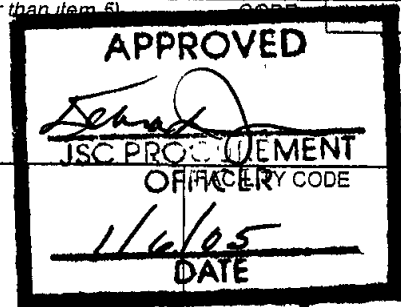


AWARD/CONTRACT

THIS CONTRACT IS A RATED ORDER RATING
UNDER DPAS (15 CFR 350)PAGE OF PAGES
1 2702 CONTRACT NO (Proc inst ident) NO
VNJ04HH96B3 EFFECTIVE DATE
SEE BLOCK 204 REQUISITION/PURCHASE REQUEST/PROJECT NO
42000471465 ISSUED BY CODE
LYNDON B. JOHNSON SPACE CENTER, NASA
PROJECTS PROCUREMENT/BH
2101 NASA PARKWAY
HOUSTON TX 77058

6 ADMINISTERED BY (If other than item 5)

7 NAME AND ADDRESS OF CONTRACTOR (No, street, city, county, State and ZIP code)
University of Alabama at Birmingham
701 20th Street South
AB 1170
Birmingham, Alabama 35294-0109

CODE

8. DELIVERY ☐ FOB ORIGIN ☐ OTHER 9. DISCOUNT FOR PROMPT PAYMENT N/A

10 SUBMIT INVOICES (4 copies unless other-wise specified) TO THE ADDRESS SHOWN IN ITEM

11 SHIP TO/MARK FOR

CODE

12 PAYMENT WILL BE MADE BY CODE
LYNDON B. JOHNSON SPACE CENTER, NASA
LF231/ACCOUNTS PAYABLE
2101 NASA PARKWAY
HOUSTON, TX 77058

13. AUTHORITY FOR USING OTHER THAN FULL AND OPEN

☐ 10 U.S.C.
2304(c)☐ 41 U.S.C.
253(c)

14 ACCOUNTING AND APPROPRIATION DATA

15A ITEM NO	15B SUPPLIES/SERVICES	15C QTY	15D UNIT	15E UNIT PRICE	15F AMOUNT
	SEE SECTION C				
15G TOTAL AMOUNT OF CONTRACT ⇒ \$ NTE \$48M					

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	B	SUPPLIES OR SERVICES AND PRICES/COSTS	5	PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER			
	C	DESCRIPTIONS/SPECS /WORK STATEMENTS	32		J	LIST OF ATTACHMENTS	158
	D	PACKAGING AND MARKING	1	PART IV - REPRESENTATIONS AND INSTRUCTIONS			
	E	INSPECTION AND ACCEPTANCE	2		K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS	N/A
	F	DELIVERIES OR PERFORMANCE	5		L	INSTRS, CONDS, AND NOTICES TO OFFERORS	N/A
	G	CONTRACT ADMINISTRATION DATA	13		M	EVALUATION FACTORS FOR AWARD	N/A
	H	SPECIAL CONTRACT REQUIREMENTS	8				

CONTRACTING OFFICER WILL COMPLETE ITEM 17 OR 18 AS APPLICABLE

17 ☐ CONTRACTOR'S NEGOTIATED AGREEMENT (Contractor is required to sign this document and return _____ copies to issuing office)
Contractor agrees to furnish and deliver all items or perform all the services set forth or otherwise identified above and on any continuation sheets for the consideration stated herein. The rights and obligations of the parties to this contract shall be subject to and governed by the following documents (s) this award/contract, (b) the solicitation, if any, and (c) such provisions, representations, certifications, and specifications, as are attached or incorporated by reference herein (Attachments are listed herein)

18. ☐ AWARD (Contractor is not required to sign this document) Your offer on Solicitation Number _____ including the additions or changes made by you which additions or changes are set forth in full above, is hereby accepted as to the items listed above and on any continuation sheets. This award consummates the contract which consists of the following documents (a) the Government's solicitation and your offer, and (b) this award/contract. No further contractual document is necessary.

19A NAME AND TITLE OF SIGNER (Type or print)
Eli Capilouto, DMD, MPH, ScD
Acting Provost20A NAME OF CONTRACTING OFFICER
Dawn Alexander

19B THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ALABAMA FOR THE UNIVERSITY OF ALABAMA AT BIRMINGHAM

19C DATE SIGNED

20B UNITED STATES OF AMERICA

20C DATE SIGNED

BY Eli Capilouto
(Signature of person authorized to sign)

11/02/04

BY Dawn Alexander
(Signature of Contracting Officer)

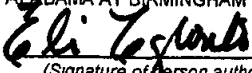

12/10/04

NSN 7540-01-152-8070

PREVIOUS EDITION UNUSABLE

26-107
JSC MS Word (Aug 95)STANDARD FORM 28 (REV. 4-85)
Prescribed By GSA
FAR (48CFR) 53.214(a)

AWARD/CONTRACT

1 THIS CONTRACT IS A RATED ORDER UNDER DPAS (15 CFR 350)		RATING DO-C9	PAGE OF PAGES 1 270				
2 CONTRACT NO (Proc Inst Ident) NO NNJ04HH96B		3 EFFECTIVE DATE SEE BLOCK 20 B	4 REQUISITION/PURCHASE REQUEST/PROJECT NO 4200047146				
5 ISSUED BY LYNDON B. JOHNSON SPACE CENTER, NASA PROJECTS PROCUREMENT/BH 2101 NASA PARKWAY HOUSTON, TX 77058		6 ADMINISTERED BY (If other than item 5) CODE					
7 NAME AND ADDRESS OF CONTRACTOR (No., street, city, county, State and ZIP code) University of Alabama at Birmingham 701 20th Street South AB 1170 Birmingham, Alabama 35294-0109		CODE	FACILITY CODE				
8. DELIVERY <input type="checkbox"/> FOB ORIGIN <input type="checkbox"/> OTHER		9. DISCOUNT FOR PROMPT PAYMENT N/A					
10. SUBMIT INVOICES (4 copies unless other-wise specified) TO THE ADDRESS SHOWN IN <input type="checkbox"/> ITEM							
11 SHIP TO/MARK FOR CODE		12. PAYMENT WILL BE MADE BY LYNDON B JOHNSON SPACE CENTER, NASA LF231/ACCOUNTS PAYABLE 2101 NASA PARKWAY HOUSTON, TX 77058					
13 AUTHORITY FOR USING OTHER THAN FULL AND OPEN <input type="checkbox"/> 10 U.S.C. 2304(c) <input type="checkbox"/> 41 U.S.C. 253(c)		14 ACCOUNTING AND APPROPRIATION DATA					
15A. ITEM NO	15B SUPPLIES/SERVICES	15C QTY	15D UNIT	15E UNIT PRICE	15F AMOUNT		
	SEE SECTION C						
15G TOTAL AMOUNT OF CONTRACT ⇒ \$					NTE \$48M		
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	E	INSPECTION AND ACCEPTANCE	2		K	REPRESENTATIONS, CERTIFICATIONS AND OTHER STATEMENTS OF OFFERORS	N/A
	F	DELIVERIES OR PERFORMANCE	5		L	INSTRS., CONDS, AND NOTICES TO OFFERORS	N/A
	G	CONTRACT ADMINISTRATION DATA	13		M	EVALUATION FACTORS FOR AWARD	N/A
	H	SPECIAL CONTRACT REQUIREMENTS	8				
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19A. NAME AND TITLE OF SIGNER (Type or print) Eli Capilouto, DMD, MPH, ScD Acting Provost				20A. NAME OF CONTRACTING OFFICER Dawn Alexander			
19B. THE BOARD OF TRUSTEES OF THE UNIVERSITY OF ALABAMA FOR THE UNIVERSITY OF ALABAMA AT BIRMINGHAM BY  (Signature of person authorized to sign)		19C. DATE SIGNED 11/02/04		20B. UNITED STATES OF AMERICA BY  (Signature of Contracting Officer)		20C. DATE SIGNED	

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PART I - THE SCHEDULE**SECTION B - SUPPLIES OR SERVICES AND PRICE/COSTS****B.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE**

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

CLAUSE NUMBER	DATE	TITLE
None included by reference		

II. NASA FAR SUPPLEMENT (48 CFR CHAPT 18)

CLAUSE NUMBER	DATE	TITLE
None included by reference		

III. FULL TEXT CLAUSES**B.2 SUPPLIES AND/OR SERVICES TO BE FURNISHED**

(a) The Contractor shall provide all resources (except as may be expressly stated in this contract as furnished by the Government) necessary to support the services to be provided in accordance with the Statement of Work in Section C. This contract is for Crew, Robotics, and Vehicle Equipment (CRAVE) for NASA, using cost reimbursable Indefinite Delivery/Indefinite Quantity (IDIQ) and firm fixed price Indefinite Delivery/Indefinite Quantity (IDIQ) contracting methods. These methods provide for the acquisition of necessary labor, supplies, and other services that cannot be sufficiently identified, predetermined, or qualified in advance.

(b) The contractor is required to furnish all the services identified in the Statement of Work and as directed through the issuance of delivery orders. These services shall be ordered in accordance with Federal Acquisition Regulation (FAR) clauses entitled "Ordering," "Order Limitations," and "Indefinite Quantity" found in Section I. The Government's obligation for the indefinite quantity is limited to that specified in Clause B.3.

(End of Clause)

B.3 IDIQ GUARANTEED MINIMUM QUANTITY OF WORK

(a) The guaranteed minimum contract value of work that will be ordered under this contract, and which will be initiated through the issuance of delivery orders shall be **\$15,000**. The maximum value that can be ordered under the IDIQ provisions of this contract is **\$48,000,000**. This amount includes both cost and fee.

(b) If the Government orders supplies or services in excess of the minimum but not up to the maximum, this circumstance shall not constitute the basis for an equitable adjustment to any contract price, estimated cost or fee.

(c) The minimum amount in paragraph (a) is applicable only if the contractor submits a minimum of 5 good faith proposals on at least 5 delivery orders through out the life of the contract.

(d) If the contractor receives a Delivery Order equal to or greater than \$15,000, the Government will have satisfied its minimum requirement under this contract.

(End of Clause)

B.4 ESTIMATED COST AND FEE FOR IDIQ/CPFF DELIVERY ORDERS

(a) Estimated cost of IDIQ/CPFF Delivery Orders: **\$ TBD [Amount will be determined as the IDIQ/CPFF Delivery Orders are issued]**.

(b) Maximum fee of IDIQ/CPFF Delivery Orders: **\$ TBD [Amount will be determined as the IDIQ/CPFF Delivery Orders are issued]**.

(c) Total estimated cost and fee of IDIQ/CPFF Delivery Orders: **\$ TBD [Amount will be determined as the IDIQ/CPFF Delivery Orders are issued]**.

(End of Clause)

B.5 FIRM FIXED PRICE (NFS 1852.216-78) (DEC 1988)

Total firm fixed price of this contract is: **\$ TBD [Amount will be determined as the IDIQ/FFP Delivery Orders are issued]**

(End of Clause)

B.6 CONTRACT FUNDING

(a) For purposes of payment of cost, exclusive of fee, in accordance with the Limitation of Funds clause, the total amount allotted by the Government to this contract is:

Cost Plus Fixed Fee Delivery Orders \$1

Firm Fixed Price Delivery Orders \$1

This allotment covers the following estimated period of performance: **TBD**

(b) An additional amount of **\$TBD** is obligated under this contract for payment of fee.

(End of Clause)

B.7 IDIQ DELIVERY ORDER ESTIMATING - CPFF

These pre-established rates shall be used in establishment of the estimated cost of individual CPFF delivery orders.

A. Fully Burdened Rates without Fee for Government Fiscal Year

Labor Category	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10
Program Manager						
Manager						
Supervisor						
Technical Professional III						
Technical Professional II						
Technical Professional I						
Analyst						
Technician III						
Technician II						
Technician I						
IT Professional III						
IT Professional II						
IT Professional I						
Secretary						
Clerk						
Business Specialist						
Data/Documents Management Specialist						
Other (Specify)						
Designer III						
Designer II						
Precision Machinist						
Scientist/Technical Specialist III						
Scientist/Technical Specialist II						

Rates to be applied to non-labor cost such as materials.
Identify the rate and basis of application (e.g., G&A,
Material Handling, etc.)

1. G&A

BASIS: Applied to all non-labor costs, except equipment (depreciable items with a value over \$2K), parts & materials for equipment manufacture, in-house equipment machine shop costs, and subcontract costs after the initial \$25K (to which G&A is applied).

2. _____

BASIS: {Offeror Fill-In}

3. _____

BASIS: {Offeror Fill-In}

Maximum Fee -- % of total proposed cost for estimating purposes

B. Travel

All travel shall be as approved by the Government prior to travel and will be allocated to the contract based on actual airfare and per diem rates per the most current official CONUS Per Diem Rates, located at www.dtic.mil/perdiem/pdrform.html. All requests for travel shall include the purpose and the rationale for the travel, such as why the purpose cannot be accomplished through a means other than travel (i.e., teleconferencing).

Costs relating to approved travel shall be allocated to individual delivery orders under this contract. Vouchers may be submitted upon completion of individual trips and shall be prepared and submitted in accordance with Clause G.4 entitled "Submission of Vouchers for Payment." The invoices shall include copies of receipts for airfare, lodging, car rental, and other expenses as required by the company policy. All costs for trips will be limited as follows:

1. Maximum allowable costs for lodging, meals and incidental expenses are limited to current Government-established per diem rates.
2. Maximum allowable cost for use of privately owned vehicles shall be restricted to the Federal Travel Regulations.
3. Allowable air travel expenses are limited to standard coach fare whenever it does not conflict with the ultimate purpose of the travel.
4. Allowable automobile rental cost is limited to compact cars.
5. Per diem paid on travel days are $\frac{3}{4}$ per diem. The time spent in travel is not considered.
6. No fee shall be applied to the costs of trips.

C. Materials and Other Non-labor Costs

As applicable, include separate cost estimates for materials, which are non-fee bearing and other miscellaneous non-labor costs that are required for performance of the delivery order. All non-labor costs that are proposed must be allowable and allocable in accordance with the FAR, NASA FAR Supplement, and any other applicable NASA procurement policy documents. The contractor shall include back-up information with their estimate that provides rationale for their proposed cost estimates for materials and other non-labor costs.

No fee shall be applied to the cost of materials.

D. Fee

The maximum fee for delivery orders issued under this contract shall not exceed **0 percent** of the estimated cost for each delivery order, excluding travel and materials. Fee will be negotiated on a DO basis.

B.8 IDIQ DELIVERY ORDER ESTIMATING - FFP (End of Clause)

These pre-established rates shall be used in establishment of the individual FFP delivery orders as follows. No escalation is included for non-exempt labor categories.

A. Fully Burdened Labor Rates for Government Fiscal Year (Plus Escalation for Exempt Labor Categories ONLY)

Labor Category	FY 05	FY 06	FY 07	FY 08	FY 09	FY 10
Program Manager						
Manager						
Supervisor						
Technical Professional III						
Technical Professional II						
Technical Professional I						
Analyst						
Technician III						
Technician II						
Technician I						
IT Professional III						
IT Professional II						
IT Professional I						
Secretary						
Clerk						
Business Specialist						
Data/Documents Management Specialist						
Other (Specify)						
Designer III						
Designer II						
Precision Machinist						
Scientist/Technical Specialist III						
Scientist/Technical Specialist II						

B. Materials, Travel and Other Non-labor Firm Fixed Prices

As applicable, identify separately materials and other miscellaneous non-labor prices that are required for performance of the delivery order. All non-labor prices that are proposed shall include back-up information with their estimate that provides rationale for the proposed prices to allow for a Government price analysis.

(End of Clause)
[END OF SECTION]

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1.0 INTRODUCTION

This document describes the type of work required to perform the design, development, testing, manufacturing, and evaluation (DDTM&E) and sustaining engineering (SE) necessary to certify, deliver and maintain Extravehicular Activity (EVA) equipment, Flight Crew Equipment (FCE), Crew Health and Conditioning Systems (CHeCS), Extravehicular Robotics (EVR) equipment, Environmental Control and Life Support (ECLSS) equipment, and Active Thermal Control Systems (ATCS) equipment, including ground support equipment (GSE). These categories will subsequently be referred to as Crew, Robotics and Vehicle Equipment (CRAVE). The products and services provided in this Statement of Work (SOW) will support the Space Shuttle, the International Space Station (ISS), and advanced programs of Government-Furnished Equipment (GFE) for future human Space Flight programs. This effort includes the necessary labor, material, equipment, and facilities to accomplish the tasks required by this contract.

The contractor shall provide all necessary program, business management, engineering, technical, and administrative skills necessary to accomplish the objectives and outcomes described within this contract. The contractor shall perform the services and deliver the products described in this Statement of Work (SOW), contract terms and conditions, applicable documents, Data Requirements Descriptions (DRDs), Data Requirements List (DRL), and other plans and sections contained within this contract and as directed through authorized Delivery Orders (DOs).

2.0 SCOPE OF WORK

The scope of work to be performed under this contract includes:

- EVA tools and equipment DDTM&E and SE for the Space Shuttle and ISS Programs;
- EVR equipment DDTM&E and SE for the Space Shuttle and ISS Programs;
- ECLSS equipment DDTM&E for the Space Shuttle and ISS Programs;
- ATCS equipment DDTM&E for the Space Shuttle and ISS Programs;
- Flight Crew Equipment DDTM&E and SE for the Space Shuttle and ISS Programs;
- Crew Health and Conditioning Systems DDTM&E and SE for the Space Shuttle and ISS Programs;
- Design, fabrication and test support for advanced development programs for categories of products listed above;
- Hardware/Software upgrades, modifications, and build-to-print provisioning for categories of equipment listed above.

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GFE consists of both mechanical and electrical/electronic hardware and software elements. The tasks to be performed under this contract include DDTM&E and SE of the following:

- EVA tools and equipment including, but not limited to: EVA hooks, safety tethers, foot restraints, workstations, lights, ratchets, sockets, power tools, torque multipliers and other crew aids and tools. Advanced development EVA tasks expected to be part of this contract include the design and fabrication necessary to support the pressurized garment assembly and the portable life support system in the Advanced Spacesuit Program.
- EVR equipment, including, but not limited to: dexterous hands, arms, manipulators, and end effectors, robotic workstations, including telepresence equipment, robotic mobile platforms, automated free-flying camera or instrument platforms, robotic handling interfaces, tools and targets, crew safety devices such as the Simplified Aid for EVA Rescue (SAFER) and robotic ground simulation systems.
- ECLSS equipment, including, but not limited to: Water Transfer Hardware such as connectors, hoses, and liquid containers; Detection equipment for hazardous chemicals such as hydrazine; Emergency breathing equipment including masks, hoses, and tanks; water recovery systems; air revitalizations systems; galley food processing equipment; and water metering equipment.
- ATCS equipment including, but not limited to: active thermal control and payload cold storage hardware such as: payload interface coolant subsystems, actively powered freezer and transport systems, un-powered (Passive) freezers and transport systems, hardware associated with stowing science samples, and ATCS associated crew aids and personal protection equipment (PPE). The tasks will include design, fabrication and/or testing of coolant interface subsystems, coolers and related systems, cold boxes, heat exchangers, phase change and desiccant materials and packaging, sample containers, related soft goods and supporting hardware.
- Flight Crew Equipment including, but not limited to: Housekeeping equipment, softgoods, and consumables to support routine cleaning and trash collection; Restraints and Mobility Aids for IVA such as handrails, stowage equipment, and foot restraints; Crew Provisioning items to support nominal work and personal activities such as: clothing; hygiene; crew requests; personal items; and entertainment. Tools and Diagnostics equipment such as: maintenance work area; intravehicular activity (IVA) tools and test equipment used to support routine maintenance and identification of failed systems, the isolation of failures, and the replacement of defective devices.

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- CHeCS product types are flight packaging for COTS Medical Equipment; design, test, analysis, and as-built documentation, for new or modified COTS Physical Conditioning equipment; design, test, analysis, as-built documentation for modified Commercial Off The Shelf (COTS) medical equipment, flight qualified and certified Medical equipment, flight qualified and certified physical conditional equipment; design, test, analysis, and as-built documentation, for new or modified COTS environmental monitoring equipment necessary to assure crew health; and flight qualified and certified environmental monitoring products.
- Other GFE items that are not specifically identified above but are in the general category of the GFE groupings. These items and the documentation required will be identified in the request for work.

Additional tasks expected to be part of this contract include the manufacturing, delivery, and maintenance of existing designs for each of the categories of equipment listed,, which the Government has manufacturing rights.

2.1 GENERAL OVERVIEW

Work will be authorized for this contract through the issuance of Delivery Orders (DOs). The DOs will define the detailed requirements specific to a particular task. The work processes and procedures that have been used to satisfactorily complete GFE and Flight Products are documented and located on the Engineering, Safety & Mission Assurance (S&MA), ISS program and SSP program servers. The contractor can offer changes to the general requirements following the Engineering Change Control process defined in EA-WI-027, "Configuration Management Requirements." The contractor shall furnish the personnel, equipment, materials, resources, and facilities necessary to perform any, or all of the following activities: design, development, test, evaluation, manufacturing, delivery, maintenance, storage, repair and the sustaining engineering of the GFE.

2.1.1 The contractor shall, provide support of Government-managed design, development, test, manufacture, evaluation, delivery, maintenance, repair and sustaining engineering activities for the hardware/system.

2.1.2 The contractor shall seek and use, when found, innovations that promote improvements in the overall efficiency and economy in all areas of responsibility defined in this SOW.

2.1.3 The contractor shall utilize commercial off-the-shelf (COTS) hardware/software in the design of the CRAVE hardware/system whenever the COTS hardware meets design requirements.

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2.1.4 The contractor shall perform all tasks in accordance with the JSC Engineering Directorate work instruction EA-WI-023, Project Management of GFE Flight Projects, unless otherwise directed by a DO.

2.1.5 When electrical/electronic packages and subsystems require the design/development of software or firmware, these tasks shall be performed in accordance with EA-WI-025, GFE Flight Project Software and Firmware Development, unless otherwise directed by a DO.

2.1.6 Configuration management of these tasks shall be performed in accordance with EA-WI-027, unless otherwise directed by a DO.

2.1.7 Any contractor desired exceptions to EA-WI-023, EA-WI-025 or EA-WI-027 shall be submitted for review and approved by NASA.

2.1.8 All handling, processing, or testing of Class I or II hardware at the contractor's facility, prior to acceptance by the Government, shall be documented using a work authorization document.

2.2 DESIGN AND ANALYSIS REQUIREMENTS OVERVIEW

The contractor shall perform design and analysis tasks for mechanical and electrical/electronics hardware and related software as directed by a DO. EVA tasks shall follow the requirements that are specified in JSC 26626, Extravehicular Activity (EVA) Hardware Generic Design Requirements Document. All designs produced under this contract shall comply with the requirements of JPG 8080.5, JSC Design and Procedural Manual. These tasks include, but are not limited to, the following:

2.2.1 Develop hardware and software project requirements.

2.2.2 Develop conceptual layouts and perform engineering and feasibility studies.

2.2.3 Perform preliminary design and analysis of mechanical and electrical/electronics components and subsystems.

2.2.4 Complete detail design and analysis of mechanical and electrical/electronics components and subsystems.

2.2.5 Complete detailed design and analysis of software in support of electrical/electronics packages and subsystems.

2.2.6 Complete hazard analysis.

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2.2.7 Perform failure analysis.

2.3 FABRICATION AND ASSEMBLY REQUIREMENTS OVERVIEW

The contractor shall perform the following fabrication and assembly tasks as directed by a DO:

2.3.1 Fabricate and assemble mechanical and electrical/electronics components and subsystems.

2.3.2 Fabricate and assemble Space Flight hardware.

2.3.3 Write and deliver software programs in support of electrical/electronics packages and subsystems.

2.3.4 Maintain and repair Space Flight mechanical and electrical/electronics equipment.

2.4 TESTING REQUIREMENTS OVERVIEW

The contractor shall be required to perform testing as directed by DO. The testing shall be performed at contractor, subcontractor, or Government facilities. The contractor shall test mechanical and electrical/electronics components, subsystems and integrated assemblies.

2.5 APPLICABLE DOCUMENTS

Applicable documents are listed in Attachment J-12. All listed documents are applicable to the extent specified. When there are conflicts between the listed documents and the requirements of this SOW, the SOW shall prevail. The contractor shall utilize the latest revision of the documents at the time a DO is issued.

3.0 FUNCTIONAL REQUIREMENTS

The scope of work for each end product will be identified in a DO. The effort required to complete a DO will require all or some subset of the tasks described below. Alternate forms or additional documentation may be required and will be identified in a DO.

3.1 Design and Analysis**3.1.1 Hardware/Software Project Requirements Definition**

The contractor shall develop hardware/software project requirements necessary to complete the conceptual and preliminary designs. These requirements are derived from the mission goals and objectives and from top-level performance requirements. Mission goals and objectives and top-

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level performance requirements will be provided in a DO or in the "Project Technical Requirements Specification (PTRS)." In some cases, if directed by a DO, the contractor shall develop the PTRS from the top-level requirements provided in a DO.

The hardware/software project requirements shall include, but not be limited to, those associated with function, performance, testing, operations, interfaces, facilities, environment, assembly and installation, hardware and software integration, materials and processes, S&MA, structural integrity, logistics and reporting. For hardware and software that will be used Intravehicular (IVA) and has been determined to be non-critical GFE, the contractor shall provide the documentation of project requirements in accordance with the Data Requirements Document (DRD) titled, "Flight Hardware Project Requirements and Verification Document (PRVD)."

A SRR data package shall be submitted and conform to the guidelines in DRD titled, "GFE Systems Requirements Review Data Package," unless otherwise directed by a DO. If directed by a DO, the contractor shall be required to present the requirements at a Systems Requirements Review (SRR) as defined in WI-EA-023. The SRR will occur either at Johnson Space Center (JSC), the contractor's facility or another location.

The following documents are required to be available at the SRR:

Products	Version	SRR Data Pkg.	RIDable (Y/N)
PTRS or PRVD	Final* (see Section 7.1.3.2 of WI-EA-023) *For PRVD, requirements portion only	Yes	Yes
Interface Control Documents (ICDs)	Final for Functional Characteristics content	Yes	Yes
Configuration Management Plan	Final	Yes	No
Software Development Plan	Final	Yes	No

3.1.2 Conceptual Design and Analysis

The contractor shall develop hardware/software design concepts and approaches and shall perform preliminary analyses. The conceptual design end-products may consist of functional requirements for mechanical and electrical/electronic elements; preliminary drawings, sketches, layouts, diagrams, and conceptual mockups; supporting analyses, trade studies, and feasibility assessments; and cost and schedule estimates for hardware/software design, fabrication and installation. The contractor shall also show the feasibility of designing and fabricating the proposed hardware and software along with the most probable design and fabrication approach.

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The contractor shall be required to present the conceptual design and analysis results to NASA, unless otherwise directed by a DO.

3.1.3 Preliminary Design

The contractor shall develop the preliminary designs as directed by a DO. The preliminary design process may consist of the following, as appropriate: engineering layouts, and analyses; hardware/software designs; fabrication and installation approaches; detailed equipment requirements; any special test or handling requirements; and cost schedule or estimates for manufacturing test, etc. The fabrication of breadboard, brassboard, or engineering units of the proposed design may be required as part of the preliminary design process.

Preliminary designs shall comply with the detailed equipment requirements and describe the main components, configurations, limitations, characteristics and modes of operation. A Preliminary Design Review (PDR) package shall be submitted and conform to the guidelines in DRD titled, Preliminary Design Review Data Package, unless otherwise directed by a DO. The contractor shall be required to present the design at PDR. The PDR will occur either at JSC, the contractor's facility or another location.

The PDR data package shall include detailed equipment requirements in the form of a preliminary End Item Specification (EIS) and/or preliminary Software Design Document (SDD), unless otherwise directed by a DO. For EVA projects, the detailed equipment requirements shall be provided in the form of a preliminary Certification and Acceptance Document (CARD).

A partial listing of the documentation products that are to be provided in the PDR data package are identified in the table below (a full listing of the documentation is identified in DRD titled, Preliminary Design Review Data Package. Additional documentation products will be added through DO direction.

Products	Version	PDR Data Pkg.	RIDable (Y/N)
EIS	Preliminary	Yes	Yes
CARD (for EVA Projects only)	Preliminary	Yes	No
Software Requirement Specification	Final	Yes	Yes
Engineering Drawings	Preliminary	Yes	Yes
SDD	Preliminary	Yes	Yes
V&VD Or PRVD	Preliminary for verification plan content	Yes	Yes
ICDs	Preliminary for Detailed Specification content	Yes	Yes

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Products	Version	PDR Data Pkg.	RIDable (Y/N)
Safety Data Package	Phase I	Yes	Yes
EEE Parts Analysis	Preliminary	Yes	Yes
Design Analyses Reports	Preliminary	Yes	Yes

3.1.4 Detailed Design

The contractor shall provide detailed designs as at the Critical Design Review (CDR) that may consist of the following, as appropriate: detailed fabrication and assembly drawings; detailed engineering analyses; hardware and software specifications and other documents as required; certification requirements, computer files generated from Computer Aided Design (CAD), Finite Element Analysis (FEA), and Contractor written source codes and executable programs. The CDR data package shall be submitted by the contractor and shall conform to the guidelines in the DRD entitled, "Critical Design Review," unless otherwise directed by a DO. The contractor may be required, if directed by a DO, to present the detailed design at the CDR. The CDR will occur either at JSC, the contractor's facility or another location.

The contractor shall provide, as part of the CDR Data package, final, detailed drawings, including assembly drawings suitable for fabrication and assembly of hardware and a drawing tree that shows the relationship of the GFE end item to the assembly, sub-assembly and the piece parts. All drawings shall be in the Pro-E format suitable for inclusion into the JSC Drawing Database. Electrical and electronic schematics shall be provided in the ORCAD format. The contractor shall also provide fully parameterized solid models, including assembly drawings, in a Pro-E readable format. Drawing formats, practices, naming conventions for solid models and drawings, and configuration management shall be performed in accordance with JPG 8500.4, Engineering Drawing System Manual. Drawings shall be formatted in accordance with DRD titled, Engineering Drawings. All final drawings and subsequent drawing revisions will be approved by the Government before hardware fabrication begins.

The contractor shall either: (1) release drawings through the JSC Engineering Drawing Control Center (EDCC) or (2) deliver drawings and associated files released through the contractor's system that are JPG 8500.4 compliant to the JSC Engineering Drawing Control Center (EDCC) upon delivery of the first piece of hardware. If the contractor is delivering to the EDCC, the contractor shall have a system in place similar to the JSC system for configuration management prior to delivery that has been approved by NASA. The Government will approve all top assembly drawings. If an in-place drawing system is used, the contractor, upon completion of a DO, shall deliver to the EDCC all original drawings; native engineering files (e.g. CAD models, drawing files, etc.) created or revised by the contractor or sub-contractor, and serialization/lot number records for all hardware built to those drawings.

The CDR data package shall include detailed equipment specifications in the form of an End Item Specification (EIS) and/or SDD. The detailed equipment specifications and test

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requirements for EVA projects shall be provided in the form of a CARD. In addition, the contractor shall prepare a plan for the sustaining of the GFE hardware/system based on the information shown in paragraph 3.4 of this SOW.

A partial listing of the documentation products that are to be provided in the CDR data package are identified in the table below (a full listing is identified in the DRD titled, Critical Design Review Data Package). The final versions of the preliminary documents presented at PDR are to be available. Additional documentation products will be added through issuance of delivery orders.

Products	Version	CDR Data Pkg.	RIDable (Y/N)
Engineering Drawings	Final	Yes	Yes
CARD (for EVA Projects only)	Final	Yes	Yes
ICDs	Final for Detailed Specification content	Yes	Yes
Safety Data Package	Phase II	Yes	Yes
Engineering Analyses Reports	Final	Yes	Yes
V&VD Or PRVD	Final for verification plan content	Yes	Yes
SDD	Final	Yes	Yes
Software Code	Preliminary	No	No
EIS	Final	Yes	Yes
Sustaining Engineering Plan	Preliminary	No	No
EEE Parts Analysis	Final	Yes	Yes

Upon completion of the CDR, the design of the hardware/software shall be controlled and any changes to the requirements or design that deviate from the material submitted during CDR shall be submitted to the Technical Manager's Representative (TMR) for approval. The contractor shall document the changes in an Engineering Design Change Proposal (DRD titled, Engineering Drawing Change Proposal). The contractor shall be required to present the change to the appropriate JSC Configuration Control Board.

3.1.5 Hazard Analysis

The contractor shall provide analysis verifying that the detailed hardware and software design is safe for personnel and facilities. The contractor shall meet all applicable safety and reliability design requirements as defined JSC 17481 "Safety Requirements Document for JSC Shuttle Space Flight Equipment" for the Space Shuttle program and SSP 50021, Space Station Safety Requirements, for the Space Station Program.

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The contractor shall be required to present the results or relevant calculations of the analysis at the CDR or at other forums as directed by NASA. All calculations and results shall be in the contractor's report format and be available to the Government upon request.

3.2 FABRICATION

The contractor shall provide all material, equipment, facilities, transportation, resources, and personnel to perform the fabrication, assembly, maintenance and repair of the hardware as described in a DO.

Workmanship standards shall be employed throughout all phases of hardware manufacture to control the quality of the operations.

3.2.1 Mechanical Work Disciplines

Mechanical work disciplines shall include equipment and expertise in, but not limited to, the following: conventional and specialized machining; metalsmith fabrication; riveting, soldering, brazing, and welding; conventional and specialized woodworking; lay-up, bonding, processing, and machining of composite materials; hand fairing and finishing of sculptured surfaces and contours; electrical discharge machining (wire or die sink); tubing and instrumentation installation and softgoods fabrication. Specialized services shall include heat treating, plating, rapid prototype and painting, anodizing, alodining, composite lay-up, vacuum bagging and wire wrapping. Fabrication may also include special processes identified in paragraph 3.2.3 of this SOW.

Fabrication of Space Flight hardware will require workmanship standards as specified in paragraph 2.1.3.2 of JPG 8500.4 and SKZ36103755, JSC Fabrication Tolerances and Practices, or best commercial practice. If best commercial practice is used, the contractor's standards shall be submitted per DRD titled, Flight GFE Workmanship Specification List, for review and approval.

Consideration for tight dimensional tolerances and allowances for tolerance build-up may also be required when fabricating and assembling Space Flight hardware.

3.2.2 Electrical/Electronics

The contractor shall provide Electrical/Electronic work disciplines and equipment with expertise in, but not limited to the following: fabrication and assembly of printed circuit boards with surface mount technology and through hole assembly; electrical/electronic hardware components and subsystems; and general electronics fabrication and assembly of miscellaneous hardware such as: cables, harnesses, and any associated special tooling or fixtures. Integration of

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electrical/electronic hardware into final assemblies shall use installation and operation specifications, and shall provide mounting, power, wiring and circuit protection.

Fabrication of all electronic equipment shall include the installation of all software codes, if applicable, in support of electrical/electronics packages and subsystems. Workmanship standards shall be employed throughout all phases of hardware manufacture to control the quality of the operations. These standards shall comply with the NASA-STD-8739 series. The contractor's standards shall be submitted per DRD titled Flight GFE Workmanship Specification List for review and approval.

3.2.3 Special Processes

The contractor shall provide specialized processes, which include but are not limited to, as follows: splicing, gear cutting, gear grinding, centerless and blanchard grinding, vacuum and conventional heat treating, stress relieving, plating, metalizing, plasma spraying, sand blasting, anodizing, laser engraving, painting, graphics artwork layout, silk screening and decaling of instrumentation (panels, chassis, cabinets, and printed circuit boards), and any other types of surface treatments.

3.2.4 Materials

Materials expected to be utilized in this contract include, but are not limited to, the following: ferrous metals, non ferrous metals (including super and high temperature alloys), ceramics, composites, plastics, wood, Teflon, foam, honeycomb, Nomex and Beta cloth fabrics, coolant fluids, etc.

3.2.5 Material Process Control

The contractor shall perform hardware development, modifications, and upgrades discussed in this SOW utilizing adequate materials and process control per SE-R-0006, General Specification, Space Shuttle Systems Requirements for Materials and Process, for the Space Shuttle Program and SSP 30233, Space Station Requirements for Materials and Processes, and JSC 27301, Materials Control Plan for JSC Flight Hardware, for the Space Station Program.

The contractor shall be required to submit sample materials for NASA to perform materials testing per NASA-STD-6001, Flammability, Odor, and Off-Gassing Requirements and Test Procedures for Materials in Environments that Support Combustion. The contractor shall control stress, corrosion, cracking, and material fracture by designing to MSFC-STD-3029, Design Guidelines for Controlling Stress Corrosion Cracking, and JSC 25863, Fracture Control Plan for JSC Flight Hardware, for the Space Shuttle Program and SSP 30558, Fracture Control Requirements for Space Station, for the Space Station Program. The contractor shall comply with the JSC Fastener Integrity Program that is identified in JSC 23642. All materials shall be

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reviewed and approved as part of the Preliminary Design Review, Critical Design Review, and Engineering Design Change Proposal processes. Materials and process controls for the fabrication of advanced development hardware will be specified in a DO.

3.3 TESTING

The contractor shall be required to perform development, acceptance, and qualification testing of hardware/systems as directed by a DO or identified in the CARD, V&VD or PRVD. The contractor shall test mechanical and electrical/electronics packages, components, subsystems and integrated assemblies.

3.3.1 Laboratory Use

The testing shall be performed at Contractor or Government-Furnished Facilities. The contractor shall be responsible for the efficient, well planned use of Government laboratories that may be used in support of this contract. The contractor shall identify cost effective alternative plans and approaches available for those times when Government services and facilities are not available for contractor use. The Government may direct the use of a particular test facility. Unique testing, such as human thermal vacuum testing, will be performed at Government-Furnished Facilities. Any testing that is performed at Government-Furnished facilities shall follow the appropriate work instructions for that facility.

3.3.2 Test Documentation

The contractor shall be responsible for the preparation of the test requirements, test plans and procedures, work authorization documents, discrepancy reporting and tracking, post test reports, and all documentation associated with testing of hardware/systems. All test documentation will require the approval by the Government. Unless otherwise directed by a DO, the test documentation shall include but not be limited to:

3.3.2.1 Certification Plans

Certification plans shall be provided in the form of a Verification and Validation Document (reference DRD titled, Flight GFE Verification and Validation Plan), and for EVA hardware and software, the certification plan is identified in Table 4, Verification Matrix of the DRD titled, Certification and Acceptance Requirements Document (CARD). The certification plan shall define the specific methods to be used to verify that the hardware and software meets the technical design requirements.

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The contractor shall provide a certification report,, which contains the formal certification data that are required to allow the hardware and software to be certified. Certification verification shall be prepared in accordance with DRD titled, Government Certification and Approval Request (GCAR).

3.3.2.3 Test Plans

The contractor shall provide development, certification, and acceptance test plans. The certification test plan shall be in accordance with DRD titled, Certification Plan. For EVA hardware and software, this plan is included in the Verification Matrix of the CARD. For development and acceptance test plans, the format shall be in the contractor's format.

3.3.2.4 Test Procedures

The contractor shall prepare development, certification, and acceptance test procedures. Development test procedures shall be submitted to the Technical Manager's Representative in the contractor's own test procedure format for review two weeks prior to the start of testing. If no comments are received within that time period, testing can proceed. Certification test procedures shall be prepared in accordance with DRD titled, GFE Qualification Test Procedure, and acceptance test procedures shall be submitted in accordance with DRL titled, GFE Acceptance Test Procedure.

3.3.2.5 Test Reports

The contractor shall prepare certification reports in accordance with DRD titled, "Certification Report." Post development and acceptance test reports shall be in the contractor's report format.

3.3.2.6 Test Fixture and Test Configuration Drawings

The contractor shall provide drawings and solid models in accordance with DRD titled, "Engineering Drawings," for any special test fixtures and test configurations that are used in acceptance and certification tests as specified in a DO. These drawings shall be released into the JSC drawing system.

3.3.3 Test Capability

The contractor shall perform development, qualification and acceptance testing of CRAVE hardware/system. Testing shall be performed in accordance with the requirements that have been identified in the CARD, V&VD or PRVD. Testing shall include, but not be limited to, the following:

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The contractor shall perform development/evaluation testing of hardware/systems in an appropriate laboratory setting to verify the design approach.

3.3.3.2 Thermal Testing

The contractor shall perform thermal testing of mechanical and electrical/electronic hardware to insure proper function at thermal environment limits.

3.3.3.3 Vacuum and Thermal Vacuum Testing

The contractor shall perform vacuum and thermal vacuum testing of mechanical and electrical/electronic hardware to insure proper function at vacuum or thermal vacuum environment limits.

3.3.3.4 Vibration Testing

The contractor shall perform hardware workmanship acceptance testing as well as vibration environmental testing for certification of mechanical and electrical/electronic hardware.

3.3.3.5 Oxygen Acceptance Testing

The contractor shall perform Oxygen acceptance testing on all oxygen systems components to ensure proper oxygen system workmanship. Testing shall be performed per SSP 41172, Qualification and Acceptance Environmental Test Requirements. The contractor shall provide testing, processing, and handling facilities and capabilities compatible with 100% high and low pressure oxygen systems and components. Facilities and capabilities shall include, but are not limited to, clean rooms, laminar flow benches, and precision cleaning facilities.

All new and existing GFE, pertaining to 100% oxygen systems and components, shall be evaluated for oxygen systems hazards by White Sands Test Facility (WSTF), Oxygen Systems personnel. In addition, all Oxygen systems and components shall be subjected to WSTF oxygen compatibility and acceptance testing per JSC 27301.

3.3.3.6 Electromagnetic Interference/Electromagnetic Compatibility (EMI/EMC) Testing

The contractor shall perform EMI/EMC tests to insure an electromechanical or electronic component or assembly will not adversely affect or be affected by spacecraft systems. Testing shall be in accordance with JSC 27743, EMC Test Methods for Shuttle Orbiter Equipment/

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Experiments, for the Space Shuttle Program and SSP 30238, Space Station Electromagnetic Techniques, for the Space Station Program.

3.3.3.7 Ionizing Radiation Testing.

The contractor shall perform Ionizing Radiation Testing in accordance with NSTS 07700 Volume X Book 1 and 2 for the Space Shuttle Program and in accordance with SSP 30512, Space Station Ionizing Radiation Design Environment, for the Space Station Program.

3.3.3.8 Vacuum Ultraviolet Testing

The contractor shall perform Vacuum UltraViolet (VUV) radiation testing in accordance with SSP 30425, "Space Station Program Natural Environment Definition for Design.

3.3.3.9 Atomic Oxygen Testing

The contractor shall perform Atomic Oxygen (AO) testing in an atomic oxygen Plasma Asher or equivalent facility and shall follow procedures determined appropriate by the JSC Structural Engineering Division/Materials and Process Branch, and as directed by DOs.

3.3.3.10 Contrast Ratio, Bi-directional Reflectance Distribution Function (BRDF) Testing

When Contrast Ratio and BRDF testing are required for hardware/systems, a "2 X 2" checkerboard coupon conforming to requirements specified in a DO or appropriate specifications shall be made using the same materials and processes as the flight hardware (or qualification units).

3.3.3.11 Static/Dynamic Loads Testing

The contractor shall perform static loads testing when the hardware design cannot be adequately analyzed to insure a positive margin of safety. The contractor shall perform dynamic testing such as random vibration, acoustic, modal, sine sweep, or smart hammer to complete acceptance testing requirements.

3.3.3.12 Functional Performance Testing

The contractor shall perform functional performance testing in an appropriate laboratory setting to ensure the hardware and software meets all functional performance requirements.

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The contractor shall perform software Verification and Validation (V&V) testing on software code, which supports electrical/electronic packages and subsystems.

3.3.4 System Acceptance

The contractor shall provide a Certification Data Package (CDP) for the hardware/system that has been identified in a DO as flight hardware and software required in support of the SSP or ISS programs. As part of the CDP, the contractor shall complete the V&V matrix (DRD titled, Flight GFE Projects Requirements and Verification Document) and assemble the documentation that is identified in the Flight GFE Verification and Validation Report (DRD titled, Flight GFE Verification and Validation Report). The contractor shall be required to present the data at a System Acceptance Review (SAR) that will occur either at JSC, the contractor's facility or another location.

The contractor shall provide to NASA, upon request, any special test fixtures and test configurations, instrumentation, spare components (engineering or flight) including non-compliant components, and any unused materials purchased under a DO.

The documentation products that are to be available at the SAR are shown in the table below:

Products	Version	SAR Data Pkg.	RIDable (Y/N)
Version Description Document (software and/or firmware)	Final	Yes	N/A
V&VD or PRVD	Final for verification results content	Yes	N/A
CARD (for EVA projects only)	Final with verification matrix completed	Yes	N/A
Engineering Drawings (including CAD models)	Final	Yes	N/A
Ground Safety Analysis Report (as required by KSC) (see EA-WI-023 for details)	Final	Yes	N/A
Certification Data Package (see EA-WI-023 for details)	N/A	Yes	N/A
ADP or JSC Project Parts Tag- JF 911, (see EA-WI-023 for applicability)	N/A	Yes	N/A
Safety Data Package	Phase III	Yes	N/A
ISS Functional Configuration Audit/Physical Configuration Audit (FCA/PCA)	N/A	Yes	N/A

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Products (See Section 7.5 2.7 of EA-WI-023)	Version	SAR Data Pkg.	RIDable (Y/N)
User's Guide (as described below)	Final	Yes	N/A
Sustaining Engineering Plan	Final	Yes	N/A
Qualification & Acceptance Procedures	Final	Yes	N/A

The contractor shall develop a Flight Products User's Guide (reference DRD titled, Flight Product User Guide) to provide a descriptive explanation of the GFE for the intended end use. The guide shall indicate how to use the GFE to accomplish the operational requirements and stay within any operational constraints to maintain the safety and functionality of the GFE.

3.4 SUSTAINING ENGINEERING

Sustaining a GFE item consists of many activities that interact with each other. Under nominal conditions, (e.g., no changes, no problems, no off-nominal scenario discussions, etc.), the activities can be separated into mission-specific activities and non-mission-specific activities. Any of these activities can result in the need to perform an off-nominal activity, such as closure of a discrepancy report or modification to the design, the procedures, or the certification.

Sustaining activities are grouped into the following list of nominal and off-nominal activities. The list below is a high level depiction of the activities involved in sustaining GFE. Additional activities, as applicable, may be added to DOs.

Nominal Sustaining Activities:

- Project Management Activity
- Engineering Activity
- Contracting Activity
- Configuration Control Activity
- ALERTS/Advisories (A/As) Activity
- Program Change Evaluation Activity
- Flight Readiness Activity
- Processing Activity
- Pre-flight and Post-flight Operations Activity
- In-flight Operations Activity
- Inventory Activity
- Maintenance Activity
- Limited Life/Cycle Activity
- Unique GSE, STE, and Facility Activity
- Retire GFE Activity

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- Discrepancy Reporting (DR) Activity
- Problem Reporting and Corrective Action (PRACA)
- Repair Activity
- Delta DDTM&E Activity
- Delta Certification Activity
- Alternate Production Certification Activity

The contractor shall provide sustaining engineering support following delivery of hardware and software for a period of time specified in a DO. Sustaining engineering activities shall include drawing revisions, document revisions, equipment modifications, acceptance test support, procedure review, mission support, failure investigation, and presentations to NASA review boards and management. The contractor may also be tasked by DO to provide sustaining engineering services for hardware/systems that were delivered under previous contracts.

3.5 QUALITY ASSURANCE**3.5.1 Quality System**

The contractor shall have a quality program that complies with ANSI/ISO/ASQ Q9001-2000 Quality Management Systems-Requirements, or an approved Quality Plan. The contractor's quality plan, as developed per ANSI/ISO/ASQ Q9001-2000 requirements, shall be submitted in accordance with DRD titled, R-Quality Plan or the contractor may provide a Quality Plan documenting the quality assurance provisions to be employed for the flight hardware development using the provided template DRD titled, R-Quality Plan Template. Upon completion and approval, the Quality Plan will become part of the contract and the contractor shall be responsible for implementing the processes and procedures specified therein.

The contractor's quality plan shall make provisions for the following supplements to the ANSI/ISO/ASQ Q9001-2000 elements:

3.5.1.1 Customer Verification of Subcontracted Products

The contractor shall submit the appropriate subcontract documentation to the designated NASA quality representative for determination of the need for Government Source Inspection (GSI) prior to release of the procurement.

When the NASA quality representative elects to require GSI for a subcontract, the following statement shall be included in the direction:

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"All work on this order is subject to inspection and test by the Government at any time and place. The Government quality representative who has been delegated quality assurance functions on this procurement shall be notified immediately upon receipt of this order. The Government representative shall be also notified 48 hours in advance of the time articles or materials are ready for inspection or test."

For procurements that do not require GSI, the following statement shall be included in the direction:

"The Government has the right to inspect any or all of the work included in this order at the contractor's plant."

3.5.1.2 Review and Disposition of Nonconforming Product

The cognizant Government quality representative shall approve all dispositions of nonconforming products other than those being reworked to meet specified requirements or scrap.

Nonconformance reporting shall commence with the manufacturing of the certification or production hardware and continue through all phases of the project. The reporting shall include all problems associated with the GSE for the hardware. Nonconformance reporting for materials to be used in Class I or II hardware, shall commence with the receipt of the material. All nonconformances shall be reported in accordance with DRD titled, Nonconformance Record.

Nonconformances may be repaired by Standard Repair Procedures, as determined by the Material Review Board. Before use, Standard Repair Procedures shall be submitted for NASA approval.

3.5.2 Waivers/Deviation Request

A waiver/deviation request shall be submitted in accordance with EA-WI-027 for all hardware or software not meeting defined specifications. For proposed waivers and deviations, the contractor shall establish a means to analyze the safety impact.

3.5.3 Workmanship Specifications

The following standards shall be used in the design and manufacture of Electrical/electronic equipment for high-reliability (flight hardware, critical ground support equipment, etc.) applications:

- a) Soldering, Through-Hole Technology – NASA-STD-8739.3, Soldered Electrical Connections,

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- b) Soldering, Surface Mount Technology – NASA-STD-8739.2, Workmanship Standard for Surface Mount Technology,
- c) Crimping, Cable and Harness – NASA-STD-8739.4, Crimping, Interconnecting Cables, Harnesses and Wiring,
- d) Conformal Coating and Staking – NASA-STD-8739.1, Workmanship Standard for Staking and Conformal Coating of Printed Wiring Boards and Electronic Assemblies,
- e) Fiber Optics – NASA-STD-8739.5, Fiber Optic Terminations, Cable Assemblies and Installation,
- f) Electrostatic Discharge Control (ESD) – ANSI/ESD S20.20-1999, Development of an Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrical Initiated Explosive Devices,
- g) Rigid Printed Wiring Board (PWB) Design – IPC-2221, Generic Standard on Printed Board Design, and IPC-2222, Sectional Design Standard for Rigid Organic Printed Boards, and
- h) Rigid Printed Wiring Board (PWB) – IPC-6011, Generic Performance Specification for Printed Boards, and IPC-6012, Qualification and Performance Specification for Printed Boards.”
- i) NASA Technical Standards for flight hardware workmanship are available electronically at:

<http://standards.nasa.gov>

- j) IPC standards required shall be supplemented with NASA Goddard Space Flight Center (GSFC), S-312-P-003B, Procurement Specification for Rigid Printed Boards for Space Applications and other High Reliability Uses. (Note: all specification references to “GSFC” shall be substituted with “JSC” for this procurement.) If the contractor chooses to use other standards, the contractor shall submit those standards for NASA approval per DRD titled, Flight GFE Workmanship Specification List.

3.5.4 Traceability

A system shall be in place to ensure identification of all materials/products, whether separately produced discrete items, or material produced in batches, to ensure traceability to the original source/manufacturer and to determine verification status. This system shall be maintained throughout the life of this contract, including material/product receipt; all stages of production; delivery; installation, etc.

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B - Crew, Robotics, and Vehicle Equipment (CRAVE) - Restricted**3.5.5 Changes**

The contractor shall notify the Government of any proposed changes (including from proprietary sources), including, but not limited to the following: fabrication, materials, methods, product operating characteristics, or processes previously approved. The contractor shall obtain written approval from the Government before making any change.

3.5.6 Test Results

Records of test results shall be maintained and must be traceable to the procured articles. Purchased raw materials shall be accompanied with chemical and physical test results from the manufacture or obtained from a NASA approved testing facility.

3.5.7 Software Quality Assurance

Software Quality Assurance requirements are applicable to the following categories of software and firmware: flight software and firmware; critical ground support software and firmware, i.e., software and firmware that are an integral part of the operational mission (i.e., support of flight program); and software support tools used in (1) the development of flight and critical ground support software and firmware; (2) manufacturing processes of mission critical hardware; and (3) test and integration of mission critical hardware, software, and firmware.

The contractor shall prepare a Software Quality Assurance (SQA) Plan in accordance with DRD titled, Software Quality Assurance Plan Report. The contractor shall implement the SQA requirements in accordance with the approved SQA plan.

3.5.8 Audits

The contractor shall conduct internal audits to ensure compliance with contract requirements. Additionally, the JSC Contracting Officer may request (JSC and contractor) audits of specific processes to identify potential systemic problem areas for improvement

3.5.9 Problem Reporting and Corrective Action

The contractor shall implement and participate in the process for reporting problems and the establishments of corrective action in accordance with JSC-28035, Program Problem Reporting and Corrective Action (PRACA) System for JSC Government Furnished Equipment. Refer to DRD titled, Problem Reporting and Corrective Action. The contractor shall participate in the PRACA system unless otherwise directed by a DO.

The contractor shall perform a failure analysis of defective hardware and software returned to the contractor unless deemed unnecessary by the Technical Manager's Representative. The failure

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analysis shall be performed in a systematic method such that the true cause of the failure can be identified. The contractor shall recommend corrective action required to prevent the recurrence of a failure. The results of the failure analysis and corrective action shall be submitted in a written report to the Technical Manager's Representative in accordance with DRD titled, Flight GFE Failure Analysis Report. The contractor may be required to present the results of the failure investigation and closure ration to the appropriate JSC personnel per JSC 28035, Program Problem Reporting and Corrective Action for JSC Government Furnished Equipment. When applicable, the contractor shall be responsible for ensuring all PRACA requirements are met. The contractor shall maintain a status on all open problems, which do not have NASA approval for closure.

3.5.10 Calibration System

The contractor shall have a documented calibration system that meets the requirements of ISO 10012:2003, Quality assurance requirements for measuring equipment, or the American National Standard Institute (ANSI)/National Conference of Standards Laboratories (CSL) ANSI/CSL Z540-1, General Requirements for Calibration Laboratories and Measuring and Test Equipment.

3.5.11 Acceptance Data Package

When required by a DO, an acceptance data package (ADP) for each deliverable item in a DO shall be prepared in accordance with DRD titled, Acceptance Data Package. The ADP shall provide NASA with the documentation necessary to determine the acceptability of the delivered item. The ADP shall accompany the item at delivery and will be retained by NASA. The contractor shall also provide final engineering drawings and CAD models at delivery. These shall be formatted in accordance with DRD titled, Engineering Drawings..

3.6 SAFETY, RELIABILITY, AND MISSION ASSURANCE (SR&MA)**3.6.1 Reliability Requirements**

The contractor shall maintain a reliability program, which is planned and developed in conjunction with other contractor activities. Reliability and maintainability functions shall include the evaluation of the hardware and software reliability through analysis, review, and assessments. Reliability and maintainability shall be considered in the design process. The contractor is responsible for planning, management, and effective execution of the reliability effort.

3.6.1.1 Reliability Plan

The contractor shall provide a reliability plan in accordance with the Reliability and Maintainability Plan, DRD titled, Reliability and Maintainability Plan, to ensure compliance with

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specified reliability requirements. The Plan shall serve as the master planning and control document for reliability.

3.6.1.2 Failure Modes and Effects Analysis

The contractor shall provide a failure modes and effect analysis (FMEA) in accordance with the GFE FMEA and Critical Items List (CIL) and DRD titled, Space Shuttle GFE Failure Modes and Effects Analysis and Critical Items List, for the Space Shuttle Program, and DRD titled, Space Station GFE Failure Modes and Effects Analysis and Critical Items List, for the Space Station Program.

The contractor shall update and maintain the failure modes and effects analysis to support:

- Additional design actions
- Safety Analysis
- Hardware/Software Interface analysis
- Test planning
- Mission planning
- Preparation of mandatory inspection points
- Fault detection and isolation
- Maintainability and analysis planning
- Maintainability planning
- Logistics planning

3.6.1.3 Critical Items List

The contractor shall provide a critical items list in accordance with the GFE FMEA and CIL, DRD titled, Space Shuttle GFE Failure Modes and Effects Analysis and Critical Items List, for the Space Shuttle Program, and DRD titled, Space Station GFE Failure Modes and Effects Analysis and Critical Items List, the the Space Station Program. The contractor shall update and maintain the critical items list, which requires special risk assessment to support the following:

- Waivers to program requirements
- Additional design action
- Safety analysis
- Test planning
- Mission planning
- Preparation of mandatory inspection points
- Fault detection and isolation
- Maintainability analysis and planning
- Maintenance planning
- Logistics planning

STATEMENT OF WORK**B - Crew, Robotics, and Vehicle Equipment (CRAVE) - Restricted****3.6.1.4 Limited Life Items and Status Report**

The contractor shall identify limited life items in accordance with DRD titled, Limited Life Systems List,. The contractor shall provide a report, which estimates wearout life for Orbit maintainable items to support maintenance time predictions and preventative maintenance analysis. Limited Life items include limited shelf life, limited operating life, and time-action control sensitive items, or a combination of these.

3.6.1.5 Electronic, Electrical, and Electromechanical (EEE)/Mechanical Parts Control Plan

The contractor shall prepare a Parts Control Plan in accordance with DRD Electrical, Electronic, and Electromechanical (EEE) Parts Control Plan. The contractor plan shall describe the process of how the contractor will interface with NASA management, EEE and Mechanical Parts personnel, and design engineers to assure the system, board level designs, and selected parts meet performance parameters, ensure long-term reliability, and minimize program life cycle cost. All EEE parts used for Class I or Class II hardware shall be reviewed and approved by the JSC Engineering Directorate Certified Parts Approval Program (EDCPAP), JSC 61360.

3.6.1.6 Submittal of Electronic and Mechanical Parts Data

The contractor shall submit electronic and mechanical parts data in accordance with their Parts Control Plan (Reference DRD titled, Electrical, Electronic, and Electromechanical (EEE) Parts Control Plan.) and submit a EEE Parts list and Analysis Report (Reference DRD titled, EEE Parts Lists and Analysis Report) to ensure that the system, board level design, and selected parts: meet the specification performance parameters, ensure long-term reliability, are suitable for the application, and minimize the cost of ownership over the life of the application program.

3.6.1.7 Acute Launch Emergency Reliability Tip (ALERT) System

The contractor shall provide a documented response to each requested ALERT investigation and resolution to NASA JSC in accordance with DRD titled, Government Industry Data Exchange Program and NASA Advisory Problem Data. Program/Project initiated ALERTs are disseminated by the NASA JSC contractors, NASA centers, and the Government-Industry Data Exchange Program (GIDEP).

3.6.1.8 Failure Detection, Isolation and Recovery Assessment

The contractor shall develop a Failure Detection, Isolation and Recovery (FDIR) analysis process to ensure that each end item design meets the FDIR requirements in SSP 41000, System Specification for the International Space Station (ISS). The contractor shall document this

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analysis in a Space Station Reliability and Maintainability Predictions Report in accordance with DRD titled, Reliability and Maintainability Plan.

3.6.2 Safety Requirements

The contractor shall maintain a safety program, which is planned and developed in conjunction with other contractor activities and includes the plans and reports discussed below. Safety functions shall include the evaluation of hardware and software safety through analysis, review, and assessment, as well as evaluation of waivers, attendance at status reviews, evaluation of testing, and evaluation of flight item failures. The contractor shall be responsible for planning, management, and effective execution of the safety effort.

3.6.2.1 For Space Shuttle: The contractor shall perform and update safety analyses in accordance with the Space Shuttle GFE Safety Analysis Report (SAR) and Hazard Report (HR) (DRD titled, Space Shuttle GFE Safety and Analysis Report and Hazard Report).

3.6.2.2 For Space Station: The contractor shall perform and update safety analyses in accordance with the Space Station Hazard Report (HR)/System Description (DRD titled, ISS Hazard Report).

3.6.2.3 For Payloads: The contractor shall Perform and update payload safety analysis in accordance with the Payload Safety Data Package (DRD titled, Shuttle/Station Payload Safety Data Package).

3.6.3 System Safety Program Plan

The contractor shall provide a safety plan in accordance with DRD titled, System Program Safety Plan, and the requirements stated in Chapter 2 of NSTS 5300.4 (1D-2) for Space Shuttle and SSP 50021 Safety Requirements Document, for Space Station. The contractor shall describe the methods used and assure identification, elimination, and/or control of potential hazards, which may lead to injury, loss of personnel, and/or damage or loss of flight/training hardware and software, or mission-related ground support equipment/software throughout the complete cycle of the program.

3.6.4 S&MA Certification

The contractor shall document certification and acceptance requirements for hardware and software using the V&V (DRD titled, Flight GFE Verification and Validation Plan, or the PRVR (DRD titled, Flight GFE Projects Requirements and Verification Document). For EVA projects. The contractor shall document certification and acceptance requirements for hardware and software using the CARD. The contractor shall document the results of the hardware and software certification using the Certification Data Package.

STATEMENT OF WORK**B - Crew, Robotics, and Vehicle Equipment (CRAVE) - Restricted****3.6.5 Risk Assessment Summary Report**

The contractor shall provide a Risk Assessment Executive Summary Report (RAESR) to document safety critical aspects of flight hardware and software. The RAESR shall be prepared in accordance with DRD titled, Risk Assessment Executive Summary Report.

3.6.6 Safety Review and Reporting

The contractor shall provide reports and presentation material for the S&MA Review Team (SMART) and System Safety Review Panel (SSRP) safety reviews. NASA Project Managers and S&MA representatives will approve these reports and presentations.

3.6.7 Safety and Health

3.6.7.1 Mishap Notification and Investigation. When a mishap, which results in injury, illness, property damage or loss, or environmental release or damage occurs in the performance of contract work, you are required to notify the Government as described in JPG 1700.1, JSC Safety and Health Handbook, section 2, chapter 2.7, Mishap and Incident Investigation. You are also required to perform an investigation, and report the results, along with corrective actions, to the Government. The cited chapter describes specific requirements and schedules for notification, investigation, and reporting. In addition to any additional reporting requirements imposed by the highest regulating safety and health agency or this contract, the contractor must send notifications and reports, in accordance with the specified schedule to Mishaps@ems.jsc.nasa.gov.

3.6.7.2 The following mishaps, which occur when performing work on this contract will be reported: Any mishap, which causes death or disability, or hospitalization of 3 or more workers, irrespective of employer; or results in injury or illness to a Government employee or damage to Government property. When the following recordable injuries and illnesses (using OSHA definitions) are experienced by only contractor workers, they are exempt from these reporting requirements: lost days away from work, restricted duty, and medical treatment. First aid cases are also exempt.

4.0 MANAGEMENT**4.1 PROJECT MANAGEMENT**

The contractor shall be responsible for the effective and efficient management of all tasks, products, activities and resources required to perform this SOW. The contractor shall establish, document, and maintain the processes and controls necessary to accomplish this purpose including general/project management, resource, business and schedule management, data management, and contract and subcontract management. The monthly summary report of

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associated activities shall be reported in accordance with DRD titled, Delivery Order Regular Status Report/Summary Review

4.2 CONFIGURATION MANAGEMENT

All customer controlled requirement changes or configuration baseline changes shall be proposed through the Engineering Design Change Proposal (EDCP) process and implemented after the approval by NASA, unless otherwise directed by a DO. Changes shall be processed through the responsible NASA Configuration Change Board and shall be documented through DRD titled, Engineering Drawing Change Proposal.

The contractor shall prepare specifications as required for subcontractor effort, if any. Such specifications shall be compatible with applicable requirements of this contract and any applicable DOs.

The contractor shall prepare material and process specifications to define the processing and fabrication techniques. Such specifications shall be compatible with applicable requirements of this contract and any applicable DOs.

4.3 PROGRAM DIRECTION AND MEETINGS

The JSC Contracting Officer (CO) shall be the sole source for all contractual direction, and technical direction shall come from the Contracting Officer, technical representative (COTR), or Alternate COTR. During the performance of the contract, the Technical Manager's Representative will conduct monthly reviews of the contractor design, analysis, fabrication, and testing status and data. These reviews will consist of contractor programmatic progress presentations, technical consultations, design requirement interpretations, Government visits to contractor facilities, and assistance in evaluating test data. Government personnel will also participate in all program reviews.

All contractual direction and formal data transmittals shall be coordinated between the JSC Contracting Officer and a designated contractor counterpart to the JSC Contracting Officer.

4.4 PROGRAM SCHEDULE

The contractor shall meet the milestones identified or directed through each DO. The contractor shall provide schedules in accordance with DRD titled, Project Schedule.

4.5 FINANCIAL MANAGEMENT

The contractor shall maintain a Financial Management System (FMS) for the accumulation, documentation, analysis, and reporting of project cost and staffing data. The FMS shall be the

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basis for financial communication with NASA through the reporting requirements of DRD titled, NASA Contractor Financial Management Reporting and through DRD titled, Delivery Order Status Report/Summary Review, The FMS shall be capable of accounting for forecast and accrued expenditures of both labor hours and costs, commitments, and termination/liability forecasting of cost and manpower requirements by month, by quarter, and by Government Fiscal Year (GFY) and by DO. The NASA Contractor Financial Management Reporting DRD data is to be provided in a flat file format suitable for SAP. Variance Analysis and corrective action reporting shall also be included in accordance with the DRD.

4.5.1 Work Breakdown Structure

The Work Breakdown Structure shall be in accordance with Table 1 below. NASA shall expand the sub-elements of this minimal WBS as needed to meet the status reporting requirements of the Shuttle, International Space Station or Advanced Program Offices. Each DO will be assigned a WBS sub-element number to the WBS below. Cost reporting at the DO level by WBS shall be done in accordance with DRD titled, Delivery Order Status Report/Summary Review.

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Table 1 – Work breakdown Structure	
1.0 EVA Projects	
1.1 Shuttle EVA Projects	
1.2 ISS EVA Projects	
1.3 Advanced Programs EVA Projects	
2.0 Flight Crew Equipment Projects	
2.1 Shuttle FCE Projects	
2.2 ISS FCE Projects	
2.3 Advanced Programs FCE Projects	
3.0 EVR Projects	
3.1 Shuttle EVR Projects	
3.2 ISS EVR Projects	
3.3 Advanced Programs EVR Projects	
4.0 ECLSS Projects	
4.1 Shuttle ECLSS Projects	
4.2 ISS ECLSS Projects	
4.3 Advanced Programs ECLSS Projects	
5.0 ATCS Projects	
5.1 Shuttle ATCS Projects	
5.2 ISS ATCS Projects	
5.3 Advanced Programs ATCS Projects	
6.0 CHeCS Projects	
6.1 Shuttle CHeCS Projects	
6.1.1 <i>Flight Medical Projects</i>	
6.1.2 <i>Crew Conditioning Projects</i>	
6.1.3 <i>Environmental Monitoring Projects</i>	
6.2 ISS CHeCS Projects	
6.2.1 <i>Flight Medical Projects</i>	
6.2.2 <i>Crew Conditioning Projects</i>	
6.2.3 <i>Environmental Monitoring Projects</i>	
6.3 Advanced Programs CHeCS Projects	
6.3.1 <i>Flight Medical Projects</i>	
6.3.2 <i>Crew Conditioning Projects</i>	
6.3.3 <i>Environmental Monitoring Projects</i>	

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The contractor shall provide documentation and reports in accordance with this contract and any applicable Dos and DRDs. The contractor shall develop, manage, and maintain an information and data management system for the preparation, publication, configuration control, and dissemination of data essential to this contract and the programs supported by the contractor through this contract. All the data requirements shall be delivered in the format as depicted in each DRD and compatible with JSC software loads. All documentation shall be maintained within the Engineering Directorate's Design Data Management System (DDMS).

5.1 DATA REQUIREMENTS

Each DO will identify the required documentation and applicable data requirements.

5.1.1 Data Requirements Innovation

When feasible and cost effective, the contractor shall identify alternative documentation requirements for NASA approval. The contractor shall consider factors such as cost, schedule, availability of personnel and equipment, task complexity, and other factors that are applicable for recommending alternative methods to meet project or end item requirements.

SECTION D PACKAGING AND MARKING**D.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE**

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

CLAUSE NUMBER	DATE	TITLE
None included by reference		

II. NASA FAR SUPPLEMENT (48 CFR CHAPT 18)

CLAUSE NUMBER	DATE	TITLE
None included by reference		

III. FULL TEXT CLAUSES**D.2 PACKAGING, HANDLING, AND TRANSPORTATION (NFS 1852.211-70)
(JUN 2000)**

- (a) The contractor shall comply with NPG 6000.1E, "Requirements for Packaging, Handling, and Transportation for Aeronautical and Space Systems, Equipment, and Associated Components", dated April 26, 1999, as may be supplemented by the statement of work or specifications of this contract, for all items designated Class I, II, or III.
- (b) The contractor's packaging, handling, and transportation may be used, in whole or in part, subject to the written approval of the Contracting Officer, provided (1) the Contractor's procedures are not in conflict with any requirements of this contract, and (2) the requirements of this contract shall take precedence in the event of any conflict with the contractor's procedures.
- (c) The contractor must place the requirements of this clause in all subcontracts for items that will become components of deliverable class I, II, or III items.

(End of Clause)
[END OF SECTION]

SECTION E – INSPECTION AND ACCEPTANCE**E.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE**

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

CLAUSE NUMBER	DATE	TITLE
52.246-2	AUG 1996	INSPECTION OF SUPPLIES – FIXED PRICE
52.246-3	MAY 2001	INSPECTION OF SUPPLIES-COST REIMBURSEMENT
52.246-4	AUG 1996	INSPECTION OF SERVICES – FIXED PRICE
52.246-5	APR 1984	INSPECTION OF SERVICES-COST REIMBURSEMENT
52.246-9	APR 1984	INSPECTION OF RESEARCH AND DEVELOPMENT (SHORT FORM)
52.246-16	APR 1984	RESPONSIBILITY FOR SUPPLIES

II. NASA FAR SUPPLEMENT (48 CFR CHAPT 18)

CLAUSE NUMBER	DATE	TITLE
None included by reference		

III. FULL TEXT CLAUSES**E.2 RESERVED**

E.3 MATERIAL INSPECTION AND RECEIVING REPORT
(NFS 1852.246-72) (AUG 2003)

- (a) At the time of each delivery to the Government under this contract, the contractor shall furnish a Material Inspection and Receiving Report (DD Form 250 series) prepared in 3 copies, an original and 2 copies.
- (b) The contractor shall prepare the DD Form 250 in accordance with NASA FAR Supplement 1846.672-1. The contractor shall enclose the copies of the DD Form 250 in the package or seal them in a waterproof envelope, which shall be securely attached to the exterior of the package in the most protected location.
- (c) When more than one package is involved in a shipment, the contractor shall list on the DD Form 250, as additional information, the quantity of packages and the package numbers. The contractor shall forward the DD Form 250 with the lowest numbered package of the shipment and print the words "CONTAINS DD FORM 250" on the package.

(End of Clause)

E.4 HUMAN SPACE FLIGHT ITEM (1852.246-73)(MAR 1997)

The Contractor shall include the following statement in all subcontracts and purchase orders placed by it in support of this contract, without exception as to amount or subcontract level:

"FOR USE IN HUMAN SPACE FLIGHT; MATERIALS, MANUFACTURING, AND WORKMANSHIP OF HIGHEST QUALITY STANDARDS ARE ESSENTIAL TO ASTRONAUT SAFETY.

IF YOU ARE ABLE TO SUPPLY THE DESIRED ITEM WITH A HIGHER QUALITY THAN THAT OF THE ITEMS SPECIFIED OR PROPOSED, YOU ARE REQUESTED TO BRING THIS FACT TO THE IMMEDIATE ATTENTION OF THE PURCHASER."

(End of Clause)

E.5 INSPECTION AND ACCEPTANCE (JSC 52.246-91) (JUN 1991)

Preliminary inspection for compliance with the contract specifications and requirements may be performed at origin by an authorized representative of the Government, and final inspection and acceptance will be performed at NASA Lyndon B. Johnson Space Center by the contracting officer or his/her authorized representative.

(End of Clause)

E.6 QUALITY ASSURANCE SURVEILLANCE PLAN (JSC 52.246-93) (JULY 1996)

A Quality Assurance Surveillance Plan will be developed and implemented by the Contracting

Officer's Technical Representative as a part of the contract administration and monitoring activities conducted to assure that the Government receives products and services that conform to contract requirements. The nature and extent of quality assurance surveillance contemplated in this plan will be based, in part, on the specific content of the contractor's Quality Plan as required in DRDs titled, "R-Quality Plan" or "R-Quality Plan Template".

(End of Clause)
[END OF SECTION]

SECTION F – DELIVERIES OR PERFORMANCE**F.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE**

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

CLAUSE NUMBER	DATE	TITLE
		CLAUSES APPLICABLE TO IDIQ/CPFF:
52.242-15	AUG 1989	STOP-WORK ORDER (ALTERNATE I) (APR 1984)
		CLAUSES APPLICABLE TO IDIQ/FFP:
52.242-15	AUG 1989	STOP-WORK ORDER
52.242-17	APR 1984	GOVERNMENT DELAY OF WORK
		CLAUSES APPLICABLE TO IDIQ/CPFF and FFP:
52.247-34	NOV 1991	F.O.B. DESTINATION

II. NASA FAR SUPPLEMENT (48 CFR CHAPTER 18)

CLAUSE NUMBER	DATE	TITLE
None included by reference		

III. FULL TEXT CLAUSES**F.2 COMPLETION OF WORK (JSC 52.211-95) (OCT 2001)**

All work required under this contract, including submission of all reports, shall be completed on or before 5 years after contract start or as specified on the delivery order.

(End of Clause)

F.3 PLACE OF PERFORMANCE

The effort required under this contract shall be performed at the contractor's facilities, at or near the Lyndon B. Johnson Space Center (JSC) and at other locations as covered by the Statement of Work or delivery orders.

(End of Clause)

F.4 METHOD OF PLACING DELIVERY ORDERS (JSC 52.216-95) (SEP 1998)

Delivery Orders may be placed only by the contracting officer. Delivery Orders will be in writing on JSC Form 1429 or orally, followed by written confirmation. Delivery Orders will be numbered "1," second will be Number "2", and each succeeding Delivery Order will be numbered consecutively.

Each Delivery Order placed against this contract shall consist of the following information:

- (A) delivery order number and contract number;
- (B) place of delivery or performance (including consignee);
- (C) item/items ordered, including quantity, unit price, and amount of each;
- (D) date of order, and required delivery date;
- (E) name of person placing order;
- (F) funding and appropriation data;
- (G) Procurement placement code;
- (H) total amount; and
- (I) signature of the Contracting Officer.

Amendments to orders may be issued in the same manner as original orders. Each order or amended order shall contain a citation of funds from which payment for the supplies or services ordered shall be made.

(End of Clause)

F.5 ORDERING PROCEDURES

The following contracts have been awarded to perform requirements in support of CRAVE.

-- TBD #, A-CRAVE Companies

-- TBD #, B-CRAVE Companies

Companies awarded contracts under the A-CRAVE solicitation will compete with contractors awarded contracts under the B-CRAVE solicitation for Delivery Order awards.

(a) Only the Contracting Officer may issue delivery orders and amendments to delivery orders to the contractor, providing specific authorization or direction to perform work within the scope of the contract and as specified in the schedule. The contractor may incur costs under this contract in performance of delivery orders and amendments to delivery orders issued in accordance with this clause and within the dollar amounts specified in B.6 Contract Funding. No other costs are authorized unless otherwise specified in the contract or expressly authorized by the Contracting Officer.

(b) Prior to issuing a delivery order, the Contracting Officer (or his/her designated representative) shall provide the contractors listed above with the following data:

(1) A functional description of the work identifying the objectives or results desired from the contemplated order, as applicable.

(2) Where applicable, proposed quality assurance and performance standards to be used as criteria for determining whether the delivery order requirements have been met (i.e., acceptance criteria, terms of quality, timeliness, quantity, etc.)

(3) A request for a task plan/proposal, broken out by task, from the contractor to include the Basis of Estimate (BOE), including technical approach, period of performance (including milestones and schedules), deliverables, appropriate cost information, and any other information required to determine the reasonableness of the contractor's proposal.

(4) List of any Government-Furnished items, services, facilities, etc., required to perform the delivery order.

(c) Within 14 calendar days after receipt of the Contracting Officer's (or his/her designated representative's) request, contractors shall submit a delivery order proposal conforming to the request. In special circumstances, the Contracting Officer may allow more than 14 calendar days, if deemed appropriate.

(d) After review of each contractor's proposal, and any necessary discussions, the Contracting Officer may issue a delivery order to the contractor considered to be the best value pursuant to the stated selection criteria for the Delivery Order. Past performance on previous CRAVE delivery orders will be taken into consideration during delivery order competitions.

(e) In the event of a conflict between the requirements of the delivery order and the contractor's approved task plan, the delivery order shall prevail.

(f) All delivery orders are subject to the terms and conditions of this contract. In the event of conflict between a delivery order and this contract, the contract shall control.

(End of Clause)

F.6 SHIPPING INSTRUCTIONS (JSC 52.247-94) (APR 1997)

All documentation shall be shipped to the addresses cited in the applicable Data Requirements Documents. Shipment of all other items shall be as follows:

Parcel Post Shipments and Freight Shipments

Ship to: Transportation Officer,

Building 421

NASA Johnson Space Center

2101 NASA Parkway

Houston, TX 77058-3696

Mark for: Accountable Property Officer

Mark with:

Contract Number: NNJ04HH96B

For reissue to: (Name)(Mail Code)(Bldg.)(Rm.)

(End of Clause)

F.7 BILLS OF LADING (NASA 1852.247-73) (JUN 2002)

The purpose of this clause is to define when a commercial bill of lading or a government bill of lading is to be used when shipments of deliverable items under this contract are f.o.b. origin.

(a) Commercial Bills of Lading. All domestic shipments shall be made via commercial bills of lading (CBLs). The Contractor shall prepay domestic transportation charges. The Government shall reimburse the Contractor for these charges if they are added to the invoice as a separate line item supported by the paid freight receipts. If paid receipts in support of the invoice are not obtainable, a statement as described below must be completed, signed by an authorized company representative, and attached to the invoice.

"I certify that the shipments identified below have been made, transportation charges have been paid by (company name), and paid freight or comparable receipts are not obtainable.

Contract or Order Number: __ Contract #/DO# _____

Destination: _____

(b) Government Bills of Lading.

(1) International (export) and domestic overseas shipments of items deliverable under this contract shall be made by Government bills of lading (GBLs). As used in this clause, "domestic overseas" means non-continental United States, i.e. Hawaii, Commonwealth of Puerto Rico, and possessions of the United States.

(2) At least 15 days before shipment, the Contractor shall request in writing GBLs from: Transportation Management, Attn: Mail Code JB9, 2101 NASA Parkway, Houston, TX 77058. If time is limited, requests may be by telephone: 281-483-3208. Requests for GBLs shall include the

- (i) Item identification/ description.
- (ii) Origin and destination.
- (iii) Individual and total weights.
- (iv) Dimensional Weight.
- (v) Dimensions and total cubic footage.
- (vi) Total number of pieces.
- (vii) Total dollar value.
- (viii) Other pertinent data.

(End of Clause)

F.8 FLIGHT ITEM (JSC 52.247-95) (SEP 1989)

For delivery orders requiring the shipment of flight items -

Block 16 of each Department of Defense Form 250 prepared for hardware or equipment to be shipped under this contract must be annotated as follows in 1/4-inch letters or larger by hand printing or rubber stamp:

‘THIS IS A FLIGHT ITEM: OR “THIS IS MISSION ESSENTIAL GROUND SUPPORT EQUIPMENT,” as applicable.

**(End of Clause)
[END OF SECTION]**

SECTION G – CONTRACT ADMINISTRATION DATA**G.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE**

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

CLAUSE NUMBER	DATE	TITLE
None included by reference		

II. NASA FAR SUPPLEMENT (48 CFR CHAPTER 18) CLAUSES

CLAUSE NUMBER	DATE	TITLE
1852.223-71	DEC 1988	FREQUENCY AUTHORIZATION
1852.227-86	DEC 1987	COMMERCIAL COMPUTER SOFTWARE LICENSING
1852.242-73	JULY 2000	APPLICABLE TO IDIQ/CPFF: NASA CONTRACTOR FINANCIAL MANAGEMENT REPORTING
1852.245-70	JUL 1997	CONTRACTOR REQUEST FOR GOVERNMENT- OWNED EQUIPMENT
1852.245-72	MAR 1989	LIABILITY FOR GOVERNMENT PROPERTY FURNISHED FOR REPAIR OR OTHER SERVICES

III. FULL TEXT CLAUSES**G.2 SECURITY/BADGING REQUIREMENTS FOR FOREIGN NATIONAL VISITORS AND EMPLOYEES/REPRESENTATIVES OF FOREIGN CONTRACTORS (JSC 52.204-91) (MAR 2002)**

(a) An employee of a domestic Johnson Space Center (JSC) contractor or its subcontractor who is not a U.S. citizen (foreign national) may not be admitted to the JSC site for purposes of performing work without special arrangements. In addition, all employees or representatives of a foreign JSC contractor/subcontractor may not be admitted to the JSC site without special arrangements. For employees as described above, advance notice must be given to the Security Office of the host installation [JSC or White Sands Test Facility (WSTF)] at least 3 weeks prior

to the scheduled need for access to the site so that instructions on obtaining access may be provided.

(b) All visit/badge requests for persons described in (a) above must be entered in the NASA Request for Request (RFR) and Foreign National Management System (NFMMS) for acceptance, review, concurrence and approval purposes. When an authorized company official requests a JSC or WSTF badge for site access, he/she is certifying that steps have been taken to ensure that its contractor or subcontractor employees, visitors, or representatives will not be given access to export-controlled or classified information for which they are not authorized. These individuals shall serve as the contractor's representative(s) in certifying that all visit/badge request forms are processed in accordance with JSC and WSTF security and export control procedures. No foreign national, representative, or resident alien contractor/subcontractor employee shall be granted access into JSC or WSTF until a completed RFR has been approved and processed through the NFMMS. Unescorted access will not be granted unless a favorable National Agency Check (NAC) has been completed by the JSC Security Office.

(c) The contractor agrees that it will not employ for the performance of work onsite at the JSC or WSTF any individuals who are not legally authorized to work in the United States. If the JSC or WSTF Industrial Security Specialist or the Contracting Officer has reason to believe that any employee of the contractor may not be legally authorized to work in the United States and/or on the contract, the contractor may be required to furnish copies of Form I-9 (Employment Eligibility Verification), U.S. Department of Labor Application for Alien Employment Certification, and any other type of employment authorization document.

(d) The contractor agrees to provide the information requested by the JSC or WSTF Security Office in order to comply with NASA policy directives and guidelines related to foreign visits to NASA facilities so that (1) the visitor/employee/ representative may be allowed access to JSC or other NASA Centers for performance of this contract, (2) required investigations can be conducted, and (3) required annual or revalidation reports can be submitted to NASA Headquarters. All requested information must be submitted in a timely manner in accordance with instructions provided by JSC or any other Center to be visited.

(End of Clause)

G.3 USE OF JSC CALIBRATION LABORATORY (JSC 52.204-92) (OCT 1997)

The contractor shall utilize the services of the JSC Calibration Laboratory to the maximum extent practicable for calibration of all instruments (Government property or contractor property) utilized under this contract, the total cost for maintenance of which would otherwise be a direct charge to the Government. The procedures for obtaining calibration of instruments are described in JSC Procedures and Guidelines 5151.2 - "JSC Support Contractor Procedures and Guidelines."

(End of Clause)

G.4 SUBMISSION OF VOUCHERS FOR PAYMENT (NFS 1852.216-87) (MAR 1998)

(a) The designated billing office for cost vouchers for purposes of the Prompt Payment clause of this contract is indicated below. Public vouchers for payment of costs shall include a reference to the number of this contract.

(b) (1) If the contractor is authorized to submit interim cost vouchers directly to the NASA paying office, the original voucher should be submitted to:

NASA Lyndon B. Johnson Space Center
2101 NASA Parkway
LF 231/Accounts Payable
Houston, TX 77058

(2) For any period that the Defense Contract Audit Agency has authorized the Contractor to submit interim cost vouchers directly to the Government paying office, interim vouchers are not required to be sent to the Auditor, and are considered to be provisionally approved for payment, subject to final audit.

(3) Copies of vouchers should be submitted as directed by the Contracting Officer.

(c) If the contractor is not authorized to submit interim cost vouchers directly to the paying office as described in paragraph (b), the contractor shall prepare and submit vouchers as follows:

(1) One original Standard Form (SF) 1034, SF 1035, or equivalent Contractor's attachment to:

DCAA – Huntsville Branch Office	POC: Pamela I. Blue, Birmingham Suboffice
620 Discovery Drive	Phone: (205) 731-0018 ext. 221
Bldg. II, Suite 300	Fax: (205) 731-0340
Huntsville, AL 35806-2816	E-mail: pamelablue@dcaa.mil

(2) Five copies of SF 1034, SF 1035A, or equivalent Contractor's attachment to the following offices by insertion in the memorandum block of their names and addresses:

- (i) Copy 1 NASA Contracting Officer
- (ii) Copy 2 Auditor
- (iii) Copy 3 Contractor
- (iv) Copy 4 Contract administration office; and
- (v) Copy 5 Project management office.

(3) The Contracting Officer may designate other recipients as required.

(d) Public vouchers for payment of fee shall be prepared similarly to the procedures in paragraphs (b) or (c) of this clause, whichever is applicable, and be forwarded to:

NASA Lyndon B. Johnson Space Center
2101 NASA Parkway
Attn: BH2/Michael D. Ballard
Houston, TX 77058

This is the designated billing office for fee vouchers for purposes of the Prompt Payment clause of this contract.

(e) In the event that amounts are withheld from payment in accordance with provisions of this contract, a separate voucher for the amount withheld will be required before payment for that amount may be made.

(End of Clause)

G.5 JSC HAZARDOUS MATERIALS USE (JSC 52.223-92) (DEC 1999)

(a) This clause is JSC-unique, and the requirements are in addition to any U.S. Environmental Protection Agency, U.S. Occupational Safety and Health Administration, or other state or Federal regulation or statute. Therefore, the following requirements do NOT supercede any statutory or regulatory requirements for any entity subject to this clause.

(b) "Hazardous materials," for the purposes of this clause, consist of the following:

(1) Those materials defined as "highly hazardous chemicals" in Occupational Safety and Health Administration Process Safety Management Regulation, 29 Code of Federal Regulation 1010.119, without regard for quantity.

(2) Those "extremely hazardous substances" subject to the emergency planning requirements in the Environmental Protection Agency Emergency Planning and Community Right-to-Know Regulation, 40 Code of Federal Regulation 355, Part 355, without regard for quantity.

(3) Those "hazardous substances" subject to the release notification requirements under Environmental Protection Agency's Emergency Planning and Community Right-to-Know Regulation, 40 Code of Federal Regulation 302.4, without regard for quantity.

(4) Any radioisotope material or device that produces ionizing radiation.

(5) Any Class II, III, or IV laser as defined by the American National Standards Institute No. Z136.1(1986).

(6) Any explosive or any pyrotechnics.

(7) Any pesticide.

(c) The contractor shall develop and maintain an inventory listing the identity and quantity of hazardous materials stored or used onsite at JSC for the performance of the contract.

(d) The contractor shall ensure that the proper training of its employees in the use and inherent hazards of these materials is accomplished prior to use.

(e) The contractor shall notify the JSC Occupational Health and Test Support Office (SD13) prior to any initial use or different application of these materials.

(f) The contractor shall use all hazardous materials properly and take all necessary precautions to ensure no harm is done to humans or the environment.

(g) The contractor shall insert the substance of this clause, including this Paragraph F with appropriate changes of designations of the parties, in subcontracts under which hazardous materials will be utilized, or may reasonably be expected to be utilized, onsite at JSC.

(h) In the event the contractor fails or refuses to comply with any aspect of this clause, such failure or refusal may be considered a material breach of this contract.

(End of Clause)

G.6 DESIGNATION OF NEW TECHNOLOGY REPRESENTATIVE AND PATENT REPRESENTATIVE (NFS 1852.227-72) (JUL 1997)

(a) For purposes of administration of the clause of this contract entitled "New Technology" or "Patent Rights--Retention by the Contractor (Short Form)," whichever is included, the following named representatives are hereby designated by the Contracting Officer to administer such clause:

Office Title	Code	Address
New Technology Representative	HA	NASA, Lyndon B. Johnson Space Center Technology Utilization Officer Houston, TX 77058
Patent Representative	HA	NASA, Lyndon B. Johnson Space Center Patent Counsel Houston, TX 77058

(b) Reports of reportable items, and disclosure of subject inventions, interim reports, final reports, utilization reports, and other reports required by the clause, as well as any correspondence with respect to such matters, should be directed to the New Technology Representative unless transmitted in response to correspondence or request from the Patent Representative. Inquires or requests regarding disposition of rights, election of rights, or related matters should be directed to the Patent Representative. This clause shall be included in any subcontract hereunder requiring a "New Technology" clause or "Patent Rights--Retention by the Contractor (Short Form)" clause, unless otherwise authorized or directed by the Contracting Officer. The respective responsibilities and authorities of the above-named representatives are set forth in 1827.305-370 of the NASA FAR Supplement.

(End of Clause)

G.7 SUBMISSION OF INVOICES (JSC 52.232-90) (OCT 1993)

For fixed price type delivery orders, invoices shall be prepared and submitted in quadruplicate unless otherwise specified. Invoices shall contain the following information as applicable: contract and order number, item numbers, description of supplies or services, sizes, quantities, unit prices, and extended totals. Invoices shall be submitted to:

NASA Johnson Space Center
Attn: BH2/Michael D. Ballard
2101 NASA Parkway
Houston, TX 77058-3696

In the event that amounts are withheld from payment in accordance with the New Technology Clause or other provisions of this contract, a separate invoice for the amount withheld will be required before payment for that amount may be made.

(End of Clause)

G.8 ADDITIONAL REQUIREMENTS FOR SUBMISSION OF INVOICES

In addition to clause G.7, invoices for FFP IDIQ Delivery Orders will be submitted upon completion/acceptance of the FFP IDIQ Delivery Order or milestones as specified in the order.

(End of Clause)

G.9 TECHNICAL DIRECTION (NFS 1852.242-70) (SEP 1993) (APPLICABLE TO CPFF ONLY)

(a) Performance of the work under this contract is subject to the written technical direction of the Contracting Officer's Technical Representative (COTR), who shall be specifically appointed by the Contracting Officer in writing in accordance with NASA FAR Supplement 1842.270. "Technical direction" means a directive to the contractor that approves approaches, solutions, designs, or refinements; fills in details or otherwise completes the general description of work or documentation items; shifts emphasis among work areas or tasks; or furnishes similar instruction to the contractor. Technical direction includes requiring studies and pursuit of certain lines of inquiry regarding matters within the general tasks and requirements in Section C of this contract.

(b) The COTR does not have the authority to, and shall not, issue any instruction purporting to be technical direction that--

- (1) Constitutes an assignment of additional work outside the statement of work;
- (2) Constitutes a change as defined in the changes clause;
- (3) Constitutes a basis for any increase or decrease in the total estimated contract cost, the fixed fee (if any), or the time required for contract performance;
- (4) Changes any of the expressed terms, conditions, or specifications of the contract; or
- (5) Interferes with the contractor's rights to perform the terms and conditions of the contract.

(c) All technical direction shall be issued in writing by the COTR.

(d) The contractor shall proceed promptly with the performance of the technical direction duly issued by the COTR in the manner prescribed by this clause and within the COTR's authority. If, in the contractor's opinion, any instruction or direction by the COTR falls within any of the categories defined in paragraph (b) above, the contractor shall not proceed but shall notify the

Contracting Officer in writing within 5 days after receiving it and shall request the Contracting Officer to either issue an appropriate contract modification within a reasonable time or advise the contractor in writing within 30 days that the instruction or direction is--

- (1) Rescinded in its entirety; or
 - (2) Within the requirements of the contract and does not constitute a change under the Changes clause of the contract, and that the contractor should proceed promptly with its performance.
- (e) A failure of the contractor and Contracting Officer to agree that the instruction or direction is both within the requirements of the contract and does not constitute a change under the Changes clause, or a failure to agree upon the contract action to be taken with respect to the instruction or direction, shall be subject to the Disputes clause of this contract.
- (f) Any action(s) taken by the contractor in response to any direction given by any person other than the Contracting Officer or the COTR shall be at the contractor's risk.

(End of Clause)

G.10 IDENTIFICATION OF EMPLOYEES (JSC 52.242-92) (MAR 2002)

At all times while on Government property, the contractor, subcontractors, their employees, and agents shall wear badges which will be issued by the NASA Badging & Visitor Control Office, located in Building 110 at the Johnson Space Center (JSC), or at the Main Gate at the White Sands Test Facility (WSTF). JSC employee badges will be issued only between the hours of 7:30 a.m. to 4 p.m., Monday through Thursday, and 7:30 am to 12:00 pm on Friday. JSC visitor badges will be issued between the hours of 6 a.m. to 10 p.m., 7 days a week. WSTF employee badges will be issued only between the hours of 8 a.m. to 2 p.m., Monday through Friday. WSTF visitor badges will be issued on a 7-day-a-week, 24-hour-a-day basis. Resident aliens and foreign nationals/representatives shall be issued green foreign national badges.

Each individual who wears a badge shall be required to declare citizenship and personally sign for the badge. The contractor shall be held accountable for issued badges and all other related items and must assure that they are returned to the NASA Badging & Visitor Control Offices upon completion of work under the contract in accordance with Security Management Directive (SMD) 500-15, "Security Termination Procedures." Failure to comply with the NASA contractor termination procedures upon completion of the work (e.g., return of badges, decals, keys, CAA cards, clearance terminations, JSC Public Key Infrastructure (PKI)/special program deletions, etc.) may result in final payment being delayed.

(End of Clause)

**G.11 INSTALLATION-ACCOUNTABLE GOVERNMENT PROPERTY
(NFS 1852.245-71) (JUNE 1998) AND ALTERNATE I (MAR 1989)
AS MODIFIED BY JSC VERSION (APR 2003)**

(a) The Government property described in the clause at G.12 (1852.245-77-List of Installation Accountable Property and Services) shall be made available to the contractor on a no-charge basis for use in performance of this contract. This property shall be utilized only within the physical confines of the NASA installation that provided the property. Under this clause, the Government retains accountability for, and title to, the property, and the contractor assumes the following user responsibilities:

The responsibilities of the contractor as contemplated by this clause are defined in the following property management directives and installation supplements to these directives.

- | |
|--|
| <ul style="list-style-type: none">a. NPG 4200.1, NASA Equipment Management Manualb. NPG 4200.2, NASA Equipment Management Procedures and Guidelines for Property Custodiansc. NPG 4300.1, NASA Personal Property Disposal Procedures and Guidelinesd. NPG 4100.1, NASA Materials Inventory Management Manual. JSC will provide the contractor with all applicable regulations, handbooks, and other materials that may be required. |
|--|

(b) The Government property described in the clause at 1852.245-77, List of Installation-Accountable Property and Services, shall be made available to the Contractor on a no-charge basis for use in performance of this contract. This property shall be utilized only within the physical confines of the NASA installation that provided the property. Under this clause, the Government retains accountability for, and title to, the property, and the Contractor assumes the following user responsibilities:

User Responsibilities: Reference Document (NPG 4200.2) - Chapter 2:

- 2.7. Responsibility of the Individual. The contractor shall ensure that each of its employees are responsible for Government property as follows: An employee has a duty to protect and conserve Government property and shall not use such property, or allow its use, for other than authorized purposes. Additional responsibilities include the following:
- 2.7.1. Reporting any missing or un-tagged (meeting the criteria for control) equipment, transfer, location change, or user change of equipment to the property custodian immediately.
 - 2.7.2. Notifying the property custodian, supervisor, and the Center security officer immediately if theft of Government property is suspected.
 - 2.7.3. Ensuring that equipment is used only in pursuit of approved NASA programs and projects.
 - 2.7.4. Notifying the property custodian of equipment not actively being used for determination of proper disposition.
 - 2.7.5. Ensuring that equipment is returned through the property custodian when no longer needed. Under no circumstances will an employee throw away Government equipment.

2.7.6. Assigned users retain all responsibilities including notifying property custodians of all activity associated with the user's assigned equipment.

2.8. The contractor must ensure that all on-site contractor employees notify the contracting officer, property custodian, and SEMO upon termination of employment.

Chapter 4:

4.2.11. The user will assist the custodian in completing NF 1618 and sign in the designated block.

The contractor shall establish and adhere to a system of written procedures for compliance with these user responsibilities.

(c)(1) The official accountable record keeping, physical inventory, financial control, and reporting of the property subject to this clause shall be retained by the Government and accomplished by the installation Supply and Equipment Management Officer (SEMO) and Financial Management Officer. If this contract provides for the contractor to acquire property, title to which will vest in the Government, the following additional procedures apply:

(i) The contractor's purchase order shall require the vendor to deliver the property to the installation central receiving area;

(ii) The contractor shall furnish a copy of each purchase order, prior to delivery by the vendor, to the installation central receiving area:

(iii) The contractor shall establish a record of the property as required by FAR 45.5 and 1845.5 and furnish to the Industrial Property Officer a DD Form 1149 Requisition and Invoice/Shipping Document (or installation equivalent) to transfer accountability to the Government within 5 working days after receipt of the property by the contractor. The contractor is accountable for all contractor-acquired property until the property is transferred to the Government's accountability.

(iv) Contractor use of Government property at an off-site location and off-site subcontractor use require advance approval of the contracting officer and notification of the SEMO. The contractor shall assume accountability and financial reporting responsibility for such property. The contractor shall establish records and property control procedures and maintain the property in accordance with the requirements of FAR Part 45.5 until its return to the installation.

(2) After transfer of accountability to the Government, the contractor shall continue to maintain such internal records as are necessary to execute the user responsibilities identified in paragraph (a) and document the acquisition, billing, and disposition of the property. These records and supporting documentation shall be made available, upon request, to the SEMO and any other authorized representatives of the contracting officer.

(3) The contractor shall not utilize the installation's central receiving facility for receipt of contractor-acquired property. However, the contractor shall provide listings suitable for

establishing accountable records of all such property received, on a quarterly basis, to the Contracting Officer and Supply and Equipment Management Officer.

(End of Clause)

**G.12 LIST OF INSTALLATION-ACCOUNTABLE PROPERTY AND SERVICES
(NFS 1852.245-77) (JULY 1997) AS MODIFIED BY JSC VERSION (APR 2003)**

In accordance with the clause 1852.245-71, Installation - Accountable Government Property the Contractor is authorized use of the types of property and services listed below, to the extent they are available, in the performance of this contract within the physical borders of the installation which may include buildings and space owned or directly leased by NASA in close proximity to the installation, if so designated by the Contracting Officer.

(a) Office space, work area space, and utilities. Government telephones are available for official purposes only; pay telephones are available for contractor employees for unofficial calls.

(b) General - and special-purpose equipment, including office furniture.

(1) Equipment to be made available is listed in Attachment J-6 Table 1 List of Installation Accountable Property and Services. The Government retains accountability for this property under the clause at 1852.245-71, Installation-Accountable Government Property, regardless of its authorized location.

(2) If the contractor acquires property, title to which vests in the Government pursuant to other provisions of this contract, this property also shall become accountable to the Government upon its entry into Government records as required by the clause at 1852.245-71, Installation-Accountable Government Property.

(3) The Contractor shall not bring to the installation for use under this contract any property owned or leased by the Contractor, or other property that the Contractor is accountable for under any other Government contract, without the Contracting Officer's prior written approval.

(c) Publications and blank forms stocked by the installation.

(d) Safety and fire protection for Contractor personnel and facilities.

(e) Installation service facilities:

1. Audiovisual: Presentation services, sound services, Release Print Film Library, Film Repository, and loan of audiovisual equipment.

2. Automatic Data Processing (ADP) Services (onsite only): Generally, this includes access to large general-purpose computer systems, workstations, and the accessing media; i.e., terminals, printers, data communications, and consultation and training in the use of said

systems. Unless otherwise specified in the contract, this does not include providing computer systems or ADP services for the Contractor business management, accounting, and administrative functions.

3. Transportation: Shuttle bus service for Contractor employees within the parameters provided for Government employees.

4. Disposal Services: Disposal services for excess onsite and offsite Contractor-held/Government-owned property.

5. Fabrication Services: Fabrication services such as machining, sheet metal and welding, electronics, metal finishing, model and plastics, and precision cleaning.

6. Photography, Processing, and Closed-Circuit Television: For technical and scientific photography, photographic processing, photographic sciences, and closed-circuit television.

7. Pickup and Delivery of Official Mail: Within the Center and to and from the Albert Thomas Post Office, provided the mail is properly sealed and stamped. Such mail will be picked up or dropped from only one point as designated by JSC or, if preferred, JSC will provide a box in the central mailroom for the Contractor to pick up and deposit its mail.

(f) Medical treatment of a first-aid nature for Contractor personnel injuries or illnesses sustained during on-site duty.

(g) Cafeteria privileges for Contractor employees during normal operating hours.

(h) Building maintenance for facilities occupied by Contractor personnel.

(i) Moving and hauling for office moves, movement of large equipment, and delivery of supplies. Moving services shall be provided on-site, as approved by the Contracting Officer.

(j) The user responsibilities of the Contractor are defined in paragraph (a) of the clause at 1852.245-71, Installation-Accountable Government Property.

(End of Clause)

G.13 FINANCIAL REPORTING OF NASA PROPERTY IN THE CUSTODY OF CONTRACTORS (NFS 1852.245-73) (OCT 2003)

(a) The Contractor shall submit annually a NASA Form (NF) 1018, NASA Property in the Custody of Contractors, in accordance with the provisions of 1845.505-14, the instructions on the form, subpart 1845.71, and any supplemental instructions for the current reporting period issued by NASA.

(b) (1) Subcontractor use of NF 1018 is not required by this clause; however, the Contractor shall include data on property in the possession of subcontractors in the annual NF 1018.

(2) The Contractor shall mail the original signed NF 1018 directly to the cognizant NASA Center Deputy Chief Financial Officer, Finance, unless the Contractor uses the NF 1018 Electronic Submission System (NESS) for report preparation and submission.

(3) One copy shall be submitted (through the Department of Defense (DOD) Property Administrator if contract administration has been delegated to DOD) to the following address: LF631/Property Accounting and JB3/Property Administrator 2101 NASA Parkway Houston TX 77058, unless the Contractor uses the NF 1018 Electronic Submission System (NESS) for report preparation and submission.

(c) (1) The annual reporting period shall be from October 1 of each year through September 30 of the following year. The report shall be submitted in time to be received by October 15. The information contained in these reports is entered into the NASA accounting system to reflect current asset values for agency financial statement purposes. Therefore, it is essential that required reports be received no later than October 15. Some activity may be estimated for the month of September, if necessary, to ensure the NF 1018 is received when due. However, contractors procedures must document the process for developing these estimates based on planned activity such as planned purchases or NASA Form 533 (NF 533 Contractor Financial Management Report) cost estimates. It should be supported and documented by historical experience or other corroborating evidence, and be retained in accordance with FAR Subpart 4.7, Contractor Records Retention. Contractors shall validate the reasonableness of the estimates and associated methodology by comparing them to the actual activity once that data is available, and adjust them accordingly. In addition, differences between the estimated cost and actual cost must be adjusted during the next reporting period. Contractors shall have formal policies and procedures, which address the validation of NF 1018 data, including data from subcontractors, and the identification and timely reporting of errors. The objective of this validation is to ensure that information reported is accurate and in compliance with the NASA FAR Supplement. If errors are discovered on NF 1018 after submission, the contractor shall contact the cognizant NASA Center Industrial Property Officer (IPO) within 30 days after discovery of the error to discuss corrective action.

(2) The Contracting Officer may, in NASA's interest, withhold payment until a reserve not exceeding \$25,000 or 5 percent of the amount of the contract, whichever is less, has been set aside, if the Contractor fails to submit annual NF 1018 reports in accordance with 1845.505-14 and any supplemental instructions for the current reporting period issued by NASA. Such reserve shall be withheld until the Contracting Officer has determined that NASA has received the required reports. The withholding of any amount or the subsequent payment thereof shall not be construed as a waiver of any Government right.

(d) A final report shall be submitted within 30 days after disposition of all property subject to reporting when the contract performance period is complete in accordance with (b)(1) through (3) of this clause.

(End of Clause)

**G.14 LIST OF GOVERNMENT FURNISHED PROPERTY (NFS 1852.245-76)
(OCT 1988)**

For performance of work under this contract, the Government will make available Government property identified below or in Attachment J-6 Table 2 List of Government Furnished Property and Services. The Contractor shall use this property in the performance of this contract at: (to be included in Delivery Orders, if applicable). Under the FAR 52.245 Government property clause of this contract, the Contractor is accountable for the identified property included in List A, List of Property the Contractor Shall Replace and List B, List of Property the Government Will Replace, of Attachment J-6 Table 2 List of Government Furnished Property and Services.

(End of Clause)

G.15 REPAIR OF GOVERNMENT PROPERTY (JSC 52.245-91) (JUNE 1986)

When removal of Government-owned property from its place of use for repair is necessary, the contractor must prepare a JSC Form 1318 prior to removing the equipment. The form and instructions regarding its use are available from the Property and Equipment Branch, Building 419, Room 162, phone number 281-483-6524. The repaired Government property is to be returned to the location from which it was removed unless otherwise directed by the Government.

**(End of Clause)
[END OF SECTION]**

SECTION H – SPECIAL CONTRACT REQUIREMENTS**H.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE**

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

CLAUSE NUMBER	DATE	TITLE
None included by reference		

II. NASA FAR SUPPLEMENT (48 CFR CHAPTER 18) CLAUSES

CLAUSE NUMBER	DATE	TITLE
1852.208-81	OCT 2001	RESTRICTIONS ON PRINTING AND DUPLICATING
1852.223-72	APR 2002	SAFETY AND HEALTH (SHORT FORM)
1852.223-75	FEB 2002	MAJOR BREACH OF SAFETY OR SECURITY ALTERNATE I (MAY 2002)
1852.225-70	FEB 2000	EXPORT LICENSES AND ALTERNATE 1 (FEB 2000) AND PARA (B) [INSERT: "JOHNSON SPACE CENTER"]
1852.228-72	SEP 1993	CROSS-WAIVER OF LIABILITY FOR SPACE SHUTTLE ACTIVITIES
1852.228-76	DEC 1994	CROSS-WAIVER OF LIABILITY FOR SPACE STATION ACTIVITIES
1852.228-78	SEP 1993	CROSS WAIVER OF LIABILITY FOR NASA EXPENDABLE LAUNCH VEHICLE (EVL) LAUNCHES
1852.235-73	FEB 2003	FINAL SCIENTIFIC AND TECHNICAL REPORTS AND ALTERNATES 1 AND 2
1852.244-70	APR 1985	GEOGRAPHIC PARTICIPATION IN THE AEROSPACE PROGRAM
1852.246-70	MAR 1997	MISSION CRITICAL SPACE SYSTEMS PERSONNEL RELIABILITY PROGRAM

III. FULL TEXT CLAUSES**H.2 REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF OFFERORS (JSC 52.209-90) (SEP 1988)**

This contract incorporates Section K, Representations, Certifications, and Other Statements of Offerors, as set forth in the contractor's proposal NNJ04047146R dated July 15, 2004 by reference, with the same force and effect as if it were given in full text.

(End of Clause)

H.3 SMALL BUSINESS SUBCONTRACTING GOALS (JSC 52.219-90) (JAN 2003)

For purposes of this clause, the terms, "HUB Zone Small Business Concern," "Small Disadvantaged Business Concern," "Service-Disabled, Veteran-Owned Small Business Concern," "Veteran-Owned Small Business Concern," "Women-Owned Small Business Concern," and "Historically Black College or University (HBCU)" are defined in paragraph 2.101 of the Federal Acquisition Regulation.

The total small business goal, expressed as a percent of total contract value, is TBD percent, including options. The small business percentage goal of 25% includes the following goals expressed as a percent of total contract value:

Small Disadvantaged Business Concerns	13%
Woman-Owned Small Business Concerns	5%
HUB Zone Small Business Concerns	3%
Veteran-Owned Small Business Concern	3%
Service-Disabled, Veteran-Owned Small Business Concern	3%
HBCU's (includes other minority institutions)	1%

(End of Clause)

H.4 ADDITIONAL EXPORT CONTROL REQUIREMENTS

In addition to the requirements set forth in NFS 1852.225-70 Export Licenses, the Contractor shall perform the following tasks.

The following requirements shall be met by the Contractor and its Subcontractors, respectively, to use Department of Commerce or Department of State export licenses obtained by NASA and to use any NASA export license exceptions or exemptions as they apply to the Programs and Projects of NASA.

For exports (hardware, software, technical data) originating from Houston, Huntsville, AL or Cape Canaveral, FL, submit the equivalent information described below to the Center Export Administrator (CEA) at the geographically closest NASA Space Flight Center (Johnson Space

Center (JSC), Marshall Space Flight Center (MSFC) or Kennedy Space Center (KSC)) according to the policies and procedures of that center. A courtesy copy of equivalent information submitted to MSFC or KSC shall be provided to the JSC CEA's office. The contractor shall review documents for Export Control requirements and label with the definitive classification for the document. Provide copies of shipping documents for shipments made under a NASA Export License, exemption or exception to the appropriate CEA within two weeks after the shipment.

(a) A minimum of 15 working days prior to export, the Contractor or its subcontractors who are exporting on behalf of NASA must obtain approval from the Center Export Administrator's (CEA) office by following an Advance Notification of Shipment (ANS) process.

(b) Before effecting an export on behalf of NASA, the Contractor or its subcontractors shall determine the classification recommendation of the item(s) or document(s) and whether it needs a license. If required, the contractor or its subcontractors shall provide a more technical rationale supporting the classification, if requested by NASA

(c) Formal letter, fax or email is sufficient, addressed to the CEA's office, and must include the details listed below.

- NASA license number (include date of expiration) or license exception/exception.
- Quantity and description as it appears on the applicable license.
- Date of planned shipment (and expected date of return if not a permanent export).
- Origin of shipment (Company and city).
- Destination of shipment (Country, city and company).
- Point of contact (for technical questions – must be a representative of the originating shipper).
- Export Classification Control Number (ECCN) or category under Export Administration Regulations or United States Munitions List regulations.
- Rationale for classification.
- Requirement to export (i.e., MOU, contract number, meeting minutes). You may be asked to provide copy of the requirement.
- Additional information as necessary to clarify the export.

(d) A copy of the completed Pro Forma Invoice (JSC Form 1735) attached to an email is sufficient to meet this requirement as long as all required information above is also included.

(e) After all the information is submitted, the CEA's office will respond to Contractor or its subcontractor within ten working days. Once approved, NASA will provide the destination control statement to use on all export documentation.

Included in the applicable export exceptions, the Contractor or its subcontractors are authorized to export hardware, software or data to ISS International Partner (IP) governmental offices that meet the conditions of license exception GOV (15 CFR 740.11(b)(2)(iii)(A)).

For Verification of End Use, Contractor or its subcontractors shipping on behalf of NASA using a license or license exception or exemption, shall provide a copy of all shipping documentation within two business weeks of the shipment date to the CEA's office.

For temporary exports, Contractor or its subcontractors shipping on behalf of NASA, shall notify the CEA in writing within five business days of the date that the item was actually returned.

The Contractor or its subcontractors shall keep those records required by Department of Commerce and Department of State regulations for all exports and make them available upon request to NASA and its representatives.

These requirements, do not apply to Contractor or subcontractor commercial contract related exports or exports pursuant to Technical Assistance Agreements or other license authorizations received by the Contractor or its subcontractors and for which the Contractor or its subcontractors will be the exporter of record.

The Contractor and its subcontractors shall perform annual self-audits of their export control processes and provide written audit results to the CEA in accordance with the Data Requirements Description (DRD) titled, "Export Control Audit Results" included in this contract.

The Contractor and its subcontractors shall report to the NASA JSC EST, in writing, any potential export issues (including those related to support of sustaining engineering and operations of ISS, Space Shuttle, or other NASA Programs and Projects) that cannot be resolved by the Contractor or its subcontractors, respectively. Such reports and/or notifications of issues and technical tasks should be reported to the NASA JSC EST at least three months in advance of requested action.

Upon discovery of unforeseen adverse export issues, the Contractor shall immediately notify NASA JSC EST by telephone or email of said issue and shall report to the NASA JSC EST, in writing, as the facts become known.

When directed in writing by the Contracting Officer or designated representative, the Contractor, shall export on behalf of NASA, NASA specifically identified technical data, computer software, hardware, or defense services to a named foreign entity or person, in the manner and under the conditions provided for in the direction.

(End of Clause)

H.5 (LIMITED) RELEASE OF CONTRACTOR CONFIDENTIAL BUSINESS INFORMATION (CBI) (JSC 52.227-91) (MAY 2002)

(a) NASA may find it necessary to release information submitted by the Contractor pursuant to the provisions of this contract, to individuals not employed by NASA. Business information that would ordinarily be entitled to confidential treatment may be included in the information released to these individuals. Accordingly, by signature on this contract, the Contractor hereby consents to a limited release of its confidential business information (CBI).

(b) Possible circumstances where the Agency may release the Contractor's CBI include the following:

(1) To other Agency contractors and subcontractors, and their employees tasked with assisting the Agency in handling and processing information and documents in the administration of Agency contracts, such as providing post award audit support and specialized technical support to NASA;

(2) To NASA contractors and subcontractors, and their employees engaged in information systems analysis, development, operation, and maintenance, including performing data processing and management functions for the Agency.

(c) NASA recognizes its obligation to protect the contractor from competitive harm that could result from the release of such information to a competitor. Except where otherwise provided by law, NASA will permit the limited release of CBI under subparagraphs (1) or (2) only pursuant to non-disclosure agreements signed by the assisting contractor or subcontractor, and their individual employees who may require access to the CBI to perform the assisting contract.

(d) NASA's responsibilities under the Freedom of Information Act are not affected by this clause.

(e) The Contractor agrees to include this clause, including this paragraph (e), in all subcontracts at all levels awarded pursuant to this contract that require the furnishing of confidential business information by the subcontractor.

(End of Clause)

H.6 KEY PERSONNEL AND FACILITIES (NASA 1852.235-71) (MARCH 1989)

(a) The personnel and/or facilities listed below (or specified in the contract Schedule) are considered essential to the work being performed under this contract. Before removing, replacing, or diverting any of the listed or specified personnel or facilities, the contractor shall:

(1) notify the Contracting Officer reasonably in advance, and

(2) submit justification (including proposed substitutions) in sufficient detail to permit evaluation of the impact on this contract.

(b) The contractor shall make no diversion without the Contracting Officer's written consent; provided that the Contracting Officer may ratify in writing the proposed change, and that ratification shall constitute the Contracting Officer's consent required by this clause.

(c) The list of personnel and/or facilities (shown below or as specified in the contract Schedule) may, with the consent of the contracting parties, be amended from time to time during the course of the contract to add or delete personnel and/or facilities.

List here the personnel and/or facilities considered essential:

FACILITIES:

1. The University of Alabama at Birmingham
Center for Biophysical Sciences and Engineering (CBSE)
1025 18th Street South / CBSE 100
Birmingham, AL 35204

The CBSE facility listed above is essential in that it provides office space, engineering lab space, flight hardware storage facilities, parts inventory and inspection facilities, a 100k-class clean room, a Coordinate Measuring Machine, a remote operations control center/data warehouse, and the Engineering Computing Service Center (ECSC).

2. The University of Alabama at Birmingham
Research Machine Shop
701 19th Street South / LHRB B4
Birmingham, AL 35294

The Research Machine Shop is essential in that it provides office space, machines, and material storage space for CBSE parts fabrication work.

KEY PERSONNEL:

1. **Program Manager, Mr. Lee Moradi**

The Program Manager is essential in that this position has full responsibility and authority to successfully complete the tasks within the CRAVE Program. This is the principal point of contact with the customer for the duration of the program. The Program Manager directs all activity and is responsible for all aspects of the technical, schedule, and cost performance. Given the potential for multiple and concurrent projects, we expect to identify Project /Delivery Order Managers as necessary, that will report to this position and have responsibility for individual project implementation.

2. **Lead Engineer, Mr. Tom Lewis**

The Lead Engineer is essential to provide technical leadership to the rest of the engineering team on CRAVE. The Lead/Project Engineer supports the Program Manager and is responsible for the technical correctness and performance of all tasks within CRAVE. He provides continuity across concurrent projects, and will manage one of the projects within the CRAVE as the contract grows.

3. **Systems Engineer, Ms. Lisa Smith**

The Systems Engineer is one of the most critical functions within our organization as it relates so vitally to the interface and requirements definition, analysis support, implementation, verification and certification. This position requires considerable experience in this area and established working relationships at JSC, KSC and MSFC that will benefit in the performance of this responsibility.

4. **Safety, Reliability and Maintainability Engineer, Mr. Greg Lang**

The Safety, Reliability and Maintainability Engineer is essential due to the individual's responsibility for phased Payload System Safety Data Packages for flight hardware and flight operations, and system safety

data packages for Ground Support Equipment (GSE) and ground processing operations at KSC. The S&MA function also includes Failure Modes and Effects Analysis (FMEA), development of Critical Items Lists (CILs) and other tasks to ensure that Safety, Reliability, and Maintainability requirements are met in the overall system design and operational scheme in a timely and efficient manner.

5. Quality Assurance and Configuration Manager, Mr. Tom Gallimore

Is responsible for quality assurance and configuration management. This position supports the project manager in day-to-day operations, but reports directly to the Associate Director for Engineering for QA matters.

(End of Clause)

H.7 PROVIDING FACILITY ITEMS (JSC 52.245-97) (FEB 2003)

Include in a contract under which existing facilities will be provided to a contractor. The contracting officer must first document the file with a detailed explanation of the circumstances which make furnishing of facilities in the best interest of the Government (See: NASA Federal Acquisition Regulation (FAR) Supplement 1845.302-1.)

The purpose of this clause is to set forth the parties' intent regarding their respective responsibilities for providing facility items under this contract. The parties accordingly agree as follows:

- (a) "Provide," as used in this clause, has the same meaning as set forth in NASA FAR Supplement 1845.301. "Facilities," as used in this clause, has the same meaning as set forth in FAR 45.301.
- (b) The Government shall provide to the contractor the facilities identified in Attachment J-6, Table 2 Government Furnished Property/Facilities List A, List of Property the Contractor Shall Replace, for use in performance of this contract, only if in the best interest of the Government and if identified on the Delivery Order.
- (c) The contractor shall replace any of the existing facilities identified in (b) above that reach the end of their useful life during the contract period or which are beyond economical maintenance or repair, if the facilities are still needed for contract performance. Such replacements shall be made with contractor-owned facilities and shall not be a direct charge to the contract.
- (d) The contractor shall not acquire facility items for the Government, unless specifically authorized by the contract or consent has been obtained in writing from the contracting officer pursuant to FAR 45.302-1(a). The contractor agrees to provide all facilities necessary for performance of this contract except as provided in (b) above.

(End of Clause)

H.8 SUBCONTRACTING WITH RUSSIAN ENTITIES FOR GOODS OR SERVICES

- (a) The Contractor shall not subcontract with
- (1) the Russian Aviation and Space Agency (Rosaviakosmos),
 - (2) any organization or entity under the jurisdiction or control of Rosaviakosmos, or
 - (3) any other organization, entity, or element of the Government of the Russian Federation.
- (b) "Organization or entity under the jurisdiction or control of Rosaviakosmos" means an organization or entity that
- (1) was made part of the Russian Space Agency upon its establishment on February 25, 1992;
 - (2) was transferred to the Russian Space Agency by decree of the Russian Government on July 25, 1994, or May 12, 1998;
 - (3) was or is transferred to the Russian Aviation and Space Agency or Russian Space Agency by decree of the Russian Government at any other time before, on, or after March 14, 2000; or
 - (4) is a joint stock company in which the Russian Aviation and Space Agency or Russian Space Agency has at any time held controlling interest.
- (c) The Contractor shall obtain the contracting officer's permission to subcontract with any Russian entity or with any other entity performing any part of the contract in the Russian Federation. The Contractor shall support such a request with facts (and, if requested, supporting documentation) sufficient to establish to the contracting officer's satisfaction that the entity with which the Contractor seeks permission to subcontract is not an entity described in paragraphs (a) and (b).
- (d) The contracting officer may direct the Contractor to provide the information required under paragraph (c) for any other prospective or existing subcontract at any tier. The contracting officer may direct the Contractor to terminate for the convenience of the government any subcontract at any tier with an entity described in paragraphs (a) and (b), subject to an equitable adjustment.
- (e) The Contractor shall include the substance of this clause in all its subcontracts, and shall require such inclusion in all other subcontracts of any tier.

(End of Clause)
[END OF SECTION]

PART II - CONTRACT CLAUSES

SECTION I - CONTRACT CLAUSES

I.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE

NOTICE: The following contract clauses pertinent to this section are hereby incorporated by reference:

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

CLAUSE NUMBER	DATE	TITLE
52.202-1	JUL 2004	DEFINITIONS (ALTERNATE I) (MAY 2001)
52.203-3	APR 1984	GRATUITIES
52.203-5	APR 1984	COVENANT AGAINST CONTINGENT FEES
52.203-6	JUL 1995	RESTRICTIONS ON SUB-CONTRACTOR SALES TO THE GOVERNMENT
52.203-7	JUL 1995	ANTI-KICKBACK PROCEDURES
52.203-8	JAN 1997	CANCELLATION, RECISION, AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY
52.203-10	JAN 1997	PRICE OF FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY
52.203-12	JUN 2003	LIMITATION OF PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS
52.204-2	AUG 1996	SECURITY REQUIREMENTS (ALTERNATE I) (APR 1984) {EDUCATIONAL INSTITUTIONS ONLY}
52.204-4	AUG 2000	PRINTED OR COPIED DOUBLE-SIDED ON RECYCLED PAPER
52.204-7	OCT 2003	CENTRAL CONTRACTOR REGISTRATION
52.209-6	JUL 1995	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT
52.211-5	AUG 2000	MATERIAL REQUIREMENTS

Crew, Robotics, and Vehicle Equipment (CRAVE)

CLAUSE NUMBER	DATE	TITLE
52.211-15	SEP 1990	DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS
52.215-2	JUN 1999	AUDIT AND RECORDS – NEGOTIATION (ALTERNATE II) (APR 1998)
52.215-8	OCT 1997	ORDER OF PRECEDENCE – UNIFORM CONTRACT FORMAT
52.215-10	OCT 1997	PRICE REDUCTION FOR DEFECTIVE COST OR PRICING DATA
52.215-12	OCT 1997	SUBCONTRACTOR COST OR PRICING DATA
52.215-14	OCT 1997	INTEGRITY OF UNIT PRICES
52.215-15	DEC 1998	PENSION ADJUSTMENTS AND ASSET REVERSIONS
52.215-18	OCT 1997	REVERSION OF ADJUSTMENT OF PLANS FOR POSTRETIREMENT BENEFITS OTHER THAN PENSIONS
52.215-19	OCT 1997	NOTIFICATION OF OWNERSHIP CHANGES
52.215-21	OCT 1997	REQUIREMENTS FOR COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA
52.216-7	DEC 2002	APPLICABLE TO ONLY IDIQ/CPFF: ALLOWABLE COST AND PAYMENT {FOR EDUCATIONAL INSTITUTIONS ONLY: MODIFY THE CLAUSE BY SUBSTITUTING THE WORDS “SUBPART 31.2” WITH THE WORDS “SUBPART 31.3”} {FOR NON-PROFIT INSTITUTIONS ONLY: MODIFY THE CLAUSE BY SUBSTITUTING THE WORDS “SUBPART 31.2” WITH THE WORDS “SUBPART 31.7”}
52.216-8	MAR 1997	FIXED FEE
52.216-18	OCT 1995	ORDERING
52.216-19	OCT 1995	ORDER LIMITATIONS [INSERT: “\$15,000; \$10,000,000; \$10,000,000; 30; AND 5”]
52.219-8	MAY 2004	UTILIZATION OF SMALL BUSINESS CONCERNS
52.219-9	JAN 2002	SMALL BUSINESS SUBCONTRACTING PLAN (ALTERNATE II) (OCT 2001) {NOT APPLICABLE TO SMALL BUSINESS}
52.219-16	JAN 1999	LIQUIDATED DAMAGES SUBCONTRACTING PLAN

CLAUSE NUMBER	DATE	TITLE
52.219-23	JUN 2003	NOTICE OF PRICE EVALUATION ADJUSTMENT FOR SMALL DISADVANTAGED BUSINESS CONCERNS
52.219-25	OCT 1999	SMALL DISADVANTAGED BUSINESS PARTICIPATION PROGRAM
52.222-1	FEB 1997	DISADVANTAGED STATUS REPORTING NOTICE TO THE GOVERNMENT OF LABOR DISPUTES
52.222-2	JUL 1990	PAYMENT FOR OVERTIME PREMIUMS [PARAGRAPH A: INSERT: \$0]
52.222-3	JUN 2003	CONVICT LABOR
52.222-4	SEP 2000	CONTRACT WORK HOURS AND SAFETY STANDARDS ACT OVERTIME COMPENSATION
52.222-19	JUN 2004	CHILD LABOR-COOPERATION WITH AUTHORITIES AND REMEDIES
52.222-20	DEC 1996	WALSH-HEALEY PUBLIC CONTRACTS ACT
52.222-21	FEB 1999	PROHIBITION OF SEGREGATED FACILITIES
52.222-26	FEB 2002	EQUAL OPPORTUNITY (ALTERNATE 1) (FEB 1999)
52.222-29	JUN 2003	NOTIFICATION OF VISA DENIAL
52.222-35	DEC 2001	EQUAL OPPORTUNITY FOR SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS
52.222-36	JUN 1998	AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES
52.222-37	DEC 2001	EMPLOYMENT REPORTS ON SPECIAL DISABLED VETERANS, VETERANS OF THE VIETNAM ERA, AND OTHER ELIGIBLE VETERANS
52.222-41	MAY 1989	SERVICE CONTRACT ACT OF 1965, AS AMENDED
52.223-5	AUG 2003	POLLUTION PREVENTION AND RIGHT TO KNOW
52.223-6	MAY 2001	DRUG FREE WORKPLACE
52.223-10	AUG 2002	WASTE REDUCTION PROGRAM
52.223-14	AUG 2003	TOXIC CHEMICAL RELEASE REPORTING
52.225-5	JUN 2004	TRADE AGREEMENTS
52.225-8	FEB 2000	DUTY FREE ENTRY
52.225-13	JUN 2003	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES

CLAUSE NUMBER	DATE	TITLE
52.227-1	JUL 1995	AUTHORIZATION AND CONSENT (ALTERNATE I)(APR 1984)
52.227-2	AUG 1996	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT
52.227-11	JUN 1997	PATENT RIGHTS – RETENTION BY THE CONTRACTOR (SHORT FORM) AS MODIFIED BY NFS 1852.227-11
52.227-14	JUN 1987	RIGHTS IN DATA-GENERAL AS MODIFIED BY NFS 1852.227-14 ALTERNATES II AND III (JUN 1987)
52.227-16	JUN 1987	ADDITIONAL DATA REQUIREMENTS
52.228-5	JAN 1997	INSURANCE – WORK ON A GOVERNMENT INSTALLATION
52.228-7	OCT 1988	INSURANCE – LIABILITY TO THIRD PERSONS
52.229-3	APR 2003	FEDERAL, STATE, AND LOCAL TAXES
52.230-2	APR 1998	COST ACCOUNTING STANDARDS {NOT APPLICABLE TO SMALL BUSINESS}
52.230-5	APR 1998	COST ACCOUNTING STANDARD {EDUCATIONAL INSTITUTIONS ONLY}
52.230-6	NOV 1999	ADMINISTRATION OF COST ACCOUNTING STANDARDS
52.232-2	APR 1984	PAYMENTS UNDER FIXED-PRICE RESEARCH AND DEVELOPMENT CONTRACTS APPLICABLE TO ONLY IDIQ/FFP:
52.232-8	FEB 2002	DISCOUNTS FOR PROMPT PAYMENT
52.232-9	APR 1984	LIMITATION ON WITHHOLDING OF PAYMENTS APPLICABLE TO ONLY IDIQ/FFP:
52.232-11	APR 1984	EXTRAS
52.232-23	JAN 1986	ASSIGNMENT OF CLAIMS
52.232-25	OCT 2003	PROMPT PAYMENT (ALTERNATE 1) (FEB 2002)
52.232-34	MAY 1999	PAYMENT BY ELECTRONIC FUNDS TRANSFER – OTHER THAN CENTRAL CONTRACTOR REGISTRATION
52.233-1	JUL 2002	DISPUTES (ALTERNATE I) (DEC 1991)
52.233-3	AUG 1996	PROTEST AFTER AWARD (ALTERNATE I) (JUN 1985)

CLAUSE NUMBER	DATE	TITLE
52.237-2	APR 1984	PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT AND VEGETATION
52.237-3	JAN 1991	CONTINUITY OF SERVICES [90 DAYS]
52.239-1	AUG 1996	PRIVACY OR SECURITY SAFEGUARDS APPLICABLE TO ONLY IDIQ/CPFF:
52.242-1	APR 1984	NOTICE OF INTENT TO DISALLOW COSTS
52.242-2	APR 1991	PRODUCTION PROGRESS REPORTS APPLICABLE TO ONLY IDIQ/CPFF:
52.242-3	MAY 2001	PENALTIES FOR UNALLOWABLE COSTS APPLICABLE TO ONLY IDIQ/CPFF:
52.242-4	JAN 1997	CERTIFICATION OF FINAL INDIRECT COSTS
52.242-13	JUL 1995	BANKRUPTCY
52.243-1	AUG 1987	CHANGES-FIXED-PRICE (ALTERNATE V) (APR 1984)
52.243-2	AUG 1987	CHANGES – COST – REIMBURSEMENT (ALTERNATES II AND V) (APR 1984)
52.244-2	AUG 1998	SUBCONTRACTS (ALTERNATE I) (AUG 1998)
52.244-5	DEC 1996	COMPETITION IN SUBCONTRACTING
52.244-6	MAY 2004	SUBCONTRACTS FOR COMMERCIAL ITEMS
52.245-2	MAY 2004	GOVERNMENT PROPERTY (FIXED PRICE CONTRACTS) (ALTERNATE II) (APR 1984)
52.245-5	MAY 2004	GOVERNMENT PROPERTY ALT 1 (JUN 2004) (COST REIMBURSEMENT, TIME AND TIME AND MATERIAL OR LABOR HOUR CONTRACTS) (DEVIATION - AS MODIFIED BY NASA PIC 99-15)
52.245-17	MAY 2004	SPECIAL TOOLING { APPLICABLE ONLY TO FIXED PRICED DELIVERY ORDERS }
52.245-18	FEB 1993	REQUEST FOR SPECIAL TEST EQUIPMENT
52.246-24	FEB 1997	LIMITATION OF LIABILITY – HIGH VALUE ITEMS
52.246-25	FEB 1997	LIMITATION OF LIABILITY – SERVICES
52.247-1	APR 1984	COMMERCIAL BILL OF LADING NOTATIONS
52.247-63	JUN 2003	PREFERENCE FOR U.S. FLAG AIR CARRIER
52.247-64	APR 2003	PREFERENCE FOR PRIVATELY OWNED U.S. FLAG COMMERCIAL VESSELS
52.247-67	JUN 1997	SUBMISSION OF COMMERCIAL TRANSPORTATION BILL TO THE GENERAL SERVICES ADMINISTRATION FOR AUDITS
52.248-1	FEB 2000	VALUE ENGINEERING

Crew, Robotics, and Vehicle Equipment (CRAVE)

CLAUSE NUMBER	DATE	TITLE
52.249-2	MAY 2004	APPLICABLE TO ONLY IDIQ FFP: TERMINATION FOR THE CONVENIENCE OF THE GOVERNMENT (FIXED-PRICE) {NOT APPLICABLE TO NON-PROFIT ORGANIZATIONS OR EDUCATIONAL INSTITUTIONS ON A NO-FEE BASIS}
52.249-5	SEP 1996	TERMINATION FOR THE CONVENIENCE OF THE GOVERNMENT (EDUCATIONAL AND OTHER NONPROFIT INSTITUTIONS) – {ON A NO-FEE BASIS}
52.249-6	MAY 2004	TERMINATION (COST REIMBURSEMENT) {NOT APPLICABLE TO EDUCATIONAL AND OTHER NONPROFIT INSTITUTIONS ON A NO-FEE BASIS}
52.249-8	APR 1984	APPLICABLE TO ONLY IDIQ FFP: DEFAULT (FIXED PRICE SUPPLY AND SERVICE)
52.249-14	APR 1984	APPLICABLE TO ONLY IDIQ/CPFF: EXCUSABLE DELAYS
52.251-1	APR 1984	GOVERNMENT SUPPLY SOURCES
52.253-1	JAN 1991	COMPUTER GENERATED FORMS

II. NASA FAR SUPPLEMENT (48 CFR CHAPTER 18) CLAUSES

CLAUSE NUMBER	DATE	TITLE
1852.203-70	JUN 2001	DISPLAY OF INSPECTOR GENERAL HOTLINE POSTERS
1852.216-89	JUL 1997	ASSIGNMENT AND RELEASE FORMS
1852.219-74	SEP 1990	USE OF RURAL AREA SMALL BUSINESS
1852.219-75	MAY 1999	SMALL BUSINESS SUBCONTRACT REPORTING{NOT APPLICABLE TO SMALL BUSINESS OR NON-PROFIT}
1852.219-76	JUL 1997	NASA 8 PERCENT GOAL
1852.219-77	MAY 1999	NASA MENTOR-PROTÉGÉ PROGRAM
1852.219-79	MAR 1999	MENTOR REQUIREMENTS AND EVALUATION
1852.223-74	MAR 1996	DRUG-AND-ALCOHOL-FREE WORKPLACE
1852.228-75	OCT 1988	MINIMUM INSURANCE COVERAGE
1852.228-80	SEP 2000	INSURANCE – IMMUNITY FROM TORT LIABILITY
1852.235-70	FEB 2003	CENTER FOR AEROSPACE INFORMATION
1852.237-70	DEC 1988	EMERGENCY EVACUATION PROCEDURES
1852.242-78	APR 2001	EMERGENCY MEDICAL SERVICES AND EVACUATION
1852.243-70	OCT 2001	ENGINEERING CHANGE PROPOSALS (ALTERNATE II) (SEP 1990)
1852.243-71	MAR 1997	SHARED SAVINGS

I.2 APPROVAL OF CONTRACT (FAR 52.204-1) (DEC 1989)

This contract is subject to the written approval of the Procurement Officer for the NASA Johnson Space Center and shall not be binding until so approved.

(End of Clause)

I.3 CLAUSES INCORPORATED BY REFERENCE (FAR 52.252-2) (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this/these address(es):

_____ <http://www.acqnet.gov/far/> _____
_____ <http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm> _____

(End of Clause)

I.4 AUTHORIZED DEVIATIONS IN CLAUSES (FAR 52.252-6) (APR 1984)

The use in this solicitation or contract of any Federal Acquisition Regulation (48 CFR Chapter 1) clause with an authorized deviation is indicated by the addition of “(DEVIATION)” after the date of the clause.

The use in this solicitation or contract of any NASA FAR Supplement Regulation (48 CFR 18) clause with an authorized deviation is indicated by the addition of “(DEVIATION)” after the name of the regulation.

(End of Clause)

I.5 SECURITY CLASSIFICATION REQUIREMENTS (NFS 1852.204-75) (SEP 1989)

Performance under this contract will involve access to and/or generation of classified information, work in a security area, or both, up to the level of confidential. See Federal Acquisition Regulation clause 52.204-2 in this contract and DD Form 254, Contract Security Classification Specification.

(End of Clause)

1.6 SECURITY REQUIREMENTS FOR UNCLASSIFIED INFORMATION TECHNOLOGY RESOURCES (NFS 1852.204-76) (JUL 2002)

(a) The contractor shall be responsible for Information Technology security for all systems connected to a NASA network or operated by the contractor for NASA, regardless of location.

This clause is applicable to all or any part of the contract that includes information technology resources or services in which the contractor must have physical or electronic access to NASA’s sensitive information contained in unclassified systems that directly support the mission of the Agency. This includes information technology, hardware, software, and the management, operation, maintenance, programming, and system

administration of computer systems, networks, and telecommunications systems. Examples of tasks that require security provisions include:

- (1) Computer control of spacecraft, satellites, or aircraft or their payloads;
- (2) Acquisition, transmission or analysis of data owned by NASA with significant replacement cost should the contractor's copy be corrupted; and
- (3) Access to NASA networks or computers at a level beyond that granted the general public; e.g., bypassing a firewall.

(b) The contractor shall provide, implement, and maintain an IT Security Plan. This plan shall describe the processes and procedures that will be followed to ensure appropriate security of IT resources that are developed, processed, or used under this contract. The plan shall describe those parts of the contract to which this clause applies. The contractor's IT Security Plan shall be compliant with Federal laws that include, but are not limited to, the Computer Security Act of 1987 (40 U.S.C. 1441 et seq.) and the Government Information Security Reform Act of 2000. The plan shall meet IT security requirements in accordance with Federal and NASA policies and procedures that include, but are not limited to:

- (1) OMB Circular A-130, Management of Federal Information Resources, Appendix III, Security of Federal Automated Information Resources;
- (2) NASA Procedures and Guidelines (NPG) 2810.1, Security of Information Technology; and
- (3) Chapter 3 of NPG 1620.1, NASA Security Procedures and Guidelines.

(c) Within the 30 days after contract award, as specified in DRD titled, "Information Technology Security Plan," the contractor shall submit for NASA approval an IT Security Plan. This plan must be consistent with and further detail the approach contained in the offeror's proposal or sealed bid that resulted in the award of this contract and in compliance with the requirements stated in this clause. The plan, as approved by the Contracting Officer, shall be incorporated into the contract as a compliance document.

(d) (1) Contractor personnel requiring privileged access or limited privileged access to systems operated by the contractor for NASA or interconnected to a NASA network shall be screened at an appropriate level in accordance with NPG 2810.1, Section 4.5; NPG 1620.1, Chapter 3; and paragraph (d)(2) of this clause. Those contractor personnel with non-privileged access do not require personnel screening. NASA shall provide screening using standard personnel screening National Agency Check (NAC) forms listed in paragraph (d)(3) of this clause, unless contractor screening in accordance with paragraph (d)(4) is approved. The contractor shall submit the required forms to the NASA Center

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Chief of Security (CCS) within fourteen (14) days after contract award or assignment of an individual to a position requiring screening. The forms may be obtained from the CCS. At the option of the government, interim access may be granted pending completion of the NAC.

- (2) Guidance for selecting the appropriate level of screening is based on the risk of adverse impact to NASA missions. NASA defines three levels of risk for which screening is required (IT-1 has the highest level of risk):
- (i) **IT-1** -- Individuals having privileged access or limited privileged access to systems whose misuse can cause very serious adverse impact to NASA missions. These systems include, for example, those that can transmit commands directly modifying the behavior of spacecraft, satellites or aircraft.
 - (ii) **IT-2** -- Individuals having privileged access or limited privileged access to systems whose misuse can cause serious adverse impact to NASA missions. These systems include, for example, those that can transmit commands directly modifying the behavior of payloads on spacecraft, satellites or aircraft; and those that contain the primary copy of "level 1" data whose cost to replace exceeds one million dollars.
 - (iii) **IT-3** -- Individuals having privileged access or limited privileged access to systems whose misuse can cause significant adverse impact to NASA missions. These systems include, for example, those that interconnect with a NASA network in a way that exceeds access by the general public, such as bypassing firewalls; and systems operated by the contractor for NASA whose function or data has substantial cost to replace, even if these systems are not interconnected with a NASA network.
- (3) Screening for individuals shall employ forms appropriate for the level of risk as follows:
- (i) IT-1: Fingerprint Card (FC) 258 and Standard Form (SF) 85P, Questionnaire for Public Trust Positions;
 - (ii) IT-2: FC 258 and SF 85, Questionnaire for Non-Sensitive Positions; and
 - (iii) IT-3: NASA Form 531, Name Check, and FC 258.
- (4) The Contracting Officer may allow the contractor to conduct its own screening of individuals requiring privileged access or limited privileged access provided the contractor can demonstrate that the procedures used by the contractor are equivalent to NASA's personnel screening procedures. As used here, equivalent includes a check for criminal history, as would be conducted by NASA, and completion of a questionnaire covering the same information as would be required by NASA.

(5) Screening of contractor personnel may be waived by the Contracting Officer for those individuals who have proof of –

- (i) Current or recent national security clearances (within last three years);
- (ii) Screening conducted by NASA within last three years; or
- (iii) Screening conducted by the contractor, within last three years, that is equivalent to the NASA personnel screening procedures as approved by the Contracting Officer under paragraph (d)(4) of this clause.

(e) The contractor shall ensure that its employees, in performance of the contract, receive annual IT security training in NASA IT Security policies, procedures, computer ethics, and best practices in accordance with NPG 2810.1, Section 4.3 requirements. The contractor may use web-based training available from NASA to meet this requirement.

(f) The contractor shall afford NASA, including the Office of Inspector General, access to the contractor's and subcontractors' facilities, installations, operations, documentation, databases and personnel used in performance of the contract. Access shall be provided to the extent required to carry out a program of IT inspection, investigation and audit to safeguard against threats and hazards to the integrity, availability and confidentiality of NASA data or to the function of computer systems operated on behalf of NASA, and to preserve evidence of computer crime.

(g) The contractor shall incorporate the substance of this clause in all subcontracts that meet the conditions in paragraph (a) of this clause.

(End of Clause)

I.7 STATEMENT OF EQUIVALENT RATES FOR FEDERAL HIRES
(FAR 52.222-42) (MAY 1989)

In compliance with the Service Contract Act of 1965, as amended, and the regulations of the Secretary of Labor (29 CFR part 4), this clause identifies the classes of service employees expected to be employed under the contract and states the wages and fringe benefits payable to each if they were employed by the contracting agency subject to the provisions of 5 U.S.C. 5341 or 5332. This Statement is for Information Only. It is not a Wage Determination.

STANDARD FORM 98a February 1973 U S DEPARTMENT OF LABOR Employment Standards Administration	NOTICE OF INTENTION TO MAKE A SERVICE CONTRACT AND RESPONSE TO NOTICE (Attachment A)		11 Notice No NASA 15026 MOU
12 CLASSES OF SERVICE EMPLOYEES TO BE EMPLOYED ON CONTRACT	13 NUMBER OF EMPLOYEES IN EACH CLASS	14 HOURLY WAGE RATE THAT WOULD BE PAID IF FEDERALLY EMPLOYED	
Drafter, I	1	GS-3 \$11.31	
Drafter, II	1	GS-4 \$12 70	
Drafter, III	1	GS-5 \$14.21	
Drafter, IV	1	GS-7 \$17.60	
Machine-Tool Operator	1	WG-9 \$20.18	
Engineering Technician, I	1	GS-3 \$11 31	
Engineering Technician, II	1	GS-4 \$12.70	
Engineering Technician, III	1	GS-5 \$14.21	
Engineering Technician, IV	1	GS-7 \$17 60	
Engineering Technician, V	1	GS-9 \$21 52	
Engineering Technician, VI	1	GS-11 \$26.04	
Tool and Die Maker	1	WG-13 \$24.02	
Sewing Machine Operator	1	WG-6 \$16.40	
Fabric Worker	1	WG-7 \$17.74	
Welder	1	WG-10 \$21 21	
Sheet-Metal Worker	1	WG-10 \$21.21	
General Clerk, I	1	GS-1 \$9 22	
General Clerk, II	1	GS-2 \$10.37	
General Clerk, III	1	GS-3 \$11.31	
General Clerk, IV	1	GS-4 \$12 70	

(End of Clause)

I.8 OMBUDSMAN (NFS 1852.215-84) AND (ALTERNATE I) (JUN 2000)

(a) An ombudsman has been appointed to hear and facilitate the resolution of concerns from offerors, potential offerors, and contractors during the preaward and postaward phases of this acquisition. When requested, the ombudsman will maintain strict confidentiality as to the source of the concern. The existence of the ombudsman is not to diminish the authority of the contracting officer, the Source Evaluation Board, or the selection official. Further, the ombudsman does not participate in the evaluation of proposals, the source selection process, or the adjudication of formal contract disputes. Therefore, before consulting with an ombudsman, interested parties must first address their concerns, issues, disagreements, and/or recommendations to the Contracting Officer for resolution.

- (b) If resolution cannot be made by the Contracting Officer, interested parties may contact the installation ombudsman,

Randy K. Gish
2101 NASA Parkway
Houston, TX 77058
Phone: 281-483-0490
FAX: 281-483-2200
randy.k.gish@nasa.gov

Concerns, issues, disagreements, and recommendations, which cannot be resolved at the installation may be referred to the NASA ombudsman, James A. Balinkas, the Director of the Contract Management Division, at 202-385-0445, facsimile 202-358-3083, e-mail james.a.balinskas@nasa.gov. Please do not contact the ombudsman to request copies of the solicitation, verify offer due date, or clarify technical requirements. Such inquiries shall be directed to the Contracting Officer or as specified elsewhere in this document.

- (c) If this is a task or delivery order contract, the ombudsman shall review complaints from contractors and ensure they are afforded a fair opportunity to be considered, consistent with the procedures of the contract.

(End of Clause)

I.9 INFORMATION INCIDENTAL TO CONTRACT ADMINISTRATION

(a) With the exception of financial information, the Government shall have unlimited rights to use and distribute to third parties any administrative or management information developed by the contractor or a subcontractor at any tier in whole or in part for the performance of the contract or first produced in the performance of the contract, whether or not said information is specified as a contract deliverable, if created in whole or in part at Government expense. The Contracting Officer may, at any time during the contract performance or within a period 3 years after acceptance of all items to be delivered under this contract, order any administrative or management information developed by the **contractor or a subcontractor at any tier in whole or in part for the performance of the contract or first produced in the performance of the contract.**

(b) The Contracting Officer may release the contractor from the requirements of this clause for specifically identified information at any time during the 3-year period set forth in paragraph A of this clause.

(End of Clause)

I.10 TECHNICAL INFORMATION RELEASES AND PUBLICATIONS

As authorized by paragraph (d)(1) of the Rights in Data-General Clause (FAR 52.227-14) of this contract, the following exception shall apply:

During the performance of this contract, if data relating to this contract is planned for use in oral or written presentations, professional meetings, seminars, or in articles to be published in professional, scientific, and technical journals and similar media, the contractor shall assure that an advance information copy of the presentation or article is sent to the COTR to have the benefit of advance information concerning accomplishments of interest to provide an opportunity to make suggestions to the contractor concerning revisions, if it is considered that such comments might be useful to the contractor to help assure the technical accuracy of the information to be presented or published. The information copy will be forwarded to the COTR of the contract at least four weeks in advance of the date the author intends to give the presentation or submit the article for publication.

The advance information copy may be submitted in the format or medium, which will be utilized in its ultimate release.

(End of Clause)

I.11 DATA RIGHTS NOTICE

(a) Any proposal submitted during the course of contract performance must expressly identify any computer software or technical data that is to be provided with less than unlimited data rights. The contractor shall notify the Contracting Officer in writing prior to incorporating any item, component, subcomponent, process, or software, wherein the related technical data or computer software qualifies as limited rights data or restricted computer software in accordance with Alternate II and III of FAR 52.227-14 and NFS 1852.227-86. This notification does not apply to commercial off-the-shelf (shrink-wrapped) computer software, and corresponding documentation, that has a standard commercial license unless the software is to be incorporated as a subcomponent in a developmental effort.

(b) Technical data and computer software delivered shall not be marked with restrictive legends unless the Contracting Officer has given prior written consent.

(c) All license agreements shall be compliant with Federal laws, regulations and the terms and conditions of this contract and shall be transferable to the government upon completion of the contract without additional cost to the Government. One copy of the final negotiated license agreement shall be forwarded to the Contracting Officer within 30 days of agreement to ensure compliance.

(End of Clause)

I.12 SPECIAL PROVISION FOR CONTINGENT REPROCUREMENT RIGHTS

(a) Because of the long life of the Space Shuttle and Space Station Programs, and in order to preclude problems in the event the contractor at some point becomes no longer

able or willing to supply the hardware required to be delivered under this contract, the contractor shall deliver to the Government a complete data package sufficient in technical detail to enable a responsible third party to manufacture the hardware. This data shall be delivered as part of the Critical Design Review Package, as specified in DRD titled, "Critical Design Review Data Package."

(b) To the extent that any such data qualifying as proprietary (limited rights data and/or restricted computer software), and contingent upon 1) the Government's exercise of one, or both, hardware production options, and 2) the contractor's inability or unwillingness to supply the Government's additional requirements for the hardware at any time in the future, the Government shall then have the additional right to use such data for purposes of manufacture (or rehabilitation, repair, etc.) and to release it to a third party for such purposes.

(c) Until such time as the events described in paragraph (b) occur, any data which should be included in the CDR package but which is proprietary, shall be included in a supplemental package to be retained by the contractor's facility in order for the Government to review the data and ensure that it is complete and sufficient in technical detail. In addition, periodic reviews may be requested by the Government at the contractor's facility. The contractor will automatically notify the Government when any changes are made to procedures, processes, materials, etc., which affect the proprietary data contained in the supplemental package in order that any necessary reviews may be conducted. The Government shall not have the right to remove or obtain such copies in the course of conducting such reviews. Only Government personnel will be permitted to review the supplemental package.

(d) If the events in paragraph (b) occur, in accordance with paragraph (g)(2) (vi) of the clause at 52.227-14, Rights in Data—General (JUN 1987) and its Alternates and as modified by 18-52.227-14 NASA FAR Supplement, the Government will notify the contractor in writing of its intent to exercise its contingent reprourement rights, if the Government reasonably determines that the Contractor is no longer capable of supplying, or no longer willing to supply the Government's additional requirements for hardware, parts, maintenance, rehabilitation, or the like.

(e) The Contractor shall incorporate, and require its subcontractors at all tiers to incorporate, this clause in all subcontracts. It is the contractor's responsibility to ensure that this clause is enforceable at all subcontract levels.

(End of Clause)

I.13 LIMITED RIGHTS DATA NOTICE

(a) Notwithstanding any other terms and conditions of this contract, the Government shall have the right to disclose technical data marked as limited rights data outside of the Government, without obtaining permission from the contractor, under the following circumstances:

- (1) Use (except for manufacture) by support service contractors.
 - (2) Evaluation by non-government evaluators.
 - (3) Use (except for manufacture) by other contractors participating in the Government's program of which the specific contract is a part, for information and use in connection with the work performed under each contract.
 - (4) Emergency repair or overhaul work.
 - (5) Release to a foreign government, or instrumentality thereof, as the interests of the United States Government may require, for information or evaluation, or emergency repair or overhaul work by such government.
- (b) Prior to disclosure, except in emergency circumstances as identified in paragraphs 4 and 5 above, the Government shall require the recipient to sign an agreement, provided by and acceptable to the contractor, to protect the data from unauthorized use and disclosure. The contractor shall provide a copy of the acceptable nondisclosure agreement to the Contracting Officer no later than 30 days after contract award.

(End of Clause)

I.14 INDEFINITE QUANTITY (52.216-22) (OCT 1995)

- (a) This is an indefinite-quantity contract for the supplies and services specified, and effective for the period stated in the contract. The quantities of supplies and services specified in the contract are estimates only and are not purchased by this contract.
- (b) Delivery or performance shall be made only as authorized by orders issued in accordance with the Ordering clause. The Contractor shall furnish to the Government, when and if ordered, the supplies or services specified in the contract up to and including the maximum designated in the contract.
- (c) Except for any limitations on quantities in the Order of Limitation clause, there is no limit on the number of orders requiring delivery to multiple destinations or performance at multiple locations.
- (d) An order issued during the effective period of this contract and not completed within that period shall be completed by the Contractor within the time specified in the order. The contract shall govern the Contractor's and Government's rights and obligations with respect to that order to the same extent as if the order were completed during the Contract's effective period; provided, that the Contractor shall not be required to make any deliveries under this contract after 12 months from the completion date of the contract.

(End of Clause)

I.15 SUBCONTRACTS FOR COMMERCIAL ITEMS (52.244-6) (APR 2003)

- (a) *Definitions* As used in this clause-
"Commercial item" has the meaning contained in the clause at 52.202-1, Definitions.
"Subcontract" includes a transfer of commercial items between divisions, subsidiaries, or affiliates of the Contractor or subcontractor at any tier.
- (b) To the maximum extent practicable, the Contractor shall incorporate, and require its subcontractors at all tiers to incorporate, commercial items or nondevelopmental items as components of items to be supplied under this contract.
- (c)(1) The Contractor shall insert the following clauses in subcontracts for commercial items:
- (i) 52.219-8, Utilization of Small Business Concerns (Oct 2000) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds \$500,000 (\$1,000,000 for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.
 - (ii) 52.222-26, Equal Opportunity (Apr 2002) (E.O. 11246).
 - (iii) 52.222-35, Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (Dec 2001) (38 U.S.C. 4212(a));
 - (iv) 52.222-36, Affirmative Action for Workers with Disabilities (June 1998) (29 U.S.C. 793).
 - (v) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (Apr 2003) (46 U.S.C. Appx 1241 and 10 U.S.C. 2631) (flow down required in accordance with paragraph (d) of FAR clause 52.247-64).
- (2) While not required, the Contractor may flow down to subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.
- (d) The Contractor shall include the terms of this clause, including this paragraph (d), in subcontracts awarded under this contract.

(End of Clause)

I.16 TITLE TO EQUIPMENT (1852.245-75) (MAR 1989)

- (a) In accordance with the FAR 52.245 Government property clause of this contract, title to equipment and other tangible personal property acquired by the Contractor with funds

provided Government property clause of this contract, title to equipment and other tangible personal property acquired by the Contractor with funds provided for conducting research under this contract and having an acquisition cost less than \$ 5,000 shall vest in the Contractor upon acquisition, provided that the Contractor has complied with the requirements of the FAR 52.245 Government property clause.

(b) Upon completion or termination of this contract, the Contractor shall submit to the Contracting Officer a list of all equipment with an acquisition cost of \$ 5,000 or more acquired under the contract during the contract period. The list shall include a description, manufacturer and model number, date acquired, cost, and condition information, and shall be submitted within 30 calendar days after completion or termination of the contract, in accordance with Federal Acquisition Regulation subsection 45.606-5.

(c) Title to the property specified in paragraph (b) of this clause vests in the Contractor, but the Government retains the right to direct transfer of title to property specified in paragraph (b) of this clause to the Government or to a third party within 180 calendar days after completion or termination of the contract. Such transfer shall not be the basis for any claim by the Contractor.

(d) Title to all Government-furnished property remains vested with the Government (see the FAR 52.245 Government property clause).

(e) Title to the contractor-acquired property listed below shall vest with the Government.

None

(End of Clause)

I.17 LIMITATIONS ON SUBCONTRACTING

(a) By submission of an offer and execution of a contract, the offeror/contractor agrees that in performance of the contract in the case of a contract for-

(1) Services- At least 51 percent of the cost of performance incurred for personnel shall be expended for employees of the contractor.

(2) Supplies- (other than procurement from a nonmanufacturer of such supplies)- The contractor shall perform work for at least 51 percent of the cost of manufacturing the supplies, not including the cost of materials.

(End of Clause)

[END OF SECTION]

SECTION J – LIST OF ATTACHMENTS

- J-1 Data Requirements List & Data Requirement Descriptions**
- J-2 Acronym List**
- J-3 DOL Wage Determination**
- J-4 IT Security Plan (after issuance of first DO)**
- J-5 Small Business Plan**
- J-6 Table 1 - List of Installation-Accountable Property and Services
Table 2 – Government Furnished Property/Facilities**
- J-7 Government Property Plan**
- J-8 Flight GFE Configuration Management Plan**
- J-9 Reliability and Maintainability Plan**
- J-10 System Safety Plan**
- J-11 Quality Plan**
- J-12 Applicable Documents**
- J-13 Total Compensation Plan**

Attachment J-1

Data Requirements List & Data Requirements Descriptions

DATA REQUIREMENTS LIST (DRL) AND DATA REQUIREMENTS DESCRIPTIONS

The following pages set out the documentation requirements of this contract, starting with a DRL, which is an index to the DRDs. Each DRD prescribes the required data product content, schedule, type, and other particulars for specific data submission requirements.

Subject to the Clause 52.227-14, Rights in Data - General, this document sets forth the data requirements in each Data Requirements Description (DRD) and shall govern that data required for this contract. The contractor shall furnish data defined by the DRD's listed on the Data Requirements List (DRL) by category of data. Such data shall be prepared, maintained, and delivered to NASA in accordance with the requirements set forth within this document. 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 this document, per FAR 52.215.33. NASA-Owned/Contractor-Held records shall be managed by the Contractor in accordance with Title 36 of the code of Federal Regulations, Chapter XII B, Records Management, and NMI 1440.6, NASA Records Management Program. The records shall be organized in accordance with the instructions in NHB 1442.1, NASA Uniform Files index, as applicable. The contractor shall disposition records and non-records in accordance with NHB 1441.1, NASA Retention Schedules, which has been approved by NASA and the National Archives and Records Administration (NARA). All questions on records management issues shall be directed through the Contracting Officer to the JSC Records Management Officer.

Documents included as applicable documents in the data requirements form a part of this document to the extent specified herein. References to documents other than applicable documents in the data requirements of this document 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.

DESCRIPTION

This document identifies and defines the requirements and data types for information and data required under this contract.

The Data Requirement Descriptions (DRDs), along with the Data Requirements List (DRL), define, by an individual Data Requirement, the information and data required for each deliverable document.

The data types are used to identify the approval and control required for each DRD. The Data Requirements List (DRL) is an index of all the DRDs by category and includes additional requirements for each DRD and the data types, as described below

Documentation submitted pursuant to this clause may incorporate references to other current approved documentation, provided the references are adequate and include such identification elements as title, document number, and approval date (where applicable). However, if the pertinent information is of relatively minor size, the contractor shall incorporate the information itself, in lieu of using a reference. The contractor shall assure that any referenced information is readily available to appropriate users of the submitted document.

DATA TYPES

For the purpose of this clause, the following information/documentation types are applicable:

Type 1 (written approval)- That information and documentation which requires NASA approval prior to release. Approved type 1 information and documentation shall be controlled, and deviations from or changes to the concepts, techniques, and/or requirements stated therein shall require NASA approval prior to implementation. All work under this contract covered by approved type 1 documents shall be performed in accordance with those approved documents. The Contracting Officers Technical Representative will have approval authority and will sign the data prior to its release. Contractually binding documents will not be implemented nor revised without contractual authorization.

Type 2 (mandatory submittal)- That information and documentation for which NASA reserves a time-limited right to disapprove, in whole or in part. Type 2 data shall be submitted to JSC for review not less than 30 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 received any comment prior to the released target date, the document may be released for appropriate use. Any NASA comment received shall be appropriately dispositioned before the document is to be used. Type 2 data may be approved by NASA prior to its submittal.

Type 3 (submittal upon request)- That information and documentation which is provided to NASA for surveillance, information, review, and/or management control. This information does not require formal NASA review and approval. Information in this category would include design solutions, status, and cost/schedule reporting; analyses and test results, handbooks; and other designated lists, reports, etc.

Type 1 submissions shall be marked "TYPE 1 PRELIMINARY pending NASA approval or Type I APPROVED BY NASA, as appropriate." Additional special designations and deviations may be required on specific submissions in accordance with configuration management requirements.

Type 2 submissions shall be marked "TYPE 2 PRELIMINARY - RELEASE TARGET DATE, xx/xx/xx" or "TYPE 2 FINAL - NASA COMMENTS INCLUDED" or "TYPE 2 FINAL DOCUMENT," where NASA comments were not received.

NOTE: Documents submitted under this clause, even though directly (Type 1) or implicitly (Type 2) approved by NASA, shall not take precedence over the specifications as set out in Section C, Statement of Work.

The contractor shall normally deliver a complete revised Type 1 or Type 2 data requirement with NASA comments incorporated within 45 days of receipt of comments.

Type 3 submissions shall be marked "TYPE 3 DOCUMENT - FOR INFORMATION, SURVEILLANCE, REVIEW OR MANAGEMENT CONTROL".

NUMBER OF COPIES AND DISTRIBUTION REQUIREMENTS

The contractor shall provide one copy of each DRD to the standard distribution list shown in Block 8 of the DRLs. Additional distribution shall be made as directed, in writing, by the Contracting Officer. The number of copies required will not exceed the limits set forth in Clause 1852.208-81, Restrictions on Printing and Duplicating, without prior Contracting Officer approval. Data Transmittal Forms will be used to confirm delivery of electronically resident DR deliverables.

ELECTRONIC FORMAT

All the data requirements shall be delivered in the format as depicted in each DRD and compatible with JSC software loads. All documentation shall be maintained within the Engineering Directorate's Design Data Management System (DDMS).

DRDs shall be maintained electronically.

FURTHER EXPLANATION OF DRL

Block 3 – Frequency of submittal.

Code Description

AD As Directed
AN Annually
AR As Required
BE Biannually
BM Bimonthly
BW Biweekly

Code Description

DA Daily
DD Deferred Delivery
MO Monthly
OT One Time
PV Per Vehicle
QU Quarterly

Code Description

RD As Released
RT One Time Revisions
SA Semi Annually
TY Three Per Year
UR Upon Request
WK Weekly

Block 4 – As of Date- If reports are of a recurring nature an as of date will be included in this block.

Block 6 – Copies –

Code Description

E Electronic
CD Compact Disk
HC Hard Copy

Special note regarding document titles:

Any reference to “NPG” is synonymous with “NPR”.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

a. Title of Contract, Project, SOW, etc. CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)				b. Contract/RFP No. NNJ04HH96B		c. DRL Date/Mod Date	
1. Line Item 1	2. DRD Title Flight GFE Configuration Management Plan	3. Frequency OT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD	6b. Number 3
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input checked="" type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy on CD NT3/Government Furnished Equipment Branch 1 electronic copy on CD Contracting Officer's Technical Representative 1 electronic copy on CD		9. Remarks Block 5. To be delivered with the proposal Block 6. 3 electronic copies stored on CD are permanent record					
1. Line Item 2	2. DRD Title Delivery Order Status Report/Summary Review	3. Frequency MO	4. As-of-Date	5. 1st subm. date 1st period after start	6. Copies	6a. Type E	6b. Number 3
7. Data Type: <input type="checkbox"/> (1) Written approval <input checked="" type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy by e-mail NT3 Government Furnished Equipment Branch 1 electronic copy by e-mail COTR 1 hard copy and 1 electronic copy by e-mail Contracting Officer 1 hard copy and 1 electronic copy by e-mail		9. Remarks					
1. Line Item 3	2. DRD Title Project Technical Requirements Specification	3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type E/CD	6b. Number 2/2
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input checked="" type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy on CD and 1 web based compatible electronic CD NT3/ Government Furnished Equip Branch 1 electronic copy by e-mail		9. Remarks Block 5: As included in the DO scope, consistent with EA-WI-023 processes Block 6 Permanent electronic copy stored on CD is formal record					
1. Line Item 4	2. DRD Title GFE Systems Requirements Data Package	3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD	6b. Number 3
7. Data Type: <input type="checkbox"/> (1) Written approval <input checked="" type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy on CD Technical Manager's Representative 1 web based compatible electronic CD Flight Hardware QE 1 electronic copy on CD		9. Remarks Block 5: As included in the DO scope, consistent with EA-WI-023 processes					

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

a. Title of Contract, Project, SOW, etc.				b. Contract/RFP No.		c. DRL Date/Mod Date	
CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)				NNJ04HH96B			
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
5	Flight GFE Projects Requirements & Verification Document	RT		See 9		CD	4
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed)		9. Remarks					
Delivery Order Manager Technical Manager's Representative NT3/Gov't Furnished Equip Branch		1 electronic copy on CD 1 electronic copy on CD and 1 web based compatible electronic CD 1 electronic copy on CD Block 5: As included in the DO scope, consistent with EA-WI-023 processes					
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
6	Preliminary Design Review Data Package	RT		See 9		CD	4
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input checked="" type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed)		9. Remarks					
Delivery Order Manager Technical Manager's Representative NT3 Gov't Furnished Equipment Branch		1 electronic copy on CD 1 electronic copy by on CD and 1 web based compatible electronic CD 1 electronic copy on CD Block 5: As included in the DO scope, consistent with EA-WI-023 processes					
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
7	Flight GFE Workmanship Specifications List	RT		See 9		E	4
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed)		9. Remarks					
Delivery Order Manager Technical Manager's Representative NT3/ Government Furnished Equip. Branch NX/Advanced programs and Analysis Division		1 electronic copy by e-mail 1 electronic copy by e-mail 1 electronic copy by e-mail 1 electronic copy by e-mail Block 5: As included in the DO scope, consistent with EA-WI-023 processes					
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
8	Project Schedule	RT		See 9		E/CD	2/1
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed)		9. Remarks					
Delivery Order Manager Technical Manager's Representative NT3/Gov't Furnished Equip Branch		1 electronic copy by e-mail 1 electronic copy on CD 1 electronic copy by e-mail Block 3: After initial schedule established, request for revisions to the schedule are submitted to the Technical Manager's Representative. Block 5: With DO proposal, updated and more details provided as DO progresses.					

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

a. Title of Contract, Project, SOW, etc. CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)				b. Contract/RFP No. NNJ04HH96B		c. DRL Date/Mod Date	
1. Line Item 9	2. DRD Title Flight GFE Interface Control Document	3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD	6b. Number 3
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Technical Manager's Representative 1 electronic copy on CD and NT3/Gov't Furnished Equip Branch 1 web based compatible electronic CD 1 electronic copy on CD		9. Remarks Block 3. Frequent revisions are required between PDR and Flight readiness. Block 5: As included in the DO scope, consistent with EA-WI-023 processes					
1. Line Item 10	2. DRD Title GFE EndItem Specification	3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD	6b. Number 4
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic on electronic CD Technical Manager's Representative 1 electronic on CD and 1 web based NT3/Gov't Furnished Equip Branch compatible electronic CD 1 electronic copy on CD		9. Remarks Block 3 Frequent revisions are required between PDR and flight readiness Block 5. As included in the DO scope, consistent with EA-WI-023 processes					
1. Line Item 11	2. DRD Title Flight GFE Failure Analysis Report	3. Frequency AR	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type E	6b. Number 3
7. Data Type: <input type="checkbox"/> (1) Written approval <input checked="" type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy by e-mail NT3/ Government Furnished Equip Branch 1 electronic copy by e-mail		9. Remarks Block 5 Submit by mutual agreement with Technical Manager's Representative and contractor report submitted in support of DRD no. 40					
1. Line Item 12	2. DRD Title Flight GFE Verification and Validation Plan	3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/E	6b. Number 3/1
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy on CD and 1 Web NT3/Gov't Furnished Equip Branch based compatible electronic CD 1 electronic copy on CD		9. Remarks Block 3: Submitted consistent with EA-WI-023 and scope of the DO. Frequent revisions are made between PDR and CDR. Block 5. As included in the DO scope, consistent with EA-WI-023 processes					

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

a. Title of Contract, Project, SOW, etc.				b. Contract/RFP No.		c. DRL Date/Mod Date	
CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)				NNJ04HH96B			
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
13	GFE Software Requirements Specification	RT		See 9		CD/E	2/2
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager Technical Manager's Representative NT3/Gov't Furnished Equip Branch		1 electronic copy by e-mail 1 electronic copy on CD and 1 web based compatible electronic CD 1 electronic copy by e-mail		9. Remarks Block 3. Frequent modifications are made between PDR and CDR Block 5. As included in the DO scope, consistent with EA-WI-023 processes			
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
14	GFE Software Development Plan	RT		See 9		E	3
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager Technical Manager's Representative NT3 Government Furnished Equipment Branch		1 electronic copy by e-mail 1 electronic copy by e-mail 1 electronic copy by e-mail		9. Remarks Block 5 As included in the DO scope, consistent with EA-WI-023 processes			
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
15	GFE Software Design Document	AR		See 9		CD/E	3/1
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager Technical Manager's Representative NT3/ Government Furnished Equip. Branch		1 electronic copy by e-mail 1 electronic copy on CD and 1 web based compatible electronic CD 1 electronic copy on CD		9. Remarks Block 5. As included in the DO scope, consistent with EA-WI-023 processes			
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
16	Engineering Drawings	RT		PDR		E /HC	4/4
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager Technical Manager's Representative NT3/Gov't Furnished Equip Branch Engineering Drawing Control Center		1 electronic by e-mail 3 HC at design reviews, 1 E by e-mail 1 HC at design reviews, 1 E by e-mail 1 electronic transfer via network		9. Remarks Block 3. First submittal into the EDCC and revision on the EDCC thereafter Block 5 As included in the DO scope, consistent with EA-WI-023 processes			

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

a. Title of Contract, Project, SOW, etc. CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)				b. Contract/RFP No. NNJ04HH96B		c. DRL Date/Mod Date	
1. Line Item 17	2. DRD Title EEE Parts Lists and Analysis Report	3. Frequency AR	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/E	6b. Number 3/1
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy by e-mail and 1 web based compatible electronic CD NT3/Gov't Furnished Equip Branch 1 electronic copy by e-mail		9. Remarks Block 5 As included in the DO scope, consistent with EA-WI-023 processes					
1. Line Item 18	2. DRD Title Critical Design Review Data Package	3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD	6b. Number 4
7. Data Type: <input type="checkbox"/> (1) Written approval <input checked="" type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy on CD Technical Manager's Representative 1 electronic copy on CD and 1 web based compatible electronic CD NT3 Gov't Furnished Equip Branch 1 electronic copy on CD		9. Remarks Block 3. Revisions made to the package during the CDR for completeness or clarifications and the record of the review item dispositions are added to the formal CDR package Block 5: As included in the DO scope, consistent with EA-WI-023 processes					
1. Line Item 19	2. DRD Title Engineering Drawing Change Proposal	3. Frequency AR	4. As-of-Date	5. 1st subm. date As needed	6. Copies	6a. Type E	6b. Number 5
7. Data Type: <input type="checkbox"/> (1) Written approval <input checked="" type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy by e-mail NT3/ Government Furnished Equip Branch 1 electronic copy by e-mail Contracting Officer's Technical Representative 1 electronic copy by e-mail Contracting Officer 1 electronic w/electronic signature		9. Remarks Block 6: e-mail copy is sufficient with electronic signature approvals					
1. Line Item 20	2. DRD Title GFE Qualification Test Procedure	3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/E	6b. Number 1/3
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy by e-mail and 1 web based compatible electronic CD Flight Hardware QE 1 electronic copy by e-mail		9. Remarks Block 5. As included in the DO scope, consistent with EA-WI-023 processes Submitted to Flight hardware Technical Manager's Representative two weeks prior to start of test					

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC-STD-123)

a. Title of Contract, Project, SOW, etc.				b. Contract/RFP No.		c. DRL Date/Mod Date	
CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)				NNJ04HH96B			
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
21	Flight Product User's Guide	RT		See 9		CD/E	2/1
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed)		9. Remarks					
Delivery Order Manager Technical Manager's Representative		1 electronic copy by e-mail 2 electronic copies on CD		Block 5. As included in the DO Scope, Consistent with EA-WI-023 processes Block 8 TMR will distribute copy for training			
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
22	Software Code	AR		See 9		CD/E	1/2
7. Data Type: <input type="checkbox"/> (1) Written approval <input checked="" type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed)		9. Remarks					
Delivery Order Manager Technical Manager's Representative NT3 Government Furnished Equipment Branch		1 electronic copy by e-mail 1 electronic copy on CD 1 electronic copy on CD		Block 5: As included in the DO Scope, Consistent with EA-WI-023 processes			
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
23	Information Technology (IT) Security Program Plan and Reports	As defined in JPG 2810.1		See 9		E/HC	3/1
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed)		9. Remarks					
IA/Chief Information Office Contracting Officer's Technical Representative Contracting Officer		1 electronic copy by e-mail 1 electronic copy by e-mail 1 electronic and 1 signed hard copy		1 Block 5: Within thirty (30) days after DO award 2. Additional Submissions. As defined in JPG 2810 1. 3. The final plan, as approved by the Contracting Officer, shall be incorporated in the contract as an Attachment.			
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
24	Certification Plan	RT		See 9		CD	4
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed)		9. Remarks					
Delivery Order Manager Technical Manager's Representative NT3/Govt Furnished Equip Branch		1 electronic copy on CD 1 electronic copy on CD and 1 web based compatible electronic CD 1 electronic copy on CD		Block 3. The document is revised when a configuration change is made Block 5: As included in the DO Scope, Consistent with EA-WI-023 processes			

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

a. Title of Contract, Project, SOW, etc. CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)				b. Contract/RFP No. NNJ04HH96B		c. DRL Date/Mod Date	
1. Line Item 25	2. DRD Title Certification Report	3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/E/HC	6b. Number 3/1/2
7. Data Type:		<input type="checkbox"/> (1) Written approval		<input checked="" type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 2 HC, 1 electronic copy on CD and 1 web based compatible electronic CD NT3/Govt. Furnished Equip Branch 1 electronic copy on CD		9. Remarks Block 3 The report is updated through out the life of the project whenever a configuration change is made Block 5: As included in the DO Scope, Consistent with EA-WI-023 processes			
1. Line Item 26	2. DRD Title Engineering Analysis	3. Frequency AR	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD	6b. Number 3
7. Data Type:		<input type="checkbox"/> (1) Written approval		<input checked="" type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed) Delivery Order Manger 1 electronic copy on CD Technical Manager's Representative 1 electronic copy on CD and 1 web based compatible electronic CD		9. Remarks Block 5: As included in the DO Scope, Consistent with EA-WI-023 processes			
1. Line Item 27	2. DRD Title Acceptance Data Package	3. Frequency OT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/E/HC	6b. Number 3/1/1
7. Data Type:		<input type="checkbox"/> (1) Written approval		<input checked="" type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy on CD and 1 web based compatible electronic CD NT/Quality Record Center 1 electronic copy on CD and 1 HC with flight hardware		9. Remarks Block 5: As included in the DO Scope, Consistent with EA-WI-023 processes Block 7. Submittal to record center as directed by DO.			
1. Line Item 28	2. DRD Title Export Control Audit Results	3. Frequency See 9	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type E/CD/HC	6b. Number 2/1/1
7. Data Type:		<input type="checkbox"/> (1) Written approval		<input checked="" type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed) Export Control Office/Center Export Administrator (CEA) 1 electronic copy by e-mail Contracting Officer's Technical Representative 1 electronic copy on CD Contracting Officer 1 electronic copy by e-mail and 1 hard copy		9. Remarks Block 3: Frequency. Annually, at the end of each fiscal year Block 5: After award of 1 st delivery order, yearly on Sept. 30 thereafter			

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC-STD-123)

a. Title of Contract, Project, SOW, etc. CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)				b. Contract/RFP No. NNJ04HH96B		c. DRL Date/Mod Date	
1. Line Item 29	2. DRD Title R-Quality Plan	3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/E	6b. Number 2/1
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval		<input type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request			
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager NT2/Government Furnished Equipment Branch Contracting Officer's Technical Representative		1 electronic copy by e-mail 1 electronic copy on CD, 1 electronic copy on CD		9. Remarks Block 3 Changes in the plan submitted by e-mail Block 5 Initial submittal with the proposal, approval at contract award			
1. Line Item 30	2. DRD Title Patent Rights-Retention	3. Frequency AR	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type E/CD	6b. Number 1/4
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval		<input type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request			
8. Distribution (Continue on a blank sheet if needed) Contracting Officer Contracting Officers Technical Representative New Technology Office		1 electronic w/ electronic signature 1 electronic on CD See Clause 18-52 227-11		9. Remarks Block 5. 12 months after contract start.			
1. Line Item 31	2. DRD Title Shuttle/Station Payload Safety Data Package	3. Frequency AR	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/E	6b. Number 3/1
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval		<input type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request			
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager Technical Manager's Representative NT Quality Record Center (copy with flt hw)		1 electronic copy by e-mail 1 electronic copy on CD and 1 web based compatible electronic CD 1 electronic copy on CD		9. Remarks Block 3. A payload may require 4 submittals of the SDP throughout development Block 5 As included in the DO Scope, Consistent with EA-WI-023 processes Block 8 Part of ADP			
1. Line Item 32	2. DRD Title Limited Life Systems List	3. Frequency AR	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/E/HC	6b. Number 3/1/1
7. Data Type: <input type="checkbox"/> (1) Written approval		<input checked="" type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request			
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager Technical Manager's Representative NT3/Govt Furnished Equip Branch		1 electronic copy by e-mail 1 electronic copy by e-mail and 1 web based compatible electronic CD 1 electronic copy by e-mail and 1 hard copy		9. Remarks Block 3 Multiple submittals are required consistent with EA-WI-023 and Delivery Order. Frequent revisions after CDR. Block 5 As included in the DO Scope, Consistent with EA-WI-023 processes			

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

a. Title of Contract, Project, SOW, etc.				b. Contract/RFP No.		c. DRL Date/Mod Date	
CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)				NNJ04HH96B			
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
33	Space Station GFE Failure Modes and Effects Analysis and Critical Items List	AR		See 9		CD/E	2/2
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy by e-mail and 1 web based compatible electronic CD NT52/SMART Executive Secretary 1 electronic copy on CD		9. Remarks Block 5 Consistent with EA-WI-023 and the scope of the DO or defined in the DO Block 3. As included in the DO Scope, Consistent with EA-WI-023 processes with the intent to be early enough to affect the design process					
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
34	Space Shuttle GFE Safety and Analysis Report & Hazard Report	AR		See 9		CD/E	2/2
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy by e-mail and 1 web based compatible electronic CD NT52/SMART Executive Secretary 1 electronic copy on CD		9. Remarks Block 5: As included in the DO Scope, Consistent with EA-WI-023 processes Initial submittal 30 days prior to PDR and CDR. Final Submittal 30 days prior to SAR					
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
35	Software Quality Assurance Plan Report	RT		See 9		CD/E	2/2
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy on CD and 1 web based compatible electronic CD NT3/ Government Furnished Equip Branch 1 electronic copy by e-mail		9. Remarks Block 5 Submittal 90 days prior to start of software development					
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
36	ISS Hazard Report	AR		See 9		CD/E	1/4
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy by e-mail and 1 web based compatible electronic CD NT52/SMART Executive Secretary 1 electronic copy by e-mail Safety Review Panel Electronic copies as required		9. Remarks Block 3. A complete project may require at least 3 submittals, 30 days prior to PDR, CDR and flight hardware delivery. Block 5 As included in the DO Scope, Consistent with EA-WI-023 processes					

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

a. Title of Contract, Project, SOW, etc.				b. Contract/RFP No.		c. DRL Date/Mod Date	
CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)				NNJ04HH96B			
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
37	Reliability and Maintainability Plan	OT		See 9		CD/E	2/1
7. Data Type:		<input type="checkbox"/> (1) Written approval		<input type="checkbox"/> (2) Mandatory Submittal		<input checked="" type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager NT3/Government Furnished Equipment Branch Contracting Officer's Technical Representative		1 electronic copy by e-mail 1 electronic copy on CD 1 electronic copy on CD		9. Remarks Block 5. To be delivered with the proposal	
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
38	Government Certification Approval Request (GCAR)	AR		See 9		HC/E	1/2
7. Data Type:		<input checked="" type="checkbox"/> (1) Written approval		<input type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed) Technical Manager's Representative NT3 Gov't Furnished Equip Branch		1 HC and 1 electronic copy by e-mail 1 electronic copy by e-mail		9. Remarks Block 5 As included in the DO Scope, Consistent with EA-WI-023 processes. GCAR is required 2 weeks prior to scheduled certification date	
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
39	Risk Assessment Executive Summary Report (RAESR)	AR		See 9		CD/E	3/1
7. Data Type:		<input checked="" type="checkbox"/> (1) Written approval		<input type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager Technical Manager's Representative NT3/ Government Furnished Equip Branch		1 electronic copy by e-mail 1 electronic copy on CD and 1 web based compatible electronic CD 1 electronic copy on CD		9. Remarks Block 3 Up to 3 submittals are required for a full flight hardware project Block 5 As included in the DO Scope, Consistent with EA-WI-023 processes	
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
40	Problem Reporting and Corrective Action (PRACA)	AR		See 9		E	4
7. Data Type:		<input checked="" type="checkbox"/> (1) Written approval		<input type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager Technical Manager's Representative NT3/Gov't Furnished Equip Branch PRACA Center (NT)		1 electronic copy by e-mail 1 electronic copy by e-mail 1 electronic copy by e-mail 1 electronic copy by e-mail		9. Remarks Block 3. Submitted when reportable problems occur of as defined in the DO Block 5: Submit report within 2 business days of problem isolation but no later than 10 days after detection	

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

a. Title of Contract, Project, SOW, etc. CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)				b. Contract/RFP No. NNJ04HH96B		c. DRL Date/Mod Date	
1. Line Item 41	2. DRD Title Nonconformance Record	3. Frequency AR	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type E	6b. Number 3
7. Data Type:		<input type="checkbox"/> (1) Written approval		<input checked="" type="checkbox"/> (2) Mandatory Submittal		<input checked="" type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy by e-mail NT3/Government Furnished Equipment Branch 1 electronic copy by e-mail		9. Remarks Block 5: As defined in the DO Block 6: Electronic records submitted by internet. No permanent electronic copies are delivered			
1. Line Item 42	2. DRD Title Government Industry Data Exchange Program and NASA Advisory Problem Data	3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type E	6b. Number 2
7. Data Type:		<input checked="" type="checkbox"/> (1) Written approval		<input checked="" type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail JSC ALERT Coordinator (NX) 1 electronic copy by e-mail (ALERT → Acute Launch Emergency Reliability Tip)		9. Remarks Block 5: Reported one time when discrepancy occurs Block 6: electronic records submitted by internet.			
1. Line Item 43	2. DRD Title Electrical, Electronic, and Electromechanical (EEE) Parts Control Plan	3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/E	6b. Number 3/1
7. Data Type:		<input checked="" type="checkbox"/> (1) Written approval		<input checked="" type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy on CD and 1 web based compatible electronic CD NX/Advanced Program and Analysis Div 1 electronic copy on CD		9. Remarks Block 5: As included in the DO Scope, Consistent with EA-WI-023 processes Submitted 60 days after award of first DO that requires electronics.			
1. Line Item 44	2. DRD Title Certification Data Package	3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/E/HC	6b. Number 3/1/1
7. Data Type:		<input checked="" type="checkbox"/> (1) Written approval		<input checked="" type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager 1 electronic copy by e-mail Technical Manager's Representative 1 electronic copy on CD and 1 web based compatible electronic CD NT3/Gov't Furnished Equip Branch 1 HC and 1 electronic copy on CD		9. Remarks Block 3 Revisions made by electronic submittal by e-mail Block 5 As included in the DO Scope, Consistent with EA-WI-023 processes Submit concurrently with the GCAR			

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

a. Title of Contract, Project, SOW, etc. CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)				b. Contract/RFP No. NNJ04HH96B		c. DRL Date/Mod Date	
1. Line Item 45	2. DRD Title Certification and Acceptance Requirements Document	3. Frequency RT	4. As-of-Date	5. 1st subm. date CDR	6. Copies	6a. Type CD/E	6b. Number 2/1
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager Technical Manager's Representative 1 electronic copy by e-mail 1 electronic copy on CD and 1 web based compatible electronic CD			9. Remarks				
1. Line Item 46	2. DRD Title Wage/Salary and Fringe Benefit Data	3. Frequency See 9	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/HC	6b. Number 2/2
7. Data Type: <input type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input checked="" type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) BA2/Contract Labor Relations Officer Contracting Officer COTR 1 electronic copy on CD and 1 hard copy 1 hard copy 1 electronic copy on CD			9. Remarks Block 5: 30 days after issuance of each delivery order				
1. Line Item 47	2. DRD Title GFE Acceptance Test Procedure	3. Frequency OT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/HC	6b. Number 2/1
7. Data Type: <input checked="" type="checkbox"/> (1) Written approval <input type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Technical Manager's Representative NT3/ Government Furnished Equip Branch 1 electronic copy on CD 1 electronic copy on CD and 1 HC			9. Remarks Block 5. As included in the DO Scope, Consistent with EA-WI-023 processes Usually delivered with or before Acceptance Data Package Block 6. Hard copies provided if modifications made are not captured electronically <u>Actual procedure is maintained as record.</u>				
1. Line Item 48	2. DRD Title Flight GFE Verification & Validation Report	3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/E	6b. Number 3/1
7. Data Type: <input type="checkbox"/> (1) Written approval <input checked="" type="checkbox"/> (2) Mandatory Submittal <input type="checkbox"/> (3) Submitted upon request							
8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager Technical Manager's Representative NT3/Gov't Furnished Equip Branch 1 electronic copy by e-mail 1 electronic copy on CD and 1 web based compatible electronic CD 1 electronic copy on CD			9. Remarks Block 5: As included in the DO Scope, Consistent with EA-WI-023 processes				

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC-STD-123)

a. Title of Contract, Project, SOW, etc.						b. Contract/RFP No. NNJ04HH96B		c. DRL Date/Mod Date	
CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)									
1. Line Item 49	2. DRD Title Space Shuttle GFE Failure Modes and Effects Analysis (FMEA) and Critical Items List			3. Frequency AR	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/E	6b. Number 2/2
7. Data Type:		(1) Written approval			X(2) Mandatory Submittal	(3) Submitted upon request			
		8. Distribution (Continue on a blank sheet if needed) Delivery Order Manager Technical Manager's Representative NT52/SMART Executive Secretary 1 electronic by e-mail 1 electronic copy by e-mail and 1 web based compatible electronic CD 1 electronic copy on CD			9. Remarks Block 3 A complete project requires 3 submittals, at PDR, CDR, and at GFE delivery. Block 5- As included in the DO Scope, Consistent with EA-WI-023 processes				
1. Line Item 50	2. DRD Title Reserved			3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
7. Data Type:		(1) Written approval			X(2) Mandatory Submittal	(3) Submitted upon request			
		8. Distribution (Continue on a blank sheet if needed)			9. Remarks				
1. Line Item 51	2. DRD Title NASA Contractor Financial Management Reporting			3. Frequency MO	4. As-of-Date	5. 1st subm. date See DRD/SOW	6. Copies	6a. Type CD/HC	6b. Number 3/4
7. Data Type:		(1) Written approval			(2) Mandatory Submittal	(3) Submitted upon request			
		8. Distribution (Continue on a blank sheet if needed) LF6/Cost Accounting 1 copy by CD and 1 Hard Copy with signature Contracting Officer 1 copy by CD and 1 Hard Copy Budget/Program Analyst 1 copy by CD and 1 Hard Copy COTR 1 Hard Copy			9. Remarks Due monthly after award of first DO Monthly letter to state no cost changes/no work in process if no DOs currently active.				
1. Line Item 52	2. DRD Title Government Property Management Plan			3. Frequency RT	4. As-of-Date	5. 1st subm. date See 9	6. Copies	6a. Type CD/HC	6b. Number 3/2
7. Data Type:		(1) Written approval			(2) Mandatory Submittal	(3) Submitted upon request			
		8. Distribution (Continue on a blank sheet if needed) Property Administrator 1 copy by CD and 1 Hard Copy Contracting Officer 1 copy by CD and 1 Haid Copy COTR 1 copy by CD			9. Remarks Block 5: Initial due with proposal, with updates as required.				

JSC DATA REQUIREMENTS LIST (DRL), DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

a. Title of Contract, Project, SOW, etc.				b. Contract/RFP No.		c. DRL Date/Mod Date	
CREW, ROBOTICS AND VEHICLE EQUIPMENT (CRAVE)				NNJ04HH96B			
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
53	System Safety Plan	OT		See 9		CD/E	2/1
7. Data Type:		<input type="checkbox"/> (1) Written approval		<input checked="" type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed)		9. Remarks			
		Delivery Order Manager NT3/Government Furnished Equipment Branch Contracting Officer's Technical Representative		1 electronic copy by e-mail 1 electronic copy on CD 1 electronic copy on CD Block 5: Due with proposal			
1. Line Item	2. DRD Title	3. Frequency	4. As-of-Date	5. 1st subm. date	6. Copies	6a. Type	6b. Number
54	R-Quality Plan Template	OT		See 9		CD/HC	2/2
7. Data Type:		<input type="checkbox"/> (1) Written approval		<input checked="" type="checkbox"/> (2) Mandatory Submittal		<input type="checkbox"/> (3) Submitted upon request	
		8. Distribution (Continue on a blank sheet if needed)		9. Remarks			
		BH/Contracting Officer SR&QA		1 electronic copy on CD and 1 hard copy 1 electronic copy on CD and 1 hard copy Block 5: Due with proposal and then revisions as required			

JSC DATA REQUIREMENT (DRL)/DATA REQUIREMENT DESCRIPTION (DRD)
 Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Flight GFE Configuration Management Plan	SEPT 2004	01	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
This DRD describes the contractor's plan to control the configuration of flight hardware during development, production, certification, and deployment of both qualification and flight hardware within the contractor's facilities, subcontractor's facilities, and those of NASA JSC.		<input checked="" type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input type="checkbox"/> SR&QA	
6. References (Optional)		7. Interrelationships (e.g., with other DRDs) (Optional)	
EA-WI-027, SSP 50123, NSTS 077000			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: This document describes how the contractor shall maintain configuration control of qualification and flight hardware and software during the design, development, certification, verification, and deployment within its facilities, its subcontractor's facilities and NASA JSC facilities. It defines to the government how the contractor will maintain records, documentation, drawings, and reports necessary for NASA's to assure that configuration management is maintained throughout the life of the flight product.

CONTENTS: It shall address how the contractor's products shall comply with the Engineering Directorate's products defined in EA-WI-027 "Configuration Management Requirements", the Shuttle Program Process NSTS 07700 "Space Shuttle Configuration Management Requirements", and the Space Station Program process reference SSP 50123 "Configuration Management Handbook."

FORMAT: The plan shall be provided in Microsoft Word. The format shall be in the contractor's format.

MAINTENANCE. The Configuration Management Plan shall be defined at the beginning of the contract award. The COTR shall approve the plan and provide notice of acceptance per technical direction. The contractor shall maintain their plan as needed throughout the award period. The plan shall be available for review at any point throughout the contract

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Delivery Order Status Report / Summary Review	SEPT 2004	02	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
Provide information on the contractor's safety, technical, quality, financial, and delivery-to-schedule progress for use by the contract surveillance team consisting of Engineering, Quality, and Administrative personnel.		<input checked="" type="checkbox"/> Technical <input checked="" type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
	DRD 8 Project Schedule DRD 50 Delivery Order Resource Status Report		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The monthly Delivery Order (DO) Status Report shall contain information on the contractor's safety, technical, quality, cost, and deliver-to-schedule performance. This report is required for all authorized Cost Plus and Firm Fixed Priced Delivery Orders. This report, along with detailed financial reports, serves as the contractor's formal reports given to NASA for contract surveillance. A review shall be held with NASA to discuss the highlights for the month.

FORMAT: The report shall be provided in a business report style with a report body font size that does not exceed 12. The Summary Review shall be a view graph presentation prepared in Microsoft Power Point.

CONTENTS: The contents of the report shall address all the flight hardware products and services defined in the DO(s) held by the contractor that are still active. The structure of the report shall be selected by the contractor and agreed upon by the COTR. The following shall be addressed in the report unless addressed in the DO

A SAFETY SUMMARY

- OSHA reportable events as categorized (defined) by OSHA or NASA from the resources of this contract
- Personnel Injuries
- New Flight Hardware Safety DRs and status of all remaining open DRs

B. COST PERFORMANCE SUMMARY (Performance Based)

- Project Actual-to-Date Cost & Projected Total Cost - Last Period
- Project Actual-to-Date Cost & Projected Total Cost - This Period
- Projected Total Cost Addition due to Approved Changes
- Graphics of Initial Cost Projection, Initial Cost Projection + Approved Changes Projection, Full Cost Projection
- Description of the origin of variance not due to approved change whether plus or minus
- Excel Spreadsheets as follows:
 - Delivery Order Summary Listing all Authorized Delivery Orders by Cost Type and Fixed Price Showing Title, Plan/Actuals for Dollars, Hours, and Full-Time Equivalents (FTEs), Period of Performance (POP) and Percent Complete
 - WBS Summary Showing Title, Plan/Actuals for Dollars, Hours, and Full-Time Equivalents (FTEs), and Percent Complete (CPFF only)
 - Individual DO Reports Showing WBS, Title, Plan/Actuals for Dollars, Hours, and Full-Time Equivalents (FTEs), and Percent Complete (CPFF only)
- Additional Data May Be Required by the Government for this Report and will be directed in the DOs

C. RESOURCE PERFORMANCE SUMMARY (Performance Based)

For the WBS reporting level requested in the DO, the following summary is to be provided:

JSC DATA REQUIREMENTS (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC –STD-123)

- Graphic of the Initial Planned Manpower for each WBS item for the DO, Current Planned Manpower with Approved Changes for the Project, Actual Manpower used to date, and % of WBS task completed

D. TECHNICAL & QUALITY PERFORMANCE STATUS

- Nominal Technical / Quality Performance Achieved
- Better than Nominal Technical / Quality Performance Achieved
- Nominal Technical / Quality Performance not Achieved
- Action to be taken to resolve unachieved Nominal Performance
- Notice of potential failure to meet future Nominal Performance, identification of causes, along with recommendations as appropriate.
- Other Technical and Quality Subjects as needed

E. PRODUCT PRODUCTION AND SCHEDULE STATUS

- Overall DO Schedule Status
- DO Completed Products and Schedule – Projected in Last Monthly Period
- DO Completed Products and Schedule – Actual This Period
- Projected Next Months Products and Schedule
- Change from last month due to Approved Changes
- Variance not due to approved change and description of cause

F. DEPLOYED HARDWARE STATUS

- Open Anomalies Status (all formal reporting status)
- Corrective Actions Status
- Lessons Learned

G. MANAGEMENT

- Corrective Actions Taken
- Organization
- Efficiencies Implementation
- Outside Dependencies

H. SUMMARY REVIEW

- The summary review shall be a presentation that contains the highlights of the report. The COTR and the contractor shall agree upon the contents of the review. The Summary Review shall not address the contents of Section C above. The summary review shall include a listing by DO for all authorized DOs (both CPFF and FFP) with hours, cost, and price.

I. Minutes during the Summary Review shall be taken and submitted with the status report

MAINTENANCE: Corrections to a Monthly DO Status Report shall be identified and changes made if applicable in the subsequent Monthly Status Report.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Project Technical Requirements Specification (PTRS)	SEPT 2004	03	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
The PTRS defines the requirements of the Engineering Directorate Customer(s), the SR&QA organization, and the Engineering Directorate for Government Furnished Equipment or payload project team.		<input checked="" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (Optional)		7. Interrelationships (e.g., with other DRDs) (Optional)	
EA-WI-023 "Project Management of GFE Flight Projects"		DRD 10 End Items Specification	
8. Preparation Information: The contractor shall prepare the deliverable as follows.			

SCOPE: The PTRS contains the performance, functional, environmental, interface, criticality, maintainability, safety, and human factors requirements for the flight Government Furnished Equipment (GFE) including flight payload hardware. This is the formal agreement between the Engineering Directorate and its customer(s). The contractor shall provide all or a part of the engineering effort required to produce this document. The contractor shall survey the multiple sources of GFE flight hardware and/or payload requirements and define those that are essential for mission success.

FORMAT: The format for the PTRS is addressed in EA-WI-023. The electronic link to this Tier 3 document is found under the Quality Management System documentation for the Engineering Directorate (EA) on the JSC Home Page. The version of EA-WI-023 in existence at the time of the Delivery Order (DO) will define the format.

CONTENT: The PTRS shall define the minimum technical requirements and any constraints for the GFE or payload hardware that apply to performance, design, operation, interoperability, reliability, maintainability and transportability. The minimum set of technical requirements shall include all functional requirements that will be used as a measure of mission performance success. A general outline of the content in a PTRS is contained in EA-WI-023. The PTRS is the source of requirements used to develop the detailed design requirements that will be contained in the End Item Specification.

MAINTENANCE: This document is update as required during the "Requirements Definition Phase". A version is presented at the Systems Requirements Review (SRR) as a RIDable document and placed under project control at that point. The final version is presented at the Preliminary Design Review PDR. This final version is to be updated as a result of the review for final signature between the Engineering Directorate and the customer. If the DO requests, the PTRS may be maintained throughout the project as a part of a configuration control management activity. The technically relevant content of the PTRS is captured in the End Items Specification after PDR.

JSC DATA REQUIREMENTS (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
GFE Systems Requirements Review (SRR) Data Package	SEPT 2004	04	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
This data package provides objective evidence to a multidiscipline NASA team that the requirements on the Engineering Directorate's customer organization, the Engineering Directorate, the SR&QA Directorate, other influencing organizations and supporting organizations have been completely specified for the Government Furnished Equipment which includes payloads.		<input checked="checked" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
EA-WI-023 "Project Management of GFE Flight Projects"	Other DRDs (see below)		
8. Preparation Information: The contractor shall prepare the deliverable as follows.			

SCOPE/CONTENT: The contractor may be required in the Delivery Order (DO) to deliver all or a part of the products required for a SRR Data Package. The SRR Data Package includes up-to-date engineering information defined by other DRDs listed below, SRR specific data, other data defined in the Delivery Order, and a presentation package used for the SRR review. This data package provides the NASA review team evidence that the essential requirements needed for flight hardware performance success have been identified. The guidelines defined in EA-WI-023 provide the needs of the Engineering Directorate.

The presentation materials shall include the following:

- End-item (system, component, payload) description, major elements, expected performance
- Project Deliverables
- Constraints and Guidelines
- Top Level Qualification Approach
- Validation & Verification process
- Specific material requested in the DO

The latest version of these documents is to be provided.

- Interface Control Documents, DRD 09
- Configuration Management Plan, DRD 01
- Software Development Plan, DRD 14
- Project Technical Requirements Specification, DRD 03

FORMAT: Other DRDs have formats defined. The contractor's format shall be used for DO specific data unless a specific format is requested in the DO. The SRR specific information and presentation package shall be provided electronically using Microsoft presentation software.

MAINTENANCE: The SRR Data Package is updated by adding the copy of the RIDs after all RIDs have been closed. This package shall be retained for the Project as a quality record of the SSR. Modifications to documents required by approved RIDs shall be made when appropriate to do so for each of the documents. The updated documents are not retained as part of the SRR package. Any changes to the DO required because of NASA changes to the SRR data products shall require the normal contract DO change process to be followed. The SRR quality record shall be delivered to NASA.

PERFORMANCE: Delivery Date: The data products for the SRR review shall be delivered to a location determined by the COTR two weeks prior to the formal review date defined in the DO. Delivery two (2) Weeks and two (2) days before the formal review will be considered better than normal delivery. Delivery one (1) week and five (5) days or less than the review will be considered less than normal performance. A delivery of one (1) week or less is considered poor performance. Complete Content: Normal performance is that data package contains products that are accepted with little

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

modification required. Little modification means that all issues with the content controllable by the contractor can be resolved within one (1) month of the review. All content issues resolved within three (3) weeks of the review is better than normal performance and content issues longer than five (5) weeks is worse than normal performance.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Flight Hardware Project Requirements and Verification Documentation	SEPT 2004	05	NNJ04HH96B
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)		5. DRD Category: (<i>check one</i>)	
This document is delivered instead of the Flight Hardware Project Technical Requirements Specification and the Flight Hardware Verification and Validation Plan when the Flight Hardware requested is simple in nature, a payload, or presents little risk to the crew or NASA assets		<input checked="checked" type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)		7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)	
EA-WI-023 "Project Management of GFE Flight Products"		DRD 03 Project Technical Requirements Specification DRD 12 Verification and Validation Plan	
8. Preparation Information: The contractor shall prepare the deliverable as follows			

SCOPE: This document defines the requirements for the flight hardware and the verification approach when the requirements have been determined to be suitable to use of JSC 28484 "Program Requirements Document For Johnson Space Center Non-Critical Government Furnished Equipment" by engineering, the customer and SR&QA. Payloads may fall into this category.

CONTENT: This document will contain the functionality of a separate Project Technical Requirements Specification, a Verification and Validation Plan, and the Verification and Validation Report. If requested by the DO the contractor shall provide all or a portion of this document. The contents shall depend on the nature of the Delivery Order but will include all or some of the content described for the PRVD contained in EA-WI-023.

FORMAT: The PRVD outline described in EA-WI-023 describes the format. The software used to develop this document shall be compatible with Microsoft Word.

MAINTENANCE: This document is updated as required throughout the flight hardware project. The appropriate NASA configuration control board shall approve all changes to this document after initial approval.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Preliminary Design Review Data Package	SEPT 2004	06	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
This data package contains the early engineering, safety, quality and project documentation to be reviewed by the NASA customer and thier designated support in order to assure that the contractor's intended products meet the requirements for safety, cost, performance and schedule.		<input checked="" type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
6. References (Optional)		7. Interrelationships (e.g., with other DRDs) (Optional)	
EA-WI-023 "Project Management of GFE Flight Products"			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The contractor is required to develop engineering data and to deliver all or a part of the products required for the Preliminary Design Review data package described by EA-WI-023 and defined by the content below.

CONTENT:

- a) End-Item Specifications,
- b) Interface Control Documents,
- c) Preliminary Engineering Drawings (represents 10% of all drawings that would be required and will be for assessing the primary integration questions)
- d) Software Requirements Specification
- e) Software Design Document
- f) Phase I RAESR and supporting safety documentation
- g) Verification and Validation Plan (Project Requirement and Verification Document for non-critical IVA GFE)
- h) Preliminary EEE Parts List and Analysis
- i) Workmanship Specifications List
- j) Contractor unique Workmanship Specifications
- k) Summary of Waivers/Deviations Requested or Approved
- l) Engineering Analysis
- m) Summary PDR Presentation (See EA-WI-023 for sample content)
- n) Change Requests for Cost Efficiency
- o) Project Cost Projection (to submit for NASA only review)
- p) Other data specified in the DO
- q) PDR Minutes

FORMAT: The format of the DRD shall be used. Documentation under this DRD that is not defined by another DRD is to be delivered in the contractor's format. The format of the summary presentation shall be defined by the contractor. A sample of the content for this presentation is contained in EA-WI-023. The software used for electronic submittal shall be Microsoft software. An electronic version of the Summary Presentation shall be delivered to the GFE or Payload Technical Management Representative and the COTR at least 1 week prior to the PDR Presentation. The Project Cost Projection shall be provided to the TMR using Microsoft Software stored on permanent CDs. The CDs shall be labeled appropriately.

MAINTENANCE: The PDR Data Package is a one time delivery. The PDR package shall be appended by the RIDs from this review and any additional data submitted during the review. Modifications to drawings or documents as a result of the RIDs are not considered a part of the PDR Data Package. The RIDs serves as documentation of the agreements made during the review. A complete copy of the PDR Data Package shall be maintained as a project quality record in electronic

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
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format on a permanent data storage disk. This quality record shall be delivered to NASA at the completion of the contract or 1 month after PDR is completed, whichever comes first.

PERFORMANCE: 1) Delivery Date: The data products for the PDR review shall be delivered to a location determined by the COTR 2 weeks prior to the formal review date defined in the DO. Delivery 2 Weeks and 2 days before the formal review will be considered better than normal delivery. Delivery 1 week and 5 days or less than the review will be considered less than normal performance. A delivery of 1 week or less is considered poor performance.

2) Complete Content: Normal performance is defined as receiving a data package that contains products that are accepted with little modification required. Little modification means that all issues with the content, controllable by the contractor, can be resolved within 1 month of the review. All content issues resolved within 3 weeks of the review is considered better than normal performance and content issues requiring longer than 5 weeks is considered worse than normal performance

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-12)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Flight Hardware Workmanship Specification List	SEPT 2004	07	NNJ04HH96B
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)		5. DRD Category: (<i>check one</i>)	
This document defines the list of workmanship specifications that the contractor identifies to be used for the manufacturing of the flight and associated ground support hardware.		<input checked="" type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)		7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)	
NASA Technical Standards Program, http://standards.nasa.gov		PDR Data Package DRD 06 CDR Data Package DRD 18	
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: This list contains all applicable workmanship specifications that are applied as fabrication requirements or software development requirements. This list establishes the lowest level of requirements to be met to assure quality products are delivered for flight.

CONTENT: This list is presented for NASA review and approval. Many workmanship specifications are identified by NASA, and if used, shall provide acceptable flight hardware products. These may be standard industry specifications, military specifications or NASA specifications. Use of alternate contractor specifications requires that they meet all specifications required for the Project and they not include proprietary processes. This list requires NASA approval.

FORMAT: This list shall be provided in electronic format compatible with Microsoft EXCEL software.

MAINTENANCE: The initial submittal is at PDR. This list can be modified by the contractor as required with NASA approval.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
 (Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Project Schedule	SEPT 2004	08	NNJ04HH96B
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)		5. DRD Category: (<i>check one</i>)	
Provide schedule information to NASA so that interdependent program activities can be planned and critical milestones monitored		<input checked="checked" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)	7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)		
	DRD 02		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The schedule shall serve as the basis for communications between the Contractor and NASA concerning essential schedules. The detail breakdown required depends on the type of products and services requested and will be defined in the Delivery Order (DO). Current Schedules are reviewed Monthly.

CONTENTS: Project schedules shall be prepared using the Critical Path Method and include a detail network analysis and graphical representation to illustrate order and interdependence of activities and sequence of work based upon the Work Breakdown Structure in the DO. The project schedule shall provide the percentage of the original schedule completed and the percentage of the original planned resources used. The DO may require a complete project schedule or a schedule for a portion of a project. As a minimum the following detail is required.

Title, Type of hardware, WBS number, Key Milestones (e.g. SRR, PDR, CDR, SAR, sign-off, GCAR delivery, CARD sign-off, hardware delivery), key product deliveries, design activity, manufacturing activity, test activity and milestones, delivery and return from remote facilities, actual event, start and finish dates that accompany the graphics, assembly time, slack time, major external project milestones not controlled by the contractor.

FORMAT: All schedules will be submitted using Microsoft Project.

MAINTENANCE: Schedules change throughout the project and frequent modifications will be required. The initial schedule that has been approved by the Technical Manager's Representative shall be set as the baseline. Changes and additions will be maintained on this schedule and noted as to the reason for the change

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
 (Based on JSC -STD-123)

	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Flight Hardware Interface Control Document	SEPT 2004	09	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
This document defines the requirements for the interfaces between the Government Furnished Equipment or payload and program interfaces required to make the hardware fully functional.		<input checked="checked" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (Optional)		7. Interrelationships (e.g., with other DRDs) (Optional)	
EA-WI-023 "Project Management of GFE Flight Projects"			
8. Preparation Information: The contractor shall prepare the deliverable as follows			

SCOPE: The ICD is the formal definition of the interfaces between end items, other systems, and/or payloads. Depending on the nature of the flight hardware, multiple ICDs using different formats may be required. The ICD shall fully describe the quality characteristics of the interface so that the hardware is fully functional upon integration

FORMAT: See EA-WI-023 for the format of the ICD for major GFE or payload projects. The electronic link to the Tier 3 documents under the Quality Management System for the Engineering Directorate on the Home Page for JSC provides the latest version on this Work Instruction. The version in place when the Delivery Order is initiated is the version applied to work under the DO. For partial flight hardware projects, this general format shall be used but end item to end item interfaces are described using the contractor format instead of system to vehicle interfaces described in EA-WI-023. If requested by the DO, ICDs using International Space Station or Shuttle Program formats may be required.

CONTENT: The document is a complete description of the interface requirements and interface design details necessary to assure that the hardware is functional when integrated. It addresses the engineering design parameters associated with mechanical, biological, chemical, electrical, fluid, electronic, human factors, and software design.

MAINTENANCE: Initial version at the Preliminary Design Review; update as required through the appropriate GFE configuration control processes throughout the project. An up-to-date revision is required at Critical Design Review and a final revision for hardware certification and delivery.

JSC DATA REQUIREMENTS (DRL)/DATA REQUIREMENTS (DRD) DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
GFE End Item Specification	SEPT 2004	10	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
The End Item Specification (EIS) defines the engineering requirements to be used that capture all NASA Program, SR&QA organization, and NASA Engineering requirements. It also provides technical metrics for the acceptability of the flight hardware products.		<input checked="checked" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
EA-WI-023 "Project Management of GFE Projects"	DRD 3, Project Technical Requirements Specification		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The contractor may be required in the Delivery Order (DO) to deliver all or a part of the products required for the EIS. The EIS shall define all technical requirements and all constraints for the GFE (including payload) that apply to the safety, performance, design, operation, interoperability, reliability, maintainability, verifiability, and transportability of the flight hardware.

CONTENT: The EIS contains the performance, functional, environmental, interface, maintainability, reliability and safety requirements for the Government Furnished Equipment system or end items. All requirements contained in the Project Technical Requirements Specification are addressed along with the detailed design constraints, requirements arising from the reality of the certification and verification approaches, and other requirements that are needed in order to meet the program level requirements.

FORMAT: See EA-WI-023 for the standard format used by the Engineering Directorate for system level projects. For partial projects or one component of a larger system or payload, the contractor's format for the EIS may be used. This EIS shall provide the information needed as a partial element of the relevant system level EIS.

MAINTENANCE: Update of this document will be required frequently through the requirements definition phase. It is approved at the Preliminary Design Review and modified after PDR through approval from the responsible NASA configuration control boards.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Flight Hardware Failure Analysis Report	SEPT 2004	11	NNJ04HH96B
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)		5. DRD Category: (<i>check one</i>)	
To provide and document the detailed data generated during the testing and analysis of defective hardware returned to the supplier.		<input checked="checked" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)	7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)		
ANSI/ASQC Q9001-1994			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The report documents the test and analyses conducted during an investigation of defective hardware returned to the supplier to identify the root cause of the failure. It also records the contractor's recommended corrective action required to prevent another occurrence of the same failure.

CONTENT: The report shall contain the following information as a minimum:

1. Description of when, where, and how the hardware failed along with supporting evidence.
2. Documentation on how the hardware was transported to the vendor.
3. Documentation of how the hardware was received and processed by the vendor.
4. Documentation of tests performed, success criteria and actual test results obtained in order to assess the failure
5. Documentation of the analysis performed and results obtained to assess the failure.
6. Documentation on verification of the original certification data and any discrepancies found.
7. Method used to arrive at root cause of the failure.
8. Rational used to arrive at recommended corrective action.
9. Plan for implementation and estimated cost of corrective action for the contractor.

FORMAT: The contractor's format shall be used The software used shall be compatible with Microsoft Word

MAINTENANCE: The report is updated as required

JSC DATA REQUIREMENT T (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
 —Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Flight GFE Verification and Validation Plan	SEPT 2004	12	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
This plan defines the approach to verifying and validating that the Government Furnished Equipment meets the design requirements and can be qualified.		<input checked="checked" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (Optional)		7. Interrelationships (e.g., with other DRDs) (Optional)	
EA-WI-023 Project Management of GFE Flight Projects		Project Technical Requirements Specification, DRD 3 End Item Specification, DRD 10 Flight Software Requirements Specification, DRD 13	
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: This plan defines the Verification and Validation (V&V) activities planned to confirm that the GFE (including GFE payloads) comply with their specifications, function properly in the complete integrated environment with other actual flight hardware and payload products, and are ready for flight use for a human rated environment.

CONTENT: EA-WI-023 contains a definition of the objectives of the V&V Plan and gives the detailed content for the NASA to NASA System Level V&V Plan. If the DO requests, the contractor shall produce all or a part of the products for this document. For Flight Hardware GFE or payloads that are not full systems, the contractor shall produce a V&V Plan that provides the relevant information described in the EA-WI-023. The relevant content addresses how the requirements in the End Item Specification are to be verified.

FORMAT: The format for the V&V Plan described within EA-WI-023 shall be used to develop a System Level document for NASA to use at the Program Level. For components of a system or payloads, relevant sections of the V&V Plan described in EA-WI-023 shall be used using the contractor's format. The COTR shall approve the contractor's format.

MAINTENANCE: The initial plan is provided at PDR and requires NASA approval. At CDR a fully developed V&V Plan is submitted and requires NASA approval. The V&V approach is changed after CDR by approval of the appropriate NASA configuration change board.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
GFE Software Requirements Specification	SEPT 2004	13	NNJ04HH96B
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)		5. DRD Category: (<i>check one</i>)	
Documents the functional, performance, and interface requirements that are to be met by the software design used in flight GFE.		<input checked="checked" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)	7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)		
EA-WI-018 Use of Off-the-Shelf Software in Flight Projects, EA-WI-025 GFE Flight Project Software and Firmware Development	Project Technical Requirements Specification, DRD 3 End Item Specification, DRD 10 Flight Hardware Interface Control Document, DRD 9		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: Documents the functional, performance, and interface requirements for software used in flight GFE to enable review and approval prior to detailed design and production. This document also serves as the record for changes that may be made for a variety of reasons throughout the project. Software requirements are derived from the PTRS, the End Item Specification, the Specific Design Requirements Document, the Certification and Acceptance Requirements Document and the Flight Hardware Interface Control Document.

CONTENT: This specification defines the detailed functional, performance and interface requirements and implementation constraints for the software required to command, control, or monitor flight GFE.

FORMAT: The format of the SRS described in EA-WI-025 shall be provided unless specified otherwise in the DO. The contractor's format shall be approved by the Technical Manager's Representative.

MAINTENANCE: The first submittal of the SRS is at the Preliminary Design Review and approval by NASA is required. This document is RIDable as defined in EA-WI-025. A version is reviewed again at Critical Design Review and approval is required. Changes shall be made to this document as the flight hardware or software configuration is changed through the appropriate NASA design review board.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
 (Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
GFE Flight Software Development Plan	SEPT 2004	14	NNJ04HH96B
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)		5. DRD Category: (<i>check one</i>)	
The Software Development Plan defines the contractor's approach to software acquisition, development, certification, verification, and delivery		<input checked="checked" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)		7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)	
EA-WI-018, Use of OFF the Shelf Software in Flight Projects Work Instruction (cont in # 8)			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The Software Development Plan documents the contractor's planned approach to software acquisition, development, certification, verification, delivery, and operational utilization. It describes the software management approach and the implementation of quality assurance throughout the effort.

CONTENTS: The plan shall address the approach to controlling the configuration of the software after CDR compatible with Engineering's configuration management processes defined in EA-WI-027. It shall address the compatibility of the contractor's products with the products required by Engineering that are described in EA-WI-025. The plan shall describe the contractor's use of Off-The-Self (OTS) software, which is compatible with Engineering process EA-WI-018. If requested in the DO, parts or all of the Engineering Directorate's Software Development Plan shall be provided.

FORMAT: The contractor's Software Development Plan shall be developed to the contractor's format. The plan shall demonstrate that the products produced shall be consistent with the content required in Engineering's Software Development Plan described in Appendix D of EA-WI-025. If requested in the DO to provide parts for all Engineering versions of the Software Development, the format in Appendix D of EA-WI-025 shall be used as the format.

MAINTENANCE: The contractor's Software Development Plan is maintained for contractor's internal use. The document can be reviewed at any time upon request. If requested by the DO, a Software Development Plan, generated as a deliverable for Engineering to their customer, shall be updated as required and shall not exceed 4 updates unless otherwise specified in the DO.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
GFE Flight Software Design Document	SEPT 2004	15	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data) The purpose of the Software Design Document is to formally report the software design to NASA.		5. DRD Category: (check one) <input checked="" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (Optional) EA-WI-025, GFE Flight Project Software and Firmware Development ; EA-WI-018 Use of Off-the Shelf Software in Flight Projects	7. Interrelationships (e.g., with other DRDs) (Optional)		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: This document describes the design of the software in sufficient detail that the software could be understood and modified by another knowledgeable programmer other than the developer.
This document describes the rationale for the selected design.

CONTENT:

Software structure
 Module definitions and functions
 Algorithms
 High level interface descriptions
 Threads of control
 Decomposition into compilation and code units
 Design of the Interfaces.
 Consideration given to the changes that may be required during flight operation by non-programmers.
 Mapping between the logical or functional design of the software and its detailed design units.

MAINTENANCE: A preliminary version is presented at PDR for approval. The document is updated as required to represent the approved configuration and is again formally reviewed at CDR. Modifications of the document after CDR are controlled by the appropriate NASA GFE configuration control board. A variety of software types may be required by a DO and require different flight program review processes.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Engineering Drawings	SEPT 2004	16	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
To provide the design data used to manufacture, install, verify, operate, modify, and maintain the products delivered under this contract.		<input checked="checked" type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
JPG 8500.4 Engineering Drawing Systems Manual Web Site: http://www4.edcc.jsc.nasa.gov			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: This DRD establishes the requirements for content, format, control, and maintenance of drawings and associated lists prepared by the contractor and/or obtained from subcontractors or vendors for all products designed under this contract.

CONTENT: All drawings shall be submitted to NASA in electronic format through the Electronic Drawing Control Center unless otherwise addressed in the DO. The contractor shall have the ability to submit and receive CAD generated solid models, electrical/electronic schematics, and printed circuit board layouts. The contractor shall understand and participate as required in the review process that NASA follows in order to approve flight hardware drawings, considered a part of the Engineering Drawings delivery.

FORMAT: Solid models shall be submitted in ProEngineer. All solid models shall be full parameterized in the ProEngineer format. Electrical/electronic schematics and printed circuit board layouts shall be transferred in ORCAD. The format of the drawing shall comply with the guidelines in JPG 8500.4. A request may be made by the contractor to the JSC Contracting Officer to use an existing drawing system that is in place. In accordance with the guidelines set forth in JPD8500.2H, the JSC Contracting Officer and the Technical Monitor may determine that the system is adequate and approve its use. Manufacturing processes shall be referenced to the appropriate specifications or industry standard (e.g. ASME, ANSI).

When a contractor standard or process is referenced, the full standard or process shall be provided as part of the drawing package. Contractor proprietary processes that cannot be submitted cannot be used in support of this contract. COTS hardware shall be identified by the vendor's part number, cage code (if available) and manufacturer's name and address. The parts list shall be submitted in Microsoft Excel and Design Change Notices shall be submitted in Microsoft Word.

MAINTENANCE: Updated as required prior to CDR. All updates are submitted for approval by the appropriate configuration control board prior to obtaining authorization after CDR. Upon completion of the DO, all original drawings and native engineering models created or revised by the contractor or sub-contractors along with the serialization records for all the hardware built to those drawings under the DO shall be delivered to JSC.

PERFORMANCE STANDARD: Drawings are complete and are approved through the NASA process through the Engineering Drawing Control Center on initial submittal. Acceptable performance: up to 10% of the drawings require modifications and re-submittal. Unacceptable performance: 25% or more require re-submittal. Better than normal performance: 6% or less require re-submittal.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Electrical, Electronic, and Electromechanical (EEE) Parts List and Analysis Report	SEPT 2004	17	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
Report to document the analysis used to verify that the selected electrical parts are not overstressed in worst case environments, operating conditions, and duty cycles.		<input checked="checked" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
NSTS 5300.4 (1D-2) SSP 30321	Preliminary Design Review Acceptance Data Package Certification Report		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The contractor shall deliver an EEE parts list and all or a part of the products required for EEE Parts Analysis. This report documents the analysis used to verify the appropriate de-rating and stress considerations of the EEE parts selected to meet the full functional performance when used within a system operation under all environmental conditions after worst case impacts of manufacturing, assembly and handling processes. This analysis is also used for system reliability predictions and trends for operation problems.

FORMAT: The contractor's format shall be used. The software used shall be compatible for submittal to NASA.

CONTENT: Analysis for all parts in the EEE Parts, As-Designed Parts List and the bill of materials associated with the complete product. After manufacture, the report shall be updated by including all changes identified in the EEE Parts, As-Built Parts List. This report shall include.

- Analysis of the worst case electrical, mechanical, and high and low temperature thermal stresses by parts from purchase through manufacturing to their use in the intended application
- Data verifying that NASA's de-rating requirements have been complied with
- Electrical drawing with input/output functions (signals, sources and loads and frequencies)
- Environmental and mechanical conditions placed on the hardware
- Analysis to define the environmental and mechanical conditions if required because of the placement of the hardware relative to other influencing hardware
- Tabulation of the worst case stress ratios for the parameters contained in the programs parts de-rating requirements. The tabulation is referenced to designators on the drawings. It identifies the part number, parameters to be verified, device's parametric rating, parameter's worst case calculated induced stress level, specific application, and ratio of the calculated stress level to device rating for the parameter.
- A separate section that identifies parts that were accepted for use even though they did not meet the defined de-rating requirements. The rationale for acceptance of their use and the NASA approval document reference is recorded here

MAINTENANCE: This document is modified whenever the hardware configuration is changed sufficiently to require additional analysis

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD) (Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Critical Design Review Data Package	SEPT 2004	18	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
This data package contains the mature engineering, safety, quality and project documentation to be reviewed by the NASA customer and thier designated support in order to assure that the contractor's intended products meet the requirements for safety, cost, performance and schedule.		<input checked="checked" type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input type="checkbox"/> SR&QA	
6. References (Optional)		7. Interrelationships (e.g., with other DRDs) (Optional)	
EA-WI-023 "Project Management of GFE Flight Projects"		Preliminary Design Review Data Package, DRD 06 See other DRDs below	
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The contractor may be required in the Delivery Order (DO) to deliver all or a part of the products required for a Critical Design Review data package as described in EA-WI-023. Content that is not required will be defined in the DO.

CONTENT:

- a. Summary of PDR Review Items Disposition that had actions to be completed by or prior to CDR.
- b. GFE End-Item Specification, DRD 10
- c. Flight GFE Interface Control Documents, DRD 9
- d. Engineering Drawings (90% of final drawings), DRD 16
- e. GFE Software Design Document, DRD 15
- f. Risk Assessment Executive Summary Report, DRD 39
- g. Flight GFE Verification and Validation Plan, DRD 12
- h. Certification and Acceptance Requirements Document (for EVA Projects only), DRD 45
- i. EEE Parts List and Analysis Report, DRD 17
- j. Limited Life Items List, DRD 32
- k. Flight GFE Workmanship Specifications List, DRD 7
- l. Contractor Unique Workmanship Specifications
- m. Summary of Waivers/Deviations Requested
- n. Engineering Analysis, DRD 26
- o. Flight Product User's Guide, DRD 21
- p. Sustaining Engineering Plan
- q. Summary Presentation (See EA-WI-023 for content)
- r. CDR Minutes

FORMAT: The format of each deliverable above that is defined by a DRD is to be delivered in the format specified in that DRD. The format of the summary presentation (item q) shall be defined by the contractor after consideration of the content for this presentation contained in EA-WI-023. The software used shall be Microsoft's Power Point or Microsoft's Word. An electronic version on CD of the Summary Presentation shall be delivered to the Flight Hardware Technical Manager's Representative and to the COTR at least 3 working days prior to the CDR Presentation for early distribution to the review team.

MAINTENANCE: The CDR Data Package is a one time delivery. The package shall be appended by the RIDS from this review. A complete copy shall be maintained as a project quality record in electronic format on a permanent data storage disk. This quality record shall be delivered to NASA at least two months after the CDR review or at the end of the Delivery Order, whichever occurs first.

PERFORMANCE: 1) Delivery Date: The data products for the CDR review shall be delivered to a location determined by the COTR or the TMR two weeks prior to the formal review date defined in the DO. Delivery two Weeks and two days before the formal review will be considered better than normal delivery. Delivery one week and five days or less than the review will be considered less than normal performance. A delivery of one week or less is considered poor performance.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

for this product. 2) Complete Content: Normal performance is considered if the data package contains products that are accepted with little modification required. Little modification means that all issues with the content controllable by the contractor can be resolved within 1 month of the review. All content issues resolved within three weeks of the review is considered better than normal performance and content issues resolved longer than eight weeks is considered poor performance.

JSC DATA REQUIREMENT LIST (DRL)/DATA REQUIREMENT DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Engineering Design Change Proposal	SEPT 2004	19	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
Define contractor proposed changes to controlled NASA requirements or product configuration.		<input checked="checked" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
EA-WI-027			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: This DRD provides a description of the minimum information required to be submitted to NASA when a change to NASA requirements is believed by the contractor to save money, reduce risk, increase efficiency, improve performance, or improve safety

CONTENTS: The Engineering Design Change Proposal (EDCP) shall contain the following data as a minimum. It is acceptable for the contractor to submit a change using the forms provided by the appropriate NASA change board.

1. Contractor EDCP number, date, and title
2. Description of change including technical impacts and technical impacts if not changed
3. Justification for change
4. Effectivity of the change specified in terms of deliverable subcontract end items and affected serial number.
5. Retrofit requirements and proposed incorporation/action shall be provided when applicable.
6. Documents Affected
7. Estimate of cost impact
8. Impact to Schedule
9. Impacts to Safety

FORMAT: The contractor's format shall be used unless a NASA configuration control board form is used. Changes to NASA controlled documentation shall be submitted with the current "From" text or drawing and the proposed "To" text or drawing

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Flight Hardware Qualification Test Procedures	SEPT 2004	20	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
To define all procedures and success criteria for testing new flight hardware or modified flight hardware and qualify that the GFE meets design requirements.		<input checked="" type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input type="checkbox"/> SR&QA	
6. References (Optional)		7. Interrelationships (e.g., with other DRDs) (Optional)	
Task Performance Sheet (TPS), NT-CWI-001 http://www4.jsc.nasa.gov/eaprojects/EA-ISO9000/NT-CWI-001.doc		Verification and Validation Plan, DRD 12 End Item Specification, DRD 10 Flight Hardware Software Requirements Specification, DRD 13 Certification and Acceptance Document, DRD 45	
8. Preparation Information: The contractor shall prepare the deliverable as follows.			

SCOPE: To document the detailed procedures used to test GFE flight products in order to assure that engineering processes and assumptions used are adequate for qualification.

CONTENTS: The procedures shall contain the following:

1. Identification of the specific End Item being tested
2. Detail description of the test objective
3. Description of all relevant test equipment and facility used
4. Full set of procedures
5. Criteria for passing or failing each test
6. Specification of the tolerances on all operational parameters with go, no-go criteria
7. Initial Settings for all Controls, Power Supply Voltages, etc.
8. Safety hardware that is mandatory to be verified operational prior to testing, with reference to procedures used

FORMAT: A Test Preparation Sheet shall be used to document and control the detailed instructions needed to actual perform the procedure.

JSC DATA REQUIREMENT T (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Flight Product User's Guide	SEPT 2004	21	NNJ04HH96B
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)		5. DRD Category: (<i>check one</i>)	
To provide all necessary information on how the flight product, or ground support hardware is to be operated, serviced and maintained.		<input checked="" type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)		7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)	
EA-WI-023 "Project Management of GFE Flight Products" EA-WI-025 GFE Flight Project Software and Firmware Development			
8. Preparation Information: The contractor shall prepare the deliverable as follows.			

SCOPE: The User's Guide is a compilation of information that is required for the user to operate, service and maintain the hardware and software without assistance from the providing contractor.

CONTENTS: The guide shall define procedures that assure safe and efficient handling of the hardware and software. It shall identify hazards that may be encountered throughout the procedures along with all controls for the hazard

FORMAT: The User's Guide may contain text, graphics, video, or photographic content. The contractor shall use the contractor's formats for the written portions of the guide. Those portions of the guide that may be used by the flight crew shall have a flight crew representative assessment of the final product and corrections made prior to final submittal. Electronic graphical procedures shall be provided in ProE format. A suggested format for software can be found in EA-WI-025 GFE Flight Project Software and Firmware Development.

MAINTENANCE: The User's guide shall be updated for up to two years after hardware acceptance by NASA. Flight crew experiences when using the guide and corrections of technical content may be some of the sources for updates.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Software Code	SEPT 2004	22	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
EA-WI-027 Configuration Management Requirements; EA-WI-025 GFE Flight Project Software and Firmware Development		<input checked="" type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
EA-WI-027 Configuration Management Requirements; EA-WI-025 GFE Flight Project Software and Firmware Development	Flight Hardware Software Design Document, DRD 15		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: Software, like hardware, is an essential element of GFE performance. The software for GFE is to be documented and placed under configuration controlled (See EA-WI-025).

CONTENT: Software includes all source code files, header files, data files, and derived products.

MAINTENANCE: Throughout the life of a project, it can be expected that software will undergo multiple configuration changes. The software files will be modified after consideration by the appropriate EA and program configuration control boards.

JSC DATA REQUIREMENTS (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Information Technology (IT) Security Program Plan and Reports	SEPT 2004	23	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
To meet IT security reporting requirements		<input checked="" type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input type="checkbox"/> SR&QA	
6. References (Optional)		7. Interrelationships (e.g., with other DRDs) (Optional)	
NFS 1852.204-76 (July 2001) NPG 2810.1 JPG 2810.1			
8. Preparation Information: The contractor shall prepare the deliverable as follows.			

SCOPE: All contracts that purchase, lease, network to, or otherwise utilize government-funded IT (as defined by the Clinger-Cohen Act of 1996) must comply with the NASA IT Security Requirements.

CONTENT:

SECURITY PROGRAM PLAN:

This plan shall contain the overall security policies, as required, for each system and application in a form compatible with the NASA Information Technology System (ITS) Security Program and the security and policies of the Center at which the work is being performed. For work being performed at JSC or at remote contractor sites not located at a NASA field center, the plan shall be in accordance with JPG 2810.1, JSC IT Security Handbook.

This plan shall also address the contractor's approach for ensuring verification of compliance with Section 508 of the Rehabilitation Act of 1974.

SECURITY STATUS REPORT

This report shall document the security status of all ITS, including any suspected security violations or infractions.

INFORMATION ON EMPLOYEES IN SENSITIVE POSITIONS/ASSIGNMENTS REPORT:

The Information on Employees in Sensitive ITS Positions/Assignments Report shall provide information for personnel screening as required by JPG 2810 1.

SYSTEM ADMINISTRATOR SECURITY CERTIFICATION PROGRAM.

This Agency-wide program applies to all lead system administrators administering systems on NASA IP address space.

All individuals who perform tasks as a system administrator or have authority to perform tasks normally performed by system administrator shall be required to demonstrate knowledge appropriate to those tasks. This demonstration, referred to as the NASA System Administrator Security Certification, is a NASA funded two-tier assessment to verify that system administrators are able to –

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. Demonstrate knowledge in system administration for the operating systems for which they have responsibility
2. Demonstrate knowledge in the understanding and application of Network and Internet Security.

Certification is granted upon achieving a score above the certification level on both an Operating System test and the Network and Internet Security Test. The Certification earned under this process will be valid for three years. The criteria for these skills assessments has been established by the NASA Chief Information Officer. The objectives and procedures for this certification can be obtained by contacting the IT Security Awareness and Training Center at (216) 433-2063.

A system administrator is one who provides IT services, network services, files storage, web services, etc. to someone else other than themselves and takes or assumes the responsibility for the security and administrative controls of that service or machine. A lead system administrator has responsibility for information technology security (ITS) for multiple computers or network devices represented within a system; ensuring all devices assigned to them are kept in a secure configuration (patched/mitigated); and ensuring that all other system administrators under their lead understand and perform ITS duties. An individual that has full access or arbitrative rights on a system or machine that is only servicing themselves does not constitute a "system administrator" since they are only providing or accepting responsibility for their system. An individual only servicing their own IT system, is not required to obtain a System Administrator Certification.

MAINTENANCE: As defined in JPG 2810.1

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
 (Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Certification Plan	SEPT 2004	24	NNJ04HH96B
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)		5. DRD Category: (<i>check one</i>)	
The Qualification Plan formally presents the approach to qualifying the first unit delivery of GFE		<input checked="" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)	7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)		
EA-WI-023 Project Management of GFE Flight Projects JSC 26626 EVA Hardware Generic Design Requirements Document	DRD 12 Verification and Validation Plan DRD 45 Certification and Acceptance Requirements Document		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The Certification plan documents the approach to qualifying GFE products for flight. It describes in detail how the processes of testing, analysis, demonstration and inspection shall be used to certify that contracted requirements are met. The requirements addressed by the Certification process are typically those that need to be addressed only one time in order to prove the design has met the intent.

CONTENT: The Certification Plan defines how the GFE products are qualified to meet the design requirements that have applied to the end item. Analysis, Test, Inspection, Demonstration, a combination of methods, or other methods may be used. The Certification Plan addresses those engineering design aspects that need to be verified on the first delivery only in order to verify that a requirement has been met. This is typically performed on dedicated certification products. In some cases the products may be used for flight if it can be shown that the certification process did not degrade the product.

MAINTENANCE: This document is maintained throughout the life of the project after the initial submittal at CDR. Revisions to the plan may be required every time there is a change to the configuration of the GFE. All versions of the plan shall be retained throughout the life of the GFE product.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
 (Based on JSC -STD-12)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Certification Report	SEPT 2004	25	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data) Documents the results of the Certification process. This documentation is used to complete a portion of the overall verification of the GFE. It is modified throughout the life of the products as configuration changes are made that require additional Certification or re-qualification.		5. DRD Category: (check one)	
		<input checked="" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (Optional)		7. Interrelationships (e.g., with other DRDs) (Optional)	
EA-WI-023 "Project Management of GFE Flight Products" EA-WI-025 GFE Flight Project Software and Firmware Development		Verification and Validation Plan, DRD 12 Certification and Acceptance Requirements Document DRD 45 Certification Plan, DRD 24 EEE Parts List and Analysis, DRD 17 Flight Hardware Certification Test Procedures, DRD 20	
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: Documents the results of certification testing, analysis, inspections, and demonstrations used to verify one time the design and performance of GFE Flight products. This report addresses all objectives defined in the Certification Plan.

CONTENT: The Certification Report contains all records used to verify that the GFE flight products met all the requirements that were allocated to the certification process in the Verification and Validation Plan. It contains the certification test results, the analysis results, results of demonstrations, results of inspections that are performed initially when hardware is first delivered and may be performed again when a configuration change is made. The detailed records of test procedures, analytical runs, inspections procedures, and demonstration procedures that support the results are to be available to the NASA as a part of this DRD.

MAINTENANCE: The Certification Report is updated every time a configuration change is made that would have affected the certification process had it been a part of the original design. Additional certification testing, analysis, inspection and demonstration will be required. A change record is maintained as part of the document.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Engineering Analysis	SEPT 2004	26	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
Engineering analysis is performed to provide design facts that are used as part of the 1 st item certification, certification of design changes, and certification of existing designs that are used beyond original certification limits. Analysis is relied upon to assure safety and to understand failures.		<input checked="" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
EA-WI-023 "Project Management of GFE Flight Projects"	DRD 06 PDR Data Package DRD 18 CDR Data Package DRD 39 RAESR DRD 44 Certification Data Package		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: Engineering work required to be performed to support the programs requires analyses at all stages throughout a project as defined in EA-WI-023 and EA-WI-025. Analysis can be explicitly identified in a Delivery Order or implicitly identified by requiring whole projects or phases of project as defined in the work instructions.

CONTENT: Engineering analysis required for design, performance prediction, and off-nominal assessment will be required. Some types of analysis that are frequently required in complex flight hardware are:

- Process Performance, and Control
- Stress and fracture control
- Thermal Stress Analysis
- Electromagnetic Effects
- EEE Parts Stress and de-rating
- Operational life
- Systems Integration and Off-Nominal Performance
- Stored Energy Impact and Isolation
- Materials Compatibility [off-gassing, corrosion, flammability, toxicity, performance, life]
- Safety [Hazard, Operability, Ground Handling]
- Failure Modes and Effects Analysis
- Failure Investigation Analysis
- Reliability Analysis

The analysis performed and report shall include a description of the assumptions made, sufficient technical details that analysis experts in the specific technical discipline can understand to determine the adequacy of the analysis, and a description of the software.

FORMAT: The format for reporting the results of some analyses may be dictated by a program. The contractor shall identify the need for a specific format from the configuration management information maintained on the program's web site. If a specific format is not requested, the contractor's format is to be used.

MAINTENANCE: Analyses may need to be performed as a result of design changes or changes in the intended use of hardware or software. The need for revisions to analyses and amendments to analysis reports can be expected throughout the duration of the Delivery Order.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-12)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Acceptance Data Package	SEPT 2004	27	NNJ04HH96B
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)		5. DRD Category: (<i>check one</i>)	
The ADP is a collection of documents that define the current status of a GFE flight products at the time of acceptance by NASA representatives.		<input checked="" type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)		7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)	
ISS: SSP 30695 "Acceptance Data Package Requirements Specification" EA-WI-023 "Project Management of GFE Flight Projects"			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The ADP is the collection of documentation that provides information that established a complete status of the certified and verified deliverable flight products or support products for flight products. It provides documentation of the "as-built" configuration. An ADP shall be submitted with shipment/transfer of each flight hardware/software product. The ADP is maintained throughout the life of the flight hardware/software in order to retain a record of the current status.

FORMAT: The format will vary depending on the program that the hardware supports. For ISS, the format is defined in SSP30695. The format to be used shall be defined at PDR for the flight products.

CONTENT: The information required in a specific ADP is dependent on the nature of the products to be provided. The need for and the content of the ADP shall be determined by the review team at PDR or shall be specified in the DO. Items which may be contained in the ADP are given below. The Space Shuttle Program accepts the ISS requirements for ADPs.

- a. Signed DD Form 250/1149 or equivalent signifying that NASA accepts that the products and supporting information that is provided meet the contracted obligation for the flight products. The DD250 is approved by the Contracting Officer's Technical Representative.
- b. Historical Log/note/comments (see JSC Form 772 "Functional Equipment Historical Record")
- c. Waivers/deviations
- d. Unexplained Anomalies
- e. List of Shortages
- f. Unplanned/Deferred Work
- g. Pre-planned Assigned Work
- h. Identification - As-Designed List; As-Built List
- i. Operating Time/Cycle (if certified life and operating cycles are limited)
- j. Age-Sensitive/Time-Action Items
- k. Non-Standard Calibration Record
- l. Discrepancy Reports requiring Material Review Board approval
- m. Repair Limitations
- n. Pressure Vessel Data, including pressure cycle data (if certification limited)
- o. Non-Flight Hardware Temporary Installation (e.g. CAPS for shipping which are removed before flight)
- p. Materials Safety Data Sheets
- q. Selected Engineering drawings (e.g., assembly level drawings)

- r. Software/Firmware Version Description Document (VDD) (see EA-WI-025)
- s. Special instructions to maintain safety and functionality of the GFE during storage, handling, maintenance and disposal

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

- t. Certification (including reference to completed documentation indicating that qualification of design and design changes and acceptance requirements have been satisfied, acceptance test procedures (ATP) numbers and ATP report numbers)
- u. Users Guide or Systems Operating Manual for hardware and software - DRD 21
- v. Energy Storage Products Log and Qualification References (Pyrotechnics, batteries, springs, etc.)

MAINTENANCE: The data package is maintained throughout the life of the product. As additional use, certification testing, analysis, etc. is undertaken, these results are added to the data package.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
 (Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Export Control Audit Results	SEPT 2004	28	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
To provide insight into the Contractor's Export Control processes		<input checked="" type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
NFS 1852.225-70 and Clause H.4			
8. Preparation Information: The contractor shall prepare the deliverable as follows.			

SCOPE: Audits should include a thorough examination of all export control processes (as outlined in the Contractor's Export Control Plan) associated with this contract, areas for improvement (if any), and corrective action plans for identified areas of improvement. Affected subcontractors are required to do their own self-audits and report the results of the audit to NASA through the contractor. Prior to audit completion, inclusion on the audit process thru informal statuses to the JSC Export Services Team or Center Export Administrator is optional and might prove useful in the success of this effort.

CONTENT:

- (a) Define your current audit processes
- (b) Document the export control processes audited and audit findings
- (c) Based on audit findings, the contractor/subcontractor shall include corrective action plans for any processes identified for improvements and notification of when the correction of any non-conformances has been completed.

MAINTENANCE: The document shall be maintained electronically.

JSC DATA REQUIREMENTS TEST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
R- Quality Plan	SEPT 2004	29	NNJ04HH96B
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)		5. DRD Category: (<i>check one</i>)	
The Quality Plan is used to document the specific details of the contractor's Quality Management System (QMS) related to a specific product or process.		<input type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input checked="" type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)	7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: A contract specific Quality Plan shall be prepared which identifies activities performed to ensure the quality of products and services. The Quality Plan is to be submitted with the Contractor's proposal. The plan will be approved by the Contracting Officer concurrent with Contract award.

FORMAT: The Quality Plan format shall match the elements of the ANSI/ISO/ASQ Q9001-2000- Model for Quality Assurance in Design/Development, Production, Installation, and Servicing and Supplements contained in the Statement of Work, Quality Assurance section.

CONTENTS: The quality plan shall address each element of the ANSI/ISO/ASQ Q9001-2000- Model for Quality Assurance in Design/Development, Production, Installation, and Servicing in enough detail to describe how requirements will be implemented for this contract.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-12)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Patent Rights-Retention	SEPT 2004	30	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
Identification of any subject inventions including information on patent applications and related filings.		<input type="checkbox"/> Technical	
		<input checked="" type="checkbox"/> Administrative	
		<input type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
NFS Clause 18-52.227-11			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: Inventions by the Contractor as part of their performance on this government contract.

CONTENT: The content of the deliverable shall include

- A listing every twelve (12) months of all subject inventions required to be disclosed during the period
- A final report prior to closeout of the contract listing all subject inventions or certifying that there were none.
- Upon request, the filing date, serial number and title, a copy of the patent application, and patent number and issue date for any subject invention in any country in which the contractor has applied for patents

FORMAT: The electronic or paper version of NASA form 1679, Disclosure of Invention and New Technology (Including Software) to disclose subject Invention

FIRST SUBMISSION DATE: 12 months after contract start

Frequency Of Submission: Once a year

Additional Submissions: Final report at contract closeout.

MAINTENANCE: Updated annually by the Contractor and submitted in printed form.

13. REMARKS: None

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Shuttle/Station Payload Safety Data Package (SDP)	SEPT 2004	31	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
This DRD defines the payload safety review process and data required to assist the Shuttle/ISS Payload Organizations in documenting compliance with the payload safety requirements		<input type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input checked="" type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
NSTS/ISS 13830			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE/CONTENT/MAINTENANCE:

The contractor shall submit Safety Data Packages (Phases 0-III) and other supporting documentation as required by NSTS/ISS13830. The payload Safety Process as defined by NSTS/ISS 13830 shall be followed using the latest Revision, which can be found at the following URL's

<http://jsc-web-pub.jsc.nasa.gov/psrp/> (Public Access, JSC Internal Homepage access not required)

<http://wwwsrqa.jsc.nasa.gov/pce/> (JSC Internal Homepage access required)

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Limited Life Items List	SEPT 2004	32	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
The purpose of this DRD is to provide the necessary information and definitions to consistently and clearly identify limited life components to maintain GFE in a use ready condition. This information permits operations, logistics and maintenance organizations, to plan for the timely removal and replacement of hardware identified with limited life so as to ensure continuation of proper operation.		<input type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input checked="" type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
See "Reference Documents" under item 8 below			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

REFERENCE DOCUMENTS:

JSC 17057, GFE Limited Cycle Time/Age Life Item Requirements
 NSTS 22206, Requirements for Preparation and Approval of Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL)
 SSP 30234, Instructions for Preparation of Failure Modes and Effects Analyses and Critical Items List for Space Station

SCOPE: Limited life includes limited shelf life, limited operating life, time-action control sensitive (including maintenance activities), or a combination of these.

CONTENT: At a minimum, the following data shall be provided.

A. Deliverable item:

1. Name;
2. Part Number;
3. Serial number,
4. Contractor and Government Entity (CAGE) code;
5. Life limiting parameter, material, or function (including analyses);
6. Restrictions or limitations on refurbishments;
7. Mean Time Between Failures (MTBF) (only for items identified as criticality 1, 1R, or 2 per NSTS 22206 or SSP 30234); and
8. MTBF units (e g. hours)

B. For deliverable items which are, or contain, operating time/cycle sensitive items. these additional data shall be provided:

1. Time/cycle item part name;
2. Time/cycle item part number;
3. Time/cycle item part serial number;
4. Time/cycle item part CAGE code;
5. Specification requirement (allowable time/cycles); and
6. Remaining time/cycles from point of delivery.

C. For deliverable items which are, or contain, age-sensitive/time-action items, these additional data shall be provided:

1. Age-sensitive/time-action item part number;

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

2. Age-sensitive/time-action item part serial/lot number;
3. Age-sensitive/time-action item part CAGE code;
4. Age-sensitive/time-action item part birth date;
5. Age-sensitive/time-action item part expiration date (action due date);
6. Type of action required (i.e , replace, service, inspect, etc.);
7. Last operation and/or servicing date (time-action items only); and
8. Next operation and/or servicing date (time-action items only).

Format: Electronic tables for entry into NASA databases. Analyses (item A.5 above) may be provided via hardcopy, in contractor format. For multiple GFE deliveries, analyses is not required for deliveries subsequent to the initial delivery unless there is a change.

MAINTENANCE: Update as required

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-123-----)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Space Station GFE Failure Modes Effects and Analysis (FMEA) and Critical Items List	SEPT 2004	33	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
To identify failure modes and effects, and critical items to support risk assessment, additional design action, safety analysis, hardware/software interface analyses, test planning, mission planning, preparation of mandatory inspection points, fault detection and isolation, maintainability analyses and planning, maintenance planning and logistics planning		<input type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input checked="" type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: Identification of failure modes and effects, and critical items to support risk assessment, additional design action, safety analyses, hardware/software interface analyses, test planning, mission planning, preparation of mandatory inspection points, fault detection and isolation, maintainability analyses and planning, maintenance planning, and logistics planning.

The flight hardware and Ground Support Equipment FMEA/CIL shall be documented in accordance with SSP 30234, "Instructions for Preparation of Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL) for the International Space Station." If the GFE is defined as a criticality 3 using an Initial Assessment of Criticality, JSC 28484 methodology can be used.

FORMAT: The flight hardware FMEA/CIL worksheets shall be prepared in accordance with SSP 30234. Other information supporting the FMEA/CIL (summary tables, ground-rules and assumptions, reliability block diagrams, incomplete design areas) will be part of the RASER.

A Critical Items List (CIL) for Ground Support Equipment (GSE) shall be submitted in hardcopy form only, in subcontractor format, as part of the RASER.

FMEA/CIL worksheets shall be submitted electronically per SSP 30234.

NEED DATE or MILESTONE REQUIRING FMEA/CIL DATA SUPPORT.

The FMEA/CIL data requirements apply to all flight (including OSE, FSE) hardware.

The data provided for the first applicable IDR may be preliminary data (data integrity equivalent to that expected at a PDR). If the initial submittal is preliminary data, final data must be provided to support a subsequent IDR (data integrity equivalent to that expected at a CDR).

Multiple deliveries of the GFE do not require corresponding data deliveries

Note: This DRD also applies to GSE required to support the flight hardware

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

SDRL Specifications

SEQUENCE NUMBER:

TITLE OR DESCRIPTION OF DATA: Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL)

CONTRACT NUMBER:

STATEMENT OF WORK PARA:

AUTHORITY: (DID/SDS No.) 6

NASA OFFICE OF PRIME RESPONSIBILITY: S&MA

TRANSMITTAL BY:

NASA DOCUMENT TYPE:

ELECTRONIC SUBMITTAL REQUIRED: Yes

FREQUENCY:

AS OF DATE:

DATE OF 1ST SUBMISSION:

DATE OF SUBSEQUENT SUBMISSION / EVENT ID:

DISTRIBUTION AND ADDRESSES

Remarks:

Applicable Code: Critical item worksheets (Flight Hardware and GSE Hardware) shall be Type 1 Remainder of document shall be Type 3

Frequency, Date of first Submission, and Date of Subsequent Submission/Event ID: Initial Submittal shall be early enough to affect the design process.

Subsequent submittals shall be thirty (30) days prior to program milestone reviews as determined by program milestone review plan. Quarterly delivery of working files provided electronically in a delimited flat ASCII database file per SSP 30234.

A Critical items list (CIL) for Ground Support Equipment (GSE) shall be submitted in hardcopy form only, in Product Group format.

Note. FMEA/CIL supporting information (summary tables, ground rules and assumptions, reliability block diagrams, incomplete design areas) are reported as part of SS-SM-005 (R&M Predictions Report).

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

INTERNATIONAL SPACE STATION
FAILURE MODE AND EFFECTS ANALYSIS
WORKSHEET HEADER PAGE

PREPARED BY DESIGN
PREPARED BY RELIABILITY
FMEA WORKSHEET NUMBER:

ORIGINAL DATE:

FLIGHT/GSE:

END ITEM:

SYSTEM:

SUBSYSTEM:

SEGMENT FUNCTION:

END ITEM FUNCTION:

SOFTWARE INTERFACE:

ORU NAME:

ORU NO:

CRITICALITY 1 DURING MAINTENANCE:

SUCCESS PATHS:

SUCCESS PATHS REMAINING

PART NAME:

PART NUMBER

DRAWING NUMBER:

LCN/REF DES

QTY

ITEM FUNCTION:

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

WORKSHEET NUMBER:
FAILURE MODE CODE:
FAILURE MODE TEXT:

CRITICAL ITEM (Y/N):
IS FUNCTION RESTORABLE ON-ORBIT:
CHECKOUT PRELAUNCH:
CHECKOUT ON-ORBIT:
DETECTABILITY GROUND CREW
DETECTABILITY FLIGHT CREW:
LOSS OF REDUNDANCY FROM A SINGLE CAUSE:
CAUSE: 1:
CAUSE: 2:
CAUSE: 3:
CAUSE: 4:
CAUSE: 5:
CAUSE: 6:
STAGE(S) AFFECTED:

ORU/ASSEMBLY	
MISSION PHASES	FAILURE EFFECT
A. PRELAUNCH	
B. TRANSPORTATION	
C. ASSEMBLY	
D. OPERATIONS	
E. RETURN	

SUBSYSTEM/NEXT ASSEMBLY	
MISSION PHASES	FAILURE EFFECT
A. PRELAUNCH	
B. TRANSPORTATION	
C. ASSEMBLY	
D. OPERATIONS	
E. RETURN	

END ITEM/SEGMENT	
MISSION PHASES	FAILURE EFFECT
A. PRELAUNCH	
B. TRANSPORTATION	
C. ASSEMBLY	
D. OPERATIONS	
E. RETURN	

CREW/ISS/ACRV/ORBITER	
MISSION PHASES	FAILURE EFFECT
A. PRELAUNCH	
B. TRANSPORTATION	
C. ASSEMBLY	
D. OPERATIONS	
E. RETURN	

SOFTWARE INTERFACE EFFECT:		
TIME TO EFFECT:	QTY.	UNITS:
TIME TO DETECT:	QTY:	UNITS:

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

CRITICALITY: MSN PHASES:
CORRECTIVE ACTION:

FAILURE DET/VERIF

WORKSHEET REMARKS:
HAZARD:
HAZARD DOCUMENT ORGANIZATION CODE:
HAZARD NUMBER:
HAZARD DOCUMENT

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Space Shuttle GFE Safety Analysis Report (SAR) and Hazard Report (HR)[HR_1]	SEPT 2004	34	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data) The SAR is used to document the safety analysis performed on a system Subsystem or operation. The HR is the output of the hazard analysis and is used to provide program management a summary of risk in terms if cause, control and verification.		5. DRD Category: (check one) <input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (Optional) See "Reference Documents" under item 8. below	7. Interrelationships (e.g., with other DRDs) (Optional) GCAR		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

Reference Documents:

- a. NSTS 5300.4 (1D-2), "Safety, Reliability, Maintainability and Quality Provisions for the Space Shuttle Program"
- b. JSC 17481A, "Safety Requirements Document for JSC Space Shuttle Flight Equipment"
- c. NSTS 07700, Vol. V, "Information Management"

SCOPE: A SAR and HR 's are applicable to all Government-furnished equipment (GFE) classified flight hardware

FORMAT: The format of the SAR and HR's shall be in accordance with NSTS 22254 "Methodology for Conduct of Space Shuttle Program Hazard Analyses"

CONTENTS: The hardware provider shall provide the SAR and HR 's for program management visibility.

a. SAR: A safety analysis shall be performed in accordance with NSTS 22254 and a SAR shall contain the following as a minimum:

- (1) System, subsystem, assembly, or item identifier
- (2) Event and mission phases considered.
- (3) Page, date, and revision number.
- (4) Identification of the preparer and approvals with signatures.
- (5) Description of the type of hazard analysis performed.
- (6) Analysis of each generic hazard listed in JSC 17481A and unique hazards showing applicability or inapplicability, controls, and verifications
- (7) Safety matrix relating equipment subsystems to generic hazards.
- (8) Hazard list providing HR number, title, status, and classification for any baselined hazards.
- (9) Summary of open HR 's with actions required for closure.
- (10) Summary of candidate accepted risks with acceptance rationale.

The SAR may be sufficed by a properly and completely filled out hazard analysis worksheet or Government Certification Approval Request (GCAR) in situations where the system, subsystem, assembly, or item is non-critical, low cost, and not complex in design.

b. HR 's: If HR 's are required based on the safety analysis performed, the HR's shall comply with the requirements of NSTS 07700, volume V and NSTS 22254 The HR 's shall contain, by attachment, documentation of work performed to support closure.

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
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JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

Software Quality Assurance Plan, Reports	SEPT 2004	35	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
Software assurance planning is used to document the software assurance activities to be performed during the life cycle phases. Reports document the status of the activities.		<input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (Optional)		7. Interrelationships (e.g., with other DRDs) (Optional)	
See "Reference Documents" in Box 8 below.		Certification Data Package (CDP); Problem Reporting and Corrective Action (PRACA)	
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

REFERENCE DOCUMENTS:

- a) NASA-STD-2201-93, Software Assurance Standard
- b) NPD 2820.1, NASA Software Policies
- c) NASA-STD-2100-91, NASA Software Document Standard
- d) SAE, AS9100 - Model for Quality Assurance in Design/Development, Production, Installation, and Servicing
- e) Other approved vendor/contractor, international, U.S., or Military Standards
- f) Project planning documents per the SOW (Statement of Work)
- g) JSC 27291, GFE Software Design, Development, Test and Evaluation Work Instruction

SCOPE: Software Assurance includes Quality Assurance, Quality Engineering, Verification and Validation, Nonconformance Reporting and Corrective Action, Safety Assurance, Software Reliability and Security Assurance. Software Assurance activities are conducted during the software development life cycle. The phases of the software development life cycle are:

- a) Concept and Initiation Phase
- b) Requirements Phase
- c) Design Phase
- d) Implementation Phase
- e) Integration and Test Phase
- f) Acceptance and Delivery Phase
- g) Operations/Maintenance Phase

DEFINITIONS: Software Quality Assurance applies to all software developed for NASA, including:

- a) deliverable software,
- b) software included as part of deliverable hardware (including firmware),
- c) non-deliverable software (Commercially available or user-developed) used for development, fabrication, manufacturing process control, testing, or acceptance of deliverable software or hardware (test and acceptance software; software design, test, and analysis tools; compilers, etc.)
- d) Commercially available (COTS), reused, or government-furnished software (GFS)

CONTENT: Contractor shall provide a Software Assurance Plan in accordance with M400 as contained in NASA-STD-2100-91. The Software Assurance Plan shall identify the software assurance approval authority responsible for the establishment and composition of all software baselines and any changes to the baseline. (Per NASA-STD-2201-93 section 3 2.6.)

Contractor shall provide software assurance activity reports in accordance with R008 in accordance with NASA-STD-2100-91.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC --STD-123)

MAINTENANCE: Review annually at a minimum.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Space Station Hazard Reports (HR's)/System Descriptions [HR_2]	SEPT 2004	36	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
Station GFE HR's and System Descriptions are used by the Prime Contractor to prepare an integrated Stage Hazard Analysis which will entail the analysis of the interfaces between End Items on-orbit for each mission in support of the Safety Review Panel and Ground Safety Review Panel (GSRP).		<input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
	GCAR		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE/CONTENT/MAINTENANCE: This requirement shall consist of system descriptions with Hazard Reports and their supporting data. The hazard reports and system description will cover each GFE end item for all phases.

The System Description shall describe the GFE (FLT, OSE, FSE, & GSE) end-items and their systems and associated ground systems and support equipment. The system description shall also include on-orbit assembly, on-orbit operations and start-up sequences. Top-level schematics/functional block diagrams that depict safety features shall be provided.

The flight hazard reports shall address interfaces with element level end items other GFE, and CFE. For each subsequent revisit to the station, each GFE provider will assess on-orbit configurations changes to their End Item which may affect the safety of the station and submit as applicable. A contract letter stating no impact is acceptable. The GFE and Ground Operations hazard report will cover the Support Equipment (GSE/TSE) interfacing with flight hardware at KSC as well as the operations to process the flight hardware through KSC for integration into the Orbiter.

CONTENT. Flight Hazard Reports and system descriptions shall be submitted on each GFE end-item and shall address hazards from launch through return/decommissioning. The Hazard Reports document the results of the safety analysis which is performed to identify hazards and their causes, identify specific safety requirements and non-conformances, specify control methods in the design, and identify verification activities.

Ground Hazard Reports and System descriptions shall address all hazards associated with launch processing and includes the Ground Safety Checklist (JF970).

These submittals shall include the additional forms in Appendix C as appropriate.

Hazard Reports shall be submitted with a level of maturity commensurate with the hardware, software, and operations that are being reviewed.

Each review will address products with different levels of maturity. The following table shall apply:

Product Maturity	Review Phase	Report Content
PDR	I	Hazards identified
CDR	II	Controls documented
Launch - 1 year	III	Verification complete*

* All verifications that are not complete at the Phase III level review shall be documented in a verification matrix to be identified in block 5 "status of open work" of the hazard report.

The final submittal of hazard reports and system descriptions shall be grouped by mission. This grouping is necessary to support FRR.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

Hazard reports and their supporting documentation for contractor furnished equipment shall be delivered 90 days prior to the phase safety review for which it is first manifested.

FORMAT. Formats for the Hazard Reports are contained in appendices to this DRD S&MA-4 shall be submitted in hard copy and in Microsoft Word.

Appendix A: Flight Hazard Analysis Report and System Description content (See JF1366 and JF1477)

Appendix B: Ground Hazard Analysis Report and System Description content (See JF970)

Appendix C: Additional Forms

Appendix D: Hazard Report Format

Appendix A

Flight Hazard Analysis Report and System Description Format and Content

1.0 Scope

Identify the hardware that was analyzed and the maturity (Phase 1, 2, 3) of the analysis

2.0 System Description

Describe the major end-items and their systems and associated ground systems and support equipment. The system description shall also include on-orbit assembly, on-orbit operations and start-up sequences. Top level schematics / functional block diagrams that depict safety features shall be provided.

3.0 Supporting Data

This section contains data that is important to the analysis and does not fit in other sections. The contractor may determine how this section is arranged.

4.0 Hazard Reports and Substantiating Data

This section shall include all hazard reports applicable for the mission, supporting data, and additional forms as defined in Appendix C.

5.0 Ground Safety Checklist - Attach form JF970.

Appendix B

Ground Hazard Analysis Report and System Description Report

GROUND HAZARD ANALYSIS REPORT AND SYSTEM DESCRIPTIONS

FOR

PG-X

Prepared By.

Name of Tier I Subcontractor

Approved By

Tier I Safety Manager

Date

Tier I Subcontractor
Vehicle AIT Manager
Date:

Tier Program Manager
Date:

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

Ground Hazard Analysis Report and System Description Format and Content

- 1.0 Scope. Identify the hardware that was analyzed and the maturity of the analysis.
- 2.0 GSE Design and Ground Operations. This section will be completed for each supported launch. This section includes:
- 1) Cargo element/launch package description and brief mission scenario.
 - 2) Descriptions of GSE, cargo element/launch package subsystems that are safety critical during ground processing, and their ground operations. Schematics and block diagrams with safety features, inhibits, etc., identified should be included.
 - 3) Ground operations scenarios or a brief description of the in-line and off-line sequencing of ground processing tasks, including transport, receipt, assembly, test/checkout and ultimate usage.
- 3.0 Supporting Data. This section contains data that is important to the analysis and does not fit in other sections. Tier 1 contractor may determine how this section is arranged.
- 4.0 Hazard Reports and Substantiating Data. This section shall include all hazard reports applicable for the mission.

Appendix C

Additional Forms

Appendix D

Hazard Report Form

Format and Content

D-1 Hazard Reports shall be delivered in Microsoft Word format.

D-2 The following format and structure shall apply.

TEAM NAME
International Space Station

Hazard Report Number _____

1. HAZARD TITLE

- a. Review Level.
- b. Review Date
- c. Scope

2 HAZARD CONDITION DESCRIPTION:

3 CAUSE SUMMARY

	2A	3A	4A	5A	6A
Cause 1					

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC-STD-123)

Control 1
Control 2
Cause 2
Control 1
Cause n
Control 1
Control 2

1. Title:
SEVERITY. LIKELIHOOD:

2. Title:
SEVERITY: LIKELIHOOD:

n. Title
SEVERITY. LIKELIHOOD

4 PROGRAM STAGE(S)

5 INTERFACES.

6 STATUS OF OPEN WORK: (Phase III Only)

7 REMARKS:

8 SUBMITTAL CONCURRENCE:

Tier 1 Subcontractor Safety Manager	Date
Tier 1 Integrated Product Team Manager/Subsystem Manager	Date
Tier 1 Program Manager	Date

9 APPROVAL.

S&MA Lead/NASA	S&MA Lead/Contractor
----------------	----------------------

Hazard Report Number _____

CAUSE

1 HAZARD CAUSE DESCRIPTION
SEVERITY LIKELIHOOD

2 CONTROL(S):

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

Control 1

Control 2

Control 3

3 METHOD FOR VERIFICATION OF CONTROL(S):
Verification of Control 1

Verification of Control 2

Verification of Control n

4 SAFETY REQUIREMENT (S):

Document: Paragraph:
Title

Document: Paragraph:
Title

5 MISSION PHASE (S):

Launch Processing
Launch
Rendezvous/Docking
Deployment
Orbital Assembly & Checkout
On-Orbit Operation
On-Orbit Maintenance
Return/Decommissioning

6 PROGRAM STAGE(S):

7 DETECTION AND WARNING METHOD(S):

8 CAUSE REMARKS.

9 CIL REFERENCE:

10 POINT OF CONTACT:

Name: Telephone:

Hazard Report Number _____

CAUSE

1 HAZARD CAUSE DESCRIPTION:

SEVERITY LIKELIHOOD:

2 CONTROL(S):

Control 1

Control 2

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

Control 3

3 METHOD FOR VERIFICATION OF CONTROL(S)

Verification of Control 1

Verification of Control 2

Verification of Control n

4. SAFETY REQUIREMENT(S):

Document: Paragraph.
Title:

Document: Paragraph.
Title:

5. MISSION PHASE(S):

Launch Processing
Launch
Rendezvous/Docking
Deployment
Orbital Assembly & Checkout
On-Orbit Operation
On-Orbit Maintenance
Return/Decommissioning

6. PROGRAM STAGE(S):

7. DETECTION AND WARNING METHOD(S):

8. CAUSE REMARKS:

9 CIL REFERENCE:

10. POINT OF CONTACT.

Name: Telephone:

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

SDRL Specifications:

SEQUENCE NUMBER

TITLE OR DESCRIPTION OF DATA: Hazard Analysis Report and System Description

CONTRACT NUMBER:

STATEMENT OF WORK PARA:

AUTHORITY: (DID / SDS No.) SMA-4

NASA OFFICE OF PRIME RESPONSIBILITY: S&MA

TRANSMITTAL BY (DD Form 250 / 1149 / Letter)

NASA DOCUMENT TYPE: (Type 1 / 2 / 3) Type 3

ELECTRONIC SUBMITTAL REQUIRED: Y

FREQUENCY.

AS OF DATE:

DATE OF 1ST SUBMISSION:

DATE OF SUBSEQUENT SUBMISSION / EVENT ID:

DISTRIBUTION AND ADDRESSES:

- Submittal of S&MA-4 is forty-five (45) days prior to each IDR *.
- Hazard reports shall be delivered in Microsoft Word**.
- Hazard reports and their supporting verification documentation for each intersite deliverable item shall be delivered ninety (90) days prior to the safety review for which it is first manifested *.

* Note: Safety reviews will be accomplished during, and in conjunction with the IDRs.

**Note: Supporting data to each hazard report may be submitted by hard copy.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Reliability and Maintainability (R&M) Plan	SEPT 2004	37	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
Used to assure proper implementation of R&M quantitative requirements. Used by program management to verify predictions, allocations, etc., are consistent with program requirements.		<input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
NSTS 5300.4 (1D-2)			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: Formulate an R&M Plan to serve as a master planning, program definition, and control document to govern the R&M quantitative-related activities required for the project

FORMAT: Each quantitative requirement shall be addressed in narrative form and in sufficient detail to describe the philosophy and approach for implementation. Existing policies and procedures can be used if in total compliance with the requirements stated below.

CONTENTS: The plan shall identify and define the following as a minimum:

- a) The work to be accomplished for each applicable task.
- b) The time phasing and staff loading involved.
- c) The organizational element assigned responsibility and authority for implementing the required task.
- d) Lines of communication between the organizational element responsible for implementing the task and other interfacing organizational elements.
- e) Appropriate NASA-contractor program milestone review points.
- f) Method of control over subcontractor and vendor-related tasks
- g) The purpose and expected results of each task. Planned methods for monitoring, assessing, reporting, and taking appropriate action regarding status, accomplishments, and problems.
- h) Specific techniques for allocating quantitative requirements to lower level functional elements of the system, subsystem, assembly, or components
- i) Specific techniques for making R&M predictions.
- j) The method of data collection and analysis, and plan for ensuring an effective corrective action system.
- k) Data base requirements.
- l) Contents and submittal schedules of the prediction, allocation, assessment, and verification reports.
- m) Means by which demonstration and verification will be accomplished.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
 (Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Government Certification Approval Request	SEPT 2004	38	NN-04047146R
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)		5. DRD Category: (<i>check one</i>)	
To establish the joint JSC and hardware provider agreed upon requirements to be used for acceptance and certification of flight hardware.		<input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)	7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The GCAR is a form that documents the certification information for an item.

FORMAT: The GCAR form JF 1296 with instructions at <http://wwwsrqa.jsc.nasa.gov/gcars/instructions.htm>.

CONTENTS: See the instructions at the above website for details.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-12)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Risk Assessment Executive Summary Report (RAESR)	SEPT 2004	39	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data) To provide management with a single report summarizing S&MA risks.		5. DRD Category: (check one)	
		<input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
See "Reference Documents" under item 8 below	GCAR; HR; CARD; FMEA; CIL		
8. Preparation Information: The contractor shall prepare the deliverable as follows.			

Reference Documents:

- a. NSTS 5300.4 (1D-2), "Safety, Reliability, Maintainability and Quality Provisions for the Space Shuttle Program"
- b. NSTS 07700, Vol. V, "Information Management"
- c. NSTS 22254, "Methodology for Conduct of Space Shuttle Program Hazard Analyses"
- d. JSC 17481A, "Safety Requirements Document for JSC Space Shuttle Flight Equipment"
- e. NSTS 22206, "Instructions for Preparation of Failure Modes and Effects Analysis and Critical Items List"
- f. SSP 30309, Revision E, "Safety Analysis Requirements Document"
- g. SSP 50021, "Space Station Safety Requirements"
- h. SSP 30599, Revision A, "Safety Review Process"
- i. SSP 30234, Rev. E.; "Instructions for Preparation of Failure Modes Effects & Analysis & Critical Items List for ISS"

SCOPE: The RAESR documents the results of the risk assessment performed for flight hardware/software and operations and provides management visibility of the total risk picture. The RAESR consists of four major sections: the system description, the results of the Safety Analysis including operational safety; the Failure Modes and Effects Analysis (FMEA), and the Risk Reports which includes the combination of Hazard Report and Critical Items List (CIL) data.

FORMAT and CONTENTS.

Outline

- i. Cover Page
- ii. Signature Page
- iii. Table of contents

- 1.0 Introduction
- 1.1 Purpose/Scope
- 1.2 Background
- 1.3 System Description
- 1.4 Documentation
 - 1.4.1 Safety Requirements Documents
 - 1.4.2 Reference Documents

- 2.0 Safety Analysis
 - 2.1 Assumptions
 - 2.2 System Safety Analysis
 - 2.3 Operational Safety Analysis

- 3.0 Failure Modes and Effects Analysis
 - 3.1 Ground Rules
 - 3.2 Failure Modes and Effects Analysis Worksheets
- 4.0 Risk Summary

- Appendix A
Risk Reports (HR/CIL combination)
- Appendix B
Government Certification Approval Request (SMACAR)

- Appendix C
Definitions

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Problem Reporting and Corrective Action (PR-CA) for Johnson Space Center (JSC)	SEPT 2004	40	NNJ04HH96B

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-123)

Government Furnished Equipment (GFE)				
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)			5. DRD Category: (<i>check one</i>)	
To report problems and to document their subsequent resolution and approval.			<input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)		7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)		
JSC 28035, NSTS 22206, SSP 30234		Nonconformance Record DRD		
8. Preparation Information: The contractor shall prepare the deliverable as follows:				

SCOPE: Nonconformances requiring JSC GFE PRACA reporting are defined in JSC 28035. PRACA reporting is limited to flight equipment, equipment that is representative of flight equipment (flight-like) and critical ground support equipment.

CONTENTS: A. The following data is mandatory for the initial reporting of a problem. The initial report shall be transmitted to the JSC PRACA Center within 2 business days after isolation to a configuration item but no later than 10 business days after occurrence/detection.

1. PRACA Number [a unique tracking number assigned to the PRACA report]
2. Nonconformance Number [a unique local nonconformance number]
3. Detect Date [The date (mm/dd/yyyy) nonconformance occurred or was detected]
4. Location [The location where the nonconforming item was at, at the time of occurrence/detection]
5. Program [The affected NASA program (SSP, ISS, or both)]
6. Project Office [The responsible NASA Project Office (EVA, FCE, Life Sciences, Orbiter, RMS, Other_____)]
7. Contact [The technical point of contact, organization, and phone number]
8. Report Date [Date the PRACA report was initiated]
9. Detected During [The specific test or operation performed when the nonconformance occurred]
10. Title [A brief, but descriptive, title for the problem]
11. Description [A narrative description of the problem including the observed event(s) as well as the expected event(s).]
12. Identification of the Configuration Item by

- a. Part name
- b. Part number
- c. Serial number, lot number, or version
- d. Manufacturer's name
- e. Manufacturer's Contractor and Government Entity (CAGE) code

B. The following data shall be provided when it becomes known (with the exceptions noted). This data shall be provided as updates to the initial PRACA report. This data is mandatory for the closure of the report.

- 13 The end item (if not the configuration item), specific subassemblies, and the nonconforming article shall be identified

- a. Part name
- b. Part number
- c. Serial number, lot number, or version
- d. Manufacturer's name
- e. Manufacturer's CAGE code

14. FMEA No. [Failure Mode and Effects Analyses number. Note: if the hardware is used by the Space Station and the Space Shuttle Programs, provide both FMEA numbers.]

15. FMEA Criticality [criticality per NSTS 22206 or SSP 30234 This data is required within 10 calendar days of opening the problem report.

Note: if the hardware is used by the Space Station and the Space Shuttle Programs, provide both FMEA criticalities.]

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

16. FMEA/CIL Impact [yes or no, is the FMEA/CIL retention rationale impacted by the occurrence of this problem?]
17. Out-of-Family Problem [yes or no, based on the definitions of In-Family and Out-of-Family in JSC 28035.]
18. Fracture Critical [yes or no, is the material involved fracture critical?]
19. ECD [Estimated Completion Date for submitting a final closure of the problem This data is required within 30 calendar days of opening the problem report]
- 20 Process Escape [yes or no, per the definition of process escape in JSC 28035]

C. The following data shall be provided to close the report

21. Final report [A final report documenting the specific information required for closure per JSC 28035, i.e. final closure with corrective action (this is preferred) or final closure without corrective action (explanation)]

22. Approval signatures

23 Date Approved

D. The contractor shall maintain a status list on all open problems including estimated completion date. This status shall be submitted to the Technical Manager Representative and the JSC PRACA Center on a monthly basis during the contract.

FORMAT: The contractor's format is acceptable; however, data shall be easily identifiable to the data labels specified in Contents.

JSC Form 2174 is a preferred document for initiating problem reports.

Reports shall be sent to: Johnson Space Center
2101 NASA Parkway
JSC PRACA Center
Mail Code NT-52
Houston, TX 77058

Email (preferred): Primary gfepraca@jsc.nasa.gov
cc terry.l.miller1@jsc.nasa.gov

Voice: Primary 281-244-1941
Secondary 281-244-1935

Facsimile: Primary 281-244-2854

Hours of operation. 8:00 a.m. - 4:30 p.m. Central, Monday through Friday

MAINTENANCE. Update as required.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Nonconformance Record	SEPT 2004	41	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data) To provide that all nonconformance are documented in consistent manner and to assure that all the necessary data is included and available.		5. DRD Category: (check one)	
		<input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
	Problem Reporting and Corrective Action (PRACA) for Johnson Space Center (JSC) Government Furnished Equipment (GFE)		
8. Preparation Information: The contractor shall prepare the deliverable as follows.			

SCOPE: This DRD establishes the minimum data elements necessary to provide records of the closed loop system for the control of nonconforming products. Nonconformance reporting shall commence with the manufacturing of the certification or production hardware and continue through all phases of the project. The reporting shall include all problems associated with the GSE for the hardware. Nonconformance reporting for materials to be used in Class I or II hardware shall commence with the initial receipt of materials.

A nonconformance is defined as when an item fails to meet a specified requirement

CONTENTS: The record shall contain the following data elements:

1. A unique and traceable number;
2. Identification of the nonconforming article or material:
 - a. Nomenclature
 - b. Part identification number
 - c. Serial no./Lot no./Version
 - d. Manufacturer's name or the Manufacturer's Contractor and Government Entity (CAGE) code (preferable)
3. The date the nonconformance was discovered;
4. The name of the initiator of the nonconformance record;
5. A description of the nonconformance including a description of the required characteristics or specification,
6. The type of activity being conducted (e.g., fabrication, assembly, qualification test, system test, pre-delivery or pre-installation test, etc.,) Reference must be made to applicable procedure numbers;
7. When appropriate, identification of the next higher assembly.
 - a. Nomenclature
 - b. Part identification number
 - c. Manufacturer's name or the Manufacturer's CAGE code (preferable)
8. Disposition of the nonconforming article or material;
9. The signatures of the personnel authorized to provide disposition;
10. Verification that the prescribed disposition was acceptably completed; and

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

11. When applicable, a cross-reference to an associated PRACA report.

FORMAT: The contractor's format is acceptable.

MAINTENANCE: Update as required These records shall be available upon request.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
GIDEP and NASA Advisory Problem Data Sharing and Utilization Program Documentation and Reporting	SEPT 2004	42	NNJ04HH96B
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)		5. DRD Category: (<i>check one</i>)	
See Below.		<input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)		7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)	
SO300-BT-PRO-010 GIDEP Operations Manual SO300-BU-GYD-010 GIDEP Requirements Guide NPG 8735.1 NASA Procedure and Guidelines		See Below	
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

USE: This DRD provides the minimum information to be incorporated in the contractor and subcontractor implementation procedures and contractual data-reporting requirements to comply with the program requirement to participate in the GIDEP and NASA Advisory Problem Data Sharing and Utilization Program. The types of data include:

- Contractor and subcontractor implementation procedures.
- Preparation and submittal of GIDEP documents.
- Preparation and submittal of NASA Advisories
- Task management, control, and tracking status.
- Milestone/mission support (assessment/impact status reports).
- Cost data on special problems (involving criminal investigations).

Applicable Documents.

- SO300-BT-PRO-010, GIDEP Operations Manual and Policy.
- SO300-BU-GYD-010, GIDEP Requirements Guide.
- NPG 8735.1, NASA Procedure and Guidelines, "Procedure for Exchanging Parts, Materials, and Safety Problem Data Utilizing the Government-Industry Data Exchange Program and NASA Advisories "

Interrelationships: Non-Conforming Parts and Materials Reports - Incidents involving non-conforming products or materials are to be reported through the GIDEP Reporting System to comply with Government Policy as defined by Office of Federal Procurement Policy, Policy Letter No. 91-3 (Appendix D of GIDEP Operation Manual, SO300-BT-PRO-010).

DISTRIBUTION: Distribution will comply with the DRL or Contracting Officer letter (must include the JSC GIDEP/NASA Advisory Coordinator as a minimum).

INITIAL SUBMITTAL

- Contractor and subcontractor Implementation procedures (60 days after contract award)
- Release of GIDEP documents (in compliance with GIDEP Operations Manual and Policy)
- Release of NASA Advisories (in accordance with NASA policy)
- Problem data assessments (30 days after receipt of the problem data).
- Milestone/mission support (as required to support the milestone or mission events).
- Cost data (as required for special problems involving criminal investigations).

SUBMITTAL FREQUENCY As required.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS (DRD) DESCRIPTION (DRD)
(Based on JSC -STD-123)

REMARKS Special controls shall be implemented to comply with the confidentiality of the problem reports involving criminal investigations. The implementation procedures must address this special need for the control of information with the restricted distribution as well as the need to track and report the cost of the problem investigation and resolution.

SCOPE:

Generic problems reported by GIDEP or NASA Advisory distribution networks shall be assessed to determine if there is a real or potential impact on the program or program assets. Generic problems experienced by the program or by program assets shall be reported in the GIDEP or NASA Advisory network, as appropriate. Management documentation shall be adequate to ensure that (1) the subject problem data are received, properly distributed, and thoroughly assessed for potential impact; (2) identified impact issues are resolved or corrected with NASA program management concurrence; (3) cost data for special problem issues are accumulated and reported; and (4) all this information is captured and retained in a database.

CONTENT:

- a. The contractor and subcontractor Implementation procedures shall provide details that will ensure that the contractor understands and will implement these procedures, which cover the scope; task importance, management responsibilities; technical expertise to identify and resolve any impacts; "special problem" information sensitivity; and documentation necessary to comply with GIDEP and NASA policies.
 - b. GIDEP documents are to comply with the GIDEP Operations Manual and Policy requirements for the appropriate document being prepared and released.
 - c. NASA Advisories are to comply with contents as required to complete the JSC NASA Advisory Form, JSC Form 1159 (JF1159), and to accurately report the problem and conditions.
 - d. Implementation documentation shall include an index of problem reports received and assessed for impact; hardware/systems/subcontractors subject to the assessments; status of the impact assessments by problem report by hardware/system/subcontractor; and corrective actions for problems with identified impacts, including (1) NASA program management involvement and concurrence, (2) required supporting documentation for all problems experienced on the program/project that meet the criteria for release of a GIDEP report or NASA Advisory and the released GIDEP reports and NASA Advisories, and (3) any other data required to comply with the applicable GIDEP and NASA documents.
 - e. Details of the required milestone/mission support efforts and reports with the associated roles and responsibilities shall be provided.
 - f. Financial data to justify and substantiate any reported "cost impacts" are to be included.
- Format. Electronic submittal is the preferred medium for providing access to or submittal of information and data under this DRD. Format guidelines are as follows.

- a. The contractor's format is acceptable for their internal implementation procedures.
- b. GIDEP documents are to be prepared on the appropriate GIDEP form found in the GIDEP Operations Manual.
- c. NASA Advisories are to be prepared on the JSC NASA Advisory Form, JF1159.
- d. The contractor's format is acceptable for providing the "Task Management, Control, and Tracking Status," as long as it includes all the necessary information. An electronic database with access permission to appropriate NASA personnel is preferred.
- e. Formats for these reports are to comply with the applicable milestone/mission event.
- f. Cost data are to be provided as required by the financial management reporting system and as necessary to substantiate the data being submitted in support of criminal investigations.

MAINTENANCE: Data shall be maintained as required to.

- a. Document the current implementation procedures and GIDEP and NASA Advisory policies.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

- b. Ensure that the released GIDEP information is complete, factual, accurate, and up to date.
- c. Ensure that the released NASA Advisory information is complete, factual, accurate, and up to date.
- d. Tracking status provided periodically to demonstrate complete accomplishment of the task.
- e. Stay current and accurate or as requested to support management activities.
- f. Substantiate submitted costs or to include additional costs as they are identified

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
 (Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Electrical, Electronic, and Electromechanical (EEE) Parts Control Plan	SEPT 2004	43	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
To define and document the contractor's requirements, system and implementation plan for controlling the selections, acquisitions, traceability, testing, handling, packaging, storage and application of Electrical, Electronic and Electromechanical (EEE) Parts for flight and critical ground support equipment.		<input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
NPD 8730.2, NPG 7120.5 (Para.4.5), NSTS 5300.4(1D-2) and SSP 30312	Non-Conforming Parts and Materials Reports		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE/CONTENTS/MAINTENANCE. The contractor shall implement NASA's policy for controlling risk and enhance reliability by controlling the EEE Parts used in flight and critical ground support equipment. To carry out this policy, the contractor shall accomplish the following:

- a. Select parts and packaging technology based on their intended use considering, but not limited to, performance, environmental, criticality, and lifetime requirements. To the greatest extent possible, part selection shall be made from previously qualified parts that are identified in the WEB-Based NASA Parts Selection List (NPSL) without compromising the design.
- b. Enhance equipment and system reliability by utilizing documented derating criteria of the parts parameters in the design applications.
- c. Utilize the results of surveys/audits as a means to determine capability and qualification of suppliers/sources. When using third party survey result, the survey process used by third-party auditors/surveyors (including those performed by other Government agencies or commercial third-party auditors) and the survey results must be reviewed prior to their use to determine that the process and results meets minimum NASA requirements. The contractor shall document in a Parts Control Plan the features discussed below as a minimum. The plan shall demonstrate that the contractor has the technical expertise, documentation system and defined management roles and responsibilities that will assure adequate implementation of the Plan.
 1. Parts Selection: The Parts Control Plan shall describe a concurrent engineering process, integrated with hardware design, in which parts are selected for use in hardware on the basis of suitability for the intended application. The plan shall identify parts that are considered standard and how other (nonstandard) parts will be evaluated and controlled. As a cost-control initiative and without overly limiting the designer's ability to select emerging technologies, the plan will address how the system will limit the number of different part types and the number of nonstandard parts used in hardware design.
 2. Controlling specifications: Parts shall be controlled by specifications which delineate as a minimum
 - a. Complete identification of the part.
 - b. Physical, environmental, and performance specifications.
 - c. Reliability requirements, including inspections and tests for qualification, acceptance, and lot sampling.
 - d. Special handling, packaging, and storage requirements.
 - e. Documentation, data retention, and submittal requirements.

3. Part Qualification:

JSC DATA REQUIREMENTS (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

- a. Parts shall be qualified to the requirements of the controlling specification. Part qualification must demonstrate that the part meets its ratings, that it is suitable for the application, and that the manufacturer is using materials, processes, design, and quality controls that will produce a consistent, reliable, high quality device.
 - b. Where adequate qualification data are not available, the plan shall describe the process of qualification testing to demonstrate that the part meets its ratings and that it is suitable for the application.
 - c. Parts shall be requalified in the event of manufacturer process changes, or when a new lot of qualified parts is procured and it cannot be documented that the parts manufacturer has not changed the materials, processes, equipment, or facility used to manufacture the part.
 - d. The plan shall address how the contractor will document and maintain the documentation to support the "qualified status" of parts and the respective suppliers.
4. Design Configuration Acceptability and Control: The plan must address how the selected parts for a design are reviewed for suitability for the application and environment, how the parts quality and reliability will meet the operational performance requirements, and if the parts are being used within the specific device ratings (including the NASA derating policy). The selection process, technical acceptability of devices, and application documentation and review results shall be available to NASA to support hardware design reviews, certification, acceptance reviews, problem resolutions, and ground and flight operations. Key elements are as-designed-parts lists, application stress analyses (including radiation effects), and nonstandard parts acceptability assessments.
5. Parts Procurement. The plan must address how the contractor will select, qualify, control, and monitor parts manufacturers. The procurement must address the contractor's source inspections, receiving inspection (including destructive physical analysis), and stocking and handling procedures prior to and during assembly. These procedures must address how the contractor will avoid the procurement and any subsequent installation of parts or "lots" of parts subject to conditions identified in GIDEP and NASA ALERT's. This section of the plan must ensure that the selection and use of the parts will not have an "obsolescence" issue.
6. Radiation Effects: The Parts Control Plan must include the following requirements:
- a. It must be shown by analysis or test that Single Event Upset (SEU) or total dose radiation effects will not cause Electrical, Electronic, or Electromechanical (EEE) parts to fail or malfunction in such a manner as to cause a safety hazard or loss of a mission. b. EEE parts that are used to control a hazard, or as part of a subsystem that controls a hazard must be immune to the SEU and total dose radiation environment to which they will be exposed. This requirement can be waived in the event that a radiation hard, or purely mechanical (for example, a fuse, circuit breaker, mechanical thermostat, or pressure relief valve) device is used as a backup hazard control.
7. Commercial Off-The-Shelf (COTS) hardware: The plan shall address the use of COTS hardware for which insufficient parts information is available. In these cases, parts used in COTS hardware may be qualified by environmental and accelerated life testing of a complete COTS assembly.
8. Documentation: The plan must define the contractor's electronic (preferred) or paper documentation system, data supporting milestone and design reviews, and NASA's access to the parts electronic data base and files.

APPLICABLE DOCUMENTS:

NPD 8730.2 NASA PARTS POLICY
NSTS 5300 4(1D-1) (For Space Shuttle Program equipment)
SSP 303 12 (For Space Station Program equipment)

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

DISTRIBUTION:

The contractors Parts Control Plan will be provided to the SR&QA EEE Parts Assurance Activity as a minimum.

INITIAL SUBMITTAL:

The plan shall be submitted 60 days after award of first DO that requires electronics and prior to parts selections, procurements and utilization.

SUBMITTAL FREQUENCY:

As required by Maintenance and to obtain approval prior to changes.

FORMAT:

Electronic format submittal is preferred. The plan is to be an official controlled document.

MAINTENANCE: As required to remain current.

JSC DATA REQUIREMENTS (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD) (Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Certification Data Package	SEPT 2004	44	NNJ04HH96B
4. Use (<i>Define need for, intended use of, and/or anticipated results of data</i>)		5. DRD Category: (<i>check one</i>)	
To provide objective evidence to NASA that the delivered item meets requirements. The certification data package, when approved, is the NASA certification.		<input checked="" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (<i>Optional</i>)		7. Interrelationships (<i>e.g., with other DRDs</i>) (<i>Optional</i>)	
EA-WI-023 "Project Management of GFE Flight Projects", EA-WI-025 "		See DRDs identified in item 8 below	
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The Certification Data Package contains all data needed to determine that the item meets design and safety requirements.

CONTENTS:

- a. Hard and soft-copy GCAR (JSC form 1296) (See <http://www.srq.nasa.gov/gcars/> for additional information and instructions)
- b. Verification and Validation plan with Verification Matrix
- c. Completed CARD (DRD 45) with completed verification Matrix (For EVA projects only)
- d. Verification and Validation Report (includes the verification matrix mapped to verification data) DRD 48
 - 1) Qualification Report DRD 25
 - a. Engineering Analysis Reports: Stress, thermal, EEE Parts Stress/De-rating, structural, off-gassing, flammability, toxicological, others specific to the product.
 - b. Qualification Test Reports
 - c. Manufacturer's Data used for a verification of hazard control
 - d. Materials Certification
 - e. Fracture Control Report and Materials Usage Agreement
 - f. Certification Compliance Matrix, 8080.1 Compliance matrix, and 50021 Compliance matrix
 - 2) Acceptance Report for Qualification Unit or first flight unit
 - 3) List of Approved Operational Controls
 - 4) Structural Integrity Verification Plan
 - 5) Verification Tracking Log (VTL)
 - 6) Inspections reports
 - 7) Demonstrations reports
- e. Risk Assessment Executive Summary Report (RAESR) (FMEA and hazard analysis) DRD 39
- f. Waivers, deviations and NCRs
- g. Discrepancy Reports and Problem Closure Reports Relevant to Certification

JSC DATA REQUIREMENT LIST (DRL)/DATA REQUIREMENT DESCRIPTION (DRD)
 (Based on JSC -STD-123)

h. Limited Life Items List DRD 32

i. Engineering Drawings DRD 16

j. Current Project Technical Requirements Specification or Original PTRS with All Approved Changes that affect the content of the PTRS DRD 3

k. Assessment of Criticality (JF1380)

l. Software / Firmware Version Description Document (VDD) [see EA-WI-025]

FORMAT: The format of the items in this list is defined by the forms that can be found in EA-WI-023, Table 7.5 3-1 or the associated DRD.

MAINTENANCE: The Certification Data Package is maintained until complete. In some cases initial flight operations may begin prior to finishing qualification and verification.

JSC DATA REQUIREMENTS (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Certification and Acceptance Requirements Document (CARD)	SEPT 2004	45	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
To establish the joint JSC and hardware provider agreed upon requirements to be used for acceptance and certification of flight hardware		<input type="checkbox"/> Technical	
		<input type="checkbox"/> Administrative	
		<input checked="" type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
JSC 22626 EVA Generic Design Requirements Document			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The CARD is a two part document. Part one addresses hardware and, if applicable, installed software definition, verification requirements, and acceptance and certification environmental requirements. These verification requirements apply to both the design certification and the acceptance testing of flight hardware. The CARD combines the end item specification and certification plan documents into one document. Part two is the associated Requirements Verification Matrix. The CARD is submitted for approval in the Critical Design Review time frame. Once the CARD is approved, it shall be placed under configuration control. The Requirements Verification Matrix is then used to verify and document the hardware compliance to the established requirements. A copy of the Requirements Verification Matrix, with the column "Verification Documentation" listing the appropriate documentation (e.g. test document number, analysis document number, technical memo number, etc.), shall be completed and submitted along with the supporting documentation as part of the GCAR/Certification Package.

FORMAT: The CARD format shall be as defined in the contents below.

CONTENTS:

Part One

a. Foreword. This includes, but is not limited to, the company or organization preparing the CARD, for whom the CARD is prepared (e.g. NASA Johnson Space Center), the contract number, project sub-task order number, and any other pertinent information.

b. Abstract. Define the high level scope of the CARD, as it relates to testing, analyses, inspections, etc

c. Table of Contents

d. Tables. List of tables (e.g. Requirements Verification Matrix) and the associated page numbers

e. Figures. List of figures and the associated page number

f. Acronyms. List the applicable acronyms and their explanation

g. Introduction. Discuss the purpose of the CARD and a description of the hardware. Include specific part numbers and dash numbers for the hardware being covered by the CARD. If available, include a line drawing of the hardware. All operational constraints for use of the hardware will be listed and explained in this section.

h. Applicable Documents. List the documents which apply to the hardware (e.g. program level documents, interface control documents, Safety and Mission Assurance documents, etc.).

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

i. Requirements List the functional and performance requirements, both general and unique, for the hardware. Also, list any exceptions to existing requirements.

j. Verification.

1) Certification Approach. Give a brief explanation of the approach to be used for certification. This shall include, but is not limited to: The Certification Rationale, describing the certification methods (e.g. assessment, analysis, test, similarity) The Certification Plan, describing the sequence of test activity, use of the Verification Matrix, the use of test procedures, the documenting of test failures and non-compliance's, etc.

2) Acceptance Approach. Give a brief explanation of the approach to be used for acceptance. This shall include, but is not limited to: The requirement for acceptance testing of parts, components, assemblies, receiving tests, etc. The requirement for Pre-Installation Acceptance (PIA) testing, Pre-Delivery Acceptance (PDA) testing, and the requirement for Environmental Testing.

Part Two

This section is the Requirements Verification Matrix, in table format.
This matrix shall list, but is not limited to, the following information:

- a) Name and part number of the hardware
- b) The requirements
- c) Exceptions to the requirements
- d) The verification method (e.g. assessment, analysis, test, or similarity)
- e) The test procedure codes (e.g. FC-Fit Check, LT-Load Test, PDA, PIA, TT-Thermal Test, etc.)
- f) A comment block for special comments or explanations

JSC DATA REQUIREMENTS (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Wage/Salary and Fringe Benefit Data	SEPT 2004	46	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
The Wage/Salary and Fringe Benefit Data will be used by the NASA Contracting Officer and the Contract Labor Relations Office to provide the necessary data for submittal of Standard Form (SF) 98, Notice of Intention to Make a Service Contract and Response to Notice, to the Department of Labor, and to assist in the monitoring of Service Contract Act compliance.		<input type="checkbox"/> Technical <input checked="" type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
	FAR 52.222-41		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: The Wage/Salary and Fringe Benefit Data must be submitted by the Contractor, and any subcontractors which are subject to the provisions of the Service Contract Act, to the Contracting Federal Agency. In accordance with FAR regulations 22.1007 and 22.1008, the Contracting Officer is required to submit a SF 98 to the Department of Labor, Wage and Hour Division.

APPLICABLE DOCUMENTS: None

CONTENTS: The Wage/Salary and Fringe Benefit Data should contain the data included in the enclosed DRD forms, titled "Wage/Salary Rate Information", "Fringe Benefit for Service Employees", and "Fringe Benefits per Collective Bargaining Agreement". The Wage/Salary Rate Information shall contain a listing of all exempt and nonexempt labor classifications working on the contract. Separate forms should be utilized for classifications working in different geographic areas and for each subcontractor. Wage determination numbers, appropriation labor organization names, and subcontractor names, must be reflected. All nonexempt labor classifications must be matched to wage determination classes or to Collective Bargaining Agreement (CBA) classifications for represented classes. Annotate exempt or nonexempt and union or nonunion. The current hourly rates should reflect the actual lowest and highest paid employees, along with a computed average rate. State the number of employees working in each category. Separate Fringe Benefit forms should be completed for nonrepresented classifications and for each separate CBA. A separate form must be completed for the prime and each subcontractor. Three copies of each Collective Bargaining Agreement are required, if applicable.

FORMAT: The Wage/Salary and Fringe Benefit Data should be in a format substantially the same as enclosed with this DRD (Forms 2, 3, and 3A)

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

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
 (Based on JSC -STD-123)

Form 2
Page 1 of 1

WORK SHEET FOR SF-98 DATA
WAGE RATE INFORMATION

CONTRACTORS LABOR	WAGE DETERMINATION	EXEMPT OF	UNION OR	CURRENT HOURLY	MYE NO OF
<u>CLASSIFICATION</u>	<u>CLASSIFICATION</u>	<u>NONEXEMPT</u>	<u>NONUNION</u>	<u>RATE</u>	<u>EMPLOYEES</u>
Illustration of required data.					
Project Manager	Not Required	E	N	\$40.00	1
Supervisor	Not Required	E	N	\$32.00	1
Electrical Engineer	Not Required	E	N	\$26.50 - 30.00	3
Engineering Tech, Jr	Engineering Tech, I	N	N	\$14.00 - 17.00	12
Electrical Technician	Electronics Tech Maint II	N	U	\$19.02 - \$21.50	4
Secretary	Secretary I	N	N	\$14.52 - \$15.50	2
File Clerk	General Clerk II	N	N	\$9.86	1
Clerical Data Entry	Word Processor I	N	N	\$11.45 - \$12.90	3

Submit data in the above illustrated format for all labor classifications used, or planned to be used, on this contract.
 All contractor labor classifications must be matched to wage determination classes listed in CBA's represented classes
 or classes shown in WD 94-2516 for nonrepresented classes.

CONTRACTORS LABOR	WAGE DETERMINATION	EXEMPT OF	UNION OR	CURRENT HOURLY	MYE NO OF
<u>CLASSIFICATION</u>	<u>CLASSIFICATION</u>	<u>NONEXEMPT</u>	<u>NONUNION</u>	<u>RATE</u>	<u>EMPLOYEES</u>

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

FORM 3
Page 1 of 2

FRINGE BENEFITS PER COLLECTIVE BARGAINING AGREEMENT

For period from _____ to _____

Contractor:

Contract Number:

Number of employees in bargaining unit _____

Total number of employees on contract _____

1. Shift Differential: (Describe any pay over and above base rates for 2nd, 3rd, weekend, or other shifts.)

2. Health and Welfare Items and Other Fringe Items: (Indicate whether or not coverage is provided to employees and state current average hourly cost per employee covered by a Collective Bargaining Agreement.)

Item	Coverage Provided (Yes or No)	Average Hourly Cost
a. Life Insurance		
b. Accidental Death		
c. Disability		
d. Medical and Hospital		
e. Dental		
f. Retirement Plan		
g. Savings/Thrift Plan		
h. Sick Leave		
i. Tuition		
j. Other (Describe)		

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

FORM 3
Page 2 of 2

3. Paid Absences:

	Service Requirement	Days per Year
a. Vacation		
b. Holiday		
c. Sick Leave		
d. Jury Leave		
e. Funeral Leave		
f. Military Leave		
g. Other (Describe)		

4. Severance Pay: (Briefly describe terms and amounts.)

5. Other Fringe Benefits: (Describe any other fringe benefits not included above, and show average hourly cost.)

6. Premium Pay: (Discuss all premium pay provisions not previously shown on this form.)

Signature of Company Representative

Date

FORM 3A
Page 1 of 1

FRINGE BENEFITS FOR SERVICE EMPLOYEES

For Period from _____ to _____

Contractor: _____

Number of nonexempt employees on contract: _____

Total number of employees on contract: _____

1. Health and Welfare Items and Other Fringe Items:

(Indicate whether or not coverage is provided to employees and state current average hourly cost per service employee.)

<u>Item</u>	<u>Coverage Provided</u>	<u>Average Hourly Cost</u>
a. Life Insurance		
b. Accidental Death		
c. Disability		
d. Medical & Hospital		
e. Dental		
f. Retirement Plan		
g. Savings/Thrift Plan		
h. Sick Leave		
i. Tuition Reimbursement		
j. Other (Describe)		

2. Paid Absences

	<u>Service Requirement</u>	<u>Days per Year</u>
a. Vacation		
b. Holidays		
c. Sick Leave		
d. Jury Leave		
e. Funeral Leave		
f. Military Leave		
g. Other (Describe)		

Signature of Company Representative

Date

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-12)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
GFE Acceptance Test Procedures	SEPT 2004	47	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
To define all procedures and success criteria for testing of all flight hardware and the qualification unit in order to verify that each unit meets the expected engineering performance.		<input checked="checked" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
Task Performance Sheet (TPS), NT-CWI-001 http://www4.jsc.nasa.gov/eaprojects/EA-ISO9000/NT-CWI-001.doc	Verification and Validation Plan, DRD 12 Certification and Acceptance Requirements Document DRD 45 End Item Specification, DRD 10 Flight Hardware Software Requirements Specification, DRD 13 Acceptance Data Package, DRD 27		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: To document the detailed procedures used to test GFE flight products in order to assure that engineering processes and assumptions used are adequate for acceptance of each flight unit.

CONTENTS:

The procedures shall contain the following.

- Identification of the specific End Item being tested
- Detail description of the test objective
- Description of all relevant test equipment and facility used
- Full set of procedures
- Criteria for passing or failing the test
- Specification of the tolerances on all operational parameters with go, no-go criteria
- Initial Settings for all Controls, Power Supply Voltages, etc.
- Safety hardware that is mandatory to be verified operational prior to testing, with reference to procedures used.

FORMAT: A Test Preparation Sheet format shall be used to document the detailed instructions needed to perform the procedure. Acceptance test procedures generated at the contractor's facility shall be delivered as part of the Acceptance Data Package for that unit.

JSC DATA REQUIREMENTS (DRL)/DATA REQUIREMENT DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Flight GFE Verification and Validation Report	SEPT 2004	48	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data) Provides the Verification Matrix from the V&V Plan with reference to the information that supports that the requirements have been met. Documents the detailed assessments from testing, analysis, demonstration and inspection that serve as the supporting record.		5. DRD Category: (check one)	
		<input checked="" type="checkbox"/> Technical <input type="checkbox"/> Administrative <input type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
EA-WI-023 Project Management of GFE Flight Projects	Flight GFE Verification and Validation Plan, DRD 12 Qualification Report, DRD 25 Acceptance Data Package, DRD 27		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE: This report consists of all the Verification and Validation (V&V) documentation performed to confirm that the GFE (including GFE payloads) comply with their specifications, function properly in the complete integrated environment with other actual flight hardware or payload products, and are ready for use in flight.

CONTENT: EA-WI-023 contains a definition of the objectives of the V&V Plan and gives the detailed content for the NASA System Level V&V Plan. The contractor shall perform all or a part of the verification activities for qualification and acceptance. For Flight GFE (including payloads) that are not full systems, the contractor shall provide V&V reports for verification activities associated with the portion of products assigned. The configuration of the products at the time that the verification activity is performed shall be recorded in the report associated with each activity.

FORMAT: Configuration of the GFE is documented using Engineering Drawings (DRD 16), software code (DRD 22) and Flight Software Design Documents (DRD 15). Engineering Analysis uses the format is defined in DRD 26. The V&V Report shall contain the Qualification Report (DRD 25) and Acceptance Data Package (DRD 27).

MAINTENANCE: The initial report is provided at qualification or 1st flight unit completion and requires NASA approval. At CDR a fully developed V&V Plan is submitted and requires NASA approval. The V&V reports may be submitted in the period between CDR and the complete submittal at the Systems Acceptance Review and into the period of operations if additional environment qualification is still required.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Space Shuttle GFE Failure Modes and Effects Analysis (FMEA) and Critical Items List (CIL) [FMEA 1]	SEPT 2004	49	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data) To identify to program management the risk associated with design, use, and failure of systems.		5. DRD Category: (check one)	
		<input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
See "Reference Documents" under item 8 below.			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

Reference Documents:

NHB 5300.4 (1D-2), "Safety, Reliability, Maintainability and Quality Provisions for the Space Shuttle Program"

SCOPE: The FMEA and CIL are applicable to all Government-furnished equipment classified as flight hardware.

FORMAT: Electronic delivery or through data keyed directly into the NASA application. (JSC will identify the available application.) The format of the FMEA and CIL shall be in accordance with NSTS 22206 "Instructions for Preparation of Failure Modes and Effects Analysis FMEA) and Critical Items List (CIL). A suggested format is provided, with the numbers in parentheses corresponding to the data elements in NSTS 22206, table 3.0 for FMEAs and table 4.0 for CILs. Other formats are acceptable provided all FMEA data elements are included

CONTENTS: The hardware provider shall provide FMEAs and CILs for project and program management.

An FMEA shall be performed on every system, subsystem, assembly, or item to identify failure modes and the effects thereof for support of additional design action, safety analysis, hardware/software interface analysis, test planning, mission planning, preparation of mandatory inspection points, fault detection and isolation, maintainability analysis and planning, maintenance planning, and logistics planning.

The FMEA shall be conducted and prepared in accordance with NSTS 22206 The FMEA may be sufficed by a properly completed criticality worksheet alone if the system, subsystem, assembly, or item under analysis is noncritical.

The CIL is used to identify critical items which require special risk assessments to support the activities supported by the FMEA and waivers to program requirements The CIL shall be conducted and prepared in accordance with NSTS 22206.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

FAILURE MODE EFFECTS ANALYSIS/CRITICAL ITEMS LIST

FMEA NUMBER:	ORIGINATOR	PROJECT:
PART NAME:	LRUPART NUMBER:	QUANTITY:
PART NUMBER:	LRU/ORU PART NAME:	SYSTEM:
LSC CONTROL NO:	DRAWING/REF DESIGNATOR:	SUBSYSTEM:
ZONE/LOCATION:	EFFECTIVITY/AFFECT STAGE:	

CRITICAL ITEM? **CRITICALITY:**

CRITICALITY CATEGORY ____

REDUNDANCY SCREEN:

ORBITER/SPACE STATION

A -
B -
C -
D.-

FUNCTION:

FAILURE MODE CODE:
FAILURE MODE:

CAUSE:.

FAILURE DETECTION:

REMAINING PATHS: **EFFECT/ MISSION PHASE:**

CORRECTIVE ACTION:

-FAILURE EFFECTS-

END ITEM/LRU/ORU/ASSEMBLY:

SUBSYSTEM/NEXT ASSEMBLY/INTERFACE:

SYSTEM/END ITEM/MISSION:

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)

(Based on JSC -STD-123)

CREW/VEHICLE :

FAILURE MODE EFFECTS ANALYSIS/CRITICAL ITEMS LIST

FMEA NUMBER:	ORIGINATOR	PROJECT:
PART NAME:	LRUPART NUMBER:	QUANTITY:
PART NUMBER:	LRU/ORU PART NAME:	SYSTEM:
LSC CONTROL NO:	DRAWING/REF DESIGNATOR:	SUBSYSTEM:
ZONE/LOCATION:	EFFECTIVITY/AFFECT STAGE:	
HAZARD INFORMATION:		

HAZARD: YES__ NO__

HAZARD ORGANIZATION CODE:

HAZARD NUMBER:

TIME TO EFFECT:

TIME TO DETECT:

TIME TO CORRECT:

FAILURE DETECTION/FLIGHT:

REMARKS:

-RATIONALE FOR ACCEPTABILITY-

(A) DESIGN:

(B) TEST:

(C) INSPECTION:

(D) FAILURE HISTORY:

(E) OPERATIONAL USE:

(F) MAINTAINABILITY:

PREPARED BY:

REVISION:

DATE:

WAIVER NUMBER

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENT DESCRIPTION (DRD)

(Based on JSC -STD-123)

Reviewed By:

Original Signed by Janice Nesbitt 2/10/04
 Chief, Date
 Cost Accounting, Reports, and Property Branch
 Financial Management Division

Concurred By:

Original Signed by John Beal 2/6/04
 Chief Financial Officer Date

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
NASA Contractor Financial Management Reporting	SEPT 2004	51	NNJ04NH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
Report monthly financial status of contract activity.		<input type="checkbox"/> Technical	
		<input checked="" type="checkbox"/> Administrative	
		<input type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
8. Preparation Information: The contractor shall prepare the deliverable as follows			

The NASA Form 533 (NF533) reports provide data necessary for the following:

1. Projecting costs and hours to ensure that dollar and labor resources realistically support project and program schedules.
2. Evaluating contractors' actual cost and fee data in relation to negotiated contract value, estimated costs, and budget forecast data.
3. Planning, monitoring, and controlling project and program resources.
4. Accruing cost in NASA's accounting system, providing program and functional management information, and resulting in liabilities reflected on the financial statements. ^

Cost is a financial measurement of resources used in accomplishing a specified purpose, such as performing a service, carrying out an activity, acquiring an asset, or completing a unit of work or project. NASA Contractor Financial Management Reporting, NASA Procedures and Guidelines (NPG) 9501.2D, or its most current revision, identifies the cost reporting requirements for a contract.

NASA is required by law to maintain accrual accounting, which requires cost to be reported in the period in which benefits are received, without regard to time of payment. Examples of accrual accounting for common cost elements reported on the NF533 as follows:

Cost Element

Labor

Reported to NASA as hours are incurred.

Equipment & Materials
 (commercial off the shelf)

Generally reported to NASA when received and accepted by the contractor.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD) (Based on JSC -STD-123)

Cost Element

Manufactured Equipment

Defined as any equipment that is produced to specific requirements that make it useless to anyone else without rework. Cost should be reported to NASA as the equipment is being manufactured. The straight-line method for estimating accrued costs or the use of supplemental information obtained from the vendor are acceptable methods used to calculate the cost accrual amount.

Leases

Reported to NASA using a proration over the life of the lease.

Travel

Reported to NASA as costs are incurred.

Subcontracts

Actual and estimated costs reported by prime contractors shall include subcontractors' incurred costs for the same accounting period. Where subcontract costs are material, they should be separately identified on NF533 reports. The prime contractor shall include in the total cost of each subdivision of work the accrued cost (including fee, if any) of related subcontractor effort. Subcontractors should, therefore, be required to report cost to the prime contractor, using the accrual method of accounting. If the G&A and fee reported by a subcontractor are at the total subcontractor level, these costs must be allocated to specific subdivisions of work. Data submitted by the subcontractor should be structured similar to the prime contractor's NF533 to enable the prime contractor to properly report to NASA. For Firm Fixed Price subcontracts with a contract value greater than \$500,000, the prime contractor is required to document the methodology used to generate the sub-contractor costs reported and provide this information to the Contracting Officer and Center Deputy Chief Financial Officer (Finance).

Unfilled Orders

Reported as the difference between the cumulative cost incurred to date and amounts obligated to suppliers and subcontractors

Fee

Should be accrued as earned using a consistent and auditable method to determine the amount. For example: an acceptable method would be to use historical data to determine the amount to accrue each month. Fee should be reported on the NF533 following the "Total Cost" line. Award fee must be reported by the following categories. Base Fee, Fee Earned, Interim Fee, Provisional Fee, Potential Additional Fee, Interim Fee, Provisional Fee, Potential Additional Fee, and Total Fee. If any of the above fee categories do not pertain, they should not be included in the NF533

Prompt Payment Discounts

Cumulative cost reported to NASA should be the full incurred cost. The prompt payment discount amount taken should be reported as a separate line item on the NF533 below the cumulative cost amounts for the contract.

The NF533 reports are the official cost documents used at NASA for cost type, price redetermination, and fixed price incentive contracts. The data contained in the reports must be auditable using Generally Accepted Accounting Principles. Supplemental cost reports submitted in addition to the NF533 must be reconcilable to the NF 533.

The due dates for the NF533M and NF533Q reports are outlined in Chapter 3 of NPG 9501.2D. The following is a summary of the NF533 due date requirements.

<u>533 Report</u>	<u>Due Date</u>
NF533M	Due not later than 10 working days following the close of the contractor's monthly accounting period.
NF533Q	Due not later than the 15th day of the month preceding the quarter being reported.

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC -STD-123)

The due dates reflect the date the NF533 reports are received by personnel on the distribution list, not the date the reports are generated or mailed by the contractor. It is critical that the NF533 reports are submitted in a timely manner to ensure adequate time for NASA to analyze and record the cost into the NASA accounting system.

Uncompensated overtime hours worked should be reported on NF533 reports as a separate line item or in the footnotes.

For contracts which have multiple schedules, a summary NF533 is required to provide a cumulative from inception cost for the contract, regardless of schedule.

An initial NF533 report is required in the NF533Q format to be used as a baseline for the life of the contract. The initial (baseline) NF533Q report shall be submitted by the contractor within 30 days after authorization to proceed has been granted. The initial report shall reflect the original contract value detailed by negotiated reporting categories and shall be the original contract baseline plan. In addition to the initial (baseline) report, monthly NF533 reporting shall begin no later than 30 days after the incurrence of cost.

Column 7b (planned cost incurred/hours worked for the month) and 7d (cumulative planned cost incurred/ hours worked) of the NF533M represent the negotiated baseline plan for the contract. There may not be a relationship between the estimates provided in columns 8 of the NF533M to columns 7b and 7d. Columns 7b and 7d represent the legally binding contract negotiated baseline plan plus all authorized changes.

Short and long-term cost estimates, which include all data entered in columns 8 and 9a on the NF533M and NF533Q reports, shall be based on the most current and reliable information available.

Prior period cost adjustments should be reported in column 7a and 7c of NF533M and column 7a of the NF533Q with a footnote discussing the reasons for and amounts of the adjustments.

Monthly NF533 reporting is no longer required once the contract is physically complete, provided the final cost report includes actual cost only (no estimates or forecasts). The contractor must continue to submit monthly NF533 reports as long as estimates for the following period are included. If the final cost of a contract changes after the submission of the "final" contractor cost report, the contractor must submit a revised NF533 report in the month the cost change is recognized.

Variance Reports

The contractor shall provide a written narrative of variance analysis when variances exceed +/- 5% including a narrative form of corrective actions and schedules for such variances.

Format

The contractor shall deliver all reports electronically in a compatible format with the Engineering Directorate's Design Data Management System (DDMS).

Electronic NF533 Requirement

In addition to submitting the NF533M or NF533Q in a hardcopy format, the contractor, upon request, shall submit the NF533 electronically by the same due date as the hardcopy. The data shall be submitted via email using the Government prescribed flat file format (see attached Agency Defined File Format for an example of the layout details) and shall include the following header information from the hardcopy.

<u>Data Element</u>	<u>Description</u>
Contract Number	NASA assigned contract number
Modification Number	Latest definitive Modification Number
Accrual Date	Date the data was generated for
Report Period End Date	Period ending date of the NF533
Operating Days	Number of operating days for the current NF533
Date Received/Submitted	Date the report is submitted
CCR Format	Monthly (NF533M) or Quarterly (NF533Q)

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD) (Based on JSC -STD-123)

Cost Unit of Measure	Unit of measure used to report cost on the report NF533
HR/WYE Unit of Measure	Unit of measure used to report Hours/Work Year Equivalents (WYEs) on the NF533 report
Authorized Contractor Representative	Name of Contractor Approving Officer
Authorized Contractor Representative	Date the NF533 is approved and signed by the authorized Contractor Representative
Date Signed	
Monthly Grand Total Cost Incurred (7a)	Grand Total Actual Monthly cost for the prior month (column 7a on the NF533)
Monthly Grand Total HR/WYE (7a)	Grand Total Actual monthly hours/WYEs for the prior month (column 7a on the NF533)
Monthly Grand Total Cost Planned (7b)	Prior month planned cost (column 7b on the NF533)
Grand Total Cost Incurred ITD (7c)	Grand total contract cost from Inception to Date (ITD) (column 7c on the NF533)
Grand Total Planned Cost (7d)	Grand total planned contract cost (column 7d on the NF533)
Grand Total Estimated Cost (8a)	Grand total current month cost estimate (column 8a on the NF533)
Grand Total Estimated HR/WYE (8a)	Grand total current month HR/WYE estimate (column 8a on the NF533)
Grand Total Next Month Estimated Cost (8b)	Grand total next month cost estimate (column 8b on the NF533)
Grand Total Balance of Contract (8c)	Contract Balance for the remaining estimate to complete
Grand Total Contractor Estimate (9a)	Contractor estimate to complete entire scope of contract
Grand Total Contract value (9b)	Contractor distribution of contract value by the reporting categories
Grand Total Unfilled Orders Outstanding (10)	Unfilled order outstanding at the end of the reporting period

The flat file will also contain detail information for each Reporting Category (RC). A Reporting Category correlates to a task order, delivery order, or Work Breakdown Structure (WBS) and is the level at which cost is reported. Each RC can have Sub-Reporting Category line items (detailed cost elements) that add up to a RC. The Contractor is required to coordinate with the NASA Resource Analyst assigned to the contract in order to establish and maintain the Reporting Categories the contractor shall use to comply with this data requirement. The chart below describes the data elements to be included in this section of the flat file (see attached Agency Defined File Format for specific layout details)

<u>Data Element Name</u>	<u>Description</u>
Reporting Category (RC)	Task, Delivery Order, Work Breakdown Structure
Cost Incurred for Month (7a)	Prior month actual cost incurred for each RC (column 7a on NF533)
HR/WYE Incurred for Month (7a)	Prior month actual HR/WYE incurred for each RC (column 7a on NF533)
Contract prior month planned cost (7b)	Planned cost for prior month for each RC (column 7b on NF533)
Contract ITD cost (7c)	Contract ITD cost for each RC (column 7c on NF533)
Contract planned ITD cost (7d)	Contract planned ITD cost for each RC (column 7d on NF533)
Current month estimated cost (8a)	Cost estimate for the current month for each RC (column 8a on NF533)
Current month estimated HR/WYE (8a)	HR/WYE estimate for the current month for each RC (column 8a on NF533)
Next month estimated cost (8b)	Estimated cost for next month for each RC (column 8b on NF533)
Balance of Contract	Balance of contract for the remaining estimate to complete for each RC (column 8c on NF533)
Contractor Estimate	Contractor estimate for the total estimate to complete entire scope of contract for each RC (column 9a on NF533)
Contract Value	Contract value based upon contract modifications for each RC (column 9c on NF533)
Unfilled orders outstanding	Unfilled orders outstanding at the end of the reporting period for each RC (column 10 on NF533)
Reporting Category level	Used by NASA's accounting system to determine the RC level
Reporting Category Identifier	Identifies if the RC is a actual Reporting Category or a Sub-Reporting Category

JSC DATA REQUIREMENTS LIST (DRL)/DATA REQUIREMENTS DESCRIPTION (DRD)
(Based on JSC –STD-123)

The flat file shall be saved as a text file with no extension (do not include .txt after the file name) and named in strict accordance with the specific format described in the attached Agency Defined File Format document

ATTACHMENTS:

Attachment 1: Contract Summary Report/533M & Individual DO Report

Attachment 2: Quarterly 533Q Report/Baseline Report

Attachment 3 Flat File Format

NASA Monthly Contractor Financial Management Report

Form Approved OMB No 2700-0003

2 REPORT FOR MONTH ENDING OF WORK DAYS

TO:		FROM:						3 CONTRACT VALUE	
1 DESCRIPTION OF CONTRACT		a TYPE		b CONTRACT NO & LATEST DEFINITIZED MOD NO				a COST \$	b FEE \$
		c SCOPE OF WORK		d AUTH CONTR REP. (Signature)		DATE		4 FUND LIMITATION \$	
		7 COST INCURRED/HOURS WORKED		8 ESTIMATED COST/HOURS TO COMPLETE		5. BILLING		a INVOICE AMTS BILLED \$	
6 REPORTING CATEGORY		DURING MONTH		CUM TO DATE		DETAIL		b TOTAL PMTS REC'D \$	
		ACTUAL a	PLANNED b	ACTUAL c	PLANNED d	Curr Mth Est a	Next Mth Est b	9 ESTIMATED FINAL COST/HOURS	
								CONTRACTOR EAC a	CONTRACT VALUE b
IDIQ									10 UNFULFILLED ORDERS OUTSTANDING
Direct Labor Hours									
Direct Labor Cost									
Total direct labor cost									
Subcontractor Direct Labor Cost									
Subcontractor Direct Labor Cost									
Total subcontractor cost									
Travel Cost									
Material Cost									
Freight Cost									
Subcontractor Cost									
Other Direct Cost									
Total non-labor resources									
G&A									
Cost of Money									
Total Costs									
Fixed Fee									
Total Cost and Fee									
Prime FTEs - Onsite									
Prime FTEs - Offsite									
Subcontractor FTEs - Onsite									
Subcontractor FTEs - Offsite									
Cost per FTE									
TOTAL FIRM FIXED PRICE									
TOTAL CONTRACT PRICE									
Termination Liability									

NASA Quarterly Contractor Financial Management Report										Form Approved OMB No 2700-0003				2. REPORT FOR QUARTER ENDING			
TO:				FROM:						3 CONTRACT VALUE							
										a COST, \$		b FEE, \$					
1 DESCRIPTION OF CONTRACT		a TYPE		b CONTRACT NO & LATEST DEFINITIZED MOD NO						4 FUND LIMITATION \$							
		c SCOPE OF WORK		d AUTH CONTR REP (Signature)				DATE									
										5 BILLING							
										a INVOICE AMTS BILLED \$		b TOTAL PMTS REC'D \$					
6 REPORTING CATEGORY		7 COST INCURRED/HOURS WORKED			8 ESTIMATED COST/HOURS TO COMPLETE								9. ESTIMATED FINAL COST/HOURS		10 ESTI-MATED COM-PLETION DATE	11 UN-FILLED ORDERS OUT-STAND-ING	
		CUMU LATIVE ACTUAL THROUGH PRIOR MONTH a	CUR RENT MONTH ESTI MATE b	CUMU LATIVE ESTI-MATE TO DATE c	MONTH a	MONTH b	MONTH c	QUARTER d	QUARTER e	QUARTER f	BALANCE OF FY- g	NEXT FY- h	BALANCE OF CONTRACT i	TOTAL TO COM-LETE j			CONTRACTOR ESTIMATE a
IDIQ																	
Direct Labor Hours																	
Direct Labor Cost																	
Total direct labor cost																	
Subcontractor Direct Labor Cost																	
Subcontractor Direct Labor Cost																	
Total subcontractor cost																	
Travel Cost																	
Material Cost																	
Freight Cost																	
Subcontractor Cost																	
Other Direct Cost																	
Total non-labor resources																	
G&A																	
Cost of Money																	
Total Costs																	
Fixed Fee																	
Total Cost and Fee																	
Prime FTEs - Onsite																	
Prime FTEs - Offsite																	
Subcontractor FTEs - Onsite																	
Subcontractor FTEs - Offsite																	
Cost per FTE																	
TOTAL FIRM FIXED PRICE																	
TOTAL CONTRACT PRICE																	
Termination Liability																	

File names must be provided in a specific format. Each file name will begin with the SAP 2 Character center abbreviation listed below. The contract number and date will be included in the file name as well. Below is a sample file name.

MACFPS001_NAS00-0001_yyyy_mm_dd

SAP 2 Charter Center Abbreviations

Headquarters	HQ	Dryden	DR
Marshall	MA	Goddard	GO
Ames	AM	Stennis	ST
Glenn	GL	Johnson	JO
Langley	LA	Kennedy	KE

Example File Format

Header (Non-Repeating Segment)

CCR Extension Data Element	Description	Contractor Initial Data Mapping	NF 533 Required/ Optional	OTHER CCR Required/ Optional	Field Name	St Pos	EndPos	Len	Format
HEADER:									
Record Type	Used by eGate to determine record type	'HD' for Header	Required	Required	RECORD_TYPE	1	2	2	CHAR
Contract Number	Contract Number (1b)	Header field—submitted with CONTRACTOR data or defaulted by interface or extension	Required	Required	CONTRACT_NUMBER	3	12	10	CHAR
	Latest definitive Modification Number(CR8197)				MOD_NUMBER	13	18	6	CHAR
Accrual Date	Date the data was generated for Used by SAP as part of Oracle table key	Accrual Date MM01YYYY, where MM is the Accrual Month and YYYY is the fiscal year	Required	Required	ACCRUAL_DATE	19	26	8	DATE MM01YYYY

Report Period End Date	Report Period End Date is a date(2)	Header field— submitted with CONTRACTOR data or defaulted by interface or extension	Required	Required	REP_END_DATE	27	34	8	DATE
Operating Days	Operating days(2)	Header field— submitted with CONTRACTOR data	Required	Optional unless Required by contract	OPER_DAYS	35	40	6	NUMERIC
Date Received	Date Received (1d)	System Date upon which the cost data is loaded into the CCR Extension	Required	Required	DATE_REC	41	48	8	DATE
CCR Format	'M' for Monthly and 'Q' for Quarterly (SIR2047)	Submitted with CONTRACTOR data	Required	Required	CCR_FORMAT	49	49	1	CHAR
Cost Unit of Measure	Cost Unit of Measure (SIR2047)	Submitted with CONTRACTOR data	Required	Required	COST_UOM	50	51	2	CHAR
HR/WYE Unit of Measure	Hour/Work-Year-Equivalent Unit of Measure (SIR2047)	Submitted with CONTRACTOR data	Required	Required	HR_WYE_UOM	52	53	2	CHAR
	Authorized Contractor Representative – Name of Contractor Approving Officer (CR 8197)				AUTH_SIGNATURE	54	78	25	CHAR
	Authorized Contractor Representative Date Signed – Date CCR is approved/signed by authorized contractor representative(CR 8197)				AUTH_SIGNATURE_DATE	79	86	8	DATE MMDDYYYY

ATTACHMENT 3- FLAT FILE FORMAT
 PAGE 2 OF 9

Grand Total Cost Incurred Month (7a)	The Grand Total Contract Prior Month Actual Dollars Column 7a reports actual costs for the prior month	Submitted with CONTRACTOR data	Required	Optional Only required if lower detailed line item data is submitted in monthly batch file	GT_COST_INCUR_MONTH	87	99	13	CURRENCY(2)
Grand Total HRWYE (7a)	The Grand Total Contract Prior Month Actual Hours Column 7a reports actual HR or WYE for the prior month	Submitted with CONTRACTOR data	Required if detailed line item data is submitted in monthly batch file	Required if detailed line item data is submitted in monthly batch file	GT_HRWYE_PRIOR_MONTH	100	109	10	NUMERIC(1)
	The Grand Total Contract Prior Month Planned Dollars Column (7b) reports planned costs for the prior month (CR8197)				GT_COST_PLANNED_MONTH	110	122	13	CURRENCY (2)
Grand Total Cost Incurred ITD (7c)	The Grand Total Contract Cost Dollars Column 7c which represents Contract Cost Inception to Date	Submitted with CONTRACTOR data	Required Does not require detailed line item data if provided from Cost Incurred Month (7a)	Required if detailed line item data is provided for this column	GT_ITD_COST	123	135	13	CURRENCY (2)
	Grand Total Contract Planned Cost Dollars Column (7d) which represents Planned Contract Cost Inception to Date (CR 8197)				GT_COST_PLANNED_ITD	136	148	13	CURRENCY (2)
Grand Total Estimated Cost (8a)	The Grand Total Contract Estimated Cost for first upcoming month, or Current Month Estimate for cost	Submitted with CONTRACTOR data	Required	Required if detailed line item data is provided for this column	GT_EST_COST	149	161	13	CURRENCY (2)

Grand Total HRWYE (8a)	The Grand Total Contract Estimated Hours for first upcoming month, or Current Month Estimate for HRWYE	Submitted with CONTRACTOR data	Required if detailed line item data is provided for this column	Required if detailed line item data is provided for this column	GT_HRWYE_FIRST_MONTH	162	171	10	NUMERIC (1)
Grand Total Next Month Estimated Cost (8b)	The Grand Total Contract Estimated Cost for second upcoming month or Next Month Estimate for cost	Submitted with CONTRACTOR data	Required if detailed line item data is provided for this column	Required if detailed line item data is provided for this column	GT_NEXT_MONTH_EST	172	184	13	CURRENCY (2)
	Grand Total Balance of Contract for the remaining estimate to complete (CR 8197)				GT_BALANCE_CONTRACT	185	197	13	CURRENCY (2)
	Grand Total Contractor Estimate for the total estimate to complete entire scope of contract (CR 8197)				GT_BALANCE_CONTRACTOR_ESTIMATE	198	210	13	CURRENCY (2)
	Grand Total Contract Value based upon Contract Modifications (CR 8197)				GT_CONTRACT_VALUE	211	223	13	CURRENCY (2)
	Grand Total Unfilled Orders Outstanding at end of reporting period (CR 8197)				ST_UNFILLED_ORDERS	224	236	13	CURRENCY (2)

Example File Format

Detail (Repeating Segment)

CCR Extension Data Element	Description	Contractor Initial Data Mapping	NF 533 Required/ Optional	OTHER CCR Required/ Optional	Field Name	St Pos	End Pos	Len	Format
CCR DETAIL LINE ITEMS:									
Record Type	'DM' for Monthly column 7a Detail, 'DQ' for ITD Column 7c Detail	"RD" for Detail	Required	Required	RECORD_TYPE	1	2	2	CHAR
Reporting Category	Reporting Category (6)	Line item field—submitted with CONTRACTOR data	Required	Required	SERV_ORD_CAT	3	26	24	CHAR
Cost Incurred Month (7a)	Prior Month incurred costs (ACTUALS) for given category	Line item field—submitted with CONTRACTOR data	Required if detailed line item data is not provided from Cost Incurred Month (7c)	Determined by contract requirement- data from Column 7a, 7c or 8a	COST_INCUR_MONTH	27	39	13	CURRENCY (2)
HRWYE Incurred Month (7a)	Prior month incurred hours worked [Actuals] for given category	Line item field—submitted with CONTRACTOR data	Optional unless Required by contract for WYE calculation	Optional unless Required by contract for WYE calculation	HRWYE_INCUR_MONTH	40	49	10	NUMERIC (1)
	Contract Prior Month Planned Dollars Column (7b) reports planned costs for the prior month (CR 8197)				COST_PLANNED_MONTH	50	62	13	CURRENCY (2)
	Contract Cost Dollars Column (7c) which represents Contract Cost Inception to Date (CR 8197)				CUR_COST_INCUR_ITD	63	75	13	CURRENCY (2)
	Contract Planned Cost Dollars Column (7d) which represents Planned Contract Cost Inception to Date (CR 8197)				COST_PLANNED_ITD	76	88	13	CURRENCY (2)
Current Month Estimated Cost (8a)	Estimated costs for first upcoming month for given category	Line item field—submitted with CONTRACTOR data	Required	Determined by contract requirement- data from Column 7a, 7c or 8a	CUR_MONTH_EC	89	101	13	CURRENCY (2)

HR/WYE Current Month Estimate (8a)	Estimated hours for first upcoming month for given category Will only be needed if labor hours are required to be submitted electronically per contract	Line item field— submitted with CONTRACTOR data	Optional unless Required by contract for WYE calculation	Optional unless Required by contract for WYE calculation	HRWYE_CUR_MONTH_EST	102	111	10	NUMERIC (1)
Next Month Estimated Cost (8b)	Estimated costs for second upcoming month for given category	Line item field— submitted with CONTRACTOR data	Required unless not part of Contract scope	Required unless not part of Contract scope	NEXT_MONTH_EC	112	124	13	CURRENCY (2)
	Balance of Contract for the remaining estimate to complete (8c) (CR 8197)				BALANCE_CONTRACT	125	137	13	CURRENCY (2)
	Contractor Estimate for the total estimate to complete entire scope of contract (9a) (CR 8197)				CONTRACTOR_ESTIMATE	138	150	13	CURRENCY (2)
	Contract Value based upon Contract Modifications (CR 8197)				CONTRACT_VALUE	151	163	13	CURRENCY (2)
	Unfilled Orders Outstanding at end of reporting period (CR 8197)				UNFILLED_ORDERS	164	176	13	CURRENCY (2)
	Used by SAP to determine Reporting Category Level (1 1 2 2 1) (CR 8197)				REPORTING_LEVEL	177	206	30	CHAR
	Fill in an "X" if record is a Reporting Category Otherwise, leave blank for Sub-Reporting Category Line Items and Element of Cost detail records This field is used by SAP to determine if the record is a Reporting Category (CR 8197)				REPORTING_CAT_INDICATOR	207	207	1	CHAR

Example File Format

Sub-Reporting Category Line Items – Repeating Segment

Field Name	Start Pos	End Pos	Length	Format	Variable Repetition (?,*,+,n-n)	Description
SUB_RECORD_TYPE	1	2	2	CHAR		
SUB_REP_CAT	3	26	24	CHAR		'SM' for Monthly column 7a Detail, 'SQ' for ITD column Detail Reporting Category
SUB_COST_INCUR_MONTH	27	39	13	CURRENCY (2)		Prior month incurred costs (Actuals) for given category
SUB_HRWYE_INCUR_MONTH	40	49	10	NUMERIC (1)		Prior month incurred hours worked (Actuals) for given category
SUB_COST_PLANNED_MONTH	50	62	13	CURRENCY (2)		Contract Prior Month Planned Dollars Column (7b) reports planned costs for the prior month
SUB_CUR_COST_INCUR_ITD	63	75	13	CURRENCY (2)		Contract Cost Dollars Column (7c) which represents Contract Cost Inception to Date
SUB_COST_PLANNED_ITD	76	88	13	CURRENCY (2)		Contract Planned Cost Dollars Column (7d) which represents Planned Contract Cost Inception to Date
SUB_CUR_MONTH_EC	89	101	13	CURRENCY (2)		Estimated costs for first upcoming month for given category (8a)
SUB_HRWYE_CUR_MONTH_EST	102	111	10	NUMERIC (1)		Estimated hours for first upcoming month for given category Will only be needed if labor hours are required to be submitted electronically per contract (8a).
SUB_NEXT_MONTH_EC	112	124	13	CURRENCY (2)		Estimated costs for second upcoming month for given category (8b)
SUB_BALANCE_CONTRACT	125	137	13	CURRENCY (2)		Balance of Contract for the remaining estimate to complete (8c)
SUB_CONTRACTOR_ESTIMATE	138	150	13	CURRENCY (2)		Contractor Estimate for the total estimate to complete entire scope of contract (9a)
SUB_CONTRACT_VALUE	151	163	13	CURRENCY (2)		Contract Value based upon Contract Modifications (9b)
SUB_UNFILLED_ORDERS	164	176	13	CURRENCY (2)		Unfilled Orders Outstanding at end of reporting period
REPORTING_LEVEL	177	206	30	CHAR		Used by SAP to determine Reporting Category Level (1.1 2 2 1) (CR 8197).
REPORTING_CAT_INDICATOR	207	207	1	CHAR		Fill in an "X" if record is a Reporting Category. Otherwise, leave Blank for Sub-Reporting Category Line Items and Element of Cost detail records This field is used by SAP to determine if the record is a Reporting Category (CR 8197)

Example File Format

533 Agency FILE RECORD LAYOUT (Element of Cost Detail – Repeating Segment (CR8197))

Field Name	Start Pos	End Pos	Length	Format	Variable Repetition (?*,+,n-n)	Description
RECORD_TYPE	1	2	2	CHAR		'EM' for Monthly column 7a Detail, 'EQ' for ITD column Detail
EOC_REP_CAT	3	26	24	CHAR		Reporting Category
EOC_COST_INCUR_MONTH	27	39	13	CURRENCY (2)		Prior month incurred costs (Actuals) for given category
EOC_HRWYE_INCUR_MONTH	40	49	10	NUMERIC (1)		Prior month incurred hours worked (Actuals) for given category
EOC_COST_PLANNED_MONTH	50	62	13	CURRENCY (2)		Contract Prior Month Planned Dollars Column (7b) reports planned costs for the prior month.
EOC_CUR_COST_INCUR_ITD	63	75	13	CURRENCY (2)		Contract Cost Dollars Column (7c) which represents Contract Cost Inception to Date
EOC_COST_PLANNED_ITD	76	88	13	CURRENCY (2)		Contract Planned Cost Dollars Column (7d) which represents Planned Contract Cost Inception to Date
EOC_CUR_MONTH_EC	89	101	13	CURRENCY (2)		Estimated costs for first upcoming month for given category (8a)
EOC_HRWYE_CUR_MONTH_EST	102	111	10	NUMERIC (1)		Estimated hours for first upcoming month for given category Will only be needed if labor hours are required to be submitted electronically per contract (8a).
EOC_NEXT_MONTH_EC	112	124	13	CURRENCY (2)		Estimated costs for second upcoming month for given category (8b)
EOC_BALANCE_CONTRACT	125	137	13	CURRENCY (2)		Balance of Contract for the remaining estimate to complete (8c)
EOC_CONTRACTOR_ESTIMATE	138	150	13	CURRENCY (2)		Contractor Estimate for the total estimate to complete entire scope of contract (9a)
EOC_CONTRACT_VALUE	151	163	13	CURRENCY (2)		Contract Value based upon Contract Modifications (9b)
EOC_UNFILLED_ORDERS	164	176	13	CURRENCY (2)		Unfilled Orders Outstanding at end of reporting period
REPORTING_LEVEL	177	206	30	CHAR		Used by SAP to determine Reporting Category Level (1 1 2 2 1) (CR 8197).
REPORTING_CAT_INDICATOR	207	207	1	CHAR		Fill in an "X" if record is a Reporting Category Otherwise, leave Blank for Sub-Reporting Category Line Items and Element of Cost detail records This field is used by SAP to determine if the record is a Reporting Category (CR 8197)

Example File Format

Trailer (provides the number of header & detail records sent from the contractor/vendor/center in order to verify the receipt of complete data after transmission)

CCR Extension Data Element	Description	Contractor Initial Data Mapping	NF 533 Required/ Optional	OTHER CCR Required/ Optional	Field Name	Start Pos	End Pos	Length	Format
TRAILER:									
Record Type	Used by eGate to determine record type	"TL" for Trailer	Required	Required	RECORD_TYPE	1	2	2	CHAR
Record Count	Count of the number of Detail records sent to process (Detail Only)	Trailer field submitted with CONTRACTOR data	Required	Required	RECORD_COUNT	3	9	7	NUMERIC
	Value of spaces				FILLER	10	207	198	CHAR

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
Government Property Management Plan	SEPT 2004	52	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
To describe the method of administering Government personal property.		<input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
Clause 52.245-5			
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

SCOPE:

The Government Property Management plan defines the contractor's use, maintenance, repair, protection, and preservation of Government personal property. It shall describe the contractor's approach to receiving, handling, stocking, maintaining, protecting, and issuing Government property. The Plan should include interaction and Departmental/Office responsibilities. The delegated Property Administrator will request detailed procedures after contract start.

APPLICABLE DOCUMENTS:

Federal Acquisition Regulation (FAR) Part 45 NASA FAR Supplement (NFS) Part 1845

CONTENTS This plan shall reference those policies and procedures, which constitute the contractor's Property Management Manual and shall include at a minimum the following categories:

Property Management	Acquisition	Receiving
Identification	Records	Movement
Storage	Physical Inventories	Reports
Consumption	Utilization	Maintenance
Subcontractor	Control Disposition	Contractor Closeout
Reconcile Contractor Records with Financial Records		Center-Unique Considerations

FORMAT:

Contractor format is acceptable; electronic format and availability as required by Contracting Officer's letter.

MAINTENANCE:

Changes shall be incorporated by change pages or complete reissue.

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
System Safety Plan	10/02 (replaced 4/99 version)	53	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
Establishes system safety tasks and activities to identify, evaluate, and eliminate or control hazards associated with space flight hardware and related operations.		<input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (Optional)	7. Interrelationships (e.g., with other DRDs) (Optional)		
See Block 8	See Block 8		
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

Applicable references for this DRD are as follows

NPG 8715.3, "Safety Manual"
 JPG 1700.1, as revised, "JSC Safety and Health Handbook."
 MIL-STD-882, as revised, "System Safety Program for Systems and Associated Subsystems and Equipment, General Requirements for"
 NSTS 5300.4, 1D-2, as revised, "Safety, Reliability, Maintainability, and Quality Provisions for the Space Shuttle Program." (Note: also used by the Space Station program.)
 JSC 17773, as revised, "Instruction for Preparation of Hazard Analyses for JSC Ground Operations."
 NSTS 1700.7, as revised, "Safety Policy and Requirements for Payloads Using the Space Transportation System."
 45 SPW HB S-100/KHB 1700.7, "Space Transportation System Payload Ground Safety Handbook."
 NSTS 22254, as revised, "Methodology for Conduct of Space Shuttle Program Hazard Analyses."
 JESA 30000, Section 9, as revised, "Product Assurance Requirements."
 SSP 30309, as revised, "Safety Analysis and Risk Assessment Requirements Document."

NOTE: Detailed System Safety requirements differ according to different flight programs. The elements of a System Safety Program Plan as outlined below are generic; refer to the appropriate applicable references listed above for specific program requirements.

System Safety Program Plans are to be tailored for individual safety engineering projects as integral parts of a formal, disciplined system safety program plan implemented by the contractor. System Safety Program Plan Requirements:

1. Source Documents. The initial issue of the documents cited herein (including those of any applicable amendments and revisions) shall be as reflected in the contract schedule.
2. General. The System Safety Program Plan shall be documented in narrative format and shall:
 - 2.a Describe the scope of the project for which the safety engineering activity is to be tailored.
 - 2.b Describe any interrelationships to other contract requirements, tasks and functional elements including appropriate cross references to minimize duplication.
 - 2.c List the contractor and NASA documents which will be applied either as directives or as guidance in the conduct of the SSPP and related system safety tasks.
 - 2.d Identify the system safety engineering requirements, tasks, and responsibilities on an item-by-item basis in accordance with the schedule.

3. Content.

3.1 System Safety Engineering Organization. The SSPP shall describe:

3.1.a The system safety organization or function within the organization of the contract including charts to show the organizational and functional relationships and lines of communication.

3.1.b The responsibility, authority, and accountability of system safety personnel and other contractor organizational elements (including subcontractors) involved in the system safety effort. Identify each organizational unit responsible for executing each task. Identify the authority in regard to resolution of all identified hazards. Include the title, address, and telephone number of the System Safety Program Manager.

3.1.c The staffing of the system safety organization for the duration of the project including manpower loading and qualifications of assigned key personnel.

3.1.d The procedures by which the contractor will integrate and coordinate the system safety efforts. Include methods of dissemination of system safety requirements to action organizations and subcontractors; coordination of subcontractors' system safety programs; integration of hazard analyses; management and engineering reviews; program status reporting; and the identities and charters of any system safety groups.

3.1.e. The process through which contractor management decisions will be made to include notification and subsequent actions for the following: critical and catastrophic hazards, corrective actions taken; mishaps or malfunctions; waivers to safety requirements; and program deviations.

3.1.f. The interfaces between the system safety organization and all other applicable disciplines such as Engineering, Occupational Safety and Health, Reliability, Quality Assurance, Medical Support, etc., at all levels of the project (NASA, contractor, and subcontractor.)

3.2 System Safety Project Milestones. The SSPP shall:

3.2.a Identify safety milestones required to accomplish evaluations of the effectiveness of the system safety effort at critical safety checkpoints (such as design reviews, self-evaluations, operational readiness reviews, audits, etc.)

3.2.b Provide a contract schedule of safety tasks showing start and completion dates, reports, reviews, and manloading, in relationship to other contract milestones.

3.2.c To preclude duplication, identify integrated system activities (i.e., design analyses, test, demonstrations, etc.) applicable to the system safety program but specified within other engineering tasks. Include as part of this section the estimated system safety manpower loading required to accomplish these integrated tasks.

3.3 System Safety Requirements. The SSPP shall:

3.3.a Describe or reference the methods that will be used to identify and apply hazard control requirements and criteria for the design and operation of equipment, software, and facilities, and for procedures covering all phases of acquisition specified in the schedule. List the safety standards and system specifications which are the sources of safety requirements with which the contractor either is required to comply or intends to adopt as a requirement.

3.3.b Describe the risk assessment procedures including the hazard severity categories, hazard probability (or frequency) levels, the precedence to be followed in satisfying safety requirements. State any qualitative or quantitative measures of system safety which the contractor is required to meet, including a description of the acceptable risk levels. Include system safety definitions which are in addition to those in JSC documents or are unique to the project covered by the SSPP.

3.3.c Describe the management controls that shall be used to ensure compliance or justify waivers and deviations with general design and operational safety criteria and the closed loop procedures to ensure hazard resolution and control.

3.4 Hazard Analyses. The SSPP shall describe.

3.4.a The analysis techniques and format that will be used in qualitative and quantitative analysis to identify hazards, their causes and effects, and recommended corrective actions

3.4.b The depth to which each analysis technique will be used within the system, operation, or scenario being analyzed. This description will include identification of hazards associated with the system, subsystem, components, personnel, support equipment, government furnished equipment, facilities, and their interrelationships in the logistics support, training, maintenance, transportability, operational environments, and phase out or disposal.

3.4.c The integration of subcontractor hazard analyses and techniques within the overall project including contractor hazard analyses.

3.4.d The techniques to be used to establish a single closed loop tracking system.

3.5 System Safety Data The SSPP shall:

3.5.a Describe the approach for researching, disseminating, and analyzing pertinent historical hazard or mishap data.

3.5.b Identify deliverable data and the level of approval required for customer acceptance. Attach a copy of the appropriate sheets from the data requirements list (DRL) of the schedule.

3.5.c Identify safety related non-deliverable data and describe the procedures for accessibility by NASA and the retention of data.

3.6. Safety Verification and Audits. The plan shall describe:

3.6.a The verification and audit requirements and procedures for ensuring that the objectives and requirements of the system safety program have been adequately demonstrated and implemented.

3.6.b The procedures for ensuring feedback of safety-pertinent information for management and engineering review and analysis.

3.6.c The review procedures established by the contractor's system safety organization to ensure safe conduct of hazardous tests with particular emphasis on those involving human test subjects.

3.7 Training. Describe techniques and procedures to be used by the contractor to ensure that the objectives and requirements of the system safety program are implemented in training for engineers, test subjects, technicians, operators, and support (including maintenance) personnel.

Authority. NFS 18-52.223-70, 18-52.223-73, 18-52.223-73 (Alt 1); JPI 52.223-92

1. DRD Title	2. Date of current version	3a. DRL Line	3b. RFP/Contract No.
R-Quality Plan Template	SEPT 04	54	NNJ04HH96B
4. Use (Define need for, intended use of, and/or anticipated results of data)		5. DRD Category: (check one)	
The Quality Plan documents the quality assurance provisions to be employed for the flight hardware. Upon completion and approval, the Quality Plan will become part of the contract and the contractor shall be responsible for implementing the processes and procedures specified therein.		<input type="checkbox"/> Technical <input type="checkbox"/> Administrative <input checked="" type="checkbox"/> SR&QA	
6. References (Optional)		7. Interrelationships (e.g., with other DRDs) (Optional)	
8. Preparation Information: The contractor shall prepare the deliverable as follows:			

The Quality Plan shall be prepared per the following template. Upon completion and approval, the Quality Plan will become part of the contract and the contractor shall be responsible for implementing the processes and procedures specified therein.

Quality Assurance Plan

[Name of Contractor or Institution]

1.0 PURPOSE

The purpose of this document is to provide documentation of the Quality Assurance (QA) provisions the [Name of Contractor or Institution] will employ under contract to NASA for the design, development, and fabrication of flight hardware in support of the CRAVE contract. This includes repair and maintenance of items returned if required by Delivery Order.

2.0 SCOPE

This document covers the processes and procedures to be followed by institution personnel for the design, development and fabrication of the flight hardware at their institution. This includes repair and maintenance of items returned if required by Delivery Order. The hardware will be certified for flight by NASA and will undergo design reviews per NASA procedures. The requirements for the hardware are defined in the Delivery Orders.

3.0 RESPONSIBILITIES

This section defines the responsibilities and authority of the NASA and [name of Contractor or Institution] personnel responsible for implementing this Quality Plan. *Subsequent sections (4.2-4 x) should define all personnel positions at the contractor or institution (i.e. Project manager, hardware design engineer, technicians, etc.), which have some responsibility relative to implementing the Quality Plan. An organizational chart may be attached but is not required. Any training or certifications that personnel have received or are planning to receive (i.e. certified in soldering) should be noted.*

3.1 NASA Delivery Order Manager (DOM)/Contracting Officer's Technical Representative (COTR) – As the NASA technical expert on the contract, the DOM/COTR is responsible for providing the necessary oversight to the contract to ensure that the Quality Plan is adhered to. The DOM/COTR is responsible for setting up the appropriate NASA hardware design reviews, serves as the NASA point of contact for [name of contractor or institution] for any problems that occur during fabrication, and arranges for the testing (if applicable) and certification of the hardware for flight.

3.2 [Name of Contractor or Institution] Personnel

4.0 DESIGN PHASE

This section should describe the work to be done during the design phase of the hardware prior to building the flight unit(s). Activities such as building of prototype hardware, testing, and design reviews should be mentioned here. An example is given below which can be used and/or modified as needed to describe the specific plan agreed to between the NASA delivery order team and contractor or institution team.

[Name of Contractor or Institution] will work closely with NASA during the design phase to ensure that the hardware will meet the performance requirements as well as spaceflight-specific requirements (safety, environmental parameters, human factors, etc.). [Name of Contractor or Institution] will build prototype hardware for the purpose of interface testing as well as evaluation by JSC personnel prior to flight hardware fabrication. A hardware Preliminary Design Review (PDR) and Critical Design Review (CDR) will be held at JSC where the hardware requirements, drawings, materials, and operations will be reviewed; upon successful completion of the CDR and closure of any Review Item Dispositions (RID)'s submitted, the flight hardware will be fabricated.

5.0 DEVELOPMENT PHASE

The sections below describe the various aspects of the flight hardware development process and should be written to reflect the methods and procedures to be employed at the institution. The NASA delivery order team will work with the contractor or institution team to determine the specific requirements for Government Source Inspections (GSI)

5.1 Procurement- *This section should detail the process for parts selection and procurement which will be used in fabricating the flight hardware. The method to be used for logging and tracking all parts along with certificates of compliance should be documented as well as how the hardware is stored. Other things to specify if applicable are, inspection and/or testing of hardware upon receipt, method for documenting and tracking limited life items, etc. An example of text for this section is given below*

[Name of Contractor or Institution] will maintain records of certificates of compliance for all purchases and will log and assign a tracking number to all hardware received; this information will be maintained in a logbook to ensure traceability of all parts used in the fabrication of flight hardware. All components to be used for flight will be stored in a designated "flight area" at [name of contractor or institution] to separate them from other laboratory hardware.

5.2 Traceability- *This section should detail the process and procedures to be used for the traceability of flight hardware. An example of text for this section is given below*

A system will be in place to ensure identification of all materials/products, whether separately produced discrete items, or material produced in batches, to ensure traceability to the original source/manufacture and to determine verification status. This system will be maintained throughout the life of this contract, including material/product receipt; all stages of production; delivery; installation, etc.

5.3 Calibration System- *This section should detail the process and procedures to be used for a calibration system. An example of text for this section is given below.*

[Name of contractor or institution] will have a documented calibration system that meets the requirements of ISO 10012:2003, Quality assurance requirements for measuring equipment, or the American National Standard Institute (ANSI)/National Conference of Standards Laboratories (CSL) ANSI/CSL Z540-1, General Requirements for Calibration Laboratories and Measuring and Test Equipment.

5.4 Manufacture/Assembly- *This section should detail the process and procedures to be used for the actual manufacture and assembly of the flight hardware. An example of text for this section is given below*

The manufacture and assembly of the flight hardware will be performed per detailed procedures written by [name of contractor or institution] to the CDR approved drawings. these procedures will be given a tracking number and logged with the hardware tracking sheet and will always be performed by certified personnel. When the hardware is not in work, it will be kept in the designated flight area.

5.5 Review and Disposition of Nonconforming Product- *This section should detail the process and procedures to be used for the Review and Disposition of Nonconforming Product for flight hardware. An example of text for this section is given below.*

The cognizant Government quality representative will approve all dispositions of nonconforming products other than those being reworked to meet specified requirements or scrap.

Nonconformance reporting will commence with the manufacturing of the certification or production hardware and continue through all phases of the project. The reporting will include all problems associated with the GSE for the hardware. Nonconformance reporting for materials to be used in Class I or II hardware will commence with the receipt of the material. All nonconformances will be reported in accordance with DRD titled, "Nonconformance Record".

Nonconformances may be repaired by Standard Repair Procedures, as determined by the Material Review Board. Before use, Standard Repair Procedures will be submitted for NASA approval.

5.6 Quality Inspections- *This section should detail the plan for quality inspections during the hardware fabrication and testing process. This section should state who will perform the inspections, where the inspections will be performed, and how frequently inspections are required. An example of text for this section is given below.*

For all sub-assembly components of the flight hardware system and during final assembly, records of the inspections performed will be maintained with the assembly procedures. All inspections will be performed at [name of contractor or institution] with the NASA delegated quality assurance representative.

5.7 Waivers/Deviation Request- *This section should detail the process and procedures to be used for waivers and deviation requests for flight hardware. An example of text for this section is given below.*

A waiver/deviation request will be submitted in accordance with EA-WI-027 for all hardware or software not meeting defined specifications. For proposed waivers and deviations, the contractor will establish a means to analyze the safety impact.

5.8 Certification and Acceptance Testing- *This section should specify how certification and acceptance test procedures are developed, approved, and performed. The required level of QA coverage at certification and acceptance testing performed at the institution should be documented. Example text is given below.*

[name of contractor or institution] will write certification and acceptance test procedures to test all aspects of the hardware; these procedures will be reviewed and approved by the NASA DOM/COTR and [name of contractor or institution] Project Manager prior to testing. Testing at [name of contractor or institution] will be performed by qualified personnel and witnessed by [NASA delegated GSI, or other agreed to personnel]. The final hardware certification and acceptance tests will be performed at [institution or JSC] per the [name of contractor or institution]- generated procedure and documented on a Task Performance Sheet (TPS) with a [NASA delegated GSI or JSC QA] witness.

5.9 Delivery to JSC- *This section should document the requirements and plan for shipment of the flight hardware to JSC. Example text is given below. [Name of Contractor or Institution] will prepare an Acceptance Data Package (ADP) for each flight hardware assembly, which will include copies of all required paperwork and drawings (ADP contents are documented in the DRD). [Name of Contractor or Institution] will package the hardware for shipment per NASA specifications to ensure the hardware does not become damaged during transport and will have the hardware sent directly to JSC bonded storage. The hardware will be sent on a DD-250 form signed by the [NASA delegated GSI or JSC QA].*

5.10 Documented History- *This section should detail the process and procedures to be used for the documented history of flight hardware. Example text is given below.*

[name of contractor or institution] will document the history of fabrication, inspection, testing, and transfer of flight hardware [such as Traveler's, Router's, Work Authorization Documents, Task Preparation Sheet's (TPS)]. Discrepancies [Discrepancies (DR's), Problem Reports (PR's), etc.] will be documented and a history maintained including disposition and closure. If flight hardware is sent to Johnson Space Center (JSC) for testing, JSC quality documentation will be used.

6.0 CHANGES TO QUALITY PLAN

Any required changes to this quality plan after it has become an official part of the contract will require review and approval by the DOM/COTR, [*Institution Project Manager*], and JSC Contracting Officer. Changes will be clearly documented against the original Quality Plan (change bars, strikethroughs, etc.) and the updated document will replace the original in the contract via a contract modification from the JSC Contracting Officer.

7.0 APPROVALS

The signatures below signify acceptance of this plan as technically acceptable to NASA and [*name of contractor or institution*]

NASA Contracting Officer

Contractor or Institution
Project Manager

Attachment J-2

ACRONYM LIST

ATTACHMENT J-2**ACRONYM LIST**

A/As	ALERTS/Advisories
ADP	Acceptance Data Package
AIT	Analysis and Integration Team
ALERT	Acute Launch Emergency Reliability Tip
AO	Atomic Oxygen
ATCS	Active Thermal Control Systems
ATP	Acceptance Test Procedures
BOE	Basis of Estimate
BRDF	Bi-directional Reflectance Distribution Function
CAD	Computer Aided Design
CAGE	Contractor and Government Entity
CARD	Certification and Acceptance Document
CBA	Collective Bargaining Agreement
CBL	Commercial Bill of Lading
CBI	Confidential Business Information
CCR	Central Contractor Registration
CDP	Certification Data Package
CDR	Critical Design Review
CEA	Center Export Administrator
CHeCS	Crew Health and Conditioning Systems
CIL	Critical Items List
CO	Contracting Officer
COTR	Contracting Officer's Technical Representative
COTS	Commercial off the Shelf
CPFF	Cost Plus Fixed Fee
CRAVE	Crew, Robotics, and Vehicle Equipment
DCAA	Defense Contract Audit Agency
DDMS	Design Data Management System
DDTM&E	Design, Development, Testing, Manufacturing and Evaluation
DID	Data Item Description
DO	Delivery Order
DOD	Department of Defense
DOL	Department of Labor
DR	Discrepancy Reporting
DRD	Data Requirements Descriptions
DRL	Data Requirements List
ECCN	Export Classification Control Number
ECD	Estimated Completion Date

ECLSS	Environmental Control and Life Support
EDCC	Engineering Drawing Control Center
EDCP	Engineering Design Change Proposal
EEE	Electronic, Electrical and Electromechanical
EIS	End Item Specification
EMC	Electromagnetic Compatibility
EMI	Electromagnetic Interference
EST	Export Services Team
EVA	Extravehicular Activity
EVL	Expendable Launch Vehicle
EVR	Extravehicular Robotics
FAR	Federal Acquisition Regulation
FCA	Functional Configuration Audit
FCE	Flight Crew Equipment
FDIR	Failure Detection, Isolation, and Recovery
FEA	Finite Element Analysis
FFP	Firm Fixed Price
FLT	Flight
FMEA	Failure Modes and Effects Analysis
FMS	Financial Management System
FSE	Flight Support Equipment
GBL	Government Bill of Lading
GCAR	Government Certification and Approval Request
GFE	Government Furnished Equipment
GFS	Government Furnished Software
GFY	Government Fiscal Year
GIDEP	Government Industry Data Exchange Program
GSE	Ground Support Equipment
GSI	Government Source Inspection
GSRP	Ground Safety Review Panel
HBCU	Historically Black College or University
HR	Hazard Report
HUBZone	Historically Underutilized Business Zone
ICD	Interface Control Document
IDIQ	Indefinite Delivery Indefinite Quantity
IPC	Information Planning Council
IPO	Industrial Property Officer
IRD	Interface Requirement Document
ISS	International Space Station
IT	Information Technology
ITS	Information Technology System
IVA	Intravehicular Activity

JPG	JSC Procedures and Guidelines
JSC	Lyndon B. Johnson Space Center
KSC	Kennedy Space Center
LRU	Line Replacement Unit
MSFC	Marshall Space Flight Center
MTBF	Mean Time Between Failures
NAC	National Agency Check
NCR	Nonconformance Report
NESS	NF 1018 Electronic Submission System
NFNMS	Foreign National Management System
NFS	NASA FAR Supplement
NPSL	NASA Parts Selection List
NPG	NASA Procedures and Guidelines
ORU	Orbital Replacement Unit
OSE	Orbital Support Equipment
OTS	Off the Shelf
PCA	Physical Configuration Audit
PDA	Pre-Delivery Acceptance
PDR	Preliminary Design Review
PIA	Pre-Installation Acceptance
PKI	Public Key Infrastructure
PPE	Personal Protection Equipment
PRACA	Problem Reporting and Corrective Action
PRVD	Flight Hardware Project Requirements and Verification Document
PTRS	Project Technical Requirements Specification
QE	Quality Engineer
QMS	Quality Management System
RAESR	Risk Assessment Executive Summary Report
R&M	Reliability and Maintainability
RFP	Request for Proposal
RFR	Request for Request
RIDS	Review Item Discrepancies
S&MA	Safety and Mission Assurance
SAR	System Acceptance Review
SAR	Safety Analysis Report

SAFER	Simplified Aid for EVA Rescue
SDB	Small Disadvantaged Business
SDD	Software Design Document
SDVOSB	Service Disabled Veteran Owned Small Business
SE	Sustaining Engineering
SEMO	Supply and Equipment Management Office
SEU	Single Event Upset
SMART	S&MA Review Team
SOW	Statement of Work
SQA	Software Quality Assurance
SR&MA	Safety Reliability and Mission Assurance
SR&QA	Safety Reliability and Quality Assurance
SRR	System Requirements Review
SRS	Software Requirements Specification
SSP	Space Shuttle Program
SSPP	System Safety Program Plan
SSRP	System Safety Review Panel
STE	Special Test Equipment
TBD	To Be Determined
TMR	Technical Manager Representative
V&V	Verification and Validation
V&VD	Verification and Validation Document
VDD	Version Description Document
VOSB	Veteran Owned Small Business
VTL	Verification Tracking Log
VUV	Vacuum Ultra Violet
WBS	Work Breakdown Structure
WOSB	Women Owned Small Business
WSTF	White Sands Test Facility

Attachment J-3

DOL WAGE DETERMINATIONS

January 1996

NOTICE OF INTENTION TO ~~MAKE~~ A SERVICE CONTRACT AND RESPONSE TO NOTICE

**U.S. DEPARTMENT OF LABOR
EMPLOYMENT STANDARDS
ADMINISTRATION**

(See Instructions on Reverse)

1. NOTICE NO.

NASA

MAIL TO:

**Administrator
Wage and Hour Division
U.S. Department of Labor
Washington, DC 20210**

2. Estimated solicitation date *(use numerals)*

Month	Day	Year
-------	-----	------

3. Estimated date bids or proposals to be opened or negotiations begun *(use numerals)*

Month	Day	Year
-------	-----	------

4. Date contract performance to begin *(use numerals)*

Month 01	Day 01	Year 07
-------------	-----------	------------

5. PLACE(S) OF PERFORMANCE

Jefferson County, AL
Madison County, AL

6. SERVICES TO BE PERFORMED *(describe)*

IV: Crew Robotics and Vehicle Equipment Support Services
Period of Performance 01-01-07 to 12-31-07

7. INFORMATION ABOUT PERFORMANCE

A. ☒ Services now performed by a contractor B. ☐ Services now performed by Federal employees C. ☐ Services not presently being performed

8. IF BOX A IN ITEM 7 IS MARKED, COMPLETE ITEM 8 AS APPLICABLE

a. Name and address of incumbent contractor

University of Alabama at Birmingham
701 20th Street South, AB1170
Birmingham, AL 35294-0109

b. Number(s) of any wage determination(s) in incumbent's contract

94-2003, 94-2007

c. Name(s) of union(s) if services are being performed under collective bargaining agreement(s). **Important:** Attach copies of current applicable collective bargaining agreements

None

RESPONSE TO NOTICE

(by Department of Labor)

A. ☒ The attached wage determination(s) listed below apply to procurement.
WD 2005-2003 Rev 2
WD 2005-2007 Rev 3

B. ☐ As of this date, no wage determination applicable to the specified locality and classes of employees is in effect.

C. ☐ From information supplied, the Service Contract Act does not apply *(see attached explanation)*.

D. ☐ Notice returned for additional information *(see attached explanation)*

Signed: _____
(U.S. Department of Labor)

(Date)

9. OFFICIAL SUBMITTING NOTICE

SIGNED:

DATE

02/14/07

TYPE OR PRINT NAME

Connie R. Pritchard
Contract Labor Relations Officer

TELEPHONE NO.

281-483-4121

10. TYPE OR PRINT NAME AND TITLE OF PERSON TO WHOM RESPONSE IS TO BE SENT AND NAME AND ADDRESS OF DEPARTMENT OR AGENCY, BUREAU, DIVISION, ETC.

NASA Johnson Space Center
Connie R. Pritchard, Mail Code BA2
2101 NASA Parkway
Houston, TX 77058

**REGISTER OF WAGE DETERMINATIONS UNDER
THE SERVICE CONTRACT ACT**

By direction of the Secretary of Labor

**U.S. DEPARTMENT OF LABOR
EMPLOYMENT
STANDARDS ADMINISTRATION
WAGE AND HOUR DIVISION
WASHINGTON D.C. 20210**

William W. Gross
Director

Division of
Wage Determinations

Wage Determination No.: 2005-2003
Revision No.: 2
Date of Revision: 12/08/2006

State: Alabama

Area: Alabama Counties of Bibb, Blount, Cullman, Fayette, Greene, Hale, Jefferson,
Lamar, Marengo, Perry, Pickens, Shelby, St Clair, Tuscaloosa, Walker

****Fringe Benefits Required Follow the Occupational Listing****

OCCUPATION CODE - TITLE

MINIMUM WAGE RATE

01000 - Administrative Support and Clerical Occupations

01011 - Accounting Clerk I	12.97
01012 - Accounting Clerk II	20.01
01013 - Accounting Clerk III	20.46
01020 - Administrative Assistant	20.45
01040 - Court Reporter	16.05
01051 - Data Entry Operator I	11.32
01052 - Data Entry Operator II	14.81
01060 - Dispatcher, Motor Vehicle	16.05
01070 - Document Preparation Clerk	12.01
01090 - Duplicating Machine Operator	12.01
01111 - General Clerk I	10.80
01112 - General Clerk II	12.76
01113 - General Clerk III	16.52
01120 - Housing Referral Assistant	19.07
01141 - Messenger Courier	9.26
01191 - Order Clerk I	12.20
01192 - Order Clerk II	14.73
01261 - Personnel Assistant (Employment) I	17.24
01262 - Personnel Assistant (Employment) II	20.67
01263 - Personnel Assistant (Employment) III	24.58
01270 - Production Control Clerk	16.24
01280 - Receptionist	11.52
01290 - Rental Clerk	12.50
01300 - Scheduler, Maintenance	13.87
01311 - Secretary I	13.87
01312 - Secretary II	14.77
01313 - Secretary III	17.63
01320 - Service Order Dispatcher	14.72

01410 - Supply Technician	20.92
01420 - Survey Worker	15.06
01531 - Travel Clerk I	9.64
01532 - Travel Clerk II	10.25
01533 - Travel Clerk III	10.89
01611 - Word Processor I	12.01
01612 - Word Processor II	13.19
01613 - Word Processor III	16.05

05000 - Automotive Service Occupations

05005 - Automobile Body Repairer, Fiberglass	17.63
05010 - Automotive Electrician	16.32
05040 - Automotive Glass Installer	15.42
05070 - Automotive Worker	15.42
05110 - Mobile Equipment Servicer	13.02
05130 - Motor Equipment Metal Mechanic	17.21
05160 - Motor Equipment Metal Worker	15.42
05190 - Motor Vehicle Mechanic	16.56
05220 - Motor Vehicle Mechanic Helper	13.05
05250 - Motor Vehicle Upholstery Worker	14.52
05280 - Motor Vehicle Wrecker	15.42
05310 - Painter, Automotive	16.32
05340 - Radiator Repair Specialist	15.42
05370 - Tire Repairer	11.71
05400 - Transmission Repair Specialist	17.21

07000 - Food Preparation and Service Occupations

07010 - Baker	10.09
07041 - Cook I	7.76
07042 - Cook II	8.79
07070 - Dishwasher	7.05
07130 - Food Service Worker	7.93
07210 - Meat Cutter	11.11
07260 - Waiter/Waitress	6.75

09000 - Furniture Maintenance and Repair Occupations

09010 - Electrostatic Spray Painter	15.20
09040 - Furniture Handler	10.09
09080 - Furniture Refinisher	15.30
09090 - Furniture Refinisher Helper	11.84
09110 - Furniture Repairer, Minor	13.52
09130 - Upholsterer	14.58

11000 - General Services and Support Occupations

11030 - Cleaner, Vehicles	8.64
11060 - Elevator Operator	7.79
11090 - Gardener	10.90
11122 - Housekeeping Aide	7.84
11150 - Janitor	8.29
11210 - Laborer, Grounds Maintenance	9.87
11240 - Maid or Houseman	7.14

11260 - Pruner	8.82
11270 - Tractor Operator	10.18
11330 - Trail Maintenance Worker	9.87
11360 - Window Cleaner	8.62

12000 - Health Occupations

12010 - Ambulance Driver	12.67
12011 - Breath Alcohol Technician	14.10
12012 - Certified Occupational Therapist Assistant	18.94
12015 - Certified Physical Therapist Assistant	19.76
12020 - Dental Assistant	11.79
12025 - Dental Hygienist	22.69
12030 - EKG Technician	21.01
12035 - Electroneurodiagnostic Technologist	21.01
12040 - Emergency Medical Technician	12.74
12071 - Licensed Practical Nurse I	12.53
12072 - Licensed Practical Nurse II	14.10
12073 - Licensed Practical Nurse III	15.76
12100 - Medical Assistant	12.38
12130 - Medical Laboratory Technician	15.29
12160 - Medical Record Clerk	11.12
12190 - Medical Record Technician	13.54
12195 - Medical Transcriptionist	12.23
12210 - Nuclear Medicine Technologist	23.19
12221 - Nursing Assistant I	8.40
12222 - Nursing Assistant II	9.45
12223 - Nursing Assistant III	10.32
12224 - Nursing Assistant IV	11.57
12235 - Optical Dispenser	15.15
12236 - Optical Technician	11.01
12250 - Pharmacy Technician	13.41
12280 - Phlebotomist	11.76
12305 - Radiologic Technologist	18.74
12311 - Registered Nurse I	21.67
12312 - Registered Nurse II	26.53
12313 - Registered Nurse II, Specialist	26.53
12314 - Registered Nurse III	32.42
12315 - Registered Nurse III, Anesthetist	32.42
12316 - Registered Nurse IV	38.46
12317 - Scheduler (Drug and Alcohol Testing)	17.19

13000 - Information and Arts Occupations

13011 - Exhibits Specialist I	17.27
13012 - Exhibits Specialist II	21.42
13013 - Exhibits Specialist III	25.39
13041 - Illustrator I	16.12
13042 - Illustrator II	19.97
13043 - Illustrator III	23.93
13047 - Librarian	22.11
13050 - Library Aide/Clerk	9.18
13054 - Library Information Technology Systems Administrator	19.97

13058 - Library Technician	12.08
13061 - Media Specialist I	14.38
13062 - Media Specialist II	16.09
13063 - Media Specialist III	17.93
13071 - Photographer I	14.12
13072 - Photographer II	15.77
13073 - Photographer III	19.55
13074 - Photographer IV	23.18
13075 - Photographer V	28.91
13110 - Video Teleconference Technician	16.78

14000 - Information Technology Occupations

14041 - Computer Operator I	14.43
14042 - Computer Operator II	16.21
14043 - Computer Operator III	19.81
14044 - Computer Operator IV	22.00
14045 - Computer Operator V	24.41
14071 - Computer Programmer I (1)	20.72
14072 - Computer Programmer II (1)	27.12
14073 - Computer Programmer III (1)	27.62
14074 - Computer Programmer IV (1)	27.62
14101 - Computer Systems Analyst I (1)	27.62
14102 - Computer Systems Analyst II (1)	27.62
14103 - Computer Systems Analyst III (1)	27.62
14150 - Peripheral Equipment Operator	14.43
14160 - Personal Computer Support Technician	22.00

15000 - Instructional Occupations

15010 - Aircrew Training Devices Instructor (Non-Rated)	25.72
15020 - Aircrew Training Devices Instructor (Rated)	31.12
15030 - Air Crew Training Devices Instructor (Pilot)	32.45
15050 - Computer Based Training Specialist / Instructor	29.28
15060 - Educational Technologist	21.18
15070 - Flight Instructor (Pilot)	32.45
15080 - Graphic Artist	20.05
15090 - Technical Instructor	19.15
15095 - Technical Instructor/Course Developer	23.42
15110 - Test Proctor	15.45
15120 - Tutor	15.45

16000 - Laundry, Dry-Cleaning, Pressing And Related Occupations

16010 - Assembler	7.52
16030 - Counter Attendant	7.52
16040 - Dry Cleaner	9.22
16070 - Finisher, Flatwork, Machine	7.52
16090 - Presser, Hand	7.52
16110 - Presser, Machine, Drycleaning	7.86
16130 - Presser, Machine, Shirts	7.86
16160 - Presser, Machine, Wearing Apparel, Laundry	7.52
16190 - Sewing Machine Operator	9.73
16220 - Tailor	10.21

16250 - Washer, Machine	10.72
19000 - Machine Tool Operation and Repair Occupations	
19010 - Machine-Tool Operator (Tool Room)	14.76
19040 - Tool and Die Maker	18.79
21000 - Materials Handling And Packing Occupations	
21020 - Forklift Operator	13.02
21030 - Material Coordinator	16.18
21040 - Material Expediter	16.18
21050 - Material Handling Laborer	11.20
21071 - Order Filler	10.05
21080 - Production Line Worker (Food Processing)	13.02
21110 - Shipping Packer	12.65
21130 - Shipping/Receiving Clerk	12.65
21140 - Store Worker I	9.01
21150 - Stock Clerk	12.69
21210 - Tools and Parts Attendant	13.02
21410 - Warehouse Specialist	13.02
23000 - Mechanics and Maintenance and Repair Occupations	
23010 - Aerospace Structural Welder	18.46
23021 - Aircraft Mechanic I	17.39
23022 - Aircraft Mechanic II	18.46
23023 - Aircraft Mechanic III	19.55
23040 - Aircraft Mechanic Helper	12.69
23050 - Aircraft, Painter	16.01
23060 - Aircraft Servicer	14.49
23080 - Aircraft Worker	15.39
23110 - Appliance Mechanic	17.30
23120 - Bicycle Repairer	12.88
23125 - Cable Splicer	24.25
23130 - Carpenter, Maintenance	15.20
23140 - Carpet Layer	14.80
23160 - Electrician, Maintenance	17.19
23181 - Electronics Technician Maintenance I	20.93
23182 - Electronics Technician Maintenance II	22.17
23183 - Electronics Technician Maintenance III	23.39
23260 - Fabric Worker	14.20
23290 - Fire Alarm System Mechanic	16.58
23310 - Fire Extinguisher Repairer	13.13
23311 - Fuel Distribution System Mechanic	22.06
23312 - Fuel Distribution System Operator	17.83
23370 - General Maintenance Worker	14.71
23380 - Ground Support Equipment Mechanic	17.39
23381 - Ground Support Equipment Servicer	14.49
23382 - Ground Support Equipment Worker	15.39
23391 - Gunsmith I	13.13
23392 - Gunsmith II	15.28
23393 - Gunsmith III	17.39
23410 - Heating, Ventilation and Air-Conditioning Mechanic	16.75

23411 - Heating, Ventilation and Air Conditioning Mechanic (Research Facility)	15.86
23430 - Heavy Equipment Mechanic	18.80
23440 - Heavy Equipment Operator	16.03
23460 - Instrument Mechanic	20.27
23465 - Laboratory/Shelter Mechanic	16.32
23470 - Laborer	10.79
23510 - Locksmith	16.32
23530 - Machinery Maintenance Mechanic	20.09
23550 - Machinist, Maintenance	17.13
23580 - Maintenance Trades Helper	13.35
23591 - Metrology Technician I	20.27
23592 - Metrology Technician II	21.52
23593 - Metrology Technician III	22.78
23640 - Millwright	17.36
23710 - Office Appliance Repairer	17.13
23760 - Painter, Maintenance	15.20
23790 - Pipefitter, Maintenance	17.33
23810 - Plumber, Maintenance	17.17
23820 - Pneudraulic Systems Mechanic	17.39
23850 - Rigger	19.48
23870 - Scale Mechanic	15.28
23890 - Sheet-Metal Worker, Maintenance	16.03
23910 - Small Engine Mechanic	15.13
23931 - Telecommunications Mechanic I	19.39
23932 - Telecommunications Mechanic II	23.50
23950 - Telephone Lineman	17.63
23960 - Welder, Combination, Maintenance	16.03
23965 - Well Driller	16.03
23970 - Woodcraft Worker	17.39
23980 - Woodworker	12.67
24000 - Personal Needs Occupations	
24570 - Child Care Attendant	9.68
24580 - Child Care Center Clerk	13.91
24610 - Chore Aide	8.04
24620 - Family Readiness and Support Services Coordinator	12.11
24630 - Homemaker	19.50
25000 - Plant and System Operations Occupations	
25010 - Boiler Tender	21.27
25040 - Sewage Plant Operator	17.67
25070 - Stationary Engineer	21.27
25190 - Ventilation Equipment Tender	13.02
25210 - Water Treatment Plant Operator	17.45
27000 - Protective Service Occupations	
27004 - Alarm Monitor	12.61
27007 - Baggage Inspector	8.84
27008 - Corrections Officer	16.56
27010 - Court Security Officer	18.61

27030 - Detection Dog Handler	12.30
27040 - Detention Officer	16.56
27070 - Firefighter	20.70
27101 - Guard I	8.84
27102 - Guard II	12.30
27131 - Police Officer I	19.29
27132 - Police Officer II	21.41
28000 - Recreation Occupations	
28041 - Carnival Equipment Operator	9.20
28042 - Carnival Equipment Repairer	9.51
28043 - Carnival Equipment Worker	7.58
28210 - Gate Attendant/Gate Tender	12.14
28310 - Lifeguard	10.82
28350 - Park Attendant (Aide)	13.58
28510 - Recreation Aide/Health Facility Attendant	9.91
28515 - Recreation Specialist	10.32
28630 - Sports Official	10.82
28690 - Swimming Pool Operator	14.95
29000 - Stevedoring/Longshoremen Occupational Services	
29010 - Blocker and Bracer	16.93
29020 - Hatch Tender	16.02
29030 - Line Handler	16.02
29041 - Stevedore I	14.10
29042 - Stevedore II	18.09
30000 - Technical Occupations	
30010 - Air Traffic Control Specialist, Center (HFO) (2)	32.38
30011 - Air Traffic Control Specialist, Station (HFO) (2)	22.33
30012 - Air Traffic Control Specialist, Terminal (HFO) (2)	24.59
30021 - Archeological Technician I	15.21
30022 - Archeological Technician II	17.02
30023 - Archeological Technician III	21.09
30030 - Cartographic Technician	22.17
30040 - Civil Engineering Technician	18.68
30061 - Drafter/CAD Operator I	14.25
30062 - Drafter/CAD Operator II	16.02
30063 - Drafter/CAD Operator III	20.80
30064 - Drafter/CAD Operator IV	22.17
30081 - Engineering Technician I	14.85
30082 - Engineering Technician II	16.66
30083 - Engineering Technician III	18.63
30084 - Engineering Technician IV	23.08
30085 - Engineering Technician V	28.17
30086 - Engineering Technician VI	34.15
30090 - Environmental Technician	21.90
30210 - Laboratory Technician	19.79
30240 - Mathematical Technician	23.13
30361 - Paralegal/Legal Assistant I	18.27
30362 - Paralegal/Legal Assistant II	22.65

30363 - Paralegal/Legal Assistant III	27.70
30364 - Paralegal/Legal Assistant IV	33.51
30390 - Photo-Optics Technician	23.13
30461 - Technical Writer I	14.65
30462 - Technical Writer II	17.92
30463 - Technical Writer III	21.68
30491 - Unexploded Ordnance (UXO) Technician I	20.58
30492 - Unexploded Ordnance (UXO) Technician II	24.90
30493 - Unexploded Ordnance (UXO) Technician III	29.85
30494 - Unexploded (UXO) Safety Escort	20.58
30495 - Unexploded (UXO) Sweep Personnel	20.58
30620 - Weather Observer, Combined Upper Air or Surface Programs (3)	20.43
30621 - Weather Observer, Senior (3)	22.71
31000 - Transportation/Mobile Equipment Operation Occupations	
31020 - Bus Aide	9.06
31030 - Bus Driver	12.93
31043 - Driver Courier	12.08
31260 - Parking and Lot Attendant	8.29
31290 - Shuttle Bus Driver	14.05
31310 - Taxi Driver	9.97
31361 - Truckdriver, Light	14.05
31362 - Truckdriver, Medium	17.60
31363 - Truckdriver, Heavy	18.72
31364 - Truckdriver, Tractor-Trailer	18.72
99000 - Miscellaneous Occupations	
99030 - Cashier	8.75
99050 - Desk Clerk	9.68
99095 - Embalmer	20.58
99251 - Laboratory Animal Caretaker I	10.87
99252 - Laboratory Animal Caretaker II	13.13
99310 - Mortician	17.51
99410 - Pest Controller	12.56
99510 - Photofinishing Worker	11.64
99710 - Recycling Laborer	11.48
99711 - Recycling Specialist	13.09
99730 - Refuse Collector	10.79
99810 - Sales Clerk	11.27
99820 - School Crossing Guard	8.36
99830 - Survey Party Chief	18.22
99831 - Surveying Aide	11.07
99832 - Surveying Technician	15.19
99840 - Vending Machine Attendant	13.16
99841 - Vending Machine Repairer	15.92
99842 - Vending Machine Repairer Helper	13.16

ALL OCCUPATIONS LISTED ABOVE RECEIVE THE FOLLOWING BENEFITS:

HEALTH & WELFARE: \$3.01 per hour or \$120.40 per week or \$521.73 per month

VACATION: 2 weeks paid vacation after 1 year of service with a contractor or successor; 3 weeks after 8 years, and 4 weeks after 20 years. Length of service includes the whole span of continuous service with the present contractor or successor, wherever employed, and with the predecessor contractors in the performance of similar work at the same Federal facility. (Reg. 29 CFR 4.173)

HOLIDAYS: A minimum of ten paid holidays per year, New Year's Day, Martin Luther King Jr's Birthday, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day, and Christmas Day. (A contractor may substitute for any of the named holidays another day off with pay in accordance with a plan communicated to the employees involved.) (See 29 CFR 4174)

THE OCCUPATIONS WHICH HAVE PARENTHESES AFTER THEM RECEIVE THE FOLLOWING BENEFITS (as numbered):

- 1) Does not apply to employees employed in a bona fide executive, administrative, or professional capacity as defined and delineated in 29 CFR 541. (See CFR 4.156)
- 2) **APPLICABLE TO AIR TRAFFIC CONTROLLERS ONLY - NIGHT DIFFERENTIAL:** An employee is entitled to pay for all work performed between the hours of 6:00 P.M. and 6:00 A.M. at the rate of basic pay plus a night pay differential amounting to 10 percent of the rate of basic pay.
- 3) **WEATHER OBSERVERS - NIGHT PAY & SUNDAY PAY:** If you work at night as part of a regular tour of duty, you will earn a night differential and receive an additional 10% of basic pay for any hours worked between 6pm and 6am. If you are a full-time employee (40 hours a week) and Sunday is part of your regularly scheduled workweek, you are paid at your rate of basic pay plus a Sunday premium of 25% of your basic rate for each hour of Sunday work which is not overtime (i.e. occasional work on Sunday outside the normal tour of duty is considered overtime work).

HAZARDOUS PAY DIFFERENTIAL: An 8 percent differential is applicable to employees employed in a position that represents a high degree of hazard when working with or in close proximity to ordnance, explosives, and incendiary materials. This includes work such as screening, blending, drying, mixing, and pressing of sensitive ordnance, explosives, and pyrotechnic compositions such as lead azide, black powder and photoflash powder. All dry-house activities involving propellants or explosives. Demilitarization, modification, renovation, demolition, and maintenance operations on sensitive ordnance, explosives and incendiary materials. All operations involving regrading and cleaning of artillery ranges.

A 4 percent differential is applicable to employees employed in a position that represents a low degree of hazard when working with, or in close proximity to ordnance, (or employees possibly adjacent to) explosives and incendiary materials which involves potential injury such as laceration of hands, face, or arms of the employee engaged in the operation, irritation of the skin, minor burns and the like; minimal damage to immediate or adjacent work area or equipment being used. All operations involving, unloading, storage, and hauling of ordnance, explosive, and incendiary ordnance material other than small arms ammunition. These differentials are only

applicable to work that has been specifically designated by the agency for ordnance, explosives, and incendiary material differential pay.

**** UNIFORM ALLOWANCE ****

If employees are required to wear uniforms in the performance of this contract (either by the terms of the Government contract, by the employer, by the state or local law, etc.), the cost of furnishing such uniforms and maintaining (by laundering or dry cleaning) such uniforms is an expense that may not be borne by an employee where such cost reduces the hourly rate below that required by the wage determination. The Department of Labor will accept payment in accordance with the following standards as compliance:

The contractor or subcontractor is required to furnish all employees with an adequate number of uniforms without cost or to reimburse employees for the actual cost of the uniforms. In addition, where uniform cleaning and maintenance is made the responsibility of the employee, all contractors and subcontractors subject to this wage determination shall (in the absence of a bona fide collective bargaining agreement providing for a different amount, or the furnishing of contrary affirmative proof as to the actual cost), reimburse all employees for such cleaning and maintenance at a rate of \$3.35 per week (or \$.67 cents per day). However, in those instances where the uniforms furnished are made of "wash and wear" materials, may be routinely washed and dried with other personal garments, and do not require any special treatment such as dry cleaning, daily washing, or commercial laundering in order to meet the cleanliness or appearance standards set by the terms of the Government contract, by the contractor, by law, or by the nature of the work, there is no requirement that employees be reimbursed for uniform maintenance costs.

The duties of employees under job titles listed are those described in the "Service Contract Act Directory of Occupations," Fifth Edition, April 2006, unless otherwise indicated. Copies of the Directory are available on the Internet. A links to the Directory may be found on the WHD home page at <<http://www.dol.gov/esa/whd/>> or through the Wage Determinations On-Line (WDOL) Web site at <<http://wdol.gov/>>.

REQUEST FOR AUTHORIZATION OF ADDITIONAL CLASSIFICATION AND WAGE RATE {Standard Form 1444 (SF 1444)}

Conformance Process:

The contracting officer shall require that any class of service employee which is not listed herein and which is to be employed under the contract (i.e., the work to be performed is not performed by any classification listed in the wage determination), be classified by the contractor so as to provide a reasonable relationship (i.e., appropriate level of skill comparison) between such unlisted classifications and the classifications listed in the wage determination. Such conformed classes of employees shall be paid the monetary wages and furnished the fringe benefits as are determined. Such conforming process shall be initiated by the contractor prior to the performance of contract work by such unlisted class(es) of employees. The conformed classification, wage rate, and/or fringe benefits shall be retroactive to the commencement date of the contract. {See Section 4.6 (C)(vi)} When multiple wage determinations are included in a contract, a separate SF 1444 should be prepared for each wage determination to which a class(es) is to be conformed.

The process for preparing a conformance request is as follows:

- 1) When preparing the bid, the contractor identifies the need for a conformed occupation) and computes a proposed rate).
- 2) After contract award, the contractor prepares a written report listing in order proposed classification title), a Federal grade equivalency (FGE) for each proposed classification), job description), and rationale for proposed wage rate), including information regarding the agreement or disagreement of the authorized representative of the employees involved, or where there is no authorized representative, the employees themselves. This report should be submitted to the contracting officer no later than 30 days after such unlisted class(es) of employees performs any contract work.
- 3) The contracting officer reviews the proposed action and promptly submits a report of the action, together with the agency's recommendations and pertinent information including the position of the contractor and the employees, to the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, for review. (See section 4.6(b)(2) of Regulations 29 CFR Part 4).
- 4) Within 30 days of receipt, the Wage and Hour Division approves, modifies, or disapproves the action via transmittal to the agency contracting officer, or notifies the contracting officer that additional time will be required to process the request.
- 5) The contracting officer transmits the Wage and Hour decision to the contractor.
- 6) The contractor informs the affected employees.

Information required by the Regulations must be submitted on SF 1444 or bond paper.

When preparing a conformance request, the "Service Contract Act Directory of Occupations" (the Directory) should be used to compare job definitions to insure that duties requested are not performed by a classification already listed in the wage determination. Remember, it is not the job title, but the required tasks that determine whether a class is included in an established wage determination. Conformances may not be used to artificially split, combine, or subdivide classifications listed in the wage determination.

**REGISTER OF WAGE DETERMINATIONS UNDER
THE SERVICE CONTRACT ACT**

By direction of the Secretary of Labor

**U.S. DEPARTMENT OF LABOR
EMPLOYMENT
STANDARDS ADMINISTRATION
WAGE AND HOUR DIVISION
WASHINGTON D.C. 20210**

William W. Gross
Director

Division of
Wage Determinations

Wage Determination No.: 2005-2007
Revision No.: 3
Date of Revision: 12/06/2006

States: Alabama, Tennessee

Area: Alabama Counties of Colbert, Franklin, Jackson, Lauderdale, Lawrence,
Limestone, Madison, Marion, Marshall, Morgan, Winston
Tennessee Counties of Giles, Lawrence, Lincoln, Moore, Wayne

****Fringe Benefits Required Follow the Occupational Listing****

OCCUPATION CODE - TITLE

MINIMUM WAGE RATE

01000 - Administrative Support and Clerical Occupations

01011 - Accounting Clerk I	13.47
01012 - Accounting Clerk II	14.65
01013 - Accounting Clerk III	16.77
01020 - Administrative Assistant	21.27
01040 - Court Reporter	17.16
01051 - Data Entry Operator I	10.78
01052 - Data Entry Operator II	12.84
01060 - Dispatcher, Motor Vehicle	16.31
01070 - Document Preparation Clerk	12.47
01090 - Duplicating Machine Operator	12.47
01111 - General Clerk I	10.25
01112 - General Clerk II	11.18
01113 - General Clerk III	13.15
01120 - Housing Referral Assistant	17.51
01141 - Messenger Courier	8.95
01191 - Order Clerk I	11.24
01192 - Order Clerk II	15.27
01261 - Personnel Assistant (Employment) I	13.50
01262 - Personnel Assistant (Employment) II	15.08
01263 - Personnel Assistant (Employment) III	16.33
01270 - Production Control Clerk	18.39
01280 - Receptionist	11.02
01290 - Rental Clerk	11.79
01300 - Scheduler, Maintenance	15.32
01311 - Secretary I	15.32
01312 - Secretary II	17.16
01313 - Secretary III	19.14

01320 - Service Order Dispatcher	13.83
01410 - Supply Technician	21.27
01420 - Survey Worker	16.43
01531 - Travel Clerk I	9.71
01532 - Travel Clerk II	10.28
01533 - Travel Clerk III	10.96
01611 - Word Processor I	12.34
01612 - Word Processor II	13.77
01613 - Word Processor III	16.31

05000 - Automotive Service Occupations

05005 - Automobile Body Repairer, Fiberglass	17.50
05010 - Automotive Electrician	16.73
05040 - Automotive Glass Installer	15.94
05070 - Automotive Worker	15.94
05110 - Mobile Equipment Servicer	14.45
05130 - Motor Equipment Metal Mechanic	17.50
05160 - Motor Equipment Metal Worker	15.94
05190 - Motor Vehicle Mechanic	15.98
05220 - Motor Vehicle Mechanic Helper	12.52
05250 - Motor Vehicle Upholstery Worker	15.22
05280 - Motor Vehicle Wrecker	15.94
05310 - Painter, Automotive	15.28
05340 - Radiator Repair Specialist	15.94
05370 - Tire Repairer	12.75
05400 - Transmission Repair Specialist	17.50

07000 - Food Preparation and Service Occupations

07010 - Baker	10.84
07041 - Cook I	9.14
07042 - Cook II	10.27
07070 - Dishwasher	7.57
07130 - Food Service Worker	8.09
07210 - Meat Cutter	13.32
07260 - Waiter/Waitress	6.82

09000 - Furniture Maintenance and Repair Occupations

09010 - Electrostatic Spray Painter	17.56
09040 - Furniture Handler	13.94
09080 - Furniture Refinisher	17.56
09090 - Furniture Refinisher Helper	14.41
09110 - Furniture Repairer, Minor	15.98
09130 - Upholsterer	17.56

11000 - General Services and Support Occupations

11030 - Cleaner, Vehicles	8.16
11060 - Elevator Operator	8.06
11090 - Gardener	12.11
11122 - Housekeeping Aide	8.62
11150 - Janitor	8.06
11210 - Laborer, Grounds Maintenance	10.00

11240 - Maid or Houseman	7.29
11260 - Pruner	8.72
11270 - Tractor Operator	12.08
11330 - Trail Maintenance Worker	10.00
11360 - Window Cleaner	8.24

12000 - Health Occupations

12010 - Ambulance Driver	14.33
12011 - Breath Alcohol Technician	13.57
12012 - Certified Occupational Therapist Assistant	18.49
12015 - Certified Physical Therapist Assistant	18.49
12020 - Dental Assistant	13.91
12025 - Dental Hygienist	18.58
12030 - EKG Technician	20.57
12035 - Electroneurodiagnostic Technologist	20.57
12040 - Emergency Medical Technician	14.33
12071 - Licensed Practical Nurse I	12.46
12072 - Licensed Practical Nurse II	14.00
12073 - Licensed Practical Nurse III	15.68
12100 - Medical Assistant	10.79
12130 - Medical Laboratory Technician	14.02
12160 - Medical Record Clerk	11.28
12190 - Medical Record Technician	13.60
12195 - Medical Transcriptionist	12.40
12210 - Nuclear Medicine Technologist	29.83
12221 - Nursing Assistant I	8.77
12222 - Nursing Assistant II	9.87
12223 - Nursing Assistant III	10.76
12224 - Nursing Assistant IV	12.08
12235 - Optical Dispenser	13.68
12236 - Optical Technician	10.14
12250 - Pharmacy Technician	12.24
12280 - Phlebotomist	12.08
12305 - Radiologic Technologist	20.57
12311 - Registered Nurse I	19.83
12312 - Registered Nurse II	24.27
12313 - Registered Nurse II, Specialist	24.27
12314 - Registered Nurse III	29.36
12315 - Registered Nurse III, Anesthetist	29.36
12316 - Registered Nurse IV	35.18
12317 - Scheduler (Drug and Alcohol Testing)	16.82

13000 - Information and Arts Occupations

13011 - Exhibits Specialist I	17.77
13012 - Exhibits Specialist II	21.76
13013 - Exhibits Specialist III	26.45
13041 - Illustrator I	17.77
13042 - Illustrator II	21.76
13043 - Illustrator III	26.45
13047 - Librarian	22.08
13050 - Library Aide/Clerk	12.82

13054 - Library Information Technology Systems Administrator	21.15
13058 - Library Technician	14.67
13061 - Media Specialist I	14.37
13062 - Media Specialist II	16.07
13063 - Media Specialist III	17.92
13071 - Photographer I	13.58
13072 - Photographer II	15.68
13073 - Photographer III	18.78
13074 - Photographer IV	22.96
13075 - Photographer V	27.87
13110 - Video Teleconference Technician	14.39
14000 - Information Technology Occupations	
14041 - Computer Operator I	13.39
14042 - Computer Operator II	17.39
14043 - Computer Operator III	18.63
14044 - Computer Operator IV	23.78
14045 - Computer Operator V	26.73
14071 - Computer Programmer I (1)	20.66
14072 - Computer Programmer II (1)	24.76
14073 - Computer Programmer III (1)	27.62
14074 - Computer Programmer IV (1)	27.62
14101 - Computer Systems Analyst I (1)	27.62
14102 - Computer Systems Analyst II (1)	27.62
14103 - Computer Systems Analyst III (1)	27.62
14150 - Peripheral Equipment Operator	13.39
14160 - Personal Computer Support Technician	23.78
15000 - Instructional Occupations	
15010 - Aircrew Training Devices Instructor (Non-Rated)	26.68
15020 - Aircrew Training Devices Instructor (Rated)	32.29
15030 - Air Crew Training Devices Instructor (Pilot)	33.42
15050 - Computer Based Training Specialist / Instructor	30.38
15060 - Educational Technologist	24.89
15070 - Flight Instructor (Pilot)	33.42
15080 - Graphic Artist	19.60
15090 - Technical Instructor	16.29
15095 - Technical Instructor/Course Developer	20.67
15110 - Test Proctor	17.16
15120 - Tutor	17.16
16000 - Laundry, Dry-Cleaning, Pressing And Related Occupations	
16010 - Assembler	7.37
16030 - Counter Attendant	7.37
16040 - Dry Cleaner	9.26
16070 - Finisher, Flatwork, Machine	7.37
16090 - Presser, Hand	7.37
16110 - Presser, Machine, Drycleaning	7.37
16130 - Presser, Machine, Shirts	7.37
16160 - Presser, Machine, Wearing Apparel, Laundry	7.51
16190 - Sewing Machine Operator	9.78

16220 - Tailor	10.23
16250 - Washer, Machine	7.99
19000 - Machine Tool Operation and Repair Occupations	
19010 - Machine-Tool Operator (Tool Room)	20.38
19040 - Tool and Die Maker	24.86
21000 - Materials Handling And Packing Occupations	
21020 - Forklift Operator	14.82
21030 - Material Coordinator	18.39
21040 - Material Expediter	18.39
21050 - Material Handling Laborer	10.29
21071 - Order Filler	10.87
21080 - Production Line Worker (Food Processing)	14.00
21110 - Shipping Packer	12.98
21130 - Shipping/Receiving Clerk	12.98
21140 - Store Worker I	10.50
21150 - Stock Clerk	14.24
21210 - Tools and Parts Attendant	14.82
21410 - Warehouse Specialist	14.82
23000 - Mechanics and Maintenance and Repair Occupations	
23010 - Aerospace Structural Welder	17.04
23021 - Aircraft Mechanic I	22.24
23022 - Aircraft Mechanic II	17.04
23023 - Aircraft Mechanic III	17.71
23040 - Aircraft Mechanic Helper	17.44
23050 - Aircraft, Painter	19.32
23060 - Aircraft Servicer	19.34
23080 - Aircraft Worker	20.27
23110 - Appliance Mechanic	18.04
23120 - Bicycle Repairer	14.66
23125 - Cable Splicer	19.76
23130 - Carpenter, Maintenance	17.56
23140 - Carpet Layer	17.29
23160 - Electrician, Maintenance	23.21
23181 - Electronics Technician Maintenance I	16.30
23182 - Electronics Technician Maintenance II	25.55
23183 - Electronics Technician Maintenance III	26.62
23260 - Fabric Worker	16.54
23290 - Fire Alarm System Mechanic	18.79
23310 - Fire Extinguisher Repairer	15.72
23311 - Fuel Distribution System Mechanic	18.79
23312 - Fuel Distribution System Operator	16.80
23370 - General Maintenance Worker	16.43
23380 - Ground Support Equipment Mechanic	22.24
23381 - Ground Support Equipment Servicer	19.34
23382 - Ground Support Equipment Worker	20.27
23391 - Gunsmith I	13.46
23392 - Gunsmith II	14.84
23393 - Gunsmith III	16.27

23410 - Heating, Ventilation and Air-Conditioning Mechanic	18.38
23411 - Heating, Ventilation and Air Conditioning Mechanic (Research Facility)	19.30
23430 - Heavy Equipment Mechanic	18.38
23440 - Heavy Equipment Operator	17.87
23460 - Instrument Mechanic	20.67
23465 - Laboratory/Shelter Mechanic	15.56
23470 - Laborer	10.33
23510 - Locksmith	18.04
23530 - Machinery Maintenance Mechanic	23.32
23550 - Machinist, Maintenance	16.92
23580 - Maintenance Trades Helper	14.41
23591 - Metrology Technician I	20.67
23592 - Metrology Technician II	21.55
23593 - Metrology Technician III	22.41
23640 - Millwright	18.79
23710 - Office Appliance Repairer	18.09
23760 - Painter, Maintenance	17.56
23790 - Pipefitter, Maintenance	18.90
23810 - Plumber, Maintenance	18.06
23820 - Pneudraulic Systems Mechanic	18.79
23850 - Rigger	18.79
23870 - Scale Mechanic	17.29
23890 - Sheet-Metal Worker, Maintenance	18.38
23910 - Small Engine Mechanic	16.75
23931 - Telecommunications Mechanic I	18.38
23932 - Telecommunications Mechanic II	20.21
23950 - Telephone Lineman	18.38
23960 - Welder, Combination, Maintenance	18.38
23965 - Well Driller	18.79
23970 - Woodcraft Worker	18.79
23980 - Woodworker	16.43
24000 - Personal Needs Occupations	
24570 - Child Care Attendant	7.78
24580 - Child Care Center Clerk	9.71
24610 - Chore Aide	7.65
24620 - Family Readiness and Support Services Coordinator	11.71
24630 - Homemaker	12.32
25000 - Plant and System Operations Occupations	
25010 - Boiler Tender	18.86
25040 - Sewage Plant Operator	17.87
25070 - Stationary Engineer	18.86
25190 - Ventilation Equipment Tender	14.85
25210 - Water Treatment Plant Operator	17.56
27000 - Protective Service Occupations	
27004 - Alarm Monitor	11.88
27007 - Baggage Inspector	9.95
27008 - Corrections Officer	14.36

27010 - Court Security Officer	15.75
27030 - Detection Dog Handler	12.55
27040 - Detention Officer	14.36
27070 - Firefighter	15.75
27101 - Guard I	9.95
27102 - Guard II	12.55
27131 - Police Officer I	17.14
27132 - Police Officer II	19.05
28000 - Recreation Occupations	
28041 - Carnival Equipment Operator	8.93
28042 - Carnival Equipment Repairer	9.38
28043 - Carnival Equipment Worker	7.40
28210 - Gate Attendant/Gate Tender	12.23
28310 - Lifeguard	10.90
28350 - Park Attendant (Aide)	13.68
28510 - Recreation Aide/Health Facility Attendant	9.99
28515 - Recreation Specialist	12.25
28630 - Sports Official	10.90
28690 - Swimming Pool Operator	14.23
29000 - Stevedoring/Longshoremen Occupational Services	
29010 - Blocker and Bracer	17.70
29020 - Hatch Tender	17.70
29030 - Line Handler	17.70
29041 - Stevedore I	16.90
29042 - Stevedore II	18.56
30000 - Technical Occupations	
30010 - Air Traffic Control Specialist, Center (HFO) (2)	33.27
30011 - Air Traffic Control Specialist, Station (HFO) (2)	22.94
30012 - Air Traffic Control Specialist, Terminal (HFO) (2)	25.27
30021 - Archeological Technician I	15.69
30022 - Archeological Technician II	17.56
30023 - Archeological Technician III	21.76
30030 - Cartographic Technician	23.09
30040 - Civil Engineering Technician	20.75
30061 - Drafter/CAD Operator I	15.69
30062 - Drafter/CAD Operator II	17.77
30063 - Drafter/CAD Operator III	18.64
30064 - Drafter/CAD Operator IV	22.94
30081 - Engineering Technician I	12.79
30082 - Engineering Technician II	15.89
30083 - Engineering Technician III	19.09
30084 - Engineering Technician IV	26.34
30085 - Engineering Technician V	30.74
30086 - Engineering Technician VI	37.17
30090 - Environmental Technician	20.17
30210 - Laboratory Technician	18.37
30240 - Mathematical Technician	23.77
30361 - Paralegal/Legal Assistant I	14.87

30362 - Paralegal/Legal Assistant II	18.43
30363 - Paralegal/Legal Assistant III	22.54
30364 - Paralegal/Legal Assistant IV	27.28
30390 - Photo-Optics Technician	22.75
30461 - Technical Writer I	18.73
30462 - Technical Writer II	22.91
30463 - Technical Writer III	25.38
30491 - Unexploded Ordnance (UXO) Technician I	20.73
30492 - Unexploded Ordnance (UXO) Technician II	25.09
30493 - Unexploded Ordnance (UXO) Technician III	30.07
30494 - Unexploded (UXO) Safety Escort	20.73
30495 - Unexploded (UXO) Sweep Personnel	20.73
30620 - Weather Observer, Combined Upper Air or Surface Programs (3)	18.39
30621 - Weather Observer, Senior (3)	18.79
31000 - Transportation/Mobile Equipment Operation Occupations	
31020 - Bus Aide	9.74
31030 - Bus Driver	12.67
31043 - Driver Courier	12.36
31260 - Parking and Lot Attendant	8.86
31290 - Shuttle Bus Driver	13.11
31310 - Taxi Driver	9.91
31361 - Truckdriver, Light	13.11
31362 - Truckdriver, Medium	16.16
31363 - Truckdriver, Heavy	16.83
31364 - Truckdriver, Tractor-Trailer	16.83
99000 - Miscellaneous Occupations	
99030 - Cashier	8.82
99050 - Desk Clerk	6.90
99095 - Embalmer	20.73
99251 - Laboratory Animal Caretaker I	8.23
99252 - Laboratory Animal Caretaker II	13.46
99310 - Mortician	20.73
99410 - Pest Controller	12.10
99510 - Photofinishing Worker	10.58
99710 - Recycling Laborer	12.99
99711 - Recycling Specialist	13.44
99730 - Refuse Collector	11.23
99810 - Sales Clerk	10.45
99820 - School Crossing Guard	10.42
99830 - Survey Party Chief	14.67
99831 - Surveying Aide	9.04
99832 - Surveying Technician	12.37
99840 - Vending Machine Attendant	12.42
99841 - Vending Machine Repairer	14.23
99842 - Vending Machine Repairer Helper	12.42

ALL OCCUPATIONS LISTED ABOVE RECEIVE THE FOLLOWING BENEFITS:

HEALTH & WELFARE: \$3.01 per hour or \$120.40 per week or \$521.73 per month

VACATION: 2 weeks paid vacation after 1 year of service with a contractor or successor; 3 weeks after 10 years, and 4 after 20 years. Length of service includes the whole span of continuous service with the present contractor or successor, wherever employed, and with the predecessor contractors in the performance of similar work at the same Federal facility. (Reg. 29 CFR 4.173)

HOLIDAYS: A minimum of ten paid holidays per year, New Year's Day, Martin Luther King Jr's Birthday, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day, and Christmas Day. (A contractor may substitute for any of the named holidays another day off with pay in accordance with a plan communicated to the employees involved.) (See 29 CFR 4174)

THE OCCUPATIONS WHICH HAVE PARENTHESES AFTER THEM RECEIVE THE FOLLOWING BENEFITS (as numbered):

1) Does not apply to employees employed in a bona fide executive, administrative, or professional capacity as defined and delineated in 29 CFR 541. (See CFR 4.156)

2) **APPLICABLE TO AIR TRAFFIC CONTROLLERS ONLY - NIGHT DIFFERENTIAL:** An employee is entitled to pay for all work performed between the hours of 6:00 P.M. and 6:00 A.M. at the rate of basic pay plus a night pay differential amounting to 10 percent of the rate of basic pay.

3) **WEATHER OBSERVERS - NIGHT PAY & SUNDAY PAY:** If you work at night as part of a regular tour of duty, you will earn a night differential and receive an additional 10% of basic pay for any hours worked between 6pm and 6am. If you are a full-time employed (40 hours a week) and Sunday is part of your regularly scheduled workweek, you are paid at your rate of basic pay plus a Sunday premium of 25% of your basic rate for each hour of Sunday work which is not overtime (i.e. occasional work on Sunday outside the normal tour of duty is considered overtime work).

HAZARDOUS PAY DIFFERENTIAL: An 8 percent differential is applicable to employees employed in a position that represents a high degree of hazard when working with or in close proximity to ordnance, explosives, and incendiary materials. This includes work such as screening, blending, drying, mixing, and pressing of sensitive ordnance, explosives, and pyrotechnic compositions such as lead azide, black powder and photoflash powder. All dry-house activities involving propellants or explosives. Demilitarization, modification, renovation, demolition, and maintenance operations on sensitive ordnance, explosives and incendiary materials. All operations involving regrading and cleaning of artillery ranges.

A 4 percent differential is applicable to employees employed in a position that represents a low degree of hazard when working with, or in close proximity to ordnance, (or employees possibly adjacent to) explosives and incendiary materials which involves potential injury such as laceration of hands, face, or arms of the employee engaged in the operation, irritation of the skin, minor burns and the like; minimal damage to immediate or adjacent work area or equipment being used. All operations involving, unloading, storage, and hauling of ordnance, explosive, and incendiary ordnance material other than small arms ammunition. These differentials are only

applicable to work that has been specifically designated by the agency for ordnance, explosives, and incendiary material differential pay.

**** UNIFORM ALLOWANCE ****

If employees are required to wear uniforms in the performance of this contract (either by the terms of the Government contract, by the employer, by the state or local law, etc.), the cost of furnishing such uniforms and maintaining (by laundering or dry cleaning) such uniforms is an expense that may not be borne by an employee where such cost reduces the hourly rate below that required by the wage determination. The Department of Labor will accept payment in accordance with the following standards as compliance:

The contractor or subcontractor is required to furnish all employees with an adequate number of uniforms without cost or to reimburse employees for the actual cost of the uniforms. In addition, where uniform cleaning and maintenance is made the responsibility of the employee, all contractors and subcontractors subject to this wage determination shall (in the absence of a bona fide collective bargaining agreement providing for a different amount, or the furnishing of contrary affirmative proof as to the actual cost), reimburse all employees for such cleaning and maintenance at a rate of \$3.35 per week (or \$.67 cents per day). However, in those instances where the uniforms furnished are made of "wash and wear" materials, may be routinely washed and dried with other personal garments, and do not require any special treatment such as dry cleaning, daily washing, or commercial laundering in order to meet the cleanliness or appearance standards set by the terms of the Government contract, by the contractor, by law, or by the nature of the work, there is no requirement that employees be reimbursed for uniform maintenance costs.

The duties of employees under job titles listed are those described in the "Service Contract Act Directory of Occupations," Fifth Edition, April 2006, unless otherwise indicated. Copies of the Directory are available on the Internet. A links to the Directory may be found on the WHD home page at <<http://www.dol.gov/esa/whd/>> or through the Wage Determinations On-Line (WDOL) Web site at <<http://wdol.gov/>>.

REQUEST FOR AUTHORIZATION OF ADDITIONAL CLASSIFICATION AND WAGE RATE {Standard Form 1444 (SF 1444)}

Conformance Process:

The contracting officer shall require that any class of service employee which is not listed herein and which is to be employed under the contract (i.e., the work to be performed is not performed by any classification listed in the wage determination), be classified by the contractor so as to provide a reasonable relationship (i.e., appropriate level of skill comparison) between such unlisted classifications and the classifications listed in the wage determination. Such conformed classes of employees shall be paid the monetary wages and furnished the fringe benefits as are determined. Such conforming process shall be initiated by the contractor prior to the performance of contract work by such unlisted class(es) of employees. The conformed classification, wage rate, and/or fringe benefits shall be retroactive to the commencement date of the contract. {See Section 4.6 (C)(vi)} When multiple wage determinations are included in a contract, a separate SF 1444 should be prepared for each wage determination to which a class(es) is to be conformed.

The process for preparing a conformance request is as follows:

- 1) When preparing the bid, the contractor identifies the need for a conformed occupation) and computes a proposed rate).
- 2) After contract award, the contractor prepares a written report listing in order proposed classification title), a Federal grade equivalency (FGE) for each proposed classification), job description), and rationale for proposed wage rate), including information regarding the agreement or disagreement of the authorized representative of the employees involved, or where there is no authorized representative, the employees themselves. This report should be submitted to the contracting officer no later than 30 days after such unlisted class(es) of employees performs any contract work.
- 3) The contracting officer reviews the proposed action and promptly submits a report of the action, together with the agency's recommendations and pertinent information including the position of the contractor and the employees, to the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, for review. (See section 4.6(b)(2) of Regulations 29 CFR Part 4).
- 4) Within 30 days of receipt, the Wage and Hour Division approves, modifies, or disapproves the action via transmittal to the agency contracting officer, or notifies the contracting officer that additional time will be required to process the request.
- 5) The contracting officer transmits the Wage and Hour decision to the contractor.
- 6) The contractor informs the affected employees.

Information required by the Regulations must be submitted on SF 1444 or bond paper.

When preparing a conformance request, the "Service Contract Act Directory of Occupations" (the Directory) should be used to compare job definitions to insure that duties requested are not performed by a classification already listed in the wage determination. Remember, it is not the job title, but the required tasks that determine whether a class is included in an established wage determination. Conformances may not be used to artificially split, combine, or subdivide classifications listed in the wage determination.

Attachment J-5

SMALL BUSINESS PLAN

The contractor will submit Plan as part of their proposal.

SMALL BUSINESS SUBCONTRACTING PLAN

DATE OF PLAN: October 28, 2004

CONTRACTOR: University of Alabama at Birmingham

ADDRESS: 701 S 20th Street, AB 620

Birmingham AL 35294-0106

DUNN & BRADSTREET NUMBER: 063690705

SOLICITATION OR CONTRACT NUMBER: NHJ04047146R

ITEM/SERVICE (Description): B-Crew, robotics and vehicle equipment (CRAVE) - restricted

TOTAL CONTRACT AMOUNT: \$ 10,000,000

Total contract or Base-Year, if options

\$

Option #1

(if applicable)

\$

Option #2

(if applicable)

\$

Option #3

(if applicable)

\$

Option #4

(if applicable)

TOTAL MODIFICATION AMOUNT, IF APPLICABLE \$ _____

TOTAL TASK ORDER AMOUNT, IF APPLICABLE \$ _____

PERIOD OF CONTRACT PERFORMANCE (Month, Day & Year): Dec. 1, 2004 - Nov 31, 2009

The following outline meets the minimum requirements of section 8(d) of the Small Business Act, as amended, and implemented by Federal Acquisition Regulations (FAR) Subpart 19.7. While this outline has been designed to be consistent with statutory and regulatory requirements, other formats of a subcontracting plan may be acceptable. It is not intended to replace any existing corporate plan that is more extensive. Failure to include the essential information of FAR Subpart 19.7 may be cause for either a delay in acceptance or the rejection of a bid or offer when a subcontracting plan is required. "SUBCONTRACT," as used in this clause, means any agreement (other than one involving an employer-employee relationship) entered into by a Federal Government prime contractor or subcontractor calling for supplies or services required for performance of the contract or subcontract.

If assistance is needed to locate small business sources, contact the Office of Small and Disadvantaged Business Utilization (OSDBU) at (202) 690-7300 or the OPDIV Small Business Specialist at _____. Sources may also be obtained from SBA's PRO-Net website.

For this procurement, HHS expects all proposed subcontracting plans to contain the following goals at a minimum: 25% for Small Business, 13% for Small Disadvantaged Business; 5% for Women-Owned Small Business; 3% for HUBZone Small Business; and 3% for Veteran-Owned Small Business and estimated subcontracting dollars. The offeror is required to include an explanation for a category that has zero as a goal.

NOTE TO CONTRACTORS: Please provide your CCR number with your Dunn & Bradstreet number

1. Type of Plan (check one)

- ☒ **Individual plan** (all elements developed specifically for this contract and applicable for the full term of this contract).
- ☐ **Master plan** (goals developed for this contract) all other elements standardized and approved by a lead agency Federal Official; must be renewed every three years and contractor must provide copy of lead agency approval.
- ☐ **Commercial products/service plan** This plan is used when the contractor sells products and services customarily used for non-government purposes. Plan/goals are negotiated with the initial agency on a company-wide basis rather than for individual contracts. The plan is effective only during the year approved. The contractor must provide a copy of the initial agency approval, and must submit an annual SF 295 to HHS with a breakout of subcontracting prorated for HHS (with an OPDIV breakdown, if possible).

2. Goals

State separate dollar and percentage goals for Small Business (SB), Small Disadvantaged Business (SDB), Woman-owned Small Business (WOSB), Historically Underutilized Business Zone (HUBZone) Small Business, Veteran-owned Small Business (VOSB), Service-Disabled Veteran-owned Small Business (SDVOSB) and "Other than small business" (Other) as subcontractors, for the base year and each option year, as specified in FAR 19.704. (Break out and append option year goals, if the contract contains option years or project annual subcontracting base and goals under commercial plans.)

- a. Total estimated dollar value of ALL planned subcontracting, i.e., with ALL types of concerns under this contract is \$ 10,000,000 (b + h = a) (Base Year)

FY-__ (1 st Option)	FY-__ (2 nd Option)	FY-__ (3 rd Option)	FY-__ (4 th Option)
\$ _____ & ____ %	\$ _____ & ____ %	\$ _____ & ____ %	\$ _____ & ____ %

- b. Total estimated dollar value and percent of planned subcontracting with SMALL BUSINESSES (including SDB, WOSB, HUBZone, SDVOSB and VOSB): (% of "a") \$ 2,500,000 and 25 % (Base Year)

FY-__ (1 st Option)	FY-__ (2 nd Option)	FY-__ (3 rd Option)	FY-__ (4 th Option)
\$ _____ & ____ %	\$ _____ & ____ %	\$ _____ & ____ %	\$ _____ & ____ %

- c. Total estimated dollar value and percent of planned subcontracting with SMALL DISADVANTAGED BUSINESSES: (% of "a") \$ 1,300,000 and 13 % (Base Year)

FY-__ (1 st Option)	FY-__ (2 nd Option)	FY-__ (3 rd Option)	FY-__ (4 th Option)
\$ _____ & ____ %	\$ _____ & ____ %	\$ _____ & ____ %	\$ _____ & ____ %

- d. Total estimated dollar value and percent of planned subcontracting with WOMAN-OWNED, SMALL BUSINESSES: (% of "a") \$ 500,000 and 5 % (Base Year)

FY-__ (1 st Option)	FY-__ (2 nd Option)	FY-__ (3 rd Option)	FY-__ (4 th Option)
\$ _____ & ____ %	\$ _____ & ____ %	\$ _____ & ____ %	\$ _____ & ____ %

- e. Total estimated dollar and percent of planned subcontracting with HUBZone SMALL BUSINESSES: (% of "a") \$ 300,000 and 3 % (Base Year)

FY-__ (1 st Option)	FY-__ (2 nd Option)	FY-__ (3 rd Option)	FY-__ (4 th Option)
\$ _____ & ____ %	\$ _____ & ____ %	\$ _____ & ____ %	\$ _____ & ____ %

FY-____ (1st Option) FY-____ (2nd Option) FY-____ (3rd Option) FY-____ (4th Option)
\$ _____ & ____% \$ _____ & ____% \$ _____ & ____% \$ _____ & ____%

FY-____ (1st Option) FY-____ (2nd Option) FY-____ (3rd Option) FY-____ (4th Option)
\$ _____ & ____% \$ _____ & ____% \$ _____ & ____% \$ _____ & ____%

FY-____ (1st Option) FY-____ (2nd Option) FY-____ (3rd Option) FY-____ (4th Option)
\$ _____ & ____% \$ _____ & ____% \$ _____ & ____% \$ _____ & ____%

- Notes:**
1. Federal prime contract goals are:
SB equals 23%; SDB equals 5%; HUBZone equals 3%, WOSB equals 5% and SDVOSB equals 3%, VOSB equals 3% and can serve as objectives for subcontracting goal development.
 2. SDB, WOSB, HUBZone, SDVOSB and VOSB goals are subsets of SB and should be counted and reported in multiple categories, as appropriate.
 3. If any contract has more than four options, please attach additional sheets showing dollar amounts and percentages.

[illegible]

Attachment to Page 3

Historically Black College or University

Total estimated dollar and percent of planned subcontracting with HBCU = 1%

- j. Provide a description of the method used to develop the subcontracting goals for SB, SDB, WOSB, HUBZone, and VOSB concerns. Address efforts made to ensure that maximum practicable subcontracting opportunities have been made available for those concerns and explain the method used to identify potential sources for solicitation purposes. Explain the method and state the quantitative basis (in dollars) used to establish the percentage goals. Also, explain how the areas to be subcontracted to SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB concerns were determined, how the capabilities of these concerns were considered for contract opportunities and how such data comports with the cost proposal. Identify any source lists or other resources used in the determination process. (Attach additional sheets, if necessary.)
see attached

- k. Indirect costs ☐ have, ☒ have not been included in the dollar and percentage subcontracting goals above (check one).
- l. If indirect costs have been included, explain the method used to determine the proportionate share of such costs to be allocated as subcontracts to SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB concerns.

3. Program Administrator:

NAME/TITLE: Terry Justice/ Executive Director of Procurement
ADDRESS: 701 S 20th Street
TELEPHONE/E-MAIL: (205) 934-4515

Duties: Does the individual named above have general overall responsibility for the company's subcontracting program, i.e., developing, preparing, and executing subcontracting plans and monitoring performance relative to the requirements of those subcontracting plans and perform the following duties?
☒ yes ☐ no

(If NO is checked, please indicate who in the company performs those duties, or indicate why the duties are not performed in your company.)

- a. Develops and promotes company-wide policy initiatives that demonstrate the company's support for awarding contracts and subcontracts to SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB concerns; and assures that these concerns are included on the source lists for solicitations for products and services they are capable of providing; ☒ yes ☐ no
- b. Develops and maintains bidder source lists of SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB concerns from all possible sources; ☒ yes ☐ no
- c. Ensures periodic rotation of potential subcontractors on bidder's lists; ☒ yes ☐ no
- d. Ensures that SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB businesses are included on the bidders' list for every subcontract solicitation for products and services that they are capable of providing; ☒ yes ☐ no

- e. Ensures that Requests for Proposals (RFPs) are designed to permit the maximum practicable participation of SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB concerns; ☒ yes [] no
- f. Reviews subcontract solicitations to remove statements, clauses, etc., which might tend to restrict or prohibit SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB participation; ☒ yes [] no
- g. Accesses various sources for the identification of SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB concerns to include the SBA's PRO-Net and SUB-Net Systems, (<http://www.sba.gov>), the National Minority Purchasing Council Vendor Information Service, the Office of Minority Business Data Center in the Department of Commerce, local small business and minority associations, contact with local chambers of commerce and Federal agencies' Small Business Offices; ☒ yes [] no
- h. Establishes and maintains contract and subcontract award records; ☒ yes [] no
- i. Participates in Business Opportunity Workshops, Minority Business Enterprise Seminars, Trade Fairs, Procurement Conferences, etc; ☒ yes [] no
- j. Ensures that SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB concerns are made aware of subcontracting opportunities and assisting concerns in preparing responsive bids to the company; ☒ yes [] no
- k. Conducts or arranges for the conduct of training for purchasing personnel regarding the intent and impact of Section 8(d) of the Small Business Act, as amended; ☒ yes [] no
- l. Monitors the company's subcontracting program performance and makes any adjustments necessary to achieve the subcontract plan goals; ☒ yes [] no
- m. Prepares and submits timely, required subcontract reports; ☒ yes [] no
- n. Coordinates the company's activities during the conduct of compliance reviews by Federal agencies; ☒ yes [] no; and
- o. Other duties: _____

4. Equitable Opportunity

Describe efforts the offeror will make to ensure that SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB concerns will have an equitable opportunity to compete for subcontracts. These efforts include, but are not limited to, the following activities:

- a. Outreach efforts to obtain sources:
 - 1. Contacting minority and small business trade associations; 2) contacting business development organizations and local chambers of commerce; 3) attending SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB procurement conferences and trade fairs; 4) requesting sources from the Small Business Administrations (SBA) PRO-Net and SUB-Net Systems, (<http://www.sba.gov/>) and other SBA and Federal agency resources. Contractors may also conduct market surveys to identify new sources, to include, accessing the NIH e-Portals in Commerce, (e-PIC), (<http://epic.od.nih.gov/>). The NIH e-Portals in Commerce is not a mandatory source and may be used at the offeror's discretion.
- b. Internal efforts to guide and encourage purchasing personnel:
 - 1. Conducting workshops, seminars, and training programs;
 - 2. Establishing, maintaining, and utilizing SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB source lists, guides, and other data for soliciting subcontractors; and
 - 3. Monitoring activities to evaluate compliance with the subcontracting plan.

- c. Additional efforts:
see attached

5. Flow Down Clause

The contractor agrees to include the provisions under FAR 52.219-8, "Utilization of Small Business Concerns," in all acquisitions exceeding the simplified acquisition threshold that offers further subcontracting opportunities. All subcontractors, except small business concerns, that receive subcontracts in excess of \$500,000 (\$1,000,000 for construction) must adopt and comply with a plan similar to the plan required by FAR 52.219-9, "Small Business Subcontracting Plan." (Flow down is not applicable for commercial items/services as described in 52.212-5(e) and 52.244-6(c).)

6. Reporting and Cooperation

The contractor gives assurance of (1) cooperation in any studies or surveys that may be required; (2) submission of periodic reports which show compliance with the subcontracting plan; (3) submission of Standard Form (SF) 294, "Subcontracting Report for Individual Contracts," and attendant Optional Form 312, SDB Participation Report, if applicable, (*required only for contracts containing the clause 52.219-25*) and SF 295, "Summary Subcontract Report," in accordance with the instructions on the forms; and (4) ensuring that subcontractors agree to submit Standard Forms 294 and 295.

Reporting Period	Report Due	Due Date
Oct 1 - Mar 31	SF 294	4/30
Apr 1 - Sept 30	SF 294	10/30
Oct 1 - Sept 30	SF 295	10/30
Contract Completion	OF 312	30 days after completion

Special instructions for commercial plan: SF 295 Report is due on 10/30 each year for the previous fiscal year ending 9/30.

- a. Submit SF 294 to cognizant Awarding Contracting Officer.
- b. Submit Optional Form 312, (OF 312), if applicable, to cognizant Awarding Contracting Officer.
- c. Submit SF 295 to cognizant Awarding Contracting Officer and to the:

Office of Small and Disadvantaged Business Utilization
Department of Health and Human Services
200 Independence Avenue, SW
Humphrey H. Building, Room 517-D
Washington, D.C. 20201

- d. Submit "information" copy of the SF 295 and the SF 294 upon request to the SBA Commercial Market Representative (CMR); visit the SBA at <http://www.sba.gov/gc> and click on assistance directory to locate your nearest CMR.

7. Record keeping

In accordance with FAR 19.704(a)(11), the following is a recitation of the types of records the contractor will maintain to demonstrate the procedures adopted to comply with the requirements and goals in the subcontracting plan. These records will include, but not be limited to, the following:

- a. SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB source lists, guides and other data identifying such vendors;
- b. Organizations contacted in an attempt to locate SB, SDB, WOSB, HUBZone, VOSB, and SDVOSB sources;
- c. On a contract-by-contract basis, records on all subcontract solicitations over \$100,000, which indicate for each solicitation (1) whether SB, SDB, WOSB, HUBZone, VOSB, and/or SDVOSB concerns were solicited, if not, why not and the reasons solicited concerns did not receive subcontract awards.
- d. Records to support other outreach efforts, e.g., contacts with minority and small business trade associations, attendance at small and minority business procurement conferences and trade fairs;
- e. Records to support internal guidance and encouragement provided to buyers through (1) workshops, seminars, training programs, incentive awards; and (2) monitoring performance to evaluate compliance with the program and requirements; and
- f. On a contract-by-contract basis, records to support subcontract award data including the name, address, and business type and size of each subcontractor. (This item is not required on a *contract-by-contract basis* for company or division-wide commercial plans.)
- g. Other records to support your compliance with the subcontracting plan: (Please describe)

8. Timely Payments to Subcontractors

FAR 19.702 requires your company to establish and use procedures to ensure the timely payment of amounts due pursuant to the terms of your subcontracts with small business concerns, small disadvantaged small business concerns, women-owned small business concerns, HUBZone small business concerns, veteran-owned small business concerns, and service-disabled veteran-owned small business concerns.

Your company has established and uses such procedures: [] yes [✓] no

9. Description of Good Faith Effort

Maximum practicable utilization of small, small disadvantaged, women-owned, HUBZone, veteran-owned, and service-disabled veteran-owned small business concerns as subcontractors in Government contracts is a matter of national interest with both social and economic benefits. **When a contractor fails to make a good faith effort to comply with a subcontracting plan, these objectives are not achieved, and 15 U.S.C. 637(d) (4) (F) directs that liquidated damages shall be paid by the contractor.** In order to demonstrate your compliance with a good faith effort to achieve the small, small disadvantaged, women-owned, HUBZone, veteran-owned, and service-disabled veteran-owned small business subcontracting goals, outline the steps your company plans to take. These steps will be negotiated with the contracting officer prior to approval of the plan.

see attached

SIGNATURE PAGE

Signatures Required:

This subcontracting plan was submitted by:

Signature: _____

Typed Name: Terry Justice

Title: Executive Director, Procurement

Date: October 28, 2004

This plan was reviewed by:

Signature: _____

Typed Name: _____

Title: Contracting Officer

Date: _____

This plan was reviewed by:

Signature: _____

Typed Name: _____

Title: Small Business Specialist

Date: _____

This plan was reviewed by:

Signature: _____

Typed Name: _____

Title: SBA Procurement Center Representative

Date: _____

And Is Accepted By:

Signature: _____

Typed Name: _____

Title: _____

Date: _____

UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Small Business Subcontracting Plan - CRAVE	Issue Date:	Document: CRAVE-PL-006
	Authorized by: Tom Gallimore	Revision:	
	Sub Authorizer: Dan Connor		

UAB-CBSE

Section j of Small Business Subcontracting Plan

For

Crew, Robotics and Vehicle Equipment (CRAVE) Contract Proposal

The University of Alabama at Birmingham
Center for Biophysical Sciences and Engineering
Birmingham, Alabama

Solicitation Number: NNJ04047146R

Date: July 15, 2004

Volume II – Plans

"Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal."

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UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Small Business Subcontracting Plan - CRAVE	Issue Date:	Document: CRAVE-PL-006
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	Sub Authorizer: Dan Connor		

ABSTRACT

This document was prepared for the National Aeronautics and Space Administration by the University of Alabama at Birmingham – Center for Biophysical Science and Engineering (UAB-CBSE) in accordance with Section L of the Crew, Robotics and Vehicle Equipment (CRAVE) Request for Proposal (RFP). This Small Business Subcontracting plan outlines the subcontract goals and small business involvement that will be implemented by The University of Alabama at Birmingham's Center for Biophysical Science and Engineering.

Solicitation Number: NNJ04047146R

Date: July 15, 2004

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UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Small Business Subcontracting Plan - CRAVE	Issue Date:	Document: CRAVE-PL-006
	Authorized by: Tom Gallimore	Revision:	
	Sub Authorizer: Dan Connor		

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UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Small Business Subcontracting Plan - CRAVE	Issue Date:	Document: CRAVE-PL-006
	Authorized by: Tom Gallimore	Revision:	
	Sub Authorizer: Dan Connor		

1.0 PURPOSE

The purpose of this document is to provide documentation of the Small Business Subcontracting goals the University of Alabama at Birmingham's Center for Biophysical Science and Engineering (UAB-CBSE) will implement under contract to NASA for the design, development, and fabrication of flight hardware in support of the CRAVE contract.

1.1 SCOPE

This document outlines the Small Business subcontract goals and describes the methods for ensuring Small Business participation. The CBSE has been developing flight hardware since the mid 1980s. During this period, we have forged relationships with reputable SBs and large companies with expertise to complement our capabilities.

2.0 INTRODUCTION

To satisfy the SB requirements of the CRAVE contract while showing significant return on investment, the CBSE has diligently searched the local (Alabama) as well as the national arena for qualified Small Businesses (SBs) to assist in performing the required tasks. These SBs are selected from our list of qualified vendors with most of whom we have conducted business before. The same list will be searched for SB participation when proposing Technical Work Packages or Delivery Order on the CRAVE contract.

2.1 Participation Goals

The Center for Biophysical Sciences and Engineering (CBSE) of the University of Alabama at Birmingham (UAB) is committed to comply with the following Small Business (SB) goals.

Total Small Business (SB) Goal	25.0%
Small Disadvantaged Business (SDB)	13.0%
Women Owned Small Business (WOSB)	5.0%
HUB Zone Business	3.0%
Veteran Owned Small Business (VOSB)	3.0%
Service Disabled Veteran Owned Small Business	3.0%
Historically Black College or University/Minority Institutions (HBCU)	1.0%

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Attachment J-6

LIST OF INSTALLATION ACCOUNTABLE PROPERTY AND SERVICES

Attachment J-6

Table 1 Installation Accountable Property and Services

The Crew and Thermal Systems Division's (CTSD) Systems Test Branch (STB) at the Johnson Space Center (JSC) provides an extensive array of testing services and capabilities for NASA and external customers. Significant test capabilities include:

- human-rated space environment chamber facilities wherein space suited crewmembers train and test in space-simulated environments
- human-rated and unmanned testing of equipment containing hazardous materials such as anhydrous ammonia
- a diverse array of small environmental test chambers
- specialized NASA program testing facilities such as the Space Station Airlock Test Article chamber complex

It is anticipated that the contractor may have temporary access to, be temporary furnished with, or temporary use, the types of facilities and or equipment described above in the performance of this contract only if it is determined to be in the best interest of the Government. Additional information pertaining to the above facilities and equipment can be found at:

<http://ctsdtests.jsc.nasa.gov/>

Other facilities to be provided include the JSC Calibration Laboratory. In accordance with clause G.3, JSC 52.204-92, all local area contractors are required to use the laboratory. This includes any need for calibration as related to any other testing that may be conducted on or near site.

ADMINISTRATIVE PROVISIONS RELATING TO INSTALLATION-ACCOUNTABLE GOVERNMENT PROPERTY AND SERVICES

- (a) Requests for specific support to be furnished by the Government pursuant to the "Installation-Accountable Government Property" clause and the "List of Installation-Accountable Government Property and Services" clause shall be made by the contractor to the Contracting Officer as part of the delivery ordering procedures (see Clause F.5 – Ordering Procedures), "Support Contractor Handbook." The completion of forms, needed to obtain support, shall be accomplished by the contractor.
- (b) If the contractor requests property or services which are not available or cannot be made available from the Government to meet the contractor's schedule needs, the requesting document will be canceled and returned to the contractor. The contractor will thereafter be responsible for acquiring the needed items or services.
- (c) If the contractor initiates a transfer of accountability (DD Form 1149) from the contractor to the Government, the contractor shall continue to account for the property in

question until contractor receives notification that the form has been signed by the JSC Supply and Equipment Management Officer (SEMO) or his/her authorized representative. If the contractor does not receive such notice in a reasonable time, contractor will make inquiry through the Property Administrator as to the status of the transfer.

Attachment J-6

Table 2 Government Furnished Property/Facilities

Although it is not the intent of the Government to provide property to contractors, it is recognized that since it is not known all the work to be required under this contract throughout the period of performance, property may be provided if it is in the best interest of the Government. In accordance with clause 1852.245-76, List of Government-Furnished Property (GFP), the following property will be provided if so included on the Delivery Order:

A. List of Property the Contractor Shall Replace

Item	Quantity	Acquisition Cost	Use of Property Location	Date to be Furnished to the Contractor
------	----------	------------------	--------------------------------	--

[Insert a description of the item(s), quantity, acquisition cost, and date the property will be furnished to the Contractor] - List of Property will be added as requirements are further identified and the determination to provide property is determined to be in the best interest of the Government.

B. List of Property the Government Will Replace

Item	Quantity	Acquisition Cost	Use of Property Location	Date to be Furnished to the Contractor
------	----------	------------------	--------------------------------	--

[Insert a description of the item(s), quantity, acquisition cost, and date the property will be furnished to the Contractor] - List of Property will be added as requirements are further identified and the determination to provide property is determined to be in the best interest of the Government.

Attachment J-7

GOVERNMENT PROPERTY PLAN

The contractor will submit Plan as part of their proposal.

UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Government Property Management Plan- CRAVE	Issue Date:	Document: CRAVE-PL-004
	Authorized by: Tom Gallimore	Revision:	
	Sub Authorizer: Dan Connor		

UAB-CBSE **Government Property Management Plan**

For

Crew, Robotics and Vehicle Equipment (CRAVE) Contract Proposal

The University of Alabama at Birmingham
Center for Biophysical Sciences and Engineering
Birmingham, Alabama

Solicitation Number: NNJ04047146R

Date: July 15, 2004

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UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Government Property Management Plan- CRAVE	Issue Date:	Document: CRAVE-PL-004
	Authorized by: Tom Gallimore	Revision:	
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ABSTRACT

This document was prepared for the National Aeronautics and Space Administration by the University of Alabama at Birmingham – Center for Biophysical Science and Engineering (UAB-CBSE) in accordance with NASA DRD #52 of the Crew, Robotics and Vehicle Equipment (CRAVE) Request for Proposal (RFP). It describes the use, maintenance, repair, protection and preservation of Government Property during execution of the contract.

LIVE Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Government Property Management Plan- CRAVE	Issue Date:	Document: CRAVE-PL-004
	Authorized by: Tom Gallimore	Revision:	
	Sub Authorizer: Dan Connor		

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Attachment J-8

FLIGHT GFE CONFIGURATION MANAGEMENT PLAN

The contractor will submit Plan as part of their proposal.

UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Flight GFE Configuration Management Plan - CRAVE	Issue Date:	Document: CRAVE-PL-005
	Authorized by: Tom Gallimore	Revision:	
	Sub Authorizer: Dan Connor		

UAB-CBSE **Flight GFE Configuration Management Plan**

For

Crew, Robotics and Vehicle Equipment (CRAVE) Contract Proposal

The University of Alabama at Birmingham
Center for Biophysical Sciences and Engineering
Birmingham, Alabama

Solicitation Number: NNJ04047146R

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Attachment J-9

RELIABILITY AND MAINTAINABILITY PLAN

The contractor will submit Plan as part of their proposal.

UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Reliability and Maintainability Plan-CRAVE	Issue Date: 11-8-2004	Document: CRAVE-PL-003
	Authorized by: Tom Gallimore	Revision:	
	Sub Authorizer: Dan Connor		
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UAB-CBSE **Reliability and Maintainability Plan**

For

Crew, Robotics and Vehicle Equipment **(CRAVE)** **Contract Proposal**

The University of Alabama at Birmingham
Center for Biophysical Sciences and Engineering
Birmingham, Alabama

Solicitation Number: NNJ04047146R

Date: Nov 8, 2004

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UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Reliability and Maintainability Plan-CRAVE	Issue Date: 11-8-2004	Document: CRAVE-PL-003
	Authorized by: Tom Gallimore	Revision:	
	Sub Authorizer: Dan Connor		
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ABSTRACT

This document was prepared for the National Aeronautics and Space Administration by the University of Alabama at Birmingham – Center for Biophysical Science and Engineering (UAB-CBSE) in accordance with NASA DRD #37 of the Crew, Robotics and Vehicle Equipment (CRAVE) Request for Proposal (RFP). It describes the Reliability and Maintainability program that will be implemented in the design, development, production and acceptance of Flight hardware systems under the CRAVE contract.

The work to be accomplished for each applicable task under the CRAVE contract for a particular Delivery Order (DO) will be established by unique DO requirements. Tasks and analysis described herein represent a range of possible deliverables and will be tailored to specific Reliability and Maintainability requirements of unique DOs and reflected in the specific R&M plan applicable for each DO.

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**Center for Biophysical
Sciences and Engineering
Engineering Division**

Document Title:
**Reliability and
Maintainability Plan-
CRAVE**

Issue Date:
11-8-2004

Document:
CRAVE-PL-003

Authorized by:
Tom Gallimore

Revision:

Sub Authorizer:
Dan Connor

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CHANGE LOG

Revision	Date	Description of Change
Preliminary	8 November 2004	Comprehensive Revision

Solicitation Number: NNJ04047146R

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Date: Nov 8, 2004

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UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Reliability and Maintainability Plan-CRAVE	Issue:  11-8-2004	Document: CRAVE-PL-003
	Authorized by: Tom Gallimore	Revision:	
	Sub Authorizer: Dan Connor		
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U4B**Center for Biophysical
Sciences and Engineering
Engineering Division**Document Title:
**Reliability and
Maintainability Plan-
CRAVE**

Issue Date:

11-8-2004

Document:

CRAVE-PL-003Authorized by:
Tom Gallimore

Revision:

Sub Authorizer:
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Attachment J-10

SYSTEM SAFETY PLAN

The contractor will submit Plan as part of their proposal.

UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Preliminary System Safety Plan - CRAVE	Issue Date:	Document: CRAVE-PL-002
	Authorized by: Tom Gallimore	Revision:	
	Sub Authorizer: Dan Connor		

UAB-CBSE **Preliminary System Safety Plan**

For

Crew, Robotics and Vehicle Equipment (CRAVE) Contract Proposal

The University of Alabama at Birmingham
Center for Biophysical Sciences and Engineering
Birmingham, Alabama

Solicitation Number: NNJ04047146R

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UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Preliminary System Safety Plan - CRAVE	Issue Date:	Document: CRAVE-PL-002
	Authorized by: Tom Gallimore	Revision:	
	Sub Authorizer: Dan Connor		

ABSTRACT

This document was prepared for the National Aeronautics and Space Administration by the University of Alabama at Birmingham – Center for Biophysical Science and Engineering (UAB-CBSE) in accordance with NASA DRD #53 of the Crew, Robotics and Vehicle Equipment (CRAVE) Request for Proposal (RFP). It describes the safety program plan that will be implemented by UAB-CBSE. This is only an overview of our existing plan that will be implemented after contract award.

Solicitation Number: NNJ04047146R

Date: July 15, 2004

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LWS Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Preliminary System Safety Plan - CRAVE	Issue Date:	Document: CRAVE-PL-002
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Attachment J-11

QUALITY PLAN

The contractor will submit Plan as part of their proposal.

UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Program Quality Plan - CRAVE	Issue Date:	Document: CRAVE-PL-001
	Authorized by: Tom Gallimore	Revision:	
	Sub Authorizer: Dan Connor		

UAB-CBSE **Preliminary Program Quality Plan**

For

Crew, Robotics and Vehicle Equipment (CRAVE) Contract Proposal

The University of Alabama at Birmingham
 Center for Biophysical Sciences and Engineering
 Birmingham, Alabama

Solicitation Number: NNJ04047146R

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UAB Center for Biophysical Sciences and Engineering Engineering Division	Document Title: Program Quality Plan - CRAVE	Issue Date:	Document: CRAVE-PL-001
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Attachment J-12

APPLICABLE DOCUMENTS

APPLICABLE DOCUMENTS LISTING

Document No.	Revision	Release Date	Title	Location (after contract start)
ANSI/CSL Z540-1		July-94	General Requirements for Calibration Laboratories and Measuring and Test Equipment	http //standards nasa gov
ANSI/ESD S20.20		April, 1999	Development of and Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrical Initiated Explosive Devices)	http://standards nasa gov
AS9100	A	August-01	Quality Systems - Aerospace - Model for Quality Assurance in Design, Development, Production, Installation and Servicing	http //standards nasa.gov
EA-WI-023	C	January, 2002	Project Management of GFE Flight Projects	http://stic.jsc.nasa.gov/dbase/iso9000/docs/EA1/master.htm
EA-WI-025	A	November, 2001	GFE Flight Project Software and Firmware Development	http //stic.jsc nasa gov/dbase/iso9000/docs/EA1/master.htm
EA-WI-027		October, 2001	Configuration Management Requirements	http://stic.jsc.nasa.gov/dbase/iso9000/docs/EA1/master.htm
IPC-2221			Generic Standard on Printed Board Design	http://standards.nasa.gov
IPC-2222			Sectional Design Standard for Rigid Organic Printed Boards	http://standards.nasa.gov
IPC-6011			Generic Performance Specification for Printed Boards	http //standards nasa gov

IPC-6012			Qualification and Performance Specification for Printed Boards	http://standards.nasa.gov
ISO 10012:2003			Measurement management systems - Requirements for measurement processes and measuring equipment	http://standards.nasa.gov
JPG 8080.5	G	November, 2001	JSC Design and Procedural Manual	http://stic.jsc.nasa.gov/dbase/iso9000/docs/EA1/master.htm
JPG 8500.4	G	November, 2001	Engineering Drawing System Manual	http://stic.jsc.nasa.gov/dbase/iso9000/docs/EA1/master.htm
JSC 17481	B	February, 2003	Safety Requirements Document for JSC Shuttle Space Flight Equipment	http://wwwsrqa.jsc.nasa.gov/gfe/BlankForms.htm
JSC 23642	E	10/22/2001	JSC Fastner Integrity Program	http://jsc-isd-lib14.jsc.nasa.gov/dis/
JSC 25863	A	August-98	Fracture Control Plan for JSC Flight Hardware	No Electronic copy
JSC 26626	A	May-95	Extravehicular Activity (EVA) Hardware Generic Design Requirements Document	http://evaweb.jsc.nasa.gov/documents.cfm
JSC 27301			Materials Control Plan for JSC Space Station Government Furnished Equipment	http://stic/dbase/iso9000/docs/ES/master.htm
JSC 27743	B	02/1997	EMC Test Methods for Shuttle Orbiter Equipment/Experiments	No Electronic copy
JSC 28035	A	May, 2001	Program Problem Reporting and Corrective Action (PRACA) System for JSC Government Furnished Equipment	http://sspweb.jsc.nasa.gov/webdata/pdcweb/joint_iss.htm

JSC 28484		07/03/03	Program Requirements Document for Johnson Space Center Non-critical Government Furnished Equipment	http://sspweb.jsc.nasa.gov/webdata/pdcweb/joint_iss.htm
JSC 61360	A	July, 1998	JSC Engineering Directorate Certified Parts Approval Program (EDCPAP)	http://stic.jsc.nasa.gov/dbase/iso9000/docs/EA1/master.htm
MSFC-STD-3029		May, 2000	Guidelines for the Selection of Metallic Materials for Stress Corrosion Cracking Resistance	http://standards.nasa.gov
NASA-STD-6001		02/09/1998	Flammability, Odor, Offgassing, and Compatibility Requirements and Test Procedures for Materials in Environments That Support Combustion	http://standards.nasa.gov
NASA-STD-8739.1		August, 1999	Workmanship Standard for Staking and Conformal Coating of Printed Wiring Boards and Electronic Assemblies	http://standards.nasa.gov
NASA-STD-8739.2		August, 1999	Workmanship Standard for Surface Mount Technology	http://standards.nasa.gov
NASA-STD-8739.3 Change 2		January, 2002	Soldered Electrical Connections	http://standards.nasa.gov
NASA-STD-8739.4		February, 1998	Crimping, Interconnecting Cables, Harnesses and Wiring	http://standards.nasa.gov
NASA-STD-8739.5		February, 1999	Fiber Optic Terminations, Cable Assemblies and Installation	http://standards.nasa.gov
NSTS 07700 Vol.10-Bk 1		6/4/1993	Flight and Ground Systems Specifications -Requirements	http://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm

NSTS 07700 Vol.10-Bk 2		6/9/1999	Flight and Ground Systems Specifications – Environmental Design, Weight and Performance, and Avionics Events	http://sspweb.jsc.nasa.gov/webdata/pdcweb/07700.htm
NSTS 5300.4 (1D-2)		September-97	Safety, Reliability, Maintainability and Quality Provisions for the Space Shuttle	http://sspweb.jsc.nasa.gov/webdata/pdcweb/subdocs.htm
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