

DRAFT for External Review

DATA PROCUREMENT DOC. NO. XXX	ISSUE RFP
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XXX

CONTRACT/RFP

EXHIBIT NUMBER

J-2

ATTACHMENT NUMBER

ISS Research Institute (ISSRI)

PROJECT/SYSTEM

DATA PROCUREMENT DOCUMENT

CONTRACTOR

DATE

National Aeronautics and
Space Administration

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National Aeronautics and Space Administration					DATA PROCUREMENT DOC.	
DOCUMENT CHANGE LOG					NO.	ISSUE
					RFP	
INCORPORATED REVISIONS				AS OF:		SUPERSEDING:
OUTSTANDING REVISIONS						PAGE:
AUTHORITY	PORTION AFFECTED - PAGE NO./NO.				REMARKS	
	INTRO	SGR	DRL	DRD		

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National Aeronautics and Space Administration PAGE REVISION LOG			DATA PROCUREMENT DOC. NO. ISSUE RFP		
NOTE: The current revision is denoted by a vertical line in the outer margin adjacent to the affected text.		AS OF:	SUPERSEDING:	PAGE:	
INSERT LATEST REVISED PAGES.			DISCARD SUPERSEDED PAGES.		
ITEM	PAGE	STATUS	ITEM	PAGE	STATUS

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1.0 INTRODUCTION

- 1.1 Scope: Subject to the Rights in Data clause, this Data Procurement Document (DPD) sets forth the data requirements in each Data Requirements Description (DRD) and shall govern that data required by the DPD for the contract. The contractor shall furnish data defined by the DRD's listed on the Data Requirements List (DRL) by category of data, attached hereto, and made a part of this DPD. Such data shall be prepared, maintained, and delivered to NASA in accordance with the requirements set forth within this DPD. In cases where data requirements are covered by a Federal Acquisition Regulation (FAR) or NASA FAR Supplement (NFS) regulation or clause, the regulation will take precedence over the DPD, per FAR 52.215-8.
- 1.2 DPD Description: This DPD consists of a Document Change Log, a Page Revision Log, a Table of Contents, an Introduction, a Statement of General Requirements, DPD maintenance procedures, a DRL, and the DRD's.
- 1.2.1 General Requirements: The general requirements, as specified in paragraph 2.0 of this DPD, prescribe those requirements applicable to the preparation, maintenance, and delivery of data that are better defined in aggregate than in the individual DRD's.
- 1.2.2 Data Requirements List (DRL): Throughout the performance of the contract, the DRL provides a listing by data category of the data requirements of the DPD.
- 1.2.3 Data Requirements Descriptions (DRD's)
- 1.2.3.1 Each data requirement listed on the DRL is given complete definition by a DRD. The DRD prescribes content, format, maintenance instructions, and submittal requirements.
- 1.2.3.2 The Work Breakdown Structure (WBS) Statement of Work (SOW) paragraph reference forms part of the DRD identification number.
- 1.2.3.3 To facilitate the usage and maintenance of the DPD, the DRDs have been sectionalized in accordance with the WBS SOW sections.
- 1.2.3.4 The DRD's are filed by data category and are in alpha-numeric sequence as listed on the DRL page (or pages) that precedes the DRD's.
- 1.2.4 Document Change Log (DCL) and Page Revision Log (PRL): The Document Change Log chronologically records all revision actions that pertain to the DPD. The Page Revision Log describes the current revision status of each page of the DPD and thus, at all times, provides its exact configuration.

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- 1.2.5 DPD Maintenance Procedures: Maintenance procedures define the detailed methods to be employed in maintaining the DPD. Detailed maintenance procedures are specified in paragraph 3.0 of this DPD.
- 1.3 Data Types for Contractual Efforts: The types of data and their contractually applicable requirements for approval and delivery are:

TYPE

DESCRIPTION

- 1 All issues and interim changes to those issues require written approval from the requiring organization before formal release for use or implementation.
- 2 NASA reserves a time-limited right to disapprove in writing any issues and interim changes to those issues. Data shall be submitted to the procuring activity for review not less than 45 calendar days prior to its release for use or implementation. The contractor shall clearly identify the release target date in the “submitted for review” transmittal. If the contractor has not been notified of any disapproval prior to the release target date, the data shall be considered approved. To be an acceptable delivery, disapproved data shall be revised to remove causes for the disapproval before its release.
- 3 These data shall be delivered by the contractor as required by the contract and do not require NASA approval. However, to be a satisfactory delivery, the data must satisfy all applicable contractual requirements.
- 4 These data are produced or used during performance of the contract and are retained by the contractor. They shall be delivered when NASA requests it according to instructions in the request. The contractor shall maintain a list of these data and shall furnish copies of the list to NASA when requested to do so.
- 5 These data are incidental to contract performance and are retained by the contractor in those cases where contracting parties have agreed that delivery is not required. However, the Contracting Officer or the Contracting Officer’s Representative shall have access to and can inspect this data at its location in the contractor’s or subcontractor’s facilities.

2.0 STATEMENT OF GENERAL REQUIREMENTS

- 2.1 Applicable Documents: Documents included as applicable documents in this DPD are the issue specified in the Statement of Work, and form a part of the

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DPD to the extent specified herein. References to documents other than applicable documents in the data requirements of this DPD may sometimes be utilized. These do not constitute a contractual obligation on the contractor. They are to be used only as a possible example or to provide related information to assist the contractor in developing a response to that particular data requirement.

2.2 Subcontractor Data Requirements

2.2.1 The contractor shall specify to subcontractors and vendors, if any, the availability source of all data required for the satisfactory accomplishment of their contracts. The contractor shall validate these requirements for documents when appropriate; where the requirement concerns other contractor data, the contractor shall provide his subcontractor or vendor with the necessary documents. All such requests shall be accomplished under the auspices of the contractor.

2.2.2 Reference to subcontractor data in the contractor's responses is permissible, providing the references are adequate and include such identification elements as title, number, revision, etc., and a copy of the referenced data is supplied with the response document at time of delivery to NASA.

2.3 Distribution

2.3.1 Distribution of required documentation shall be designated on the DRD or by the Contracting Officer in the quantities specified. Recipient names and addresses may be noted on a separate distribution list to be furnished by the Contracting Officer. Distribution will be addressed for basic contract and re-addressed for each delivery order.

2.3.2 Electronic submission of data deliverables is preferred. The preferred formats include Microsoft Word, Excel, PowerPoint, or Adobe Acrobat PDF as appropriate. The software versions shall be confirmed prior to submittals. Electronic data submittals to the program authorized data repository shall be coordinated with the COTR. Computer-Aided Design (CAD) drawings shall be submitted in the original native vector, Hewlett-Packard Graphic Language (HPGL) and raster image formats.

2.4 Printing: All printing, duplicating, or binding shall be in accordance with NFS 1852.208-81, Restrictions on Printing and Duplicating. Printing of formal reports and Type 1 and 2 data in book format shall be in accordance with the following general specifications:

- a. Method of reproduction – offset/xerography.
- b. Finished size – 8 1/2" X 11".
- c. Paper – 20-pound opaque bond.
- d. Cover – Litho cover stock.

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- e. Pages will be printed on both sides; blank pages will be avoided when possible.
 - f. Oversize pages will be avoided when possible, but if necessary will be folded to 8 1/2" X 11".
 - g. Binding shall be the most economical method commensurate with the size of the report and its intended use.
- 2.5 Microfilm: When microfilm of drawings, specifications, and associated lists is required, it shall be 35mm silver halide negative, first generation (Type 1, Class 1) in accordance with ANSI/AIIM MS32-1987 (Micro-recording of Engineering Source Documents on 35mm Microfilm). Input Form DD Form 1562, Dual Purpose Engineering Document Card, shall be used for microfilm purposes. The microfilm shall be submitted in the form of roll microfilm or master microfilm aperture cards. If microfilm rolls are used, they shall not exceed 100 feet in length. The Contracting Officer must approve any deviations from these requirements. All deviations shall be coordinated with the COTR.
- 2.6 Contractor's Internal Documents: The contractor's internal documents shall be used to meet the data requirements of this DPD unless a specific format is required by the applicable DRD.
- 2.7 Document Identification: Type 1 and 2 documents published by the contractor and submitted in response to the data requirements of this DPD shall be identified within an organized identification numbering system prescribed to NASA by the contractor and, if applicable, as approved by NASA. This number, change legend, date, and title constitute the minimum identification of the specific document and shall appear on the cover and title page. The contract number shall also appear on the cover and title page as separate markings. The originator and organization shall be included on the title page. The document number, change legend, and date shall appear on each page of the document. In the front matter of each document, identify the DPD number and applicable DRD number(s) required for document preparation. Successive issues or revisions of documents shall be identified in the same manner as the basic issue and shall have appropriate change identification. Drawings and ECP's are excluded from the marking provisions of this paragraph. All Type 1 documentation, excluding configuration management requirements, shall be marked "PRELIMINARY PENDING NASA APPROVAL," and once approved, shall be reissued with "APPROVED BY NASA" with the date and approval authority annotated on the cover.
- 2.8 Reference to Other Documents in Data Submittals: All referenced documents shall be made readily available to the cognizant NASA organization upon request. The contractor should make sure that the references are available to NASA in a manner that does not incur delays in the use of the response document.

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- 2.9 Maintenance of Type 1 Document Submittals
- 2.9.1 Revisions of Type 1 documentation may be accomplished either by individual page revision or by a complete reissue of the document identified in accordance with requirements of 2.7 above, with the exception of drawings, which shall be revised in accordance with contract configuration management requirements.
- 2.9.2 Individual page revisions shall be made as deemed necessary by the contractor or as directed by the Contracting Officer.
- 2.9.3 A Type 1 document shall be completely reissued when, in the opinion of the contractor or NASA, the document has been revised to the extent that it is unusable in its present state, or when directed by the Contracting Officer. When complete reissues are made, the entire contents of the document shall be brought up to date and shall incorporate revised pages. All revisions shall be recorded. A revision log shall identify complete reissues except for periodic reports and documents that are complete within it as final.
- 2.9.4 Changes of a minor nature to correct obvious typing errors, misspelled words, etc., shall only be made when a technical change is made, unless the accuracy of the document is affected.
- 2.9.5 All revised pages shall be identified by a revision symbol and a new date. Each document shall contain a log of revised pages that will identify the revision status of each page with the revision symbol. This list shall follow the table of contents in each document. The line or lines revised on a given page shall be designated by the use of vertical line in the margin of the page, and the change authority shall be indicated adjacent to the change.
- 2.9.6 Contractor Type 1 documents shall not be submitted containing pen and ink markups that correct, add to, or change the text, unless schedule problems exist and approval is obtained in writing from the Contracting Officer. Such markups, however, shall not exceed 20 percent of the page content and shall be acceptable provided that the reproduced copies are legible. In addition, hand-drawn schematics, block diagrams, data curves, and similar charts may be used in original reports in lieu of formally prepared artwork, as long as legibility of copies is not impaired. The Contracting Officer will determine the acceptability.
- 3.0 DPD MAINTENANCE PROCEDURES
- 3.1 NASA-Initiated Change: New and/or revised data requirements will be incorporated by contract modification to which the new or revised portion of the DPD will be appended. The contractor shall notify the Contracting Officer in the event a deliverable data requirement is imposed and is not covered by a DRD, or when a DRD is changed by a contract modification and for which no revision to DPD is appended. In such cases, the contractor shall submit the

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requested changes to NASA for approval. See paragraph 3.3.1 for change procedures.

- 3.2 Contractor-Initiated Change: Contractor-proposed data requirements, or proposed changes to existing requirements shall be submitted to NASA for approval.
- 3.3 DPD Change Procedures
 - 3.3.1 Changes to a contractual issue of this DPD will be identified by NASA on the Document Change Log and Page Revision Log. The actual revised material on the DPD page will be identified by placing a heavy vertical line in the right-hand margin extending the entire length of the change. In addition, the numerical control number of the contractual direction authorizing the change shall be placed adjacent to the vertical revision line. These revision identifiers shall be used to reflect the current revision only; any previous symbols on a page will be deleted by the current revision.
 - 3.3.2 The date of the contractual direction paper, e.g., Change Order, Supplemental Agreement, or Contracting Officer's letter shall be entered under the "Status" column of the Page Revision Log adjacent to the affected page or DRD number, and in the "as of" block. The date that was in the "as of" block will be entered in the "Superseding" block.
 - 3.3.3 The Document Change Log entitled "Incorporated Revisions" will be changed to indicate the number, portions affected, and associated Supplemental Agreement number, if applicable.
 - 3.3.4 The Document Change Log entitled "Outstanding Revisions" is changed periodically to indicate outstanding Change Orders and Contracting Officer notification letters.
- 3.4 DPD Reissues
 - 3.4.1 When conditions warrant, the DPD will be reissued by NASA and will supersede the existing DPD in its entirety. Reissues will be issued by contractual direction.
 - 3.4.2 All revision symbols (vertical lines and contractual direction control numbers) will be removed from all pages; revision dates shall remain in the Date Revised block on DRD's that have been revised. The issue symbol, which will commence with "A" and progress through "Z," will be entered in the DPD identification block of each DRD page of the DPD.

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Data Requirements Description (DRD) List

DRD	DRD Description	SOW Section
A.1b	Workforce Reports	A.1(b)
A.1c	Management Plan	A.1(c)
A.1d	WBS and WBS Dictionary	A.1(d)
A.2.1a	Financial Management Report	A.2.1(a)
A.2.2	Performance Management Reviews	A.2.2, K.3.1
A.2.3.1	Industrial Safety Plan	A.2.3.1
A.2.3.2	Export Control Plan	A.2.3.2
B.1	Staff Research Plan	B.1
C.1	Configuration Management Plan	C.1
C.2	Risk Management Plan and Analysis and Tracking Report	C.2
C.3	Information Technology Security Plan	C.3
C.4	Schedule Reports	C.4
C.5	Government Property Management Plan	C.5
D.1	Analysis of Completed and Projected ISS S/T/C Utilization	D.1 & G.3
D.2	ISS S/T/C Utilization Roadmap and Strategy	D.2
E.1a	ISS Customer Support Interface Information Source	E.1
E.1b	Customer Contact Statistics	E.1
E.2	Customer Feedback Report	E.2
F.1.1	NRA Development Data Packages	F.1.1
F.3	Projection of Archive Requirements and Data Products	F.3
F.4	Identification of EO/PO Potential	F.4
G.2	Merit Evaluation Board Results	G.2
G.4	Commercial Research Market Development Analysis	G.4
H.1	OBPR Research Prioritization Process Results	H.1
H.2	Strategic Alignment Assessment	H.2
I.1.1a	ISSRI EO/PO Annual Plan	I.1.1
I.1.1b	ISSRI EO/PO Annual Report	I.1.1
I.3.2	ISSRI EO/PO Media Coverage Report	I.3.2
K.1.3	General Grant Provisions Document	K.1.3
K.1.5	Projection of GI Program Archive Requirements and Data Products	K.1.5
K.1.6	Identification of GI Program EO/PO Potential	K.1.6
K.3.1a	GI Project Plan	K.3.1
K.3.3a	Science Requirements Document	K.3.3
K.3.3b	Hardware System Capabilities Document	K.3.3
K.3.3c	Requirement Flowdown Matrix	K.3.3
K.3.3.2	Acceptance Data Package	K.3.3.2

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DRD	DRD Description	SOW Section
K.3.4.3a	Engineering Change Proposals and Associated Documentation	K.3.4.3
K.3.4.3b	Deviation/Waiver Approval Request	K.3.4.3
K.3.4.4	Configuration Accounting and Status Reports	K.3.4.4
K.3.4.5	FCA-PCA Documentation	K.3.4.5
K.3.5	Safety and Mission Assurance (S&MA) Program Plan	K.3.5
K.3.5.1	Payload Safety Compliance Data Packages	K.3.5.1
K.3.6	Safety, Interface, and Performance Certification of Flight Readiness	K.3.6
K.3.8.4	Integration Data Package (IDP)	K.3.8.4
K.3.8.6	Guest Investigator (GI) Post-Flight Report	K.3.8.6
K.4a	Verification/Validation Planning Information/Document	K.4
K.4b	Verification/Validation Requirements Information/Document	K.4
K.4c	Verification/Validation Success Criteria Information/Document	K.4
K.4d	Verification/Validation Reports	K.4
K.5.1.2a	Structural Assessment Plan	K.5.1.2
K.5.1.2b	Structural Strength And Fatigue Analysis Reports	K.5.1.2
K.5.1.2c	Thermal Design Databook	K.5.1.2
K.5.1.2d	End Item Specifications	K.5.1.2
K.5.1.2e	As-Designed EEE Parts List	K.5.1.2
K.5.1.2f	Engineering Drawings, Models, and Associated Lists	K.5.1.2
K.5.1.4a	Test Plan	K.5.1.4
K.5.1.4b	Test and Checkout Procedures	K.5.1.4
K.5.1.4c	Structural Strength Test Plan	K.5.1.4
K.5.2.1a	Software Quality Assurance Plan	K.5.2.1
K.5.2.1b	Software Development Plan	K.5.2.1
K.5.2.1c	Software Requirements Specification	K.5.2.1
K.5.2.1d	Software Design Description	K.5.2.1
K.5.2.1e	Software Version Description	K.5.2.1
K.5.2.2a	Software Test Plan	K.5.2.2
K.5.2.2b	Software Test Description	K.5.2.2
K.5.2.2c	Software Test Reports	K.5.2.2
L.1	Archive Management, Capability, and Maintenance Plan	L.1
L.2	Annual Archive Report	L.2

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15.4 FORMAT: Specific formatting to be provided by COTR.

15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue.

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the strategy for insuring that the scientific staff shall be structured to include and retain an appropriate mix of discipline skills and experience to insure that the ISSRI can support and enhance the S/T/C community usage and output of the ISS.

15.2 APPLICABLE DOCUMENTS: RFP Clause H.9, Additional Export Control Requirements

15.3 CONTENTS: The Management 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 address the contractor's plan for work definition and authorization, scheduling, budgeting, data accumulation, Safety and Mission Assurance, subcontract, material control, indirect cost management, baseline control, and organization structure. The plan shall include a section describing Key Personnel Roles and Responsibilities. The plan shall include a description of external interfaces. The Management Plan shall include:

1. Narrative descriptions of the management, technical, and business approaches used to accomplish and monitor contractual tasks, projects, and programs as well as methods the contractor will employ to provide government insight, data accessibility, and/or deliverables.
2. Interfaces between the contractor, the government, customers, Institutes, and other contractors or entities that are necessary and pertinent to the accomplishment of contractual tasks, projects, and programs
3. Assessment of risks inherent in the management, technical, and business approaches.
4. Narrative description of the contractor's management approach to defining processes, plans, and procedures including any government approval of first time high-risk operations and critical processes, plans, and procedures.
5. Narrative description of contractor controls applicable to any tasks, activities and projects exceeding established cost or schedule plans including requirements for providing recovery plans or cancellations.
6. Narrative description of the contractor's proposed scope and approach implementing associate contractors agreements.
7. The Core Scientific Staff Plan shall include:
8. An assessment of the required skill mix, background, level of experience, and staffing levels for the identified areas of expertise,
9. How the ISSRI will identify, attract, and retain a core scientific staff, and
10. How the ISSRI will evaluate and manage the scientific staff for the duration of the contract.

15.4 FORMAT: The contractor's format is acceptable. The plan shall identify contract title and contract number and shall contain a table of contents. Descriptive material (sketches, flow charts, drawings, photographs, tables, forms, graphs, worksheets, charts, etc.) may be included if needed to clarify or explain matters in the text.

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15.5 MAINTENANCE: Changes shall be incorporated as required by change page or complete reissue.

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15.4 **FORMAT:** Per Contracting Officer instructions and in a format supported by the program-authorized electronic library. The WBS shall be in a chart format showing element relationships. The WBS Dictionary shall be ordered in consonance with the WBS and shall reference each WBS element by its identifier and name.

15.5 **MAINTENANCE:** Document will be maintained electronically. Information shall be updated as required by the contractor.

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and 533Q) shall be prepared in accordance with the detailed instructions provided on the reverse side of the NASA Forms 533M and 533Q and the supplementary instructions set forth in NPG 9501.2C, Chapter 3.

- a. 533Q Quarterly Report shall include actual cost and cost projections at the total contract level. The initial 533Q report shall reflect the original contract value detailed by negotiated reporting categories and serve as the original baseline plan.
- b. 533M Monthly Report shall include actual cost and cost projections at the total contract level.

A summary level page reflecting cumulative total contract cost since inception shall be included.

15.4 **FORMAT:** Contractor internal automated printout reports may be substituted for 533M/533Q forms (with NASA Contracting Officer's approval) provided that the contractor report contains all of the data elements required by NASA Forms 533M and 533Q. Electronic submission of contractor data is strongly encouraged (reference NPG 9501.2, paragraph 306).

15.5 **MAINTENANCE:** None required

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effectively indicate the level of success in the execution of contract requirements and the status of the ISSRI achievement against the performance standards contained within this statement of work or elsewhere in this contract. The ISSRI shall depict in PMR presentations a correlation of the metrics to the requirements, and measurements of ISSRI management responsiveness to the performance indicated by the metrics. The ISSRI shall depict in PMR presentations performance measurement, accomplishments, risks, issues and corrective actions, and ISSRI financial status, including rates and any other data necessary to report the status of the operation of the ISS Research Institute.

The ISSRI shall provide a monthly report of all ISSRI staff research activities performed under this contract and present the report content at the PMR. The monthly report shall describe each of the following elements for each member of the ISSRI core research staff: 1) current and planned research funding, 2) research activities and publications, 3) public outreach and education activities, 4) advocacy activities, and 5) ISSRI management support activities. The report shall detail the use of the ISSRI Director's discretionary fund, including identification of research that is accomplished using discretionary funds. The report shall include graphic illustrations suitable for NASA public relations purposes, copies of scientific papers, and education/outreach material completed or published in the month of the reports.

The ISSRI shall provide a listing of all anticipated and actual 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 for the subject contract period.

The ISSRI shall provide a monthly report of all Education Outreach/Public Outreach activities performed under this contract and present the report content at the PMR. Reporting, where appropriate, should be divided by *General, Public Outreach, User Outreach, and Education*. Report should include the following information:

- General, e.g., personnel changes, completed studies and surveys
- Major Accomplishments
- Consolidated schedule update, including significant events, meetings, conferences, etc.
- Outreach activities and products status
- Partnerships status
- Major event and meeting attendance
- Interim statistics and metrics
- Projected major upcoming activities
- Significant Issues

The Monthly Review package:

Summary Section:

- Stoplight Status of fiscal year Program cost, schedule, and technical performance.
- Summary status of fiscal year reserves, risks and opportunities.

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- Fiscal year cost and workforce summaries
 - Cumulative variance explanations (to fiscal year plan) and End-Of-Year trend variance explanations.
 - Major Contract Milestone Schedule – 90-Day Forward-Looking
- Component Sections (done at major element/organization/subsystem level):
- Include all Summary Section items.
 - Fiscal year schedules
 - Statement of Work reconciliation

The Quarterly Review Package:

Summary Section:

- Total Contract planning assumptions for budget horizon estimates through the end of the contract, work content summary, workload drivers and key technical metrics.
- Cost and workforce estimates through the budget horizon through the end of the contract
- Major Program Milestone Schedule – through the end of the contract
- Summary Risks & Opportunities
- Performance of contract metrics

Component Sections (done at major element/organization/substem level)

- Include all Summary Section items
- Schedules by Work Breakdown Structure element for budget horizon through the end of the contract.

15.4 FORMAT: Specific formatting to be tailored by COTR and contractor

15.5 MAINTENANCE: Changes shall be incorporated as required by change page or complete reissue.

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15.3 CONTENTS: The Industrial Safety Plan shall include:

1. Means of identifying and correcting hazards.
2. Methods to make certain that clear statements of hazardous situations and necessary cautions are in documents which detail potentially hazardous operations, such as manufacturing, inspection, and test procedures.
3. Means for ensuring that every employee understands how to recognize hazards and how to avoid having accidents.
4. Procedures for certification of personnel performing potentially hazardous operations. Job categories under the contracted effort that require certification shall be identified.
5. Controls over the procurement, storage, issuance, and use of hazardous substances and procedures for recycling and disposal of hazardous waste.
6. Controls for any special hazards to be encountered in the contracted effort.
7. Method of making sure that emergency plans and procedures, such as for severe weather, catastrophic mishap, and bomb threat, are current and sufficient.
8. Method for investigating and reporting mishaps to NASA, and a description of how mishap cause analysis is to be accomplished.
9. Requirements for formal safety inspections and correction of deficiencies.
10. Other means for discovery and control of hazards and unsafe conditions.
11. Plans for safety awareness and motivation programs.
12. Provisions for systematically identifying hazards associated with hardware delivered to the Government.

15.4 FORMAT: The contractor's format is acceptable. The plan shall identify contract title and contract number and shall contain a table of contents. Descriptive material (sketches, flow charts, drawings, photographs, tables, forms, graphs, worksheets, charts, etc.) may be included if needed to clarify or explain matters in the text.

15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue. Update as required to maintain current with program changes.

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affected for the subject contract by the ISSRI

Based on audit findings, the ISSRI shall include corrective action plans for any processes identified for improvements and notification of when the correction of any non-conformances has been completed.

15.4 **FORMAT:** The contractor's format is acceptable. The plan shall identify contract title and contract number and shall contain a table of contents. Descriptive material (sketches, flow charts, drawings, photographs, tables, forms, graphs, worksheets, charts, etc.) may be included if needed to clarify or explain matters in the text.

15.5 **MAINTENANCE:** The Export Control Plan shall be reviewed annually to ensure accuracy. Any updates to the plan require a resubmission.

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The Staff Research Plan shall include:

- 1) Current and planned research by grant/fund source for each of the research staff including:
 - a. Title and description
 - b. Funding level
 - c. Fund source
 - d. Performance period
 - e. Percentage of effort
- 2) Current and planned distribution of aggregate staff time between research and other SOW WBS elements

15.4 **FORMAT:** The contractor's format is acceptable. The plan shall identify contract title and contract number and shall contain a table of contents. Descriptive material (sketches, flow charts, drawings, photographs, tables, forms, graphs, worksheets, charts, etc.) may be included if needed to clarify or explain matters in the text.

15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue. Update as required to maintain current with program changes.

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The Software CMP shall include:

- a. Introduction;
- b. Reference Documents;
- c. Configuration Management Process Overview;
- d. Software Configuration Management Activities: 1) Configuration Identification, 2) Configuration Control, 3) Configuration Status Accounting, 4) Audits and Reviews.
- e. Tools, Techniques, and Methodologies;
- f. Supplier Control;
- g. Records collection, maintenance, and retention.

Include an alphabetized list of definitions for abbreviations, acronyms, and special terms used in the document, i.e., terms used in a sense that differs from or is more specific than the common usage for such terms.

Material that is too detailed or sensitive to be placed in the main body of text may be placed in an appendix or included as reference. Include the appropriate reference in the main body of the text. Appendices may be bound separately, but are considered to be part of the document and shall be placed under configuration control as such.

15.4 **FORMAT:** The contractor's format is acceptable. The plan shall identify contract title and contract number and shall contain a table of contents. Descriptive material (sketches, flow charts, drawings, photographs, tables, forms, graphs, worksheets, charts, etc.) may be included if needed to clarify or explain matters in the text.

15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue. Update as required to maintain current with program changes. The ISSRI shall document CM implementation details and changes/exceptions for each Order.

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contractor will document risk management activities and how the contractor will communicate risk issues and concerns to the Government.

The Risk Analysis shall contain the following data: 1) References to source data for identified risk areas such as test data, lessons learned, FMEA, hazard analysis and technical analysis; 2) Catalog of all program/project risks; 3) Risk evaluation data that identifies the impact, probability and time frame for each risk; 4) Risk classification and prioritization data. The Risk Tracking Report shall contain the following data: 1) Status of all risks and risk metrics; 2) Risk mitigation plans and verification of completed mitigation plans; 3) Risk decision summaries that will document replan of unsuccessful mitigation plans and risk acceptance/closures.

15.4 FORMAT: Contractor format is acceptable.

15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue. Update as required to maintain current with program changes. The ISSRI shall document CM implementation details and changes/exceptions for each Order.

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15.3 CONTENTS: The plan shall contain the information required by NFS 1804.470-3, NFS 1852.204-76, and NPG 2810.1.

15.4 FORMAT: The contractor's format is acceptable. The plan shall identify contract title and contract number and shall contain a table of contents. Descriptive material (sketches, flow charts, drawings, photographs, tables, forms, graphs, worksheets, charts, etc.) may be included if needed to clarify or explain matters in the text.

15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue.

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be traceable to the approved Contract Work Breakdown Structure (CWBS).

Project Schedules shall be reported in three sections. All data contained in the sections shall be consistent, statused monthly and based on the same cutoff date.

- a. Project Master Schedule – Top level, Gantt-type summary document arranged by WBS that reflects all contract and controlled milestones, major project phases (i.e., design, fabrication, integration, assembly, etc.) and all end item deliveries.
- b. WBS Summary Schedules – Gantt-type summary documents arranged by WBS for Core work and for each Delivery Order. Data reflected within these schedules shall be provided to a CWBS level for Core work and to a WBS level for each Order that is specified when it is issued, with lower level detail being provided as required by the NASA Task Monitor. These schedules shall contain:
identification of major project phases, all contract and controlled milestones, key subcontractor milestones, end item delivery dates, critical path identification, key data delivery dates, and key Government Furnished Property (GFP) need dates.
- c. Contractor Schedule Assessment Report – This report shall contain a trend analysis of weeks ahead/behind for each specified WBS element, primary and secondary critical path narrative, variance rationale and impact statements for contract/controlled milestone variances, and proposed work-around plans for significant behind schedule situations. Data reflected within this report shall be provided to a CWBS level for Core work and to a WBS level for each Order that is specified when it is issued, with lower level detail being provided as required by the NASA Task Monitor.

15.4 **FORMAT:** Contractor format is acceptable. Submission of the project schedules shall be by standard hardcopy and electronic media. A legend identifying the contractor's schedule symbols used and their meaning shall be provided.

15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue.

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- c. Receiving.
- d. Identification.
- e. Records.
- f. Movement.
- g. Storage.
- h. Physical inventories.
- i. Reports.
- j. Consumption.
- k. Utilization.
- l. Maintenance.
- m. Subcontractor control.
- n. Disposition.
- o. Contract close-out.

15.4 **FORMAT:** The contractor's format is acceptable. The plan shall identify contract title and contract number and shall contain a table of contents. Descriptive material (sketches, flow charts, drawings, photographs, tables, forms, graphs, worksheets, charts, etc.) may be included if needed to clarify or explain matters in the text.

15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue.

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OE Strategy

15.3 CONTENTS: The analysis of ISS Utilization shall document the utilization metrics for the previous 12 months of utilization. These metrics shall include: time from selection to flight of investigations flown in the time period, science accomplishments, resource availability, and resource utilization measured against Agency goals. Resource is defined for this purpose as power, crew time, upmass, downmass, and crew training time.

The analysis shall also contain a projection of resource availability for the next 3 years. The ISSRI shall coordinate with the broad potential science, technology, and commercial (S/T/C) user community in order to recommend future research directions for ISS with associated impacts on ISS resources (timeframe 5 or 10 years). The recommendation background, recommendations, and impacts shall be provided in the analysis. The ISSRI shall assess future optimization opportunities across S/T/C utilization for the next 3 years and provide the analysis and recommendations for optimization in the analysis. The ISSRI shall assess ISS process and system improvements with the potential to benefit utilization and provide the analysis and recommendations for improvements with the associated impacts in the analysis.

The ISSRI shall support NASA in fostering cross-disciplinary and domestic inter-agency flight research programs and in identifying potential domestic and international alliances with NASA to support strategic planning. These programs are intended to optimize the potential of NASA assets and ISS utilization to meet NASA objectives to solve a variety of issues of interest to multiple constituencies.

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.

15.4 FORMAT: A written report and briefing package are required. The contractor's format is acceptable. The plan shall identify contract title and contract number and shall contain a table of contents. Descriptive material (sketches, flow charts, drawings, photographs, tables, forms, graphs, worksheets, charts, etc.) may be included if needed to clarify or explain matters in the text.

15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DPD NO.: XXX ISSUE: Ext Review 2.DRD NO.: D.2
3. DATA TYPE: 1 4. DATE REVISED: 09-05-03
5. PAGE: 1/2
6. TITLE: ISS S/T/C Utilization Roadmap and Strategy
7. SOW Reference: D.2
8. DESCRIPTION/USE: To provide a strategy and roadmap specific to the ISS incorporating the appropriate elements of the Enterprises' Strategies and in alignment with the NASA Strategic Plan.
9. OPR: TBD 10. TM: TBD
11. DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
1 electronic copy: COTR
1 electronic copy: Executive Secretary for NASA Senior Management Team
1 electronic copy: ISS Program Scientist
1 electronic copy: Program Authorized Repository
Printed Document (5000 copies): Available for broad distribution
12. INITIAL SUBMISSION: 6 months after completion of next Strategy cycle, next completion estimated to be Fall 2006.
13. SUBMISSION FREQUENCY: 6 months after the completion of each Strategic Roadmap and Strategy 3-year cycle.
14. REMARKS:
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The ISS Roadmap and Strategy reflect the long term utilization plans for the ISS and incorporate the plans for all user enterprises including all payload types, pressurized and unpressurized.
 - 15.2 APPLICABLE DOCUMENTS:
 - NASA Strategic Plan**
 - OBPR Strategy**
 - OSS Strategy*
 - OES Strategy*
 - OSF Strategy*
 - OE Strategy*

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15.3 CONTENTS: This deliverable shall define the ISS mission, goals, and objectives; develop the ISS roadmap; define science, technology, applications, commercialization, and education requirements and research strategies for 5, 10, and 20 year plans; and publish the *ISS Roadmap and Strategy*.

15.4 FORMAT: A formal document suitable for publication and a briefing package are required. Specific format shall follow NASA guidelines for publications.

15.5 MAINTENANCE: Changes shall be incorporated by complete reissue.

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2. ISS specific information and the ISS Payload Information Source (www.stationpayloads.jsc.nasa.gov), including safety, descriptions of on-orbit research accommodations, experiment selection and manifesting processes, existing and proposed facilities and subrack level hardware, attached payload facility hardware, on-orbit operational guidelines and constraints, data storage and downlinking provisions, integration requirements and processes, and access to historical data regarding characterization of the physical environment.
3. OBPR specific organizational structure, research programs and goals, and available research opportunities. The reference service shall include general information regarding non-ISS based OBPR research programs and opportunities, and associated facilities and experiment hardware. This information shall be organized in accordance with the individual Research Divisions and Program Offices:
 - a. OBPR Management,
 - b. ISS Program Scientist,
 - c. Bioastronautics Research,
 - d. Fundamental Space Biology,
 - e. Physical Science Research, and
 - f. Space Product Development.
4. Links to existing Users' Guides, hardware capabilities descriptive documents, websites, taskbooks, and archives.
5. Contact information for NASA subject matter experts.

The CD product shall be designed to be used in conjunction with staffed Customer Support Interface reference desk, and constitutes to the greatest degree possible a stand-alone version of the information content listed above.

15.4 FORMAT: At a minimum, CD version

15.5 MAINTENANCE: The CD will be revised approximately once every 2 years. The Customer Support Reference will be maintained and updated as required to reflect current ISS Program and Facility documentation.

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- a. The ISSRI shall develop a customer survey method consistent with the current ISS Payloads Office Post-Increment Survey and derived from the Needs Assessment.
- b. The Survey shall solicit feedback in the areas of programmatic content and emphasis, the research solicitation and selection process, experiment definition and development, flight prioritization and manifesting, flight hardware integration and operations, deintegration, and post-flight data access and recovery.
- c. The ISSRI shall solicit feedback from the S/T/C research and education communities.
- d. The end-to-end survey and report content shall include:
 - 1. All data obtained through the ISS Payloads Office Post Increment Survey.
 - 2. Lessons learned concerning Program-relevant knowledge that they gained by experience.
 - 3. Program strengths and weaknesses to include general ISS Program and the ISS Utilization Program.
 - 4. User assessment of ISSRI performance.
 - 5. Corrective actions to ISSRI processes based on survey responses.
 - 6. Recommended corrective actions for NASA processes based on survey responses.
 - 7. Statistical analysis of data.
 - 8. Responses and comments, including tape recorded sessions (with permission).
- e. The report shall include any unsolicited feedback.

15.4 FORMAT: NASA URL website.

15.5 MAINTENANCE: The Survey contents will be maintained and updated to reflect ISS Research Program needs and shall capture the end-to-end process of working with the ISSRI, NASA, and its affiliated contractors and organizations on ISS utilization. The ISSRI shall conduct Needs Assessments to insure the survey “asks the right questions” for what is important to the customer and to customer satisfaction.

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ISSRI will coordinate the anticipated schedule by which experiments will be completed, and track progress towards completion of OBPR objectives.

15.4 FORMAT: Contractor format is acceptable for the data package and analysis that is required periodically.

15.5 MAINTENANCE: None required.

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15.4 FORMAT: Contractor format is acceptable.

15.5 MAINTENANCE: None required.

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15.3 CONTENTS: The report shall describe, for each selected flight research proposal, the anticipated education and public outreach potential in accordance with the requirements described in Section I: Educational Outreach and Public Outreach.

15.4 FORMAT: Contractor format is acceptable.

15.5 MAINTENANCE: None required.

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The report shall include:

- Names of panel members and professional background of the members
- Criteria used for evaluation and recommended prioritization
- Scoring plan for evaluation and recommended prioritization
- Evaluation ratings for each proposal and summary recommendations of flight payload prioritization.

15.4 FORMAT: Contractor's format is acceptable

15.5 MAINTENANCE: Copies of each report shall be retained by the contractor.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DPD NO.: XXX ISSUE: Ext Review
2. DRD NO.: G.4
3. DATA TYPE: 3
4. DATE REVISED: 08-28-03
5. PAGE: 1/2
6. TITLE: Commercial Research Market Development Analysis
7. SOW Reference: G.4
8. DESCRIPTION/USE: To provide market analyses that identify emerging markets and technologies that would benefit from new or improved product development through research on board the International Space Station (ISS). Results will be used in the NASA strategic planning process.
9. OPR: US/Space Product Development Division
10. TM: TBD
11. DISTRIBUTION:

1 original/record (hard copy):	UM/Data Management
1 hardcopy:	Contracting Officer
1 hardcopy:	COTR
1 hardcopy and 1 electronic:	SPD Division Director
1 hardcopy and 1 electronic:	Task Monitor
1 electronic:	Program Authorized Repository
12. INITIAL SUBMISSION: Per Contracting Officer's letter
13. SUBMISSION FREQUENCY: Annual report with an abbreviated, interim report at the mid-point of each contract year.
14. REMARKS: The contractor shall protect identified proprietary data.
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The market analyses shall be in fields aligned with OBPR's strategic objectives and shall be applicable to ISS research endeavors. These analyses will identify emerging technologies and research results derived from the ISS that may have commercial applications.
 - 15.2 APPLICABLE DOCUMENTS: OBPR Roadmaps and Research Plan
Space Product Development Annual Report
 - 15.3 CONTENTS:

The analyses shall contain:

 1. Description of assessment methodology

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2. Description of potential ISS research technologies and research results of interest to industry and illustration of applicability and potential uses to target markets.
3. Identification of emerging markets, technologies, and material processes that may benefit from research conducted on the ISS.
4. Identification of industry technologies and processes that may provide benefit to ISS research and methodologies.

15.4 FORMAT: Contractor's format is acceptable

15.5 MAINTENANCE: Changes shall be incorporated as required by change page or complete reissue.

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15.5 MAINTENANCE: None

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15.5 MAINTENANCE: None

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resource summary (e.g., funds, schedule, staff). At a minimum, the plan shall cover those outreach areas specifically identified in the Statement of Work.

15.2 APPLICABLE DOCUMENTS:

- OBPR Roadmaps and Organizing Questions
- OBPR Educational Outreach Handbook and Outreach Plans
- NASA Strategic Plan
- Education Enterprise specific guidelines and documents
- NASA Communications Strategy

15.3 CONTENTS: The EO/PO Annual Plan shall include, but is not be limited to, the ISSRI EO/PO: vision, mission, goals, metrics, themes, messages, audiences, activities, products, resources (e.g., funds, schedule, staff, organization), dissemination and delivery plans, evaluation approach, and partnerships. The plan shall document procedures for NASA review of EO/PO activities and products.

15.4 FORMAT: The published document shall conform to NASA publication standards.

15.5 MAINTENANCE: Changes shall be incorporated as required by change page or complete reissue.

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15.2 APPLICABLE DOCUMENTS:

- OBPR Roadmaps and Organizing Questions
- OBPR Educational Outreach Handbook and Outreach Plans
- NASA Strategic Plan
- Education Enterprise specific guidelines and documents
- NASA Communications Strategy

15.3 CONTENTS: The report shall summarize ISSRI EO/PO activities, products, partnerships, evaluation results, and statistics for the completed year. The report shall include an assessment of outreach results based upon the goals, plans, and metrics identified in the ISSRI Annual Plan. The report shall detail where ISS research was featured in the media, and trade, scientific, and other publications, and shall include citations and statistics. The report may include recommendations to improve ISSRI EO/PO activities and products. At minimum, the report shall cover those outreach areas specifically identified in the Statement of Work.

15.4 FORMAT: The published on the NASA portal. Hard copies shall conform to NASA publication standards.

15.5 MAINTENANCE: None

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15.3 CONTENTS: The report shall describe media coverage that directly impacts ISS research, including: where a story appeared, date, placement, headline, author, story description and/or reprint. The report shall provide summary statistics of media coverage, including by type of media (e.g., national, local, business, science, etc.). Upon request by NASA, the report shall include media content analysis and statistics.

15.4 FORMAT: The contractor's format is acceptable.

15.5 MAINTENANCE: N/A

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5. Proprietary rights to data and patent laws
 6. Applicable federal laws and regulations
 7. Suspension and termination processes
- c. Other information as agreed between the contractor and the COTR

15.4 FORMAT: Contractor's format is acceptable

15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue.

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15.4 FORMAT: Contractor format is acceptable.

15.5 MAINTENANCE: None required.

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accordance with the requirements described in SOW reference paragraphs. The report shall project ISSRI consolidated EO/PO plans for all GI Program research.

15.4 FORMAT: Contractor format is acceptable.

15.5 MAINTENANCE: None required.

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The Management Overview shall contain a concise summary of the contractor's management organization responsible for performance of the contract, including interrelationships with the Work Breakdown Structure (WBS), within the company and with other contractors, and proposed relationships with the NASA project management.

Content as required per NPG 7120.5b.

15.4 FORMAT: Contractor Format is acceptable.

15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue.

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risks, issues and corrective actions, and ISSRI financial status, including rates and any other data necessary to report the status of the Order.

The Monthly Review package:

Summary Section:

- Stoplight Status of fiscal year Program cost, schedule, and technical performance.
- Summary status of fiscal year reserves, risks and opportunities.
- Fiscal year cost and workforce summaries
- Cumulative variance explanations (to fiscal year plan) and End-Of-Year trend variance explanations.
- Major Contract Milestone Schedule – 90-Day Forward-Looking

Component Sections (done at major element/organization/subsystem level):

- Include all Summary Section items.
- Fiscal year schedules (We have not asked for resource loaded schedules)
- Statement of Work reconciliation contract.

15.4 FORMAT: Specific formatting to be tailored by COTR and contractor

15.5 MAINTENANCE: Changes shall be incorporated as required by change page or complete reissue.

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success criteria, g) description of data and samples to be archived, h) facility, ground, and flight operations on shuttle and ISS, i) integration requirements, and j) safety requirements. This section shall be reviewed and approved by each GI associated with the experiment. When the final version is complete, each GI shall sign indicating concurrence with items A through G above. An explanation of some items is provided below.

Test Matrix: A list of parameters that will be varied during the course of the experiment or for each test run; the test conditions.

Science Requirements:

- a. What is to be measured and controlled,
- b. Measurement sensitivity, accuracy, and repeatability,
- c. Spatial and temporal resolution, accuracy and frequency (sampling rate and number of measurements per unit spatial dimension),
- d. Spatial and temporal domain (field of view and length of experiment), and
- e. Timing or scheduling of data collection.

These requirements must be individually traceable to the approved objectives and the supporting modeling or analysis.

Post Flight Data Deliverables: The data collected during and after the space flight experiment to be provided to the GI. Format of the data is to be specified.

Success Criteria: There are two levels of success, which need to be clearly specified: minimum and complete. Complete success is typically defined as fully completing the test matrix and meeting all of the science requirements during experiment operation in space. Minimal success is defined as a majority of the test matrix and science requirements was achieved during experiment operation in space to allow at least one publication of the results.

Description of Data and Samples to be archived: This includes data and samples analyzed by the GI and samples not used by the GI. Examples of data include video, electronic, and photographic; samples include tissue, metal specimens, etc. Archived information may also include engineering and environmental data (such as acceleration).

15.4 FORMAT: Electronic submission

15.5 MAINTENANCE: As required by requested modifications and additions to archive requirements.

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- e. Comparison of the science requirements and hardware capabilities in terms of hardware specifications (e.g., compliance matrix).
- f. Waivers and rationale for deviations from the science requirements.
- g. Deficiencies as a function of each flight.

15.4 FORMAT: Contractor format is acceptable with NASA approval.

15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DRL NO.: XXX ISSUE: Ext Review
2. DRD NO.: K.3.3c
3. DATA TYPE: 3
4. DATE REVISED: 08-28-03
5. PAGE: 1/3
6. TITLE: Requirement Flowdown Matrix
7. SOW Reference: K.3.3
8. DESCRIPTION/USE: To provide the traceability and visibility that all requirements have been properly and completely flowed down to lower level documents.
9. OPR: TBD
10. TM: TBD
11. DISTRIBUTION:

1 original/record (hard copy):	UM/Data Management
1 electronic copy:	Program Authorized Repository
1 hardcopy:	Contracting Officer
1 hardcopy:	COTR
1 electronic copy:	Task Monitor
12. INITIAL SUBMISSION: Per negotiated work plan.
13. SUBMISSION FREQUENCY: Required Reviews and document delivery schedule will be determined by the complexity of the payload and any modifications required. Each Order will define a review complement and document delivery schedule commensurate with these complexities.
14. REMARKS: Requirements flowdown shall trace to the testable function of *Verification Requirements Information/Document*. Compliance for each requirement is documented in, *Verification Success Criteria Information/Document*.
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Requirement Flowdown Matrix covers the flowdown of requirements starting with the top level requirements (Level I) down through subsequent levels, including identification of all end item requirements.
 - 15.2 APPLICABLE DOCUMENTS
Level I, II, and III Requirements Documents, Specification
 - 15.3 CONTENTS: This matrix will identify and trace all project and program

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requirements from Level I through Level II, Level III, and specifications. The matrix shall state the paragraph numbers and requirements to be met at each level. Higher level requirements that are not flowed down and lower level requirements that do not trace to a higher level requirement shall be identified.

- 15.4 FORMAT: Contractor format is acceptable with NASA approval. The format shall include the data covered in the attached matrix which identifies and relates each requirement with the applicable next level requirement.
- 15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue.

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Requirements Flowdown Matrix (generic)

Level I Requirements	Level II Requirements	Level III Requirement (D & S Spec.)	Specification Paragraph No.
		Doc. No. Paragraph (Description of Requirement)	Paragraph (Description of Requirement)
	Doc. No. Para. X.Y.Z. (Description of Requirement)	Paragraph (Description of Requirement)	Paragraph (Description of Requirement)
Paragraph No. Para. X.Y.Z. (Description of Requirement)		Paragraph (Description of Requirement)	Paragraph (Description of Requirement)
	Doc. No. Para. X.Y.Z. (Description of Requirement)	Paragraph (Description of Requirement)	Paragraph (Description of Requirement)
	Doc. No. Para. X.Y.Z. (Description of Requirement)	Paragraph (Description of Requirement)	Paragraph (Description of Requirement)
		Paragraph (Description of Requirement)	Paragraph (Description of Requirement)

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- authorized life and the life expended.
- c. Test history log, including post manufacturing checkout and final verification tests of the CI, with the following data:
 - 1. Actual measurements identified to specified tests. Reference to applicable test reports are satisfactory provided that copies of the reports are provided.
 - 2. Brief test summary.
 - 3. List of unaccomplished tasks and estimated man-hours to complete.
 - 4. List of actual and recommended retest.
 - 5. Special test instructions, investigations, warnings, and problems encountered during test.
 - 6. Failure and corrective actions data for all failures during all testing.
 - d. Inspection records for all inspections.
 - e. Transfer records providing a history of all CI and critical component movements.
 - f. Alignment data for all CIs and critical items.
 - g. Component log books, including Government furnished items.
 - h. Weight and balance logs covering total weight and horizontal, vertical, and lateral center(s) of gravity.
 - i. Configuration Records:
 - 1. Parts and drawing list identifying all parts and incorporated or pending changes to each.
 - 2. Software configuration records defining the verified and validated software, version description documents, software certification, and the validated software program.
 - 3. List of approved and pending deviations and waivers.
 - 4. Complete list of hardware and software/firmware items shipped loose or separately.
 - 5. Copy of proposed DD Form 250.

15.4 FORMAT: Contractor format is acceptable.

15.5 MAINTENANCE: The ADP shall be kept current. Changes and/or updating shall be in accordance with the contractor's approved change control system and shall reflect current status of associated hardware, firmware, or software.

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15.3 CONTENTS:

- a. The requirements of MIL-STD-973 shall be used as a guide in the preparation of proposed changes to Government-controlled configuration documentation. The following MSFC forms or their equivalent as defined by the appropriate field center managing the task order shall be prepared as required to define the specific requirements for a proposed change.
 1. Engineering Change Proposals (ECP's) - MSFC Form 2348.
 2. Specification Change Notices (SCN's) - MSFC Form 3209.
 3. Preliminary Interface revision Notices (PIRN's) - MSFC Form 4229.
- b. Changes to drawings and parts list shall be defined on a Notice of Revision (NOR) - DD Form 1695, as defined in MIL-STD-973, or contractor's equivalent.
- c. Field Engineering Changes (FEC) shall be prepared and processed in accordance with the appropriate field site format and instructions. Format and processing instructions for specific sites may be obtained from NASA field Center Task Order Manager.

The program control number (PCN) (or its equivalent) assigned by NASA and the proposal number assigned by the contractor shall be shown on all forms and messages.

15.4 FORMAT: The formats shall be as defined in paragraph 15.3.

15.5 MAINTENANCE:

- a. ECP maintenance shall be accomplished by replacement page(s) or complete revision. ECP identification shall be revised in either method.
- b. SCN's shall be maintained as complete revision and re-identification.
- c. PIRN's shall be a complete reissue.
- d. NOR's shall be a complete reissue.

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15.4 **FORMAT:** MSFC Form 847, “Deviation/Waiver Approval Request (DAR)” or equivalent as defined by the appropriate field center, shall be used to document deviations/waivers.

15.5 **MAINTENANCE:** All requested changes to a DAR shall require the submittal of a DAR revision.

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4. Date of implementation into the affected configuration items.
- b. Configuration Identification Report shall identify the configuration item(s) baseline and change activities. Hardware and software changes shall be listed separately. The following data elements shall be provided:
 1. Contract and contractor identification.
 2. Configuration Item identification (as applicable), configuration item number, nomenclature, part number, and specification number.
 3. Configuration change data, including:
 - (a) Change proposal identification, including type of action (e.g., ECP class, deviation or waiver).
 - (b) Change applications (e.g., hardware, software, first and total effectivities).
 4. Change disposition including the identification of contractual change authorization.
- c. Change Incorporation Status Reports shall list the status of ECP incorporation into configuration items and shall be organized by configuration number. The following data elements shall be included:
 1. Configuration Item identification number and serial number.
 2. Change number, title, type and associated PCN.
 3. Change effectivity, release data, and incorporation point.
 4. In-line incorporation date, scheduled and actual.
 5. Modification Kit data, if applicable, that includes man-hours estimated, status, installation location, shipping date, and completion dates for installation and test, if required.

15.4 FORMAT: Contractor format is acceptable provided the minimum requirements of each report are addressed.

15.5 MAINTENANCE: None

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DPD NO.: XXX ISSUE: Ext Review 2. DRD NO.: K.3.4.5
3. DATA TYPE: 2/3 (ref Attachment 2) 4. DATE REVISED: 08-28-03
5. PAGE: 1/4
6. TITLE: Functional Configuration/Physical Configuration Audit Documentation
7. SOW Reference: K.3.4.5
8. DESCRIPTION/USE: To support the Functional Configuration Audit (FCA) and verify the configuration item's and system's performance against its approved configuration documentation. Test data for the FCA shall be that collected from the test of the configuration of the item that is to be formally accepted. The Physical Configuration Audit (PCA) is an audit of the configuration documentation and quality control records to ensure the as-built or as-coded configuration is defined in the documentation.
9. OPR: TBD 10. TM: TBD
11. DISTRIBUTION: See Attachment 2
12. INITIAL SUBMISSION: See Attachment 2
13. SUBMISSION FREQUENCY: Per configuration audit
14. REMARKS: The Product Baseline is normally established at the conclusion of the PCA.
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: Functional Configuration/Physical Configuration Audit Documentation contains the required documentation necessary to support the configuration audit for a configuration item (CI).
 - 15.2 APPLICABLE DOCUMENTS: Reference is made to MIL-STD-973, *April 17, 1992, and Interim Notices 1 through 3, January 13, 1995, Configuration Management.*
 - 15.3 CONTENTS: Documentation required for the FCA and PCA shall be provided as described in MIL-STD-973 and herein: See Attachment 1 for data package content.

Additional documentation requirements to be provided are:

- a. Agenda - The agenda shall specify the date, time and place for the scheduled audit, specific review items, supporting documentation, and key participants. Submit approved copies at the review. See Attachment 2.

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- b. Presentation Charts - Presentation charts shall be submitted at the start of the audit. They shall summarize the details contained in the data package and identify compliance with the contract requirements. See Attachment 2 for distribution and availability of data.
- c. Minutes - The minutes shall contain a description of the audit with sufficient detail to enable the audit to be made a matter of record. The minutes shall include the presentation charts, a listing of RIDs, action items with actionee and suspense (closure) data, and identification of the documents which describe the approved baseline established at the conclusion of the PCA. See Attachment 2 for distribution and availability of data.
- d. Review Item Discrepancies (RIDs) - RIDs showing action items, actionees, suspense dates and closure status shall be submitted. See Attachment 2 for distribution and availability of data.

15.4 FORMAT: Contractor format is acceptable.

15.5 MAINTENANCE: As required to correct errors and to maintain RID closure status.

ATTACHMENT 1

Configuration Audit Required Data

Documentation required for FCA

- Specifications.
- Drawings and parts list.
- ECPs and DARs incorporated and pending.
- Specification and drawing tree.
- Fracture control plan.
- Structural dynamics, analyses, loads, and models documentation (updated).
- Materials Usage Agreement (MUAs).
- Material Identification Usage List (MIUL).
- Certification of Qualification(s) (COQ's).
- Verification procedures and requirements.
- Verification closure reports/certifications.
- Complete list of successfully accomplished tests and test results.
- Complete list of successful tests if detailed test data are not recorded.
- Complete list of tests required but not performed.
- Software verification data.
- Software development documents.
- Software version description.
- Critical Design Review (CDR) RIDs and dispositions.
- Mission constraints.
- Nonconformance reports.
- Interface control drawings/documents.
- Hazard analysis/risk assessment.

Documents required for the PCA

- Final version of all specifications.
- Product drawings and parts list.
- Configuration accounting and status reports.
- Final version of all software documents.
- Final version of software version description document.
- Copy of all FCA findings for each CI.
- List of approved and outstanding ECPs and DARs.
- Copies of ECPs and DARs as requested at the audit.
- Acceptance test procedures and associated test results.
- Program parts selection list.
- Identification of all changes actually made during test.
- Identification of all required changes not completed.
- Identification of differences between FCA and PCA configuration and rationale showing that the changes did not degrade the selected units.
- Drawing and specification tree.
- Software verification and validation procedures and results.

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ATTACHMENT 2

FCA/PCA Documentation
Distribution and Availability of Data

Document	Data Type	FCA Copies/Availability	PCA Copies/Availability
Agenda	2	One/15 days prior to audit, Approved copies at audit	One/15 days prior to audit, Approved copies at audit
Data Package	3	One/Two weeks prior to audit	One /Two weeks prior to audit
Presentation Charts	3	One for each attendee at audit	One for each attendee at audit
Minutes	2	One at audit/ copy to each attendee within two weeks	One at audit/one to each attendee within two weeks
RIDs (generated at Review	2	Entered into an accounting system during audit. Close out to be entered into the data base.	Entered into an accounting system during audit. Close out to be entered into the data base.

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15.3 CONTENTS: The plan shall include the requirements for S&MA for this project and shall include ISSRI implementation plans. It shall also include a description of how the Safety and Mission Assurance program relates within the overall program structure, a functional overview of applicable Safety, Reliability, Maintainability, and Quality Assurance functional requirements, and how each element of the Safety and Mission Assurance program will support the basic project elements of the contract. The plan shall address each element of the Safety and Mission Assurance function, including program reporting, non-conformance reporting, supplier control, design criteria, and design reviews, and the following specific items;

- a. Safety organization or function within the total program using charts as required to illustrate the relationships and lines of communications. Describe the responsibility and authority of safety personnel and other ISSRI organizational elements involved in the safety process and identify the authority in regard to resolution of identified hazards. Address Safety participation in and support for major design, integration, and phase safety reviews. Describe or reference the methods to be used to identify and apply safety/hazard control requirements and criteria for design and operation of hardware. List the Safety standards and system specifications that are the sources of safety requirements with which the ISSRI is required to comply. Identify the analysis techniques that will be used to identify hazards and recommended corrective actions, and verification requirements for ensuring that safety is adequately demonstrated. Define the method by which waivers, deviations, specifications, procedures, engineering changes, and operations are assessed for safety impact. Identify the methodology for the closed loop hazard tracking system. Define responsibilities and methods for internal and subcontractor safety audits.
- b. *Reliability/Maintainability (R/M)* shall identify each R/M task to be performed and completed, the procedures to evaluate and control each task, identification of the functional unit with the authority and responsibility for executing each task, a schedule with estimated start and completion points relative to program milestones.
- c. *Quality Assurance* shall address the philosophy and approach for implementation by the ISSRI quality assurance organization to meet the requirements of SSP 41173. A task matrix identifying the requirements from SSP 41173 by paragraph and the corresponding ISSRI internal procedures by document number that will be used to implement each requirement shall also be included as an appendix to the plan.

15.4 FORMAT: Contractor format is acceptable.

15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue, as required.

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NSTS/ISS 18798

15.3 CONTENTS: The package shall have contents as required in NSTS 13830.

15.4 FORMAT: The ISSRI shall follow format requirements imposed by NSTS 13830.

15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue, as required.

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- b. CoFR endorsements for Utilization Hardware remaining on-orbit from the previous stage
- c. CoFR for descent Utilization Hardware
- d. Stage-specific Open Work Tracking Log

Documentation as required to verify that all performance requirements have been met.

15.4 FORMAT: ISSRI format shall be used, except format requirements imposed by the carrier and SSP 52054.

15.5 MAINTENANCE: Updated for any ascent or on-orbit conditions or anomalies affecting original certification.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DPD NO.: XXX ISSUE: Ext Review 2. DRD NO.: K.3.8.4
3. DATA TYPE: 1 4. DATE REVISED: 08-28-03
5. PAGE: 1/2
6. TITLE: Integration Data Package (IDP)
7. SOW Reference: K.3.8.4
8. DESCRIPTION/USE: To provide information necessary for KSC integration and test activities by reporting a complete status of Payload hardware at the time of custodial turnover.
9. OPR: KSC/UB-E 10. TM: Technical Integration Manager (TIM)
11. DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
1 electronic copy: COTR
1 electronic copy: Program Authorized Repository
1 electronic copy: Task Monitor
12. INITIAL SUBMISSION: One week (minimum) prior to custodial turnover for on-line integration or testing.
13. SUBMISSION FREQUENCY: As required.
14. REMARKS: For payload hardware that already has an associated ADP, a separate IDP or the original ADP plus an IDP supplement will be submitted to KSC prior to custodial turnover. The IDP supplement sections closely mirror the ADP sections so that in most cases only the appropriate section cross references need to be identified. ADP Section XIII (Pressure Vessel Data), Section XVII Material Safety Data Sheet (MSDS), and Section XVIII (Acceptance Requirements) are the only ADP Sections not required by the IDP supplement. IDP supplement Section 14 (Operating Test Procedures), Section 16 (Open Items from Phase III Ground Safety Review), Section 18 (Software Configuration), Section 19 (IDP Return Preference), and Section 20 (ESD Sensitivity) are the only totally new sections that are not already addressed in a standard ADP. If an item is not applicable, it should be annotated in the index or on a page in the appropriate section. Payload-unique Ground Support Equipment (GSE) turned over to KSC should be detailed in the related Payload IDP.
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: An IDP is applicable to all Payloads turned over to KSC Utilization custody for on-line integration and/or test. (i.e. Space Station Utilization Payloads, Partial Payload Experiments and Middeck Payloads processed by the NASA Utilization Division

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and Utilization Engineering). Mission Peculiar Equipment (MPE) and integrated stowage assemblies (excluding middeck payloads) do not require individual IDPs; however, a List of Shortages, Identification/Drawings, Limited Operating Life/Age Sensitive Items, and Proofload/Calibration Data and Diagrams, and any other relevant information must be detailed and accompany the respective shippers.

15.2 APPLICABLE DOCUMENTS:

SSP 52000-PDS Payload Data Set Blank Book Section 7

15.3 CONTENTS: See SSP 52000-PDS Tables 7.4.1-1 and 7.4.1-2.

15.4 FORMAT: Contractor format is acceptable.

15.5 MAINTENANCE: The IDP shall be maintained current. Changes and/or updating shall be in accordance with the contractor's approved change control system.

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15.3 CONTENTS: The GI Postflight Report shall include 1) an assessment of the data and sample quality and quantity including identification of data and sample deficiencies or surpluses, 2) an evaluation of the preflight, inflight, and postflight performance of associated hardware and equipment including identification of anomalies and mission operations and logistics, and 3) lessons-learned and recommendations for improvements in ISS utilization. The ISS Program Scientist and the ISS Lead Increment Scientist may request additional information. The ISSRI shall coordinate with the GI to provide this information in a timely manner.

15.4 FORMAT: Electronic submission on CD is required.

15.5 MAINTENANCE: N/A

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DPD NO.: XXX ISSUE: Ext Review 2. DRD NO.: K.4a
3. DATA TYPE: 2 4. DATE REVISED: 08-28-03
5. PAGE: 1/2
6. TITLE: Verification/Validation Planning Information/Document
7. SOW Reference: K.4
8. DESCRIPTION/USE: To document the verification/validation approach, verification activities, and organizations necessary to define and execute the project's verification/validation program.
9. OPR: TBD 10. TM: TBD
11. DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
1 electronic copy: COTR
1 electronic copy: Program Authorized Repository
1 electronic copy: Task Monitor
12. INITIAL SUBMISSION: As Defined by the Order
13. SUBMISSION FREQUENCY: Required reviews and document delivery schedule will be determined by the complexity of the payload and any modifications required. Each Order will define a review complement and document delivery commensurate with these complexities.
14. REMARKS: None
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Verification/Validation Planning Information/Document provides a detailed description of the project's verification approach and structure for implementing the verification program, as well as detailed descriptions for the planned system verification requirements.
 - 15.2 APPLICABLE DOCUMENTS: None
 - 15.3 CONTENTS: The Verification/Validation Planning Information/Document shall contain the following:
 - a. Overview of the project's verification/validation program (i.e., qualification/acceptance vs. protoflight, verification/validation of spares, refurbishment/reverification/revalidation plans).
 - b. Description of the project's organizational structure for implementing the

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verification/validation program (i.e., organizations involved in component vs. system tests, review and signoff authority for compliance data).

- c. Detailed descriptions of all system verification/validation activities (i.e., tests, analyses, inspections) to be performed based on the identified verification/validation requirements. Identify any prerequisites, constraints, and objectives for all the verification/validation activities.
- d. Detailed time-correlated sequence of system verification/validation activities.
- e. Description and planned usage of the support equipment, software, facilities, and tooling necessary to execute the verification/validation activities.

15.4 **FORMAT:** Contractor format is acceptable.

15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DRL NO.: XXX ISSUE: Ext Review 2. DRD NO.: K.4b
3. DATA TYPE: 1 4. DATE REVISED: 08-28-03
5. PAGE: 1/2
6. TITLE: Verification/Validation Requirements Information/Document
7. SOW Reference: K.4
8. DESCRIPTION/USE: To identify the verification required to be performed to satisfy each of the system requirements.
9. OPR: TBD 10. TM: TBD
11. DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
1 electronic copy: COTR
1 electronic copy: Program Authorized Repository
1 electronic copy: Task Monitor
12. INITIAL SUBMISSION: As defined by the Order
13. SUBMISSION FREQUENCY: Required reviews and document delivery schedule will be determined by the complexity of the payload and any modifications required. Each Order will define a review complement and document delivery commensurate with these complexities.
14. REMARKS: None
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Verification/Validation Requirements Information/Document identifies the verification/validation method(s) (e.g., test, analysis, inspection), level(s) (e.g., component, subsystem, system), and phase(s) (e.g., qualification, acceptance) to be performed to satisfy each of the requirements.
 - 15.2 APPLICABLE DOCUMENTS: None
 - 15.3 CONTENTS: The Verification/Validation Requirements Information/Document shall contain the following:
 - a. Identification of the verification/validation method(s) (e.g., test, analysis, inspection) to be performed to satisfy each of the requirements documented in the Requirements Documentation.
 - b. Identification of the level(s) (e.g., component, subsystem, system) at which the verification/validation is performed to satisfy each of the requirements

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documented in the Requirements Documentation.

- c. Indemnifications of the phase(s) (e.g., qualification, acceptance) during which the verification/validation is performed to satisfy each of the design input requirements documented in the Requirements Documentation.

15.4 **FORMAT:** Contractor format is acceptable.

15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DRL NO.: XXX ISSUE: Ext Review 2. DRD NO.: K.4c
3. DATA TYPE: 1 4. DATE REVISED: 08-28-03
5. PAGE: 1/1
6. TITLE: Verification/Validation Success Criteria Information/Document
7. DESCRIPTION/USE: To establish and document the detailed success criteria for each of the verification/validation planning activities.
8. OPR: TBD 10. TM: T BD
11. DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
1 electronic copy: COTR
1 electronic copy: Program Authorized Repository
1 electronic copy: Task Monitor
12. INITIAL SUBMISSION: As defined by the Order
13. SUBMISSION FREQUENCY: Required reviews and document delivery schedule will be determined by the complexity of the payload and any modifications required. Each Order will define a review complement and document delivery commensurate with these complexities.
14. REMARKS: None
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Verification/Validation Success Criteria Information/Document establishes the detailed success criteria for each of the activities identified in the verification/validation planning.
 - 15.2 APPLICABLE DOCUMENTS: None
 - 15.3 CONTENTS: The Verification/Validation Success Criteria Information/Document shall establish:
 - a. Detailed success criteria (i.e. test limits, tolerances, specifications, margins) used in determining acceptability of the results of each verification/validation activity.
 - b. Detailed constraint criteria associated with performing the verification/validation activity or on the results of each verification/validation activity.
 - 15.4 FORMAT: Contractor format is acceptable.

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15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DRL NO.: XXX ISSUE: Ext Review 2. DRD NO.: K.4d
3. DATA TYPE: 1 4. DATE REVISED: 08-28-03
5. PAGE: 1/1
6. TITLE: Verification/Validation Reports
7. SOW Reference: K.4
8. DESCRIPTION/USE: To report the results of the verification/validation activities.
9. OPR: TBD 10. TM: TBD
11. DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
1 electronic copy: COTR
1 electronic copy: Program Authorized Repository
1 electronic copy: Task Monitor
12. INITIAL SUBMISSION: 20 days after completion of each verification/validation activity
13. SUBMISSION FREQUENCY: Once per verification/validation activity
14. REMARKS: None
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Verification/Validation Reports (i.e., procedure, memo, assessment) document the results of each verification/validation activity with respect to satisfying the applicable requirement(s).
 - 15.2 APPLICABLE DOCUMENTS: None
 - 15.3 CONTENTS: The Verification/Validation Reports shall contain the following:
 - a. Conclusions and recommendations relative to success of the verification/validation activity.
 - b. Description of deviations from nominal results, failures, approved corrective actions and procedures, and retest.
 - c. Traceability back to the requirement and/or verification/validation success criteria.
 - d. Copy of as-run procedure (as appropriate).
 - e. Identification of test configuration and any differences from the flight configuration.

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- f. Specific results of each procedure including automated test segments, each analysis, or other verification/validation activity.
- g. Performance data, plots, and pictures (as appropriate).

15.4 **FORMAT:** Contractor format is acceptable.

15.5 **MAINTENANCE:** None required.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DRL NO.: XXX ISSUE: Ext Review 2. DRD NO.: K.5.1.2a
3. DATA TYPE: 2 4. DATE REVISED: 09-05-03
5. PAGE: 1/2
6. TITLE: Structural Assessment Plan
7. SOW Reference: K.5.1.2
8. DESCRIPTION/USE: To enable the Government to assure compliance with requirements for strength and fatigue analyses, tests, and structural assessment.
9. OPR: NASA GI Project Manager 10. TM: TBD
11. DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
1 electronic copy: COTR
1 electronic copy: Program Authorized Repository
1 electronic copy: Task Monitor
12. INITIAL SUBMISSION: Per negotiated work plan.
13. SUBMISSION FREQUENCY: Required Reviews and document delivery schedule will be determined by the complexity of the payload and any modifications required. Each Order will define a review complement and document delivery schedule commensurate with these complexities.
14. REMARKS: None
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Structural Assessment Plan describes contractor compliance with requirements for strength and fatigue analyses, tests, and structural assessment.
 - 15.2 APPLICABLE DOCUMENTS:
NASA-STD-5001 *Structural Design and Test factors of Safety for Space Flight hardware*
 - 15.3 CONTENTS: The Structural Assessment Plan shall be prepared in accordance with NASA-STD-5001 and describe how the contractor intends to comply with the structural strength program requirements. The plan shall identify the organization responsible for the structural analyses, tests, and assessment tasks; define satisfactory results; and include a schedule for completion. The plan shall distinguish between flight and development hardware, identify components that require design verification tests and proof tests, specify appropriate test levels and

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environments, and state the means of correlating test data with analyses.

- 15.4 **FORMAT:** Contractor format is acceptable. The plan shall be available in an electronic database.
- 15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DRL NO.: XXX ISSUE: Ext Review 2. DRD NO.: K.5.1.2b
3. DATA TYPE: 3 4. DATE REVISED: 09-05-03
5. PAGE: 1/2
6. TITLE: Structural Strength and Fatigue Analysis Reports
7. SOW Reference: K.5.1.2
8. DESCRIPTION/USE: To provide component strength and fatigue analysis and a structural analysis database used for development of the flight article.
9. OPR: NASA GI Project Manager 10. TM: TBD
11. DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
1 electronic copy: COTR
1 electronic copy: Program Authorized Repository
1 electronic copy: Task Monitor
12. INITIAL SUBMISSION: Per negotiated work plan.
13. SUBMISSION FREQUENCY: Required Reviews and document delivery schedule will be determined by the complexity of the payload and any modifications required. Each Order will define a review complement and document delivery schedule commensurate with these complexities.
14. REMARKS: None
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Structural Strength and Fatigue Analysis Reports provide a strength and fatigue analysis and a structural analyses database. Strength and fatigue analyses are documented to demonstrate that strength and fatigue requirements have been met. Preliminary strength and fatigue analyses shall assure the structural integrity of major structural elements and the credibility of weight calculations. Analyses provided in support of the CDR shall substantiate the structural integrity of detailed parts and provide the basis for approval of drawings. Analyses provided in support of certification shall fully substantiate the structural integrity of each detailed part in its final design configuration. Analyses provided in support of flight hardware shall be updated for the "as-built" configuration.
 - 15.2 APPLICABLE DOCUMENTS
NASA-STD-5001 *Structural Design and Test factors of Safety for Space Flight hardware*

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- 15.3 CONTENTS: NASA-STD-5001 shall be used as a guide in preparing the Structural Strength and Fatigue Analysis Reports. The report shall document strength and fatigue analyses for structural flight components, and provide a structural analyses database for the flight hardware. These analyses shall verify the capability of the hardware to withstand worst-case design loads.

The strength and fatigue analyses reports shall identify such items as geometric description of each component, drawing or part number, identification of all applied loads, type of material and applicable strength and fatigue allowables, environments and effects, proper identification of reference inputs into the analyses, and a summary of calculated margins of safety and life predictions. An automated procedure shall be established to calculate margins for all structures and components. When loads from a new load cycle are provided, they shall be used to automatically determine new margins of safety. Effects of structural design changes shall be incorporated into this procedure so that margins of safety for the "as-built" configuration may be accurately calculated.

When computer analyses, including finite element analyses are used, deliverable information shall include a description of the analyses with applicable geometry, dimensions, loads, other boundary conditions, annotated input data file(s), plots of model geometry, and results.

This information shall be sufficient to recreate the analysis if necessary. Computer programs, data inputs, and data outputs utilized in these analyses must be documented and available to the Government upon request.

- 15.4 FORMAT: Contractor format is acceptable. Reports shall be available in an electronic database.
- 15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DRL NO.: XXX ISSUE: Ext Review 2. DRD NO.: K.5.1.2c
3. DATA TYPE: 3 4. DATE REVISED: 08-28-03
5. PAGE: 1/2
6. TITLE: Thermal Design Databook
7. SOW Reference: K.5.1.2
8. DESCRIPTION/USE: To provide documentation of the thermal control system design, analysis, and verification.
9. OPR: TBD 10. TM: TBD
11. DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
1 electronic copy: COTR
1 electronic copy: Program Authorized Repository
1 electronic copy: Task Monitor
12. INITIAL SUBMISSION: Per negotiated work plan.
13. SUBMISSION FREQUENCY: Required Reviews and document delivery schedule will be determined by the complexity of the payload and any modifications required. Each Order will define a review complement and document delivery schedule commensurate with these complexities.
14. REMARKS:
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Thermal Design Databook describes the thermal requirements, design environments, thermal interfaces, and system architecture.
 - 15.2 APPLICABLE DOCUMENTS: None
 - 15.3 CONTENTS: The Thermal Design Databook provides thermal requirements, thermal control system design resulting from these requirements, and thermal analysis data that supports the design. Thermal data provided includes temperature and performance predictions for major components, heater power requirements, and descriptions of thermal control hardware, e.g., insulations, isolators, heaters, thermostats, heat pipes, coatings, collimators, pumped coolant loops, radiators. The Thermal Design Databook shall include the following:
 - a. Thermal requirements.

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- b. Thermal design environments and interfaces.
- c. Thermal design approach and description.
- d. Thermal analyses and resulting data.
- e. Verification process for the thermal control system including development, qualification, and acceptance tests.

15.4 **FORMAT:** Contractor format is acceptable with NASA approval.

15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DRL NO.: XXX ISSUE: Baseline
2. DRD NO.: K.5.1.2e
3. DATA TYPE: 2
4. DATE REVISED: 09-05-03
5. PAGE: 1/2
6. TITLE: As-Designed EEE Parts List
7. SOW Reference: K.5.1.2
8. DESCRIPTION/USE: To provide a summary of as-designed electrical, electronic, and electromechanical (EEE) parts usage with "where-used" and qualification information of designs released for production.
9. OPR: NASA GI Project Manager
10. TM: TBD
11. DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
1 electronic copy: COTR
1 electronic copy: Program Authorized Repository
1 electronic copy: Task Monitor
12. INITIAL SUBMISSION: Per negotiated work plan.
13. SUBMISSION FREQUENCY: Required Reviews and document delivery schedule will be determined by the complexity of the payload and any modifications required. Each Order will define a review complement and document delivery schedule commensurate with these complexities.
14. REMARKS: None.
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The As-Designed EEE Parts List identifies electrical, electronic, and electromechanical parts used in contractor, subcontractor, and supplier equipment designs.
 - 15.2 APPLICABLE DOCUMENTS:
MSFC-STD-3012, *EEE Parts Management and Control for MSFC Space Flight Hardware* or equivalent NASA Center or Project document
 - 15.3 CONTENTS: The As-Designed EEE Parts List shall use MSFC-STD-3012 as a guide and include the following for each EEE part number used:
 - a. Deliverable end item or equipment identification (part number).
 - b. EEE part type.
 - c. EEE part number.

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- d. EEE part specification.
 - e. Generic EEE part number.
 - f. EEE part qualification method and status.
 - g. Nonstandard EEE part approval status.
 - h. Identification of EEE part manufacturer [QML, QPL, name, or CAGE code (preferred)].
 - i. Quantity of EEE part used in equipment (estimated).
 - j. Indication that item is a change from the previous submission.
- 15.4 **FORMAT:** Contractor format is acceptable. Data shall be submitted by hard copy and electronic media.
- 15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue.

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DTL-31000 as tailored within this document and shall conform to the requirements of MIL-STD-100G. Product drawings and associated lists shall provide the design disclosure information necessary to define the details necessary for the manufacture, test, inspection, and logistic support of the system. The drawings shall:

1. Reflect the end-product at its current level of design maturity.
2. Provide the engineering data for logistics support products.
3. Provide the necessary data to permit manufacture and/or acquisition of items identical to the original item(s).
4. Document directly or by reference the following (in accordance with MIL-STD-100G):
 - (a) Details of unique processes (i.e., not published or generally available to industry) when essential to design and manufacture.
 - (b) Performance ratings.
 - (c) Dimensional and tolerance data.
 - (d) Critical manufacturing processes and assembly sequences.
 - (e) Tolerance input and output characteristics.
 - (f) Diagrams.
 - (g) Mechanical and electrical connections.
 - (h) Physical characteristics, including form and finish.
 - (i) Details of material identification, including heat treatment and protective coatings.
 - (j) Inspection, test, and evaluation criteria.
 - (k) Equipment calibration requirements.
 - (l) Quality assurance requirements.
 - (m) Hardware marking requirements.
 - (n) Requirements for reliability, maintainability, environmental conditions, shock, and vibration testing and other operational or functional tests.
5. Item definition - All parameters required to define each unit, assembly, subassembly, part, or material shall be presented on the applicable drawing. This includes data such as the following:
 - (a) All necessary mechanical dimensions and electrical parameters to fully define fabrication, acceptance, interface, or installation of the item depicted (i.e., weight, pressure, viscosity).
 - (b) All other necessary physical parameters to fully define fabrication, acceptance, interface, or installation of the item depicted (i.e., weight, pressure, viscosity).
 - (c) All necessary environmental conditions which units, assemblies, subassemblies, parts, and materials must meet to perform effectively in the configuration item, such that the configuration item will meet its specification requirements.
6. Limited rights-in-data items - Product drawings for items which the Government does not have unlimited rights in data shall specify the form, fit, and function requirements of the item and conform to the requirements for a control drawing as defined in MIL-STD-100G or a specification

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prepared in accordance with the requirements of MIL-STD-961, Appendix A.

Part II - Cable interconnect diagrams (CID's), electrical system schematics, and wiring lists. Cable interconnect diagrams, electrical system schematics, wiring lists, and fluid system schematics shall be prepared in accordance with MIL-STD-100G. Part I drawings shall be utilized to the maximum extent possible in providing these drawings. The drawings shall include the following:

1. Cable interconnect diagrams shall show graphically the arrangement of external electrical cabling which interconnects electrical assemblies and/or equipment. The CID shall show all cable runs and terminations; each cable shall be identified by title and reference designation number. The connector short sign and cable electromagnetic effects classification by bundle shall be identified.
2. Electrical system schematics shall illustrate and describe circuit items with symbols placed such that a circuit may be traced from item to item in the sequence of its function. The placement and arrangement of these circuits shall follow a logical sequence of presentation to provide a clear description of the distribution, attendant interlocking, and content of circuits.
3. Component Level Documentation - Schematics and/or wiring lists for components, including interconnecting cable harnesses, shall be provided.
4. Overall Grounding Schematic - The grounding schematic shall show the details of all grounds and power returns from source to loads. All connections shall be shown including black box details. It shall also show details of all Electrical Ground Support Equipment interconnections to facility and safety grounds.
5. The Fluid system schematic shall illustrate and describe all components with symbols and flow designators such that the fluid system may be traced from component to component (such as pumps, valves, meters, regulators, and filters). The schematics shall document the range requirements (flow, temperature, and pressure) for all component external interfaces and line sizes. The placement and arrangement of these components shall follow a logical sequence of presentation to provide a clear description of the flow of fluids in the system. The schematics shall reference engineering drawings and associated lists for configuration details.

15.4 FORMAT: Format of product drawings shall be in accordance with MIL-STD-100G. Contractor's CAGE number and document numbers will be utilized.

15.5 MAINTENANCE: All documents produced under this DRD must be maintained current.

Changes to and/or updating of engineering drawings and associated lists shall be in accordance with the contractor's approved drawing system and the provisions herein. Changes to engineering drawings under the Government's Class I change control shall be submitted by Engineering Change Proposal.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DRL NO.: XXX ISSUE: Ext Review 2. DRD NO.:K.5.1.4a
3. DATA TYPE: 2 4. DATE REVISED: 08-29-03
5. PAGE: 1/2
6. TITLE: Test Plan
7. SOW Reference: K.5.1.4
8. DESCRIPTION/USE: To provide insight into the development, qualification, acceptance, and verification tests required to certify a payload/facility for flight.
9. OPR: TBD 10. TM: TBD
- 11.DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
1 electronic copy: COTR
1 electronic copy: Program Authorized Repository
1 electronic copy: Task Monitor
12. INITIAL SUBMISSION: Per Contracting Officer's letter
13. SUBMISSION FREQUENCY: Required reviews and document delivery schedule will be determined by the complexity of the payload and any modifications required. Each Order will define a review complement and document delivery commensurate with these complexities.
14. REMARKS: None
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Test Plan identifies all planned tests, the facilities required to support these tests, any GSE or special test equipment needed to perform these tests, and the pertinent roles and responsibilities of all personnel involved in the performance of these tests.
 - 15.2 APPLICABLE DOCUMENTS: None
 - 15.3 CONTENTS: The Test Plan shall, as a minimum, contain the following:
 - a. System Description - A brief description of the program/project for which the test plan is being developed. This description should include an overview of the hardware, its operation, and its intended mission or flight, the quantity of units to be tested, and the approach to be used for qualification versus acceptance of the flight hardware.

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- b. Safety / Quality Assurance - Identify the safety and quality requirements for the test program including:
 - 1. Safety critical / hazardous operations.
 - 2. Handling - state hardware classification – Program Critical Hardware (PCH), Non-PCH, or other; identify whether or not handling procedures will be required; and identify whether or not shipping containers will be required.
 - 3. Electrostatic Discharge (ESD) requirements.
 - 4. Cleanliness requirements.
- c. Responsibilities - Define the organizations involved in the execution of the test program and their responsibilities.
- d. Applicable Documents - List any documents which are applicable or are referenced in the test plan, such as requirements documents, quality plans, and project plans. Identify the document number, title, and any revision.
- e. Test Program - Identify all planned test activities. For each activity provide a brief test description including the test requirement to be fulfilled, any test facilities required to conduct the test, and any Ground Support Equipment and/or Special Test Equipment required to perform the test. For each test involving multiple organizational elements, describe the roles and responsibilities of each organizational element with regard to the specific test.
- f. Flow Chart/Schedule - Provide a flow chart or a preliminary schedule of the identified tests which shows the sequence in which the tests are planned to be performed.
- g. Test Procedure Performance - Specify the organization(s) that have the lead authority for the performance of the test procedures. Include a description of the quality surveillance responsibilities for the tests to be performed and identify the system and methods by which nonconformances shall be documented and dispositioned.
- h. Test Generated Documentation - Specify the types of documentation that will be generated as a result of tests performed during the test program and give a brief description. Standard documentation generated includes a test plan, original signature test procedures, as-run test procedures, test procedure deviations and log, test discrepancy records (TDRs) and log, discrepancy records (DRs), test preparation sheets (TPSs), test reports, and a final test report. Other documentation, which may be generated, is hardware logbooks, historical logs, etc. Identify the system and methods by which these documents are controlled.
- i. Test Readiness Reviews - Specify which tests will require a test readiness review. Identify the system and methods by which Test Readiness Reviews are controlled and conducted.

15.4 FORMAT: Contractor format is acceptable.

15.5 MAINTENANCE: None required

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DRL NO.: XXX ISSUE: Ext Review 2. DRD NO.: K.5.1.4b
3. DATA TYPE: 3 4. DATE REVISED: 08-29-03
5. PAGE: 1/2
6. TITLE: Test and Checkout Procedures
7. SOW Reference: K.5.1.4
8. DESCRIPTION/USE: These procedures provide step-by-step instructions to perform test and checkout activities during the development, qualification, acceptance, and verification of payloads, experiments, and facilities. The “As Run” copy of a Test and Checkout Procedure (TCP) is used to record the results obtained from the test and provides a detailed documentation and history of test activities.
9. OPR: TBD 10. TM: TBD
11. DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
1 electronic copy: COTR
1 electronic copy: Program Authorized Repository
1 electronic copy: Task Monitor
12. INITIAL SUBMISSION: As Defined in the Order
13. SUBMISSION FREQUENCY: Required reviews and document delivery schedule will be determined by the complexity of the payload and any modifications required. Each Order will define a review complement and document delivery commensurate with these complexities.
14. REMARKS: None
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: TCP's shall be prepared to control and document test and checkout activities during the development, qualification, acceptance, and verification of payloads, experiments, facilities, and any associated ground support equipment.
 - 15.2 APPLICABLE DOCUMENTS: None
 - 15.3 CONTENTS: Each TCP shall as a minimum contain the following:
 - a. Test Article Identification -
A brief description of the article to be tested. This description should identify

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the configuration of the hardware to be tested as well as uniquely identify any software associated with the hardware.

- b. Test Requirements -
Identify the requirements for the test procedure. Include a cross reference of the step/sequence where each requirement is fulfilled to a requirement identified in a controlled document such as a verification plan, specification, ICD, or other requirements documents.
- c. Test Setup -
Identify the setup of the test hardware and software required to perform the test. Identify the configuration of any Ground Support Equipment, Special Test Equipment, test software, fixtures, or other test hardware used to perform the test including the calibration status where appropriate.
- d. Prerequisites -
List any requirements, processes, or other procedures that must be completed before performing each procedure.
- e. Test Sequence -
Identify the step-by-step sequence of events required to perform the procedure. Any deviations shall be recorded in the “As Run” copy of the TCP so that the actual sequence of events can be accurately reconstructed.
- f. Test Results -
Record the test results in the “As Run” copy of the TCP. Record the filename of any data recorded electronically in the “As Run” copy of the TCP. Any data files recorded electronically shall be delivered with the “As Run” copy of the TCP including any software required to read the data. Documentation of any non-conformances, their resolution, and any associated re-test shall be appended to the appropriate “As Run” copy of a TCP.
- g. Safety -
Identify the hazards associated with performing the test procedure. Include the methods and cautions by which the hazards shall be controlled and any required Personnel Protective Equipment.

15.4 **FORMAT:** Contractor format is acceptable.

15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DRL NO.: XXX ISSUE: Ext Review 2. DRD NO.:K.5.1.4c
3. DATA TYPE: 2 4. DATE REVISED: 09-04-03
5. PAGE: 1/2
6. TITLE: Structural Strength Test Plan
7. SOW Reference: K.5.1.4
8. DESCRIPTION/USE: To identify structural strength test objectives and schedules.
9. OPR: NASA GI Project Manager 10. TM: TBD
- 11.DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
1 electronic copy: COTR
1 electronic copy: Program Authorized Repository
1 electronic copy: Task Monitor
12. INITIAL SUBMISSION: Per negotiated work plan.
13. SUBMISSION FREQUENCY: Required Reviews and document delivery schedule will be determined by the complexity of the payload and any modifications required. Each Order will define a review complement and document delivery schedule commensurate with these complexities.
14. REMARKS: None.
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Structural Strength Test Plan describes tests to be performed and their schedules.
 - 15.2 APPLICABLE DOCUMENTS
NASA-STD-5001 *Structural Design and Test factors of Safety for Space Flight hardware*
 - 15.3 CONTENTS: The Structural Strength Test Plan shall be prepared using NASA-STD-5001 as applicable and include:
 - a. Test objectives and schedules relative to program milestones.
 - b. Description of hardware.
 - c. Instrumentation requirements.
 - d. Pretest analysis predictions.
 - e. Load cases.
 - f. Environments.

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g. Organization responsible for the test(s).

15.4 **FORMAT:** Contractor format is acceptable. The plan shall be available in an electronic database.

15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DPD NO.: XXX ISSUE: Ext Review 2.DRD NO.: K.5.2.1a
3. DATA TYPE: 2 4. DATE REVISED: 09-04-03
5. PAGE: 1/2
6. TITLE: Software Quality Assurance Plan
7. SOW Reference: K.5.2.1
8. DESCRIPTION/USE: To provide a description of the plan for conducting software quality assurance activities.
9. OPR: TBD 10. TM: TBD
11. DISTRIBUTION: 1 original/record (hard copy): UM/Data Management
1 electronic copy: Authorized Program Repository
1 hardcopy: Contracting Officer
1 hardcopy: COTR
1 hardcopy and 1 electronic: Task Monitor
12. INITIAL SUBMISSION: As specified in the Software Development Plan.
13. SUBMISSION FREQUENCY: One time as specified in the Software Development Plan.
14. REMARKS: None.
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Software Quality Assurance plan documents the software quality assurance roles and responsibilities, surveillance activities, supplier control, records collection, maintenance and retention, and risk management.
 - 15.2 APPLICABLE DOCUMENTS:
 - IEEE Standard 12207.1-1997, section 6
 - NPD 2820.1
 - NPG 8719.13-SAF
 - 15.3 CONTENTS: The Software Quality Assurance Plan shall include:
 - a. Purpose;
 - b. Reference documents;
 - c. Management;
 - d. Documentation;
 - e. Standards, practices, conventions, and metrics;

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- f. Software Reviews;
- g. Test;
- h. Problem Reporting and Corrective Action;
- i. Tools, Techniques, and methodologies;
- j. Media control;
- k. Supplier control;
- l. Records, collection, maintenance, and retention;
- m. Training;
- n. Risk Management;
- o. SQAP Change procedure and history.

Include an alphabetized list of definitions for abbreviations, acronyms, and special terms used in the document, i.e., terms used in a sense that differs from or is more specific than the common usage for such terms.

Material that is too detailed or sensitive to be placed in the main body of text may be placed in an appendix or included as reference. Include the appropriate reference in the main body of the text. Appendices may be bound separately, but are considered to be part of the document and shall be placed under configuration control as such.

15.4 **FORMAT:** As specified in the IEEE Standard 730-2002.

15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue. Update as required to maintain current with program changes.

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- b. Engineering environment (for development, operation or maintenance, as applicable), including test environment, library, equipment, facilities, standards, procedures, and tools.
- c. Work breakdown structure of the life cycle processes and activities, including the software products, software services and nondeliverable items to be performed, budgets, staffing, physical resources, software size, and schedules associated with the tasks.
- d. Management of the quality characteristics of the software products or services.
- e. Management of safety, security, privacy, and other critical requirements of the software products or services.
- f. Subcontractor management, including subcontractor selection and involvement between the subcontractor and the acquirer, if any.
- g. Quality assurance.
- h. Verification and validation, including the approach for interfacing with the verification and validation agent, if specified.
- i. Acquirer involvement.
- j. User involvement.
- k. Risk management.
- l. Security policy.
- m. Approval required by such means as regulations, required certifications, proprietary, usage, ownership, warranty and licensing rights.
- n. Means for scheduling, tracking, and reporting.
- o. Training of personnel.
- p. Software life cycle model.
- q. Configuration management.

15.4 **FORMAT:** Contractor Format is acceptable

15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DRL NO.: XXX ISSUE: Ext Review 2. DRD NO.: K.5.2.1c
3. DATA TYPE: 1 4. DATE REVISED: 08-29-03
5. PAGE: 1/2
6. TITLE: Software Requirements Specification
7. SOW Reference: K.5.2.1
8. DESCRIPTION/USE: To define and record the software requirements to be met by a computer software configuration item (CSCI). To specify the requirements for a CSCI and 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.
9. OPR: TBD 10. TM: TBD
11. DISTRIBUTION: 1 original/record (hard copy): UM/Data Management
1 electronic copy: Authorized Program Repository
1 hardcopy: Contracting Officer
1 hardcopy: COTR
1 hardcopy and 1 electronic: Task Monitor
12. INITIAL SUBMISSION: Per negotiated work plan.
13. SUBMISSION FREQUENCY: Required Reviews and document delivery schedule will be determined by the complexity of the payload and any modifications required. Each Order will define a review complement and document delivery schedule commensurate with these complexities.
14. REMARKS: Requirements pertaining to the CSCI's external interfaces may be presented in the Software Requirements Specification (SRS) or in one or more Interface Requirements Specifications (IRS's) referenced from the SRS.
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Software Requirements Specification details the software performance, interface, operational, and quality assurance requirements.
 - 15.2 APPLICABLE DOCUMENTS
IEEE/EIA 12207.1-1997, section 6 Industry Implementation of International Standard ISO/IEC 12207: 1995, Software Life cycle processes – Life cycle data

NPD 2820.1
NPG 8719.13-SAF

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- 15.3 CONTENTS: In accordance with IEEE/EIA 12207.1-1997, the Software Requirements Specification shall contain:
- a. System overview.
 - b. CSCI requirements.
 - 1. Required states and modes.
 - 2. External interface requirements.
 - 3. Internal interface requirements.
 - 4. Internal data requirements.
 - 5. Adaptation requirements.
 - 6. Safety requirements.
 - 7. Security and privacy requirements.
 - 8. Environment requirements.
 - 9. Computer resource requirements.
 - 10. Computer hardware resource utilization requirements.
 - 11. Computer software requirements.
 - 12. Computer communications requirements.
 - 13. Software quality factors.
 - 14. Design and implementation constraints.
 - 15. Personnel-related requirements.
 - 16. Training-related requirements.
 - 17. Logistics-related requirements.
 - 18. Packaging requirements.
 - 19. Precedence and criticality of requirements.
 - c. Qualification provisions.
 - d. Requirements traceability.
- 15.4 FORMAT: Contractor format is acceptable.
- 15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DPD NO.: XXX ISSUE: Ext Review 2. DRD NO.: K.5.2.1d
3. DATA TYPE: 2 4. DATE REVISED: 09-05-03
5. PAGE: 1/2
6. TITLE: Software Design Description
7. SOW Reference: K.5.2.1
8. DESCRIPTION/USE: To define and record the design of a computer software configuration item (CSCI). To be used as the basis for implementing the software, and to provide visibility into the design and the information needed for software support.
9. OPR: TBD 10. DM: TBD
11. DISTRIBUTION: 1 original/record (hard copy): UM/Data Management
1 electronic copy: Program Authorized Repository
1 hardcopy: Contracting Officer
1 hardcopy: COTR
1 hardcopy and 1 electronic: Task Monitor
12. INITIAL SUBMISSION: Per Contracting Officer's letter.
13. SUBMISSION FREQUENCY . Required Reviews and document delivery schedule will be determined by the complexity of the payload and any modifications required. Each Order will define a review complement and document delivery schedule commensurate with these complexities
14. REMARKS:
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Software Design Description describes the design of a CSCI. It describes the CSCI-wide design decisions, the CSCI architectural design, and the detailed design needed to implement the software.
 - 15.2 APPLICABLE DOCUMENTS:
IEEE Standard 12207.1-1997, section 6
NPD 2820.1
NPG 8719.13-SAF
 - 15.3 CONTENTS: In accordance with IEEE/EIA 12207.1-1997, the Software Design

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Description shall include:

- a. CSCI-wide design decisions.
- b. CSCI architectural design.
 1. CSCI components:
 - (a) Description of how the software item satisfies the software requirements, including algorithms and data structures.
 - (b) Software item input/output description.
 - (c) Static relationship of the software units.
 - (d) Concept of execution including data flow and control flow.
 - (e) Requirements traceability.
 - (f) CSCI's planned utilization of computer hardware resources.
 2. Rationale for software item design.
 3. Interface design.

15.4 **FORMAT:** Contractor format is acceptable.

15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue.

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15.3 CONTENTS : In accordance with IEEE/EIA 12207.1-1997, the Software Version. Description shall include:

- a. Full identification of the system and software (i.e., numbers, titles, abbreviations, version numbers, and release numbers.)
- b. Executable object code.
- c. Software life cycle data that defines the software product.
- d. Archive and release data.
- e. Instructions for building the executable object code, including, for example, the instructions and data for compiling and linking and the procedures used to recover the software, perform software regeneration, testing, or modification.
- f. Data integrity checks for the executable object code.
- g. Version descriptions for all the next level decomposition items
- h. Describe changes from previous version including a list of change reports (including but not limited to Engineering Change Proposal, Change Requests, Document Change Notice) that formally approved the change,
- i. List all waivers approved for this version.

15.4 FORMAT : Contractor format is acceptable.

15.5 MAINTENANCE : Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DPD NO.: XXX ISSUE: Ext Review
2. DRD NO.: K.5.2.2a
3. DATA TYPE: 2
4. DATE REVISED: 08-28-03
5. PAGE: 1/2
6. TITLE: Software Test Plan
7. SOW Reference: K.5.2.2
8. DESCRIPTION/USE: To develop and document the plans for conducting computer software configuration item (CSCI) testing. The Plan provides a baseline of activities and organizations necessary to define, develop, control and execute the project's software testing program.
9. OPR: TBD
10. TM: TBD
11. DISTRIBUTION:

1 original/record (hard copy):	UM/Data Management
1 electronic copy:	Program Authorized Repository
1 hardcopy:	Contracting Officer
1 hardcopy:	COTR
1 hardcopy and 1 electronic:	Task Monitor
12. INITIAL SUBMISSION: Per Contracting Officer's Letter
13. SUBMISSION FREQUENCY: Required Reviews and document delivery schedule will be determined by the complexity of the payload and name modifications required. Each Order will define a review complement and document delivery schedule commensurate with these complexities
14. REMARKS: Follow guidelines prescribed in IEEE Standard 12207.1-1997, clause 6.29
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Software Test Plan describes the plans for qualification testing of computer software and software systems. The Plan describes the software test environment(s), identifies activities to be performed, test processes and procedures to be used, and schedules for all testing activities.
 - 15.2 APPLICABLE DOCUMENTS:
 - NPD 2820.1
 - NPG 8719.13-SAF

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15.3 CONTENTS: The Software Test Plan will establish, implement and maintain software product assurance with the guidelines and requirements of the above listed standards.

The Software Test Plan will contain the following:

- a) Overview of the project's test program.
- b) Description of the project's organizational structure, personnel, and participating organizations for implementing the test program.
- c) Detailed descriptions of all test activities to be performed based on the identified requirements. Identify any prerequisites, constraints, and objectives for all test activities and provide requirements traceability to all test activities.
- d) Description of the test cases, levels, classes, progression, and coverage (breadth and depth), and expected results for all test activities.
- e) Detailed, time-correlated sequence of all test activities.
- f) Description of the testing environment and site, and the planned usage of the support equipment, software, facilities, and tooling necessary to execute the test activities.

15.4 FORMAT: Contractor format is acceptable.

15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue. Update as required to maintain current with program changes and Order issuance.

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- a. Test preparations, including hardware and software.
- b. Test descriptions.
- c. System or CSCI requirements addressed by the test case.
- d. Prerequisite conditions.
- e. Test inputs.
- f. Expected test results, including criteria for evaluating results, test procedures, and assumptions and constraints.
- g. Requirements traceability.

15.4 **FORMAT:** Contractor format is acceptable.

15.5 **MAINTENANCE:** Changes shall be incorporated by change page or complete reissue.

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testing. Describe the impact on software and system performance, the impact on software and system design to correct it, and a recommended solution or approach for correcting it.

3. Impact of test environment.

b. Detailed test results.

1. Project-unique identifier of a test.

2. Summary of test results.

3. Problems encountered.

4. Deviations from test cases/procedures.

c. Test log.

1. Date(s), time(s), and location(s) of tests performed.

2. Hardware and software configurations used for each test.

3. Date and time of each test-related activity, the identity of the individual(s) who performed the activity, and the identities of witnesses, as applicable.

d. Rationale for decisions.

15.4 FORMAT: Contractor Format is acceptable

15.5 MAINTENANCE: Changes shall be incorporated by change page or complete reissue.

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DATA REQUIREMENTS DESCRIPTION (DRD)

1. DPD NO.: XXX ISSUE: Ext Review 2.DRD NO.: L.1
3. DATA TYPE: 1 4. DATE REVISED: 08-28-03
5. PAGE: 1/2
6. TITLE: Archive Management, Capability, and Maintenance Plan
7. SOW Reference: L.1
8. DESCRIPTION/USE: To provide the Government with a plan for the management and maintenance of the storage of data and samples, utilization of archived data and samples, and disposal of data and samples, including staffing, facilities, equipment, functional capabilities, services, and maintenance.
9. OPR: TBD 10. TM: TBD
11. DISTRIBUTION: 1 original/record (hard copy): Contracting Officer
 1 electronic copy: COTR
 1 electronic copy: Task Monitor
 1 electronic copy: Program Authorized Repository
12. INITIAL SUBMISSION: 6 months after Authority to Proceed
13. SUBMISSION FREQUENCY: Revise as necessary to reflect requests for modifications and additions to requirements.
14. REMARKS:
15. DATA PREPARATION INFORMATION:
 - 15.1 SCOPE: The Archive Management, Capability and Maintenance Plan shall address requirements to perform assigned archive tasks.
 - 15.2 APPLICABLE DOCUMENTS: None
 - 15.3 CONTENTS: The Archive Management, Capability and Maintenance Plan shall define processes to: support storage of data and samples, establish and maintain accurate inventories of archived content, ensure timely retrieval of archived content for distribution, ensure security of data and samples and backup of data, limit access as requested by NASA, dispose of data and samples. The Report shall define the required staffing, facilities, equipment, functional capabilities (including emergency back up to equipment to maintain temperature of tissue samples and recovery plan), services, and maintenance necessary to support the management and physical storage of archived data, samples, and documentation.

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15.4 **FORMAT:** Electronic submission

15.5 **MAINTENANCE:** As required by requested modifications and additions to archive requirements.

