and media outreach meetings including symposia, workshops, colloquia, seminars, conferences and distance learning and related events. ISSRI EO/PO staff may also attend and exhibit at non-ISSRI public and media outreach events.

I.4 Educational Outreach

The ISSRI shall develop and manage an educational outreach effort focusing on using ISS research content. ISSRI educational outreach shall focus on sixth through twelfth grade, higher education, lifelong learners, and informal education through science centers, museums, and other venues.

ISSRI educational efforts shall conform to NASA educational goals and objectives and criteria for exemplary programs. Educational activities and products shall meet applicable national educational standards. (References: NASA Strategic Plan Goal 6, Objectives 6.1 - 6.4 and Goal 7, Objective 7.1, Office of Education Strategy, and OBPR Educational Outreach Handbook).

The ISSRI, working with NASA and ISS researchers, shall develop and implement approaches to make educational outreach an integrated component of ISS research. These efforts shall seek to provide opportunities for educators and students to interact directly with ISS researchers, experiments, and data.

The ISSRI shall have the capability to develop curriculum supplement materials, including lesson plans. ISSRI education products shall conform to the standards for product development, review, dissemination, and evaluation established by the NASA Office of Education, as directed by the Task Monitor.

The ISSRI shall prepare and enter statistics and evaluation data regarding ISSRI educational outreach efforts to the NASA reporting system.

I.4.1 Media Communications

The ISSRI shall gather and distribute information on ISS utilization education activities through an integrated suite of multimedia news products through media outlets,

including, but not limited to, science, business, trade, entertainment, national, regional, and local.

The ISSRI, while working with NASA Public Affairs Office (PAO) and the NASA user enterprises, shall develop, update, and implement media events such as news conferences, tours, workshops, roundtable discussions, satellite media tours, and other activities as a means to interest the news media in ISS utilization education activities. NASA PAO and the NASA user enterprises will review and approve media products and activities prior to completion or release.

The ISSRI shall provide data and reports to NASA, in accordance with DRD-I.3.2, indicating the degree of media coverage of ISS research, particularly as a result of ISSRI activities.

I.4.2 Multimedia

The ISSRI shall translate ISS utilization content into Educational outreach activities and products, such as publications, brochures, web sites, graphics, imagery, videos, visualization/animation, exhibits, and memorabilia. The ISSRI shall create a similar design standard for a set or series of ISS utilization educational outreach products, balanced with the need to tailor products for a given audience.

I.4.3 Internet Sites

All on-line material created by the ISSRI and intended for use by elementary and secondary school students or teachers shall be submitted through the NASA Portal Content Management System for publishing via the NASA web portal. ISSRI shall develop, update, and maintain a web-based catalogue of educational outreach products. The ISSRI shall make electronic products accessible via the Internet.

I.4.4 Meetings

The ISSRI shall develop, manage, facilitate, attend, and promote ISS utilization-related educational outreach meetings including symposia, workshops, colloquia, seminars, conferences and distance learning and related events. ISSRI EO/PO staff may also attend and exhibit at non-ISSRI educational outreach events.

Indefinite Delivery, Indefinite Quantity (IDIQ) Section

Implementation of the following WBS Elements will require an Order approved by the Contracting Officer. It is expected that each Order will have a Task Monitor who will be the primary interface for the Order. Orders will include specific defining information and direction for all tasks. Each Order issued will define technical and programmatic requirements, milestones, and deliverables that must be met during performance of the Order. Orders will contain references to applicable sections in this Statement of Work and in the contract Attachment J-2, Data Procurement Document. Orders may tailor the Data Requirements Descriptions (DRDs) included in Attachment J-2 and may include additional DRDs that are not included in Attachment J-2. Each Order will define the documentation and documentation delivery schedule required for that

Order. All technical direction, supplemental to issued Orders, shall be in writing and in accordance with the clause "Technical Direction," NASA 18-52.242-70.

In one anticipated GI program type, after the initial NASA Principal Investigator program has been completed with specific flight hardware, NASA may elect to have the Institute manage the flight and associated ground hardware, including the necessary maintaining/sustaining engineering. NASA will issue a separate order for each GI project assigned to ISSRI. It is also expected that a Concept study shall be performed by the ISSRI to determine the feasibility of each program prior to establishing the Order for a GI program.

The government will perform surveillance of the work performed by the ISSRI. At the discretion of the government, the depth of technical oversight used in this surveillance can vary, from no oversight to total oversight. Each Order will define the level of technical oversight that will be implemented for that Order. The level of surveillance activities may vary within the Order depending on the specific tasks being performed. The following table describes the oversight levels that will be used.

NASA Oversight Level

Oversight Level	Definition and description of activity
0	No Oversight (Accept contractor performed tasks at face value)
1	Low Oversight (-Participate in reviews and Technical Interchange Meetings (TIMs) and assess only that data presented -Perform periodic audits on pre-defined process(es) – Chair board or serve as board member, or Review Item Discrepancy (RID) writer at formal reviews)
2	Intermediate Oversight (Includes level 1 activities plus - Daily or weekly involvement to identify and resolve issues
3	In-depth Oversight (Includes level 2 activities plus – Methodical review of details - independent models to check and compare vendor data "as required")
4	Total Oversight (Perform a complete and independent evaluation of each task)

J. Concept Studies

J.1 Study Performance

The ISSRI shall perform concept studies to analyze options/concepts for new research initiatives and approaches for ISS utilization. NASA will identify concepts for studies are derived from direct ISSRI work with the user community. NASA may accept ISSRI suggestions for concept studies that foster the ISS S/T/C utilization research goals

and objectives. The ISSRI shall conduct concept studies assigned via Order. NASA will define the study scope, content, schedule, and deliverables for each concept study in the Order. Study results shall be of sufficient depth and detail to enable NASA to make a decision on program implementation.

Below are examples of potential Concept Studies that could be requested.

Strategic Concept Study

The strategic concept study topics may include, but are not limited to, the demonstration of multi-disciplinary or alternate approaches to optimizing ISS utilization resources, identification of effective and potentially new approaches targeted against the NASA strategic objectives.

GI Program Concept Study

NASA would select potential GI Program payload system and define the S/T/C objectives associated with that proposed system. The ISSRI would conduct a program concept study to include (1) proposed system modifications, (2) operations and hardware maintenance and sustainability, and (3) contribution to NASA S/T/C research objectives. A life cycle cost estimate for the research program concept would be developed by ISSRI. The concept study would assess the viability of the proposed system for optimal utilization on ISS. The study report will provide the rationale for formulating these concepts in terms of the cost, performance, risk, and science yield. Studies will typically be assigned in advance of a new GI program in order to determine its potential benefits to the ISS S/T/C goals and objectives.

Optimization Concept Study

Utilizing the archive data and sample repository, a concept study to identify potential S/T/C users who could derive resultant research from this compilation of information would be performed. As part of this study, and in conjunction with the ISSRI advocating the utilization of ISS, the ISSRI would establish a list of potential users, by discipline, who would benefit from the access to research data conducted on ISS. The ISSRI would establish and include a plan to disseminate the information to these users. The ISSRI would provide the rationale for formulating an optimization list of the users in terms of the cost, performance, risk, and science balance against the available resource.

Use of Investigation Excess Capacities

The ISSRI would seek and foster opportunities with the ISS S/T/C user community to leverage investigation capabilities and excess capacities of existing experiment hardware and operational systems. The ISSRI would, jointly with the potential payload provider, identify potential opportunities for dual-use capabilities; evaluate potential impact to research outcomes for NASA; determine technical, management, budget, and business model approaches for potential dual-use implementation, and formulate recommendations and plans for submission to NASA for consideration.

K. Guest Investigator (GI) Program

The ISSRI shall be responsible for managing and establishing a research program that solicits GIs who will use selected existing ISS payload systems (GI hardware). The ISSRI shall seek extended scientific constituencies to use the GI hardware to conduct research projects that the ISSRI manages for NASA. The ISSRI shall select new GIs through ISSRI research announcements that solicit opportunities to use the GI hardware. ISSRI responsibilities include all tasks necessary to ensure safety, sustain and maintain the GI hardware and software, support integration into the ISS carrier, and plan and implement operations, including pre-flight and post-flight operations. NASA reserves the right to task the ISSRI to perform minor modifications to the GI hardware.

The ISSRI may develop new ways to implement research with the GI hardware, and develop improvement concepts to enable new research, including new technology. Viable projects will be assigned by Order for the ISSRI to manage.

In addition to the requirements identified in Section K of the WBS, there may be Orders under the GI Program where NASA will identify additional requirements, for example, requirements for attached payloads.

K.1 GI Selection

In all activities associated with solicitation, review, and selection of research by ISSRI, the ISSRI shall exercise due diligence to ensure the absence of conflicts of interest.

K.1.1 Development and Announcement of Research Opportunities

The ISSRI shall develop Research Announcements for GI projects consistent with NASA strategic objectives and designed to optimize ISS utilization to meet these objectives. The ISSRI shall develop and conduct science and technology pre-solicitation workshops.

The ISSRI shall encourage multi-disciplinary, cross-disciplinary, and previously unidentified research approaches to address NASA strategic objectives. The ISSRI shall partner with Enterprise Divisions to review ISSRI solicitation documents for content and clarity and to maximize community responsiveness. The ISSRI shall ensure that its research solicitations are widely announced, openly competed, and independently reviewed.

K.1.2 Selection of GIs

The ISSRI shall utilize an independent peer review process equivalent to that used by NASA. The ISSRI shall invite NASA personnel to observe peer panel meetings. ISSRI shall lead the technical/engineering feasibility assessments of experiments, if required. The ISSRI may request NASA expertise to help perform the feasibility assessment. The ISSRI shall partner with NASA to develop a selection recommendation

for the ISSRI selecting official. The ISSRI shall make the final selection, notify investigators, and submit candidates to NASA for flight opportunities.

The ISSRI shall ensure that selected investigations are scientifically or technically meritorious, align with NASA research objectives, and are feasible to implement within existing GI hardware, ISS, and vehicle capabilities, and within resource limitations.

K.1.3 Award and Management of Grants/Contracts

The ISSRI shall award and manage grants and contracts to fund the selected GIs. This element of the WBS covers the ISSRI costs of awarding and managing GI grants and contracts, but does not include the dollar amount of each GI program grant or contract. The ISSRI shall develop the General Grants Provisions Document in accordance with DRD-K.1.3.

The ISSRI shall ensure the delivery of a final report of science results, including citations of any publications, derived from the funded research from each GI within one year of receipt of flight data. This report shall be submitted with Standard Form (SF) 298.

K.1.4 Funding for GI Program Grants

The ISSRI shall fund selected GIs to cover expenses incurred in their approved research program. These expenses include such items as direct salaries, benefits, institutional overhead, equipment and consumables, student support, related travel (meetings, tests, and mission support), and publication expenses. Funding of scientists who are Federal employees is subject to applicable government regulations. This element of the WBS is for the purpose of tracking the funding of each GI program grant or contract.

NASA-provided funding shall not be used to fund research performed by foreign entities (see paragraphs (c)(8)(iv) and (l) of NASA FAR Supplement clause 1852.235-72). However, the ISSRI may fund non-U.S. investigators, provided that the investigators are in residence at a U.S. institution during the specified period of performance for the selected research and that an agreement between NASA and the investigator's foreign institution is in force.

K.1.5 Identification of Data and Samples Suitable for Archiving

The ISSRI shall evaluate selected GI proposals and submit a report that identifies anticipated data and sample products to be archived and forecast archive data and sample requirements in accordance with DRD-K.1.5.

K.1.6 Identification of Education and Outreach Potential

The ISSRI shall evaluate selected GI proposals and submit a report that identifies potential Education and Outreach activities, products, schedules, and audiences in accordance with DRD-K.1.6.

K.2 Representation of GI Programs to Boards/Panels/Reviews

The ISSRI shall provide GI Program representation to the utilization boards, panels, and reviews including, but not limited to, the Payloads Control Board (PCB), the Research Planning Working Group (RPWG), and the Payload Mission Integration Team (PMIT). The ISSRI representatives shall present and advocate for the GI Program, make recommendations regarding issues that affect GI Programs, and provide data and presentations as required.

K.3 GI Management

K.3.1 Project Management

The ISSRI shall provide the overall management effort required to achieve the requirements specified in the Order. The ISSRI shall define the resources, structure, approach, and processes required to implement the Order. Following GI selection, the ISSRI shall develop a project plan in accordance with DRD-K.3.1a.

The ISSRI shall prepare and present status to the NASA Task Monitor for the Order in Project Management Reviews in accordance with DRD-A.2.2. It is expected that these reviews would occur at most monthly. These status reviews shall encompass technical, schedule, risk assessment, cost, accomplishments, issues/concerns, changes and projections. These reviews shall be held at the NASA Field Center responsible for providing the Task Monitor unless otherwise specified by the Task Monitor.

The ISSRI shall support other reviews and provide special reports, as required to discuss and resolve technical and programmatic issues and changes that may occur in the course of the Order. In addition to status reviews, the ISSRI shall prepare data for and support other reviews. If required by the Order, the ISSRI shall provide preliminary copies of review material and presentations to NASA for dry run and approval prior to the formal review.

If modifications to GI flight system are required and approved by NASA, the ISSRI shall support or conduct technical reviews of the proposed changes prior to implementation. The ISSRI shall support a pre-ship review(s) for each flight of GI flight system(s) based on carrier requirements. The type and scope of these reviews will be defined by the Order.

K.3.2 Interface Support for GIs

The ISSRI shall designate an ISSRI point of contact for each research investigator selected under the GI Program. The responsibilities of this point of contact include, but are not limited to:

(a) Ensuring that the science objectives and requirements are fully identified, not compromised, and able to be implemented.

(b) Ensuring the GI does not alter science objectives to something outside the scope of the original peer reviewed selection.
(c) Determining and securing the most effective and timely approach to achieving the investigator's approved objectives.
(d) Defining research and mission success criteria.
(e) Representing and supporting the investigator.

K.3.3 System Engineering

The ISSRI shall provide the Systems Engineering to insure that the requirements are implemented to meet the overall objectives of the Order. The ISSRI shall develop and maintain a working knowledge of GI science objectives and requirements, technology issues, and operational needs, as well as the carrier integration and interface requirements, and programmatic requirements.

The ISSRI shall insure that all requirements are defined and properly documented. The ISSRI shall document experiment specific research requirements defined in the Science Requirements Document prepared in accordance with DRD-K.3.3a. This shall include, but is not limited to, GI science requirements; safety and quality assurance requirements; data archive requirements; investigator test matrix; post-flight data deliverables; success criteria; ground and flight operational requirements; the carrier integration and interface requirements; and programmatic requirements. These requirements shall be achievable and verifiable. The ISSRI shall perform engineering integration analyses including, but not limited to: human factors, system performance, system-level electrical and mechanical design integration, Electromagnetic Interference (EMI), Electromagnetic Compatibility (EMC), mass properties, design review coordination, and system Technical Performance Measurements (TPM) (e.g., power, weight, cooling, or bandwidth).

The ISSRI shall verify and document that the hardware system capabilities can satisfy the experiment science requirements in accordance with DRD-K.3.3b. The ISSRI shall communicate hardware system limitations to the GI and shall document any waivers or deviations to the research requirements defined in the Science Requirements Document.

The ISSRI shall provide the traceability and visibility that all requirements have been properly and completely flowed down to lower level documents in accordance with DRD-K.3.3c.

K.3.3.1 Integration Data Inputs

The ISSRI shall develop integration documentation and analyses based on the carrier’s integration template and requirements. These documents shall include, but are not limited to: payload configuration, payload training requirements, payload command and data handling requirements, ground data services requirements, interface verification, payload operations requirements, integrated stowage, and payload ground integration/deintegration requirements. As required by the carrier, the ISSRI shall

interface with program/vehicle integration tools and media including, but not limited to Carrier Templates, interim User Requirements Collection (iURC), Payload Operations Data File (PODF), User Requirements Collection (URC), Payload Data Library (PDL), and Program Integration Plan (PIP) Annexes.

K.3.3.2 Acceptance Data Package

The ISSRI shall update and maintain the Acceptance Data Package (ADP) associated with the GI hardware. The ISSRI shall maintain and deliver the ADP in accordance with DRD-K.3.3.2. The ISSRI shall update the ADP to include any new items or changes that result from modifications or system engineering analyses.

K.3.4 Configuration Management

Individual Orders may have documentation controlled by NASA using NASA Configuration Control Boards. The ISSRI shall interface with NASA Field Center Configuration Control Boards as identified in each Order for each deliverable.

The ISSRI shall implement the ISSRI Configuration Management Plan (DRD-C.1) for each GI project.

K.3.4.1 Configuration Identification

The following defines the requirements for establishing and maintaining the Configuration Item(s) (CI); hardware, firmware, and software identifiers; and the technical documentation that defines the CI and lower tier parts or units. Existing documentation providing the required information shall be used to the maximum extent possible.

K.3.4.2 Interface Identification and Management

The ISSRI shall define, document, and maintain the interfaces for which the ISSRI is contractually responsible. The external and internal interfaces for the hardware and software shall be defined in the specifications or in an interface control document referenced in the specifications. Interface identification and control documentation shall be prepared and maintained in accordance with the Order.

K.3.4.3 Configuration Control

The ISSRI CM program for hardware, firmware, and software shall meet the intent of MIL-STD-973. The ISSRI shall generate and process engineering changes, deviations, waivers and related data to NASA controlled configuration documentation in accordance with DRD-K.3.4.3a. The ISSRI shall generate and process desired deviations and waivers to NASA controlled documentation in accordance with DRD-K.3.4.3b.

K.3.4.4 Configuration Status Accounting

The ISSRI shall implement and maintain a configuration status accounting system that provides information defining the as-designed and as-built configuration of the system hardware, firmware, and software and the status of changes to this configuration. The system shall provide the information defined in the reports required by DRD-K.3.4.4.

K.3.4.5 Configuration Verification and Audits

NASA reserves the right to perform independent Functional Configuration Audits (FCA) and Physical Configuration Audits (PCA) referenced in MIL-STD-973. The ISSRI shall support these periodic audits. The FCA is the formal examination of functional characteristics of a configuration item, prior to acceptance, to verify that the item has achieved the requirements specified in its functional and allocated configuration documentation. The PCA is the formal examination of the "as-built" configuration of a configuration item against its technical documentation to establish or verify the configuration item's product baseline. Action items shall be recorded, tracked, and resolved. The ISSRI shall provide the data required supporting the FCA and PCA as defined in DRD-K.3.4.5.

K.3.5 Safety and Mission Assurance (S&MA) Implementation

ISSRI shall develop, update, and implement a Safety and Mission Assurance Program and corresponding plan. S&MA elements - safety, reliability and maintainability, and quality assurance - implemented by the ISSRI shall be described in the S&MA Plan in accordance with DRD-K.3.5. A coordinated S&MA relationship shall be established between experiment/project elements in order to avoid duplication and to provide for effective operation of the project. The S&MA Program shall include the flowdown of all S&MA requirements to subcontractors and vendors.

The ISSRI shall participate in the Government-Industry Data Exchange Program (GIDEP) program in accordance with GIDEP Participation Requirements (MIL-STD-1556B). The impact on the contract end item of any Directives Document (DD) Form 1938 "Acute Launch Emergency Reliability Tip (ALERT)" received from the Government shall be evaluated. Positive corrective action shall be taken on potential problems. Upon request, the results of the evaluation and the actions taken shall be submitted in the ISSRI format to NASA for review.

The Government reserves the right to audit the ISSRI S&MA program for the contract. The ISSRI shall support these periodic audits of the ISSRI S&MA System.

K.3.5.1 Safety

The ISSRI shall comply with the safety processes defined in National Space Transport System (NSTS)/ISS 13830, and shall comply with the technical requirements of NSTS 1700.7, NSTS 1700.7 ISS addendum, Kennedy Space Center Handbook (KHB) 1700.7, and NSTS/ISS 18798. The ISSRI shall submit safety compliance data packages in accordance with DRD-K.3.5.1.

K.3.5.2 Reliability and Maintainability

K.3.5.2.1. Subsystem Reliability Requirements

The ISSRI shall meet the system level reliability requirement as defined in the Flight System Specification contained in the Acceptance Data Package. The ISSRI shall

analyze the impact on the system level reliability of any modifications to flight subsystem(s). The ISSRI shall provide the analysis to NASA for assessment and approval of the modification. The ISSRI shall track cumulative changes to system level reliability.

K.3.5.2.2. Maintainability

The ISSRI shall implement a maintainability program to ensure that delivered hardware/software systems can be effectively maintained on-orbit or during maintenance periods, and that the maintenance tasks can be performed within maintenance times allocated.

K.3.5.3 Quality Assurance

The ISSRI shall establish, implement, and maintain a Quality Assurance Program in accordance with the requirements of SSP 41173, "Space Station Quality Assurance Requirements."

K.3.5.4 Non-Conformance System

The ISSRI shall develop and implement a non-conformance reporting system to track problems and document corrective actions in accordance with Space Station Program (SSP) 30223, "Problem Reporting and Corrective Action for the Space Station Program." Level 1 items, as defined in SSP 30223, in the ISSRI non-conformance reporting system shall be reported to the ISS Program Problem Reporting and Corrective Action System.

K.3.6 Certifications of Flight Readiness (CoFR)

The ISSRI shall provide Safety, Interface, and Performance CoFR documentation to NASA in accordance with DRD-K.3.6.

K.3.7 Research Regulations Compliance

The ISSRI shall comply with all NASA processes, policies, guidelines and regulations when conducting flight research, for example, utilization of vertebrate specimens. Research, whether through the use of live animals, cells, tissues, or other matter derived from animals conducted at any NASA facility (including on-orbit), funded by NASA, or using NASA resources, (e.g., personnel, equipment, and spacecraft) must comply with the full text of NASA policies governing selection, care, and use of animals in research.

The policies on animal care and use are described in 9 Code of Federal Regulation (CFR), 14 CFR, NASA Policy Directive (NPD) 8910, and NPG 8910. These regulations are to provide NASA-supported researchers, crew members, and support personnel with policies and responsibilities needed to validate the decision to use animals for a particular research objective and to ensure proper conditions are in place concerning the care of animals selected for the research. The regulations govern pre-flight ground-based research in support of a flight experiment, ground controls for a flight experiment, and

flight research ranging from KC-135 parabolic flights up to and including research on board the International Space Station.

The ISSRI shall satisfy all Animal Welfare issues by compliance with all Institutional Animal Care and Use Committee review and approval of all protocols using animals before any aspect of research begins. Procedures for compliance with animal welfare issues are defined in the *Guide for/and the Care and Use of Laboratory Animals*, National Research Council.

K.3.8 Operations

The ISSRI shall develop and implement integrated GI research operations requirements, plans, and processes and ensure their compatibility with flight and ground systems across the ISS Program. The level of responsibility for the ISSRI will depend upon the carrier.

K.3.8.1 Operations Planning

The ISSRI shall perform pre-increment planning and integration for GI research investigations, including, but not limited to, requirements collection and analysis, payload activity scheduling, and command and data flow plans development.

The ISSRI shall develop GI research investigation procedures, displays, and operational data products. The ISSRI shall plan and integrate all activities for verification of GI research investigation procedures, displays, and operational data products.

K.3.8.2 Training and Simulations

The ISSRI shall define GI research investigation operations training requirements and shall plan and develop the training course materials required for crew and ground control team training. The ISSRI shall support the ISS Training Strategy Team process (reference SSP 58304, “Payload Training Implementation Plan”).

The ISSRI shall plan and develop the crew training program for the GI research investigations, including providing simulation engineering and scripting, simulation and training team coordination, and scheduling support functions. The ISSRI shall support crew training for the GI investigations.

The ISSRI shall coordinate and conduct ground support personnel training and certification. This includes, but is not limited to, the development of all workbooks, courseware, procedures, on-board training, and displays required to meet program standards, formats, and nomenclature.

K.3.8.3 Physical Integration with the Carrier

The ISSRI shall support all integration by the carrier of all payload hardware and software with the selected carrier(s), to include integration verification testing, as required. Specific Orders may require assembly, installation and system checkout in

NASA facilities. The ISSRI shall support the installation and checkout of the ground unit and training units at the site(s) defined by the carrier.

K.3.8.4 Integration and Launch Site Support

The ISSRI shall support all ground processing or be responsible for off-line operations and any specialized operation at the carrier integration site(s) and at the launch site to ensure the successful integration of all payload hardware with the carrier and transportation system. The specific carrier used will determine the carrier integration site(s) and the level of ISSRI responsibility.

The ISSRI shall develop ground integration documentation as required by the carrier and integrator for launch site operations. The ISSRI shall conduct off-line operations, as required for mission success. The ISSRI shall define the requirements for testing, servicing, and facility usage to process the payload hardware through carrier integration and pre-launch activities. The ISSRI shall monitor tests, evaluate test data, maintain problem reports, and ensure the payload hardware has been properly tested. ISSRI shall participate in the carrier integration team and launch processing team activities and shall add/modify requirements, concur on procedures, analyze data, make engineering recommendations and decisions required by conditions not within specifications and provide other information required for launch site support. The ISSRI shall perform payload experiment sample loading, launch scrub turnaround support, and ground-control processing, if required. Following completion of verification requirements and closure of open work, the ISSRI shall turnover the flight hardware and the Integration Data Package (IDP) in accordance with DRD-K.3.8.4 to the launch element manager for pre-flight processing and launch. The ISSRI shall comply with operational requirements of the integration and launch site facilities.

K.3.8.5 Flight Operations

The ISSRI shall provide staff to conduct GI research investigations and support carrier requirements up to 24-hour, 7-day basis, including ground-control experiment support, on-call support, and off-line activities including, but not limited to troubleshooting and training. The staffing shall be based on workload estimates, criticality of data, research monitoring and control requirements, replanning effort, crew considerations, and other considerations required for mission success. The ISSRI shall perform operations at sites defined by the payload and carrier.

K.3.8.6 Post-Flight Operations

The ISSRI shall provide support at the primary and secondary landing sites as defined by the project requirements for receipt of the flight hardware and post-flight processing; research sample and data removal (including time-critical and time-sensitive); dissecting team support and tissue archiving; and dispositioning of ground support equipment.

The ISSRI shall provide post-flight support to coordinate GI research video and/or data processing, duplication and distribution activities, lessons learned activities, EO/PO activities, and other activities, as required, to support dissemination of research

results and constructive feedback to the ISS Program. The ISSRI shall collect post-flight reporting from each investigator in accordance with DRD-K.3.8.6.

K.3.9 Investigation Data Processing and Delivery

The ISSRI shall process, disseminate, and submit to the archive all data and samples per the baselined experiment requirements. The ISSRI shall identify and provide containers, materials, and equipment required for packaging, handling, storage, and transportation and security of samples.

K.4 Verification

The ISSRI shall plan and schedule a verification program that ensures all deliverable hardware and software items produced and managed under the Order meet the technical specifications and all other contractual requirements. The process shall include: the translation of performance requirements into verification requirements and incorporation of carrier safety and interface verification requirements into system verification requirements; determination of the appropriate hardware assembly level(s) for the verification methods; preparation of verification plans, procedures, test records, analyses, inspection reports, and verification completion reports; traceability of requirements to reports and procedures; and identification of plans and procedures for requirements to be verified on-orbit. The verification planning information shall be documented in accordance with DRD-K.4a. The ISSRI shall identify the required verification activities to be performed in order to satisfy each of the design input requirements. The ISSRI shall document the verification requirements in accordance with DRD-K.4b.

The ISSRI shall conduct verification activities to comply with applicable carrier requirements to ensure that hardware and software comply with all carrier payload certification requirements. The system verification activities shall include science verification and validation activities that include an assessment of the system performance by the Guest Investigator to ensure that the hardware and software can successfully perform the functions required to meet the science requirements of the experiment. The detailed success criteria for each of the verification/validation planning activities shall be documented in accordance with DRD-K.4c. The results of the verification/validation activities shall be documented in accordance with DRD-K.4d.

The ISSRI shall generate and maintain a requirements management, traceability, and closeout system to ensure and document that the verification program addresses all requirements and all verification requirements are closed out. The closeout system shall maintain verification and assessment reports, certification statements, and comprehensive verification closure reports.

K.5 GI System Modifications

The ISSRI shall perform minor modifications to the GI hardware under $50K total cost without prior NASA approval, if the modification does not affect safety, reliability, or interfaces. The ISSRI shall notify the NASA task monitor of the minor

modifications. All modification shall meet NASA standards and processes for flight certification. Modification cost threshold of $50K is inclusive of engineering, procurement, documentation, certification, and required number of spares for all flight, ground, training, and testing. The Task Monitor and the Contract Officer must approve in advance all modifications of $50K or more.

K.5.1 Design and Development of Hardware Modifications or Kits

K.5.1.1 Engineering Analysis

The ISSRI shall provide engineering analyses for all phases of approved and authorized hardware modifications or development of kits containing supplies, samples, and tools for flight experiments.

K.5.1.2 Design Engineering

The ISSRI shall design and engineer all approved modifications or kits in accordance with specifications that are compatible with and requirements of the carrier, the host systems, the experiment operations and support equipment, the ground equipment, and other ISS and logistics systems.

The ISSRI shall document requirements for strength and fatigue analyses, tests, and structural assessment in accordance with DRD-K.5.1.2a. The ISSRI shall document the component strength and fatigue analysis and a structural analysis database used for development of the flight article in accordance with DRD-K.5.1.2b. The ISSRI shall document the thermal control system design, analysis, and verification in accordance with DRD-K.5.1.2c.

The ISSRI shall develop and maintain end item specifications for each item of development or modification in accordance with DRD-K.5.1.2d. These specifications shall meet the requirements of MIL-STD-961, Appendix A, to define the system and subsystem performance requirements and interface requirements for the system configuration items and the required ground support equipment and functional interface requirements. These specifications and related documentation will establish the development and product baseline(s) for configuration control.

The ISSRI shall provide product drawings and parts lists of the types specified in MIL-STD-100 to meet the requirements of MIL-DTL-31000. The ISSRI shall develop, maintain, and update an as-designed Electronic, Electrical & Electromechanical (EEE) parts list in accordance with DRD-K.5.1.2e. The ISSRI shall provide models and engineering data required for integration. This information shall define the detailed design of the hardware and firmware for the system in accordance with DRD-K.5.1.2f.

K.5.1.3 Fabrication and Assembly

The ISSRI shall fabricate or procure hardware elements that meet the drawings and specifications baselined by the appropriate configuration control board, and identified quality, and product assurance requirements. EEE parts shall be selected as required in the equipment specification. The ISSRI shall fabricate or procure upgrades to

ground support equipment as required. The ISSRI shall assemble the flight and ground units, and ground support equipment per the defined configuration. The ISSRI shall update the ADP with component, subassembly, and materials certification for all flight hardware fabrication.

K.5.1.4 Test and Check-out

The ISSRI shall implement a test and checkout process to demonstrate and validate compliance with identified requirements. The ISSRI shall document the development, qualification, acceptance, and verification tests required to certify a payload/facility for flight in accordance with DRD-K.5.1.4a. The ISSRI shall document procedures to perform test and checkout activities during the development, qualification, acceptance, and verification of payloads, experiments, and facilities in accordance with DRD-K.5.1.4b. Structural strength test objectives and schedules shall be documented in accordance with DRD-K.5.1.4c.

K.5.2 Design and Development of Software Modifications

The ISSRI shall implement approved modifications to the designated flight and ground software. All software changes that affect a controlled interface shall be designed and developed in accordance with the governing Interface Control Document (ICD).

K.5.2.1 Design and Development

The ISSRI shall prepare a Software Quality Assurance Plan in accordance with DRD-K.5.2.1a and a Software Development Plan in accordance with DRD-5.2.1b.

The ISSRI shall prepare and maintain all new specifications and documentation, and maintain the user guide and existing documentation for the approved modifications. The software product documentation shall be developed per International Electrical & Electronic Engineers (IEEE)/Electrical Industries Association (EIA) 12207.1-1997, Life Cycle Process as guidelines.

The ISSRI shall specify the software requirements to be met by a Computer Software Configuration Item (CSCI) in accordance with DRD-K.5.2.1c. This software requirements specification shall meet the guidelines in IEEE/EIA 12207.1-1997, clause 6.22 and shall include the methods to be used to ensure that each requirement has been met, and to document the basis for design, and qualification testing of a CSCI.

The ISSRI shall develop and maintain CSCI design descriptions for each software item of development or modification in accordance with DRD-K.5.2.1d. These specifications shall meet the guidelines in IEEE/EIA 12207.1-1997, clause 6.16, to define the basis for implementing the software and to provide visibility into the design and the information needed for software support.

The ISSRI shall prepare and submit a version description document with each new release of software in accordance with DRD-K.5.2.1e. This version description document shall describe in detail the configuration and content of the product and

instructions for set-up. For each new release, the document provides information on the status of changes since previous releases.

The ISSRI shall support the update to existing Software Interface Control Documents impacted by the change or generation of new ICD(s).

K.5.2.2 Software Testing, Verification, and Validation

The ISSRI shall develop, update, and implement a test process to demonstrate compliance with identified requirements, including interface requirements; and assure that the software acceptance testing is compliant with the approved test plans and specifications.

The ISSRI shall develop and record test plans for conducting CSCI qualification testing and system qualification testing of a software system in accordance with DRD-K.5.2.2a.

The ISSRI shall develop software test procedures and data for testing the software. The ISSRI shall document the Software Test Description in accordance with DRD-K.5.2.2b using the guidelines in IEEE/EIA 12207.1-1997, clause 6.28. The ISSRI shall document test results in accordance with DRD-K.5.2.2c using the guidelines in IEEE/EIA 12207.1-1997, clause 6.29. The ISSRI shall provide software support to system integration and test activities.

Prior to final acceptance, the ISSRI shall demonstrate that the software has successfully completed an acceptance test according to approved test criteria.

The ISSRI shall perform software verification and validation activities to assure that reviews are adequately performed, program code complies with a standard convention as specified in the Software Development Plan (DRD-K.5.2.1b), and that the discrepancies, hazards, and anomalies are reported in accordance with the approved problem and hazard reporting procedures.

The ISSRI shall perform installation support of the final executable software product(s).

K.6 Integrated Logistics Support (ILS)

The ISSRI shall develop, implement and maintain processes to provide integrated logistics support. ILS shall be defined as all the activities/capabilities required to support the maintenance, operations, engineering, and pedigree of hardware inventories over which the ISSRI has custodial responsibilities. It shall include all scheduled maintenance as defined in the ADP supplied to ISSRI with the hardware system, refurbishment, testing, qualification, design fabrication, and re-certification required to comply with new or revised NASA platform guidelines. The ISSRI shall submit requests for deviations from ADP requirements for consideration in accordance with DRD-K.3.4.3b. The ISSRI shall use SSP 50277 as a guideline when conducting ILS tasks.

The ISSRI shall perform an annual analysis of all ISSRI flight and ground hardware inventories to determine any obsolescent components or subsystems, limited life items, upgrades, and, as needed, failure responses. This analysis shall be integrated into the logistics analysis plan. NASA will approve in advance procurements or builds required to implement the logistics analysis. These approved and implemented changes shall be incorporated into the ADP as required. The ISSRI shall replace Limited Life Items as identified in the ADP.

For approved hardware modifications, the ISSRI shall derive spares and supply requirements including all spares and consumables required to support the ground and flight systems.

K.6.1 Packaging, Handling, Storage, and Transportation (PHS&T)

The ISSRI shall derive PHS&T requirements for flight hardware, both on-orbit and on the ground, and ground inventories, associated spares, and support equipment.

The ISSRI shall identify and provide containers, materials, and equipment required for packaging, handling, storage, and transportation and security of hardware. Development of specialized equipment and materials shall be limited by using standard equipment and materials whenever practicable.

K.6.2 Documentation

The ADP and Integration Data Package (IDP) shall be updated as required.

K.7 System Integration and Test

The ISSRI shall integrate the hardware and software systems. The ISSRI shall implement a test and checkout process to demonstrate and validate compliance of the system with all system-level requirements. The ISSRI shall perform integrated flight and ground system testing to validate interoperability of the system.

K.8 Delivery

K.8.1 Carrier-Specified Site

The ISSRI shall deliver an integrated and verified flight and ground system and all associated documentation, including an updated IDP, to the site designated by the carrier.

K.8.2 Hardware System Return to NASA

At the completion of the Order, or at the direction of NASA, the ISSRI shall deliver to NASA an integrated and verified flight and ground system and all associated documentation, including an updated ADP per DRD-K.3.3.2.

L. Archive Management

The diversity of NASA research programs is reflected in the array of data and sample types that are generated during the course of flight experimentation. These data and sample types include, but are not limited to, electronic data in a variety of formats, still pictures, biological tissues and specimens, physical samples, experiment logbooks, and experiment documentation. NASA will provide guidelines regarding access to and dissemination of data and samples. The transfer of experiment and mission data and samples to an ISSRI developed and managed archive will be planned and documented in the experiment requirements.

While the policy requirements for OBPR flight-related physical sciences data and sample archives are established in a report titled "Archiving Microgravity Flight Data and Samples" published by the National Research Council Space Studies Board, those for life sciences are under review. NASA will issue an Order for a study to obtain the assistance of the ISSRI in this evaluation. Based on the results, NASA intends for the ISSRI to manage the life sciences data and sample archives, implement the policy requirements, and develop new archive capabilities as directed. The ISSRI shall archive non-proprietary results of commercial research.

NASA will issue Orders specifying the materials and data to be archived and all associated requirements. The scope of archive Orders may include multiple Enterprises, ISS and associated ground research, shuttle-based research, and related information from other NASA research sources.

L.1 Archive Management, Capability, and Maintenance

The ISSRI shall develop, update, and implement an Archive Management, Capability and Maintenance Plan in accordance with DRD-L.1 that will (1) define processes to support storage of data and samples, archived content identification, utilization of archived data and samples, and disposal of data and samples, and (2) define the required staffing, facilities, equipment, functional capabilities, services, and maintenance to support the management and physical storage of archived data, samples, and documentation. The ISSRI shall update the plan, if archive requirements or processes are modified. NASA will audit the archive inventory at its discretion.

Proposed upgrades, downgrades/streamlining, and conversion of archiving capabilities/methods and sample environmental control, safeguards, and upgrades will be submitted by the ISSRI as updates to the plan for approval by NASA. Obsolescence criteria shall be developed/applied regularly to avoid unnecessary storage maintenance.

L.2 Archive Operations

The ISSRI shall receive, identify, store, and maintain a physical inventory and catalogue of data and samples to be archived. The ISS operations organization, NASA payload developer projects, and ISSRI GI Programs will provide data and samples to the ISSRI. The ISSRI shall track availability and utilization of data and samples sets

received. The ISSRI shall maintain processes to facilitate the accessibility and dissemination of data and samples, including, but not limited to, responses to requests/proposals and tracking of proprietary data agreements. The ISSRI shall submit annual reports in accordance with DRD-L.2 including inventory, utilization, and relevant associated metrics.

NASA and ISSRI GI Programs will provide experimental flight and related ground data and samples, engineering data, and associated experiment documentation to the ISSRI. This includes environmental data, if applicable. The ISSRI shall inspect, verify and validate, catalogue, and store these materials.

The ISSRI shall be accountable for all archived materials that it has stored. The ISSRI shall track and report on the status of archived data and samples. The ISSRI shall develop and maintain a searchable database of archive content and all flight experiments from which data and samples have been archived. The ISSRI shall develop a reliable method to ensure future access to, and use of, archived data and samples by the research community. NASA reserves the right to periodically request the ISSRI to provide inventory tracking data.

L.2.1 Tracking Publications

The ISSRI shall track published refereed papers deriving from NASA-sponsored research as specified in the Order. A citation reference shall be maintained and updated on a monthly basis and shall be able to be sorted by discipline and ISS, other flight, or ground-based research. This reference shall be made publicly available.

L.3 Data and Sample Dissemination

The ISSRI shall maintain records of how and when data and samples from flight experiments are requested and disseminated. This information shall be included in the ISSRI annual report (see DRD-L.2). The ISSRI shall provide assistance to archive users. Archived samples shall only be disseminated through a GI archive project or as directed by NASA. Archived, non-proprietary, reproducible data, such as digital data, shall be disseminated upon user request subject to applicable policies and regulations.

The ISSRI shall develop the capabilities for shipping data and samples in compliance with NASA policies, procedures, and guidelines, and local, regional, and federal regulations. The ISSRI shall require reports on the results of studies conducted with archived data and samples.

DEFINITIONS LIST

Archived data – digital files, analog records, or hard copy documentation

Archived samples – Any material derived from living systems, such as animals, plants, insects, microbes, and tissue cultures, stored for future use.

Carrier – The Hardware system that the Payload under discussion will be integrated into. That is the next higher integration level for a particular system or subsystem. For example, the carrier for a Facility Payload would be ISS. The Microgravity Science Glovebox (MSG) would be the carrier for a payload that is integrated into the MSG.

Deviation - A specific written authorization granted before the fact to depart from a particular Government-controlled requirement for a limited application. One time use.

Exceptions – See deviations and waivers.

Firmware – Firmware is programming that is inserted into programmable read-only memory (programmable ROM), thus becoming a permanent part of a computing device. Firmware is created and tested like software (using microcode simulation). When ready, it can be distributed like other software and, using a special user interface, installed in the programmable read-only memory by the user. Firmware is sometimes distributed for printers, modems, and other computer devices.

Flight System – The hardware and software that comprise a payload intended for flight.

GI project definition/description - NASA may elect to authorize the ISSRI to study the viability of or implement a Guest Investigator (GI) project. These projects may include the use of previously flight certified research hardware. The ISSRI will manage GI research projects for NASA. The ISSRI will also be responsible for development of concepts for GI programs. The ISSRI may develop new ways to implement research with the existing hardware, or develop improvement concepts to enable new research, potentially through new technology. It will also seek extended scientific constituencies to be selected through ISSRI research announcements. Viable programs will be assigned by task order for the ISSRI to manage.

There are several anticipated types of GI programs, such as:

* After the initial NASA Principal Investigator program has been completed with specific flight hardware, NASA may elect to have the Institute manage a GI Program utilizing the flight and associated ground hardware, including the necessary maintaining/sustaining engineering. Concept studies may be assigned to determine the feasibility of each program prior to establishing the GI program. Once a program is assigned to the Institute, the Institute will prepare the solicitations, select the GIs after consultation with NASA, and manage the GI research program. Selected

investigations must be aligned with OBPR strategic objectives and all GI investigations must enter the OBPR flight prioritization process. NASA will review for authorization and implementation any substantial system modification or new hardware development.

* The Institute will develop and manage research programs that utilize data and/or samples not required to meet the originally proposed objectives of the investigations that produced them (e.g. archived data and samples). These tasks will include facilitating investigator access to the necessary data and samples. Once data and/or samples are archived, the Institute will prepare the solicitations, select the GIs after consultation with NASA, and manage the archive GI research program.

* The Institute will create and manage a program to optimize use of available commercial hardware or excess capabilities within manifested commercial hardware for research and/or educational benefit. Once capabilities are designated as available to the Institute, the Institute will prepare the solicitations, select the GIs after consultation with NASA, and manage the GI research program.

Ground Research – pre-flight ground-based research in support of a flight experiment and ground controls for a flight experiment.

Guest Investigator – any successful responder to an ISSRI developed announcement

Integration Template – The milestone schedule and deliverable requirement(s) imposed by a Carrier or Vehicle on to the payloads integrating into that Carrier or Vehicle.

NOTE: Due to the dual nature of these hardware/software systems; almost all hardware developed will be both a carrier imposing requirements and collecting data from sub-tier payloads and a payload receiving requirements and providing data to a carrier based on that carrier's integration template. For example, to the ISS Program Office, a facility such as the Microgravity Sciences Glovebox (MSG) is a payload. However, the MSG is the carrier for the experiment payload systems it supports.

Investigation – research carried out by principal or guest investigator(s)

ISS Sortie - research performed on the Shuttle vehicle during a mission to ISS

Kit development – supplies, samples, and tools packaged for flight

Level 1 Items – As described in SSP 30223.

Order – The implementing documentation for any portion of the Indefinite Delivery, Indefinite Quantity portion of the Statement of Work. Orders contain the definition of requirements, milestones, and deliverables.

Payload – The hardware system that interfaces with a facility or carrier and provides the capability necessary to accomplish the science requirements of a single PI or group of PI's with compatible requirements.

Program – group of projects, on-going

Project – limited life, specific purpose activity

Research – scope includes S/T/C investigations

Research Staff – ISSRI staff engaged in performing research

Task Monitor – NASA official responsible for managing 1) Orders under the Indefinite Delivery, Indefinite Quantity section of the Statement of Work or 2) specified portions of work under the Core section.

Utilization – Activities requiring the use of ISS resources for the purpose of scientific, technology, or commercial research, including fundamental and applied research and entrepreneurial commercial endeavors.

Vehicle – The launch vehicle that transports the carrier and payload system to orbit, and/or upon which the system resides in orbit. Vehicles may include Expendable Launch Vehicles (ELV), the Space Shuttle, or the International Space Station. The Vehicle is the highest level of integration.

Waiver - A specific written authorization accepting a departure after occurrence from a Government-controlled requirement for a limited application. Life of hardware.

ACRONYMS LIST

ADP	Acceptance Data Package
ALERT	Acute Launch Emergency Reliability Tip
AO	Announcement of Opportunity
CFR	Code of Federal Regulations
CI	Configuration Item
CM	Configuration Management
CMP	Configuration Management Plan
CoFR	Certification of Flight Readiness
COTR	Contract Officer's Technical Representative
CSCI	Computer Software Configuration Item
DD	Directives Document
DRD	Data Requirements Description
EAR	Export Administration Regulation
EEE	Electronic, Electrical & Electromechanical
EIA	Electrical Industries Association
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EO/PO	Education Outreach and Public Outreach
EPMC	Enterprise Program Management Council
FAR	Federal Acquisition Regulation
FCA	Functional Configuration Audit
GI	Guest Investigator
GIDEP	Government-Industry Data Exchange Program
GPO	Government Printing Office
HQ	Headquarters
ICD	Interface Control Document
IDIQ	Indefinite Delivery, Indefinite Quantity
IDP	Integration Data Package
IEEE	International Electrical & Electronic Engineers
ILS	Integrated Logistics Support
ISS	International Space Station
ISSRI	International Space Station Research Institute
ITAR	International Traffic in Arms Regulations
iURC	Interim User Requirements Collection
KHB	Kennedy Space Center Handbook
MIL-STD	Military Standard
NASA	National Aeronautics and Space Administration
NFS	NASA FAR Supplement
NPD	NASA Policy Directive
NPG	NASA Procedures and Guidelines
NRA	NASA Research Announcement
NSTS	National Space Transportation System
OBPR	Office of Biological and Physical Research
OES	Office of Earth Science

OSF	Office of Space Flight
OSS	Office of Space Science
OZ	ISS Payloads Office
PAO	NASA Office of Public Affairs
PCA	Physical Configuration Audit
PCB	Payloads Control Board
PDL	Payload Data Library
PHS&T	Packaging, Handling, Storage and Transportation
PI	Principal Investigator
PIP	Program Integration Plan
PMIT	Payload Mission Integration Team
PMR	Performance Management Review
PODF	Payload Operations Data File
RID	Review Item Discrepancy
RPC	Research Partnership Center
RPWG	Research Planning Working Group
SF	Standard Form
SSP	Space Station Program
S&MA	Safety and Mission Assurance
S&TI	Scientific and Technical Information
S/T/C	Science, Technology, and Commercial
SOW	Statement of Work
SPD	Space Product Development
TBD	To be determined
TIM	Technical Interchange Meeting
TPM	Technical Performance Measurements
UM	OBPR Mission Integration Division
URC	User Requirements Collection
U.S.	United States
WBS	Work Breakdown Structure