AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
	1 | 4

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
000036	See Block 16C	See Schedule	

6. ISSUED BY	CODE	7. ADMINISTERED BY *(If other than Item 6)*	CODE
NASA/Marshall Space Flight Center Procurement Office Marshall Space Flight Center AL 35812	MSFC	NASA/Marshall Space Flight Center Marshall Space Flight Center AL 35812	MSFC

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*		9A. AMENDMENT OF SOLICITATION NO.
INFOPRO CORPORATION Attn: Larry Stanley 6705 ODYSSEY DR HUNTSVILLE AL 35806-2300	(x)	9B. DATED *(SEE ITEM 11)*
	X	10A. MODIFICATION OF CONTRACT/ORDER NO NNM08AA20C
		10B. DATED *(SEE ITEM 13)* 02/12/2008

CODE	0AFL2	FACILITY CODE

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended. ☐ is not extended.
Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGEMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)* Net Increase: $2,606,643.30
See Schedule

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	
	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
X	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: Bilateral Mod: FAR 42.103(a) Mutual Agreement & FAR 52.246-2 Changes - Cost Reimbursement (Alt. I 1)
	D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor ☐ is not. ☒ is required to sign this document and return 3 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

The Negotiated Estimated Cost remains unchanged at (b)(4). The Provisional Estimated Cost remains unchanged at (b)(4). The Award Fee Earned remains unchanged at $584,406. The Potential Award Fee remains unchanged at (b)(4). The Total Fee remains unchanged at (b)(4). The Contract Value remains unchanged at (b)(4). Total Funding Allotted increases by $2,606,643 from $35,494,808 to $38,101,451.

See Page 2 for further description of modification.

Obligated Amount for this Modification: $2,606,643.30
Incremental Funded Amount changed: from
$35,494,808.14 to $38,101,451.44

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
STEVEN W. TATE GENERAL MGR PATRIOT		Kim S Carson	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
(Signature of person authorized to sign)	7/29/2009	*(Signature of Contracting Officer)*	JUL 30 2009

NSN 7540-01-152-8070
Previous edition unusable

STANDARD FORM 30 (REV. 10-83)
Prescribed by GSA
FAR (48 CFR) 53.243

A. The purpose of Modification No. 36 is to:

1) Administratively correct the Total Funding Allotted amount shown on SF30 of Modifications 34 and 35. The Total Funding Allotted sentence should read: "Total Funding Allotted remains unchanged at $35,494,808."

2) Incrementally fund the contract in the amount of $2,606,643 through November 30, 2009.

- Clause B.5, CONTRACT FUNDING, funding is hereby increased in the amount of $2,606,643 from $35,494,808 to $38,101,451. Clause B.5 shown in Mod 35 is hereby deleted in its entirety and the revised Clause B.5, shown on the enclosed replacement page B-4 (Mod 36), is substituted in lieu thereof.

3) Delete the Data Procurement Document (DPD) Revision B and replace with DPD Revision C. Changes to the DPD are as follows:
-Delete DRD 1163CD-001, Contractor Information Technology (IT) Security Plan Program.
-Modify DRD 1163MA-010, Monthly Calibration Services Report Item 15.3b, c and delete 15.3d.
-Update DRD 1163SA-001, Safety, Health and Environmental (SHE) Plan.
-Update DRD 1163SA-003, Mishap and Safety Statistics Report.
-Update page J-2-2, Document Change Log indicating DRD changes.

4) Replace Attachment J-1, Performance Work Statement (PWS), page J-1-1 through page J-1-35, with the revised PWS, dated 7-23-09. The revised PWS reflects the changes made in the DPD. Changes to the PWS are indicated with right margin sidebars.

B. A recapitulation of the contract value is as follows:

	Negotiated Estimated Cost (a)	Provisional Estimated Cost (b)	Award Fee Earned (c)	Potential Award Fee (d)	Total Fee (c+d)	Contract Value (a+b+c+d)	Total Funding Allotted
Previous	(b)(4)		$584,406	(b)(4)			$35,494,808
This Mod			$0				$2,606,643
Revised Total			$584,406				$38,101,451

C. Purchase Request No./Accounting & Appropriation Data:

4200301705	$ 200.00	095240.04.04.22.03.08	EXPX22009D	62ER24
	$ 678.00	136905.08.04.02.08.08.03	EXPX22009D	62EM10
	$ 11,450.00	136905.08.05.05.01.08	EXPX22009D	62ER23
	$ 43,000.00	136905.08.05.12.01.08	EXPX22009D	62ES23
	$ 170,492.00	136905.08.05.12.02.08.02	EXPX22009D	62EM30
	$ 1,280.00	136905.08.05.12.02.08.03	EXPX22009D	62EM20
	$ 49,718.00	136905.08.05.12.08.07	EXPX22009D	62EM10
	$ 14,852.00	136905.08.05.12.08.07	EXPX22009D	62EV35
	$ 39,511.00	136905.08.05.12.08.07	EXPX22009D	62EM40
	$ 62,967.00	136905.08.05.12.08.07	EXPX22009D	62ET50
	$ 69,195.00	401769.06.08.02.04.02	EXCX22009D	62ES23
	$ 7,011.00	714607.01.01.02.01	SCEX22009D	62ES11
	$ 64,000.00	736466.11.01.08.42	CASX22009D	62ES23
	$ 63,000.00	736466.11.01.08.40	CASX22009D	62ES01
	$ 650,000.00	136905.08.05	EXPX22009D	62ES23
	$ 19,844.00	401769.06.08.02.04.05	EXCX22009D	62ES43
	$ 1,431.00	136905.08.04.02.08.08.04	EXPX22009D	62ER42
	$ 1,205.00	136905.08.04.02.08.11.01	EXPX22009D	62ER42
	$ 8,184.00	136905.08.05.12.02.08.01	EXPX22009D	62ES23
	$ 13,545.00	136905.08.05.12.08.07	EXPX22009D	62ES23

	$ 49,718.00	136905.08.05.12.08.07	EXPX22009D	62EM10
	$ 9,723.00	136905.08.05.12.02.08.10	EXPX22009D	62EM40
	$ 38,490.00	136905.08.05.12.03.08	EXPX22009D	62ES23
	$ 25,071.00	136905.08.05.12.07.08	EXPX22009D	62EM40
	$ 65,614.00	136905.08.05.12.07.08	EXPX22009D	62ET50
	$ 14,062.00	401769.06.03.03.02.07	EXCX22009D	62ES23
	$ 17,420.00	401769.06.03.07.02.03	EXCX22009D	62ES23
	$ 9,600.00	136905.10.30.20.10	EXPX22009D	62ET40
	$ 50,325.00	401769.06.03.03.02.07	EXCX22009D	62ES43
4200301486	$ 13,000.00	825080.04.06.13	EXPX22009D	62EM10
	$ 1,600.00	595551.01.08.01.VP08.09	CASX22009D	62EM10
	$ 5,000.00	665858.01.08.01	ESAX22008D	62EM50
	$ 1,547.00	892182.01.08.0868.01	EXCX22008R	62EM50
	$ 24,746.00	921179.01.08.01.EM70.09	CASX22009D	62EM50
	$ 1,731.00	825080.04.06.30.08	EXPX22009D	62EM50
	$ 3,462.00	825080.04.06.30.04	EXPX22009D	62EM50
	$ 981.00	524238.08.01.01.03	EXCX22008D	62EM03
	$ 674.00	524238.08.01.01.03	EXCX22008D	62EM03
	$ 8,999.00	524238.08.01.01.03	EXCX22009D	62EM03
	$ 3,633.00	522632.08.01.01	EXCX22009D	62EM03
4200302869	$ 40,000.00	524238.08.01.01.03	EXCX22009D	62EM20
	$ 120,000.00	524238.08.01.01.03	EXCX22009D	62EM10
	$ 50,000.00	522632.08.01.01	EXCX22009D	62EM10
	$ 29,422.00	401769.06.03.07.04.0	EXCX22008R	62ES42
	$ 4,600.00	401769.06.03.07.04.0	EXCX22009D	62ES42
	$ 59,000.00	524238.08.01.01.03	EXCX22009D	62EM40
	$ 10,000.00	522094.08.01.01.03.0	EXCX22009D	62EM40
	$ 30,000.00	520871.08.01.01.02	EXCX22009D	62EM40
	$ 78,909.00	522632.08.01.01	EXCX22009D	62EM40
	$ 18,765.00	522094.08.01.01.03.0	EXCX22009D	62EM30
	$ 5,442.00	524238.08.01.01.03	EXCX22009D	62EM50
	$ 32,705.45	736466.10.02.08	CASX22009D	62QD10
	$ 60,000.00	524238.08.01.01.03	EXCX22009D	62ET60
	$ 1,501.85	136905.10.10.80.40.2	EXPX22009D	62ER33
	$ 2,087.00	401769.06.08.02.04.0	EXCX22009D	62ES21
	$ 102,487.00	136905.08.04.02.08	EXPX22009D	62ET20
	$ 887.00	921179.01.08.01.ET46	CASX22009R	62ET20
	$ 60,529.00	921179.01.08.01.ET45	CASX22009R	62ET20
	$ 1,276.00	401769.06.03.07.02.0	EXCX22009D	62ET20
	$ 6,338.00	359257.01.02.01	CASX22009D	62ET20
	$ 83,939.00	359257.01.05.01	CASX22009D	62ET20
	$ 98,000.00	736466.11.01.08.38	CASX22009D	62ET02
4200299223	$ 11,845.00	439906.04.01.06.04.0	EXPX22009D	62EM10
	$ 6,500.00	444543.03.06	EXPX22009D	62EM10
	$ 2,851.00	524239.09.01.01.03	EXCX22008D	62EM03
	$ 20,000.00	520871.08.01.01.02	EXCX22009D	62EM03
	$ 10,000.00	197009.10.01.01.17	EXCX22009D	62EM10
	$ 22,600.00	197009.10.01.01.17	EXCX22009D	62EM10

D. The following pages/sections are deleted in their entirety and the attached revised pages/sections are substituted in lieu thereof:

	Pages Deleted	Sections Added/Revised
Section B	B-4 (Mod 35)	B-4 (Mod 36)
Section J-1	J-1-1 through J-1-35 (Mod 26)	J-1-1 through J-1-35 (Mod 36)
Section J-2	J-2-1 through J-2-45 Rev B (Mod 26)	J-2-1 through J-2-49 Rev C (Mod 36)

E. All other terms and conditions remain unchanged and in full force and effect.

(d) After 85 percent of the potential award fee has been paid, the Contracting Officer may direct the withholding of further payment of award fee until a reserve is set aside in an amount that the Contracting Officer considers necessary to protect the Government's interest. This reserve shall not exceed 15 percent of the total potential award fee.

(e) The amount of award fee which can be awarded in each evaluation period is limited to the amounts set forth in Clause B.2, Estimated Cost and Award Fee. Award fee which is not earned in an evaluation period cannot be reallocated to future evaluation periods.

(f) (1) Provisional award fee payments will be made under this contract pending the determination of the amount of fee earned for an evaluation period. Provisional award fee payments will be made to the Contractor on a monthly basis. The total amount of award fee available in an evaluation period that will be provisionally paid is the lesser of 70 percent or the prior period's evaluation score.

(2) Provisional award fee payments will be superseded by the final award fee evaluation for that period. If provisional payments exceed the final evaluation score, the Contractor will either credit the next payment voucher for the amount of such overpayment or refund the difference to the Government, as directed by the Contracting Officer.

(3) If the Contracting Officer determines that the Contractor will not achieve a level of performance commensurate with the provisional rate, payment of provisional award fee will be discontinued or reduced in such amounts as the Contracting Officer deems appropriate. The Contracting Officer will notify the Contractor in writing if it is determined that such discontinuance or reduction is appropriate.

(4) Provisional award fee payments will be made prior to the first award fee determination by the Government.

(g) Award fee determinations are unilateral decisions made solely at the discretion of the Government.

(End of Clause)

B.5 1852.232-81 CONTRACT FUNDING (JUN 1990)

(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 $37,194,120. This allotment is for the Marshall Engineering Technicians and Trades Support Services and covers the following estimated period of performance: November 30, 2009

(b) An additional amount of $907,331 is obligated under this contract for payment of fee.

Incremental Funding:	Previous	This Action	Total
Estimated Cost:	(b)(4)		
Provisional Award Fee:			
Earned Award Fee:	$ 584,406	$ -	$ 584,406
Total Sum Allotted:	$ 35,494,808	$ 2,606,643	$ 38,101,451

(End of Clause)

ATTACHMENT J-1

Performance Work Statement (PWS)

Introduction

This Performance Work Statement (PWS) broadly defines the requirements for Marshall Engineering Technicians and Trades Support (METTS) Services provided to the Marshall Space Flight Center (MSFC) by the Contractor. These services cover a wide range of engineering technicians and other trade skills to perform testing; ground and space based research; test operations; data analysis; machine and electrical shop operations; and other technical activities. This contract will include professionals to oversee and manage the work performed by the technical staff.

The Contractor's work on these activities is controlled by means of a Mission Services portion for work that the Government intends to remain on the contract for its duration, and by an IDIQ portion implemented through the issuance of Task Orders (TOs) for work that the Government cannot adequately define. The Mission Services contract and TOs require the Contractor to coordinate with the MSFC Directorates/Offices that exercise MSFC responsibility for the activities. MSFC Directorates and Offices are responsible for the technical excellence of MSFC managed projects, MSFC in-house projects, and technology development and application initiatives. MSFC Civil Service personnel are also deployed in support of these projects and frequent coordination between Contractor personnel and Civil Service personnel is likely. This PWS is constructed in accordance with the Level 3 Work Breakdown Structure (WBS) provided in Attachment J-3.

A Contracting Officer's Technical Representative (COTR) will be appointed for technical oversight and direction on this contract. Due to the size and complexity of this contract, Technical Monitors (TM) will also be appointed to assist the COTR in the day-to-day functions of the major areas of the contract (the Government anticipates approximately 4 civil service Technical Monitors to cover section 2.0). In addition, each IDIQ order will have a Technical Monitor appointed. This may be an existing TM or a new TM depending on the nature of the order. The TM duties will include overseeing the technical work of the Contractor in their respective work areas, ensuring that the COTR is informed of problems, and advising the COTR with respect to Contractor performance.

Scope

The Contractor shall provide all the necessary management and personnel required to perform the technical and business tasks broadly defined by the Mission Services contract and TOs issued by the Government in accordance with Clause H.4 and H.5 of this solicitation. Responses to any Task Order Requests will be in the form of a Task Order Plan (TOP). The TOPs shall be provided in accordance with Data Requirements Description (DRD) 1163MA-002, Task Order Plan. A graphical depiction of the Task Flow Process can be found in Attachment J-4. With the exception of the property listed in Clause G.6 and Attachment J-9, the Contractor shall procure all materials, supplies, incidental services, tools, and equipment necessary for the accomplishment of this PWS. Any equipment purchases must be coordinated with the COTR, Technical Monitors, and Contracting Officer and shall not include any equipment $1M in value or higher. The Contractor shall only be enabled to purchase equipment to meet the requirements of this contract. The Contractor shall comply with NASA/MSFC regulations, policies, directives, procedures, and standards when performing all work under this PWS.

1.0 Management

1.1 Contract Management. The Contractor shall provide the planning, coordination, technical direction, and surveillance of the activities necessary to ensure disciplined performance of work and timely and efficient application of resources for the accomplishment of all Mission Services contract work and TOs issued under the contract. The Contractor shall be responsible for maintaining communication with each supported organization and alerting the Contracting Officer's Technical Representative (COTR) and Contracting Officer (CO) immediately of any problems that would prevent meeting established objectives. A Management Plan shall be provided in accordance with DRD 1163MA-001 Management Plan.

The Contractor shall provide an Organizational Conflict of Interest (OCI) Avoidance Plan in accordance with DRD 1163MA-009.

1.1.1 Task Management - The Contractor shall provide planning, coordination, and surveillance of overall project activities to ensure disciplined performance of work and the timely and efficient application of resources necessary for the completion of all tasks of this PWS. The Contractor shall make adjustments in the application of resources to specific WBS elements, as demands and priorities require, in consultation with the COTR. The Contractor shall develop a TOP for Task Order Requests received from the Government in accordance with DRD1163MA-002, Task Order Plan. The Contractor shall commence work once the TOP has been issued as a Task Order by the Contracting Officer.

The Contractor shall plan and conduct an informal progress review (format to be agreed upon between Contractor and COTR) scheduled as coordinated with COTR. All work being accomplished shall be addressed, by WBS element and/or Task Order, in these progress reports.

(b)(4)

1.1.2 Contractor Employee Center-wide Training and Certifications – MSFC requires certification for certain center-wide job functions (e.g., crane operator, fork truck operator, etc.; reference MWI 3410.1, "Personnel Certification Program"). For these job functions, the Contractor shall ensure that their workforce is properly certified to the MSFC standards prior to conducting any work requiring these job functions.

When performing work or operating equipment in direct support of NASA MSFC, within the Contractor's quality management system, including requirements for Industrial Safety (See DRD 1163SA-001), the Contractor shall establish, implement, and maintain a training and certification program as required to accomplish the requirements of this PWS, reference DRD 1163QE-001. Monitoring of these training, qualification, and certification processes will be as specified in J-20, NASA MSFC Safety & Mission Assurance Surveillance Plan.

The Contractor shall keep its employees trained and certified in order to properly perform tasks requiring certification. The Contractor shall ensure all employee certifications are recorded in the MSFC CERTRAK database. Training methods include formal training and on-the-job training in order to maintain all employee levels of technical competence. Any Contractor employee authorized to operate a given test instrument or piece of equipment shall be trained on the current operating techniques of the equipment. Any Contractor request for unique training related to the specific job functions shall be approved by the COTR. Training costs approved by the COTR shall be charged to the WBS element to which it specifically supports.

The Contractor shall provide a comprehensive plan describing how they will manage all certification requirements on this contract. The certification plan shall be provided in accordance with DRD 1163SA-002, Personnel Certification Plan.

1.1.3 Contractor Employee Specialized Training and Unique Certifications – In direct support of facility unique MSFC operations under MSFC processes (facility unique OWIs, SOPs, etc.), the Contractor shall obtain specialized training and facility unique certification in all areas where required for performing a WBS element, or as directed by the COTR. The Contractor employees shall perform work in areas where certification is required only after certification is obtained, or under the supervision of an employee who has obtained certification. For unique technical capabilities where a certification program does not exist, the Contractor shall develop a certification program, to be listed in and tracked through the MSFC SHE CERTRAK database, within 90 days of contract award. All employees working in areas requiring unique certifications shall be certified and listed in the CERTRAK database within 180 days of contract award. The Contractor shall maintain all required certifications throughout the contract. As examples, within 90 days of contract award, the Contractor shall develop certification plans which will encompass certification requirements for operation of all vacuum, thermal vacuum and turbine technology, pressure systems, and instrumentation and data collection.

For facility unique operations requiring certification, the Contractor shall designate employee(s) who will serve as certification granting authorities for their specific areas of expertise. These employee(s) shall be technically competent in the areas for which they serve as the certification granting authority and approved by the COTR. Within 90 days after completion of the certification plans, all certification requirements defined in these plans, along with a list of all individuals certified to these requirements, shall be included in the MSFC SHE CERTRAK database. The MSFC SHE CERTRAK database shall be the official record of certification and the Contractor shall maintain this record to reflect current status.

The Contractor shall address specialized and unique certifications in their comprehensive certification plan. The certification plan shall be provided in accordance with DRD 1163SA-002, Personnel Certification Plan.

1.1.4 Monthly Status Reports - The Contractor shall support a formal monthly status meeting and provide a Monthly Status Report broken out by WBS element and/or Task Order, in accordance with DRD 1163MA-004, Monthly Status Report. The Monthly Status Report shall include accomplishments during the month, work upcoming for the next month, problems encountered during the reporting month, new discoveries and/or inventions. In addition, the report shall include summaries of training, travel, overtime, consulting, procurements, and commercial work. This Monthly Status Report shall be provided to the COTR on, or before, the 10th day of each month and will cover the previous month's status. The Monthly Status Report shall not exceed two pages for each WBS element. The Contractor shall produce minutes for

each of the meetings and these minutes shall include copies of all presentation charts, if applicable, and shall provide special cost analyses and projection reports, as required. Minutes shall be provided to the COTR within 5 days of meeting date.

1.1.5 Contractor Employee Clearance Document - For Contractor badged employees who no longer require access to MSFC, the Contractor shall provide verification these employees have properly cleared all accounts when the access is no longer needed. The Contractor shall establish and maintain the document in accordance with DRD1163MA-006, Contractor Employee Clearance Document.

1.1.6 Position Risk Designation for Non-NASA Employee - The position risk designation for non-NASA employees provides information necessary to determine the type of investigation required and how closely an individual is screened for a position. The Contractor shall provide the required information in accordance with DRD1163MA-007, Position Risk Designation for Non-NASA Employee.

1.1.7 Quality Systems Management - The Contractor's quality system shall be compliant to SAE AS9100 (excluding Section 7.3 "Design and Development") by transitioning from the existing quality management system within 120 days after the contract award date. The Contractor shall be verified as compliant by a MSFC audit of their quality management system to the requirements of MWI 5330.1. The Contractor shall detail their quality management system in a quality plan prepared in accordance with DRD 1163QE-001, Quality Management System Plan. The Contractor's quality management system shall be sufficiently broad in scope and cover all aspects of the technical support, testing support, and fabrication/assembly requirements of this PWS.

NASA MSFC shall approve all quality controlled special processes prior to those processes being performed to provide products to NASA and/or any other customer. Processes previously approved will be considered acceptable for use and shall be reviewed again after those documented processes have been transitioned into the Contractor quality management system format. Transition time periods for process re-approval shall be provided by NASA through the COTR.

1.2 Planning and Control

1.2.1 Work Management - The Contractor shall provide surveillance and management oversight to meet the operations of each WBS element. Each WBS element consists of diverse technical activities with unique work skills. Most WBS elements have different planning, implementing, and progress tracking systems that maintain work flow in specific work areas. The systems or processes may be manual, electronic, or both and may consist of meetings daily, weekly, or monthly.

The Contractor shall coordinate, report, and ensure the timely completion of the work specified. This encompasses the planning, coordination, technical direction, and surveillance of all activities necessary to execute all work.

a) The Contractor shall provide the overall management effort required to integrate technical and programmatic functions.

b) The Contractor shall ensure the technical excellence, cost effectiveness, and timeliness of all required work and deliverable products.

c) The Contractor shall evaluate new or used equipment to assure compatibility with directed tasks. This shall include travel to Government depots or to equipment manufacturers' or distributors' plants, as required.

1.2.2 Property Management - The Contractor shall establish and maintain a report in accordance with DRD 1163LS-001, Government Property Management Plan for all equipment, tools, etc., provided by the Government for use by the Contractor in the performance of contracted effort, and for which the Contractor has been given physical custody.

1.2.3 Technology Reports - The Contractor shall provide technical information concerning any invention, discovery, improvement, or innovation made by the Contractor in the performance of work under this contract. Technology reports shall be prepared in accordance with DRD 1163CD-002, Technology Reports.

1.2.4 Security and Information Technology - The Contractor shall incorporate appropriate safeguards to ensure the availability, integrity, and confidentiality of information and information technology resources utilized in support of this contract. Safeguards shall be commensurate with the sensitivity or criticality of the resources and shall be sufficient to minimize the risk to NASA's mission and credibility.

The contractor shall be responsible for information and information technology (IT) security when physical or electronic access to NASA's computer systems, networks, or IT infrastructure is required or when information systems are used to store, generate, process or exchange information with NASA or on behalf of NASA, regardless of whether the information resides on NASA's or a contractor's information system. At the completion of the contract, the contractor shall return all NASA information and IT resources provided to the contractor during the performance of the contract and certify that all NASA information has been purged from contractor-owned systems used in the performance of the contract. The contractor shall submit a Contractor Information Technology Security Program Plan (CITSPP) in accordance with DRD 1163CD-001.

1.2.5 Contractor Employee Travel - The Government will reimburse the Contractor for any necessary travel expenses, in accordance with the Federal Travel Regulations. The Government shall not be charged with travel expenses, unless the travel is coordinated and concurred, in writing, by the COTR prior to the beginning of the travel. Travel costs shall be charged to the WBS to which it specifically supports.

1.2.6 Contractor Employee Overtime - The Contractor shall work a five-day work week and define their work schedule within Marshall's normal work hours (6:30 AM through 5:30 PM) unless an alternate work schedule has been approved by the COTR.

Notwithstanding Clause B6, "Premiums for Scheduled Overtime," overtime for employees under WBS elements 1.0, 2.0, and 3.0 shall be coordinated with the COTR, and receive concurrence from the COTR, prior to the commencement of any overtime work. Overtime costs shall be charged to the WBS to which it specifically supports.

1.2.7 Badged Employee and Remote IT User Listing - The Contractor shall establish and maintain a report listing of all Contractor personnel working onsite at MSFC in accordance with DRD1163MA-005, Badged Employee and Remote IT User Listing.

1.2.8 Commercial Work - Upon written permission by the Contracting Officer, the Contractor may use the facilities provided under this contract for a rental fee for commercial work.

When requesting permission to use the facilities, the Contractor shall provide the following information with its request:

1). Description of the work to be accomplished
2). Estimated man hours
3). Period of Performance
4). Name of the customer
5). Amount the customer is paying the Contractor

If granted, approval to use the Government facilities will be provided on a non-interference basis with other Government work. Authorizing such use of the facilities does not waive any rights of the Government to terminate the Contractor's right to use the facilities.

The Contractor shall indemnify the Government and hold it harmless against claims for injury to persons or damage to property of the Contractor or others arising from the Contractor's possession or use of the facilities. A copy of the indemnification notice shall be included in each subcontract issued by the Contractor. The Contractor is fully liable for all damages to Government property being used for commercial purposes.

Rental rates for the facilities shall be 10 percent of each individual commercial contract. However, the Contractor may use, with the written approval of the COTR, the rates set forth in FAR 52.245-9, "Use and Charges" if the Contractor determines 10 percent to be inequitable. The Contractor shall credit future payment vouchers for rental costs incurred.

1.2.9 Contractor Procurements – Per NFS 1852.245-71, all items procured under this contract are accountable to the Government and the contractor assumes user responsibilities. The contractor shall establish a record of property procured using contract funds and transfer to the Government within 5 working days after receipt of the property. The contractor will use DD1149 (or equivalent) along with the contractor's Purchase Order (PO) and provide to the installation central receiving area prior to delivery by the vendor. The contractor will be accountable and liable for the property until it is transferred to the Government's accountability (Reference MWI 4200.1, "Equipment Control" and NFS 1852.245-71).

1.2.9.1 Operations - The Contractor shall procure general operating supplies, materials, tools and equipment necessary for the accomplishment of this PWS. Any equipment purchases must be coordinated with the COTR, Technical Monitors, and Contracting Officer and shall not include any equipment $1M in value or higher. Procurement costs shall be charged to the WBS element to which it specifically supports.

1.2.9.2 Direct - The Contractor shall procure direct materials (e.g. aluminum, titanium, stainless and carbon steels, etc) and incidental services (e.g. necessary for completion of fabrication shop customer orders) as necessary to accomplish requirements of this PWS.

1.3 Safety, Health and Environmental. The Contractor shall establish and implement an industrial safety, health, and environmental program and provide a plan in accordance with

DRD 1163SA-001, Safety, Health, and Environmental (SHE) Plan. The Contractor's industrial safety, health, and environmental program shall incorporate the following:

a) Management leadership and employee involvement

b) System and worksite analysis

c) Hazard prevention and control

d) Safety and health training

e) Environmental compliance

The Contractor shall report mishaps and safety statistics in accordance with DRD 1163SA-002, Mishap and Safety Statistics Report.

The Contractor shall follow all MSFC safety, health, and environmental regulations. Contractor personnel will engage in hazardous operations including, but not limited to, hazardous waste generation, oxygen deficiency, high voltage, confined space entry, machine shop operations, overhead crane operations, forklift operations, aerial lift operations, cryogen handling, high pressure and cryogenic systems, vertical and boom aerial lift operations, high amplitude noise exposure, and high rpm rotating objects. The Contractor shall produce, and keep current, a Job Hazard Analysis for each employee. The Contractor shall also be responsible for maintaining the data associated with each hazardous operation in MSFC's Inventory of Hazardous Operations (IHOPS) database. This requires evaluation and update of this database annually as a minimum.

In addition, the Contractor shall perform a monthly inventory to ensure all chemicals have Material Safety Data Sheets (MSDS) and are properly bar coded, inventoried, and stored per MSFC Center (MWI 8550.5) and ISO14001, or latest version, guidelines. The Contractor, as requested, shall provide an oral report at NASA team safety meetings verifying that an inventory has been completed, all MSDS notebooks have been updated, and all chemicals are properly bar coded, inventoried, and stored per MSFC Center (MWI 8550.5) and ISO14001, or latest version guidelines.

All Contractor personnel shall attend an established monthly safety meeting and document their attendance. The Contractor shall document the safety meeting attendance of employees in MSFC's Supervisor's Safety Webpage (SSWP). In addition, all Contractor supervisory personnel shall conduct a monthly safety walk through of areas under their responsibility, report their findings in SSWP, and close findings within 30 days.

1.4 Financial Reporting. The Contractor shall utilize a financial reporting system in accordance with the NFS 1852.242-73, NASA Contractor Financial Management Reporting and NASA Policy Guide (NPG) 9501.2C, NASA Contractor Financial Management Reporting. The Contractor shall submit financial management reports in accordance with DRD 1163 MA-003, Financial Management Report (533M). The 533 will be reported at the Task and WBS Level(s).

This report shall summarize standard labor hours and costs, overtime labor hours and costs, Other Direct Cost (ODC) incurred, travel, training, procurements (including materials), and commercial work for each WBS by NASA Project funding code, or reporting category, as directed by the COTR.

2.0 Mission Services Technicians and Trades Support

2.1 Materials Testing. The Contractor shall perform materials testing to support NASA and MSFC missions and objectives, and shall support engineering oversight of these tests. This testing includes, but is not limited to, ignition and combustion testing on metallic and nonmetallic materials, toxic offgas testing on materials and components, thermal vacuum stability outgassing testing on materials, and advanced materials testing supporting space exploration.

2.1.1 Promoted Ignition-Combustion Testing - The Contractor shall perform the Upward Flammability of Materials in Gaseous Oxygen (GOX) testing of materials in a high-pressure gaseous oxygen environment, with both the Elevated Temperature and the Ambient Temperature Promoted Ignition-Combustion Testers. These tests are defined by Test 17 of NASA-STD-6001, *Flammability, Odor, Offgassing, and Compatibility Requirements and Test Procedures for Materials in Environments That Support Combustion*, and any variations or revisions thereof. Test pressures range from ambient pressure to 10,000 psi, with temperatures ranging from ambient to 2,200ºF. The Contractor shall lead the effort to produce any standards related to the elevated temperature test. The Contractor shall be responsible for ensuring that all equipment is properly calibrated prior to beginning a test. Any test equipment not properly calibrated shall be replaced with calibrated equipment prior to performing any test. The Contractor shall validate the test data and ensure the test data correlates with test data generated by other sources. Any test data that cannot be validated or correlated with the test data from other sources shall be immediately be brought to the attention of the COTR. This task also involves data analysis, and inputting all test data and results into the Materials and Processes Technical Information System (MAPTIS) database.

2.1.2 Flammability Testing - The Contractor shall perform Flammability and Wire Insulation Flammability Testing of materials in air and in oxygen enriched atmospheres. These tests are as defined by Tests 1, 4 and 10 of NASA-STD-6001 and any variations or revisions thereof. The Contractor shall lead the effort to produce any standards related to the elevated temperature test. The Contractor shall be responsible for ensuring that all equipment is properly calibrated prior to beginning a test. Any test equipment not properly calibrated shall be replaced with calibrated equipment prior to performing any test. The Contractor shall validate the test data and ensure the test data correlates with test data generated by other sources. Any test data that cannot be validated or correlated with the test data from other sources shall be immediately brought to the attention of the COTR. This task also involves data analysis, and inputting all test data and results into the Materials and Processes Technical Information System (MAPTIS) database.

2.1.3 Liquid and Gaseous Oxygen Mechanical Impact Testing - The Contractor shall perform Mechanical Impact for Materials in Ambient Pressure Liquid Oxygen (LOX) testing and Mechanical Impact for Materials in Variable Pressure LOX and GOX testing for materials, as defined by Test 13A and 13B of NASA-STD-6001 and any variations or revisions thereof. The test temperature at ambient pressure is approximately -297ºF. The variable pressure test utilizes test temperatures from -297ºF to +1,000ºF, and test pressures from ambient to 10,000 psi. The Contractor shall lead the effort to produce any standards related to the elevated temperature test. The Contractor shall be responsible for ensuring that all equipment is properly calibrated prior to beginning a test. Any test equipment not properly calibrated shall be replaced with calibrated equipment prior to performing any test. The Contractor shall validate the test

data and ensure the test data correlates with test data generated by other sources. Any test data that cannot be validated or correlated with the test data from other sources shall be immediately be brought to the attention of the COTR. This task also involves data analysis, and inputting all test data and results into the MAPTIS database.

2.1.4 Advanced Materials Ignition/Combustion Testing - The Contractor shall perform advanced materials ignition testing. These include: Adiabatic Compression (Pneumatic Impact) for Materials in ambient and high pressure gaseous oxygen environments, as defined by Test 14 of NASA-STD-6001; Oxygen Index Testing of materials to determine the minimum oxygen concentration that will support the combustion of a material, as defined by the American Society for Testing and Materials (ASTM) document ASTM D2863; Multimodal Friction Ignition Testing; Heat of Combustion Testing; Wire Arc Tracking Testing; Puncture Testing; Reactivity in Aerospace Fluids Testing; and Autogenous Ignition Temperature Testing of materials to determine the temperature at which a material will spontaneously ignite without the presence of a spark or open flame, as defined by ASTM G72. This task shall also include the development and utilization of new test equipment and the development of new test methods. The Contractor shall lead the effort to produce any standards related to the elevated temperature test. The Contractor shall be responsible for ensuring that all equipment is properly calibrated prior to beginning a test. Any test equipment not properly calibrated shall be replaced with calibrated equipment prior to performing any test. The Contractor shall validate the test data and ensure the test data correlates with test data generated by other sources. Any test data that cannot be validated or correlated with the test data from other sources shall be immediately be brought to the attention of the COTR. This task also involves data analysis, and inputting all test data and results into the MAPTIS database.

2.1.5 Thermal Vacuum Stability (Outgassing) Testing

The Contractor shall perform Thermal Vacuum Stability Testing of materials to determine the characteristics of materials when exposed to vacuum conditions, as defined by the Johnson Space Center (JSC) document SP-R-0022/ASTM-E-595, and any variations thereof. The Contractor shall lead the effort to produce any standards related to the elevated temperature test. The Contractor shall be responsible for ensuring that all equipment is properly calibrated prior to beginning a test. Any test equipment not properly calibrated shall be replaced with calibrated equipment prior to performing any test. The Contractor shall validate the test data and ensure the test data correlates with test data generated by other sources. Any test data that cannot be validated or correlated with the test data from other sources shall be immediately brought to the attention of the COTR. This task also involves data analysis, and inputting all test data and results into the MAPTIS database.

2.1.6 Toxic Offgassing (Toxicity) Testing - The Contractor shall perform Toxic Offgassing Testing of materials and assembled articles. Toxicity testing includes the *Determination of Combustion By-Products from Upward Flame Propagation Testing*, *Determination of Offgassed Products* and *Determination of Offgassed Products from Assembled Articles*. These tests are defined by Tests 7 and 16 of NASA-STD-6001 and any variations or revisions thereof. The Contractor shall lead the effort to produce any standards related to the elevated temperature test. The Contractor shall be responsible for ensuring that all equipment is properly calibrated prior to beginning a test. Any test equipment not properly calibrated shall be replaced with calibrated equipment prior to performing any test. The Contractor shall validate the test data and ensure the test data correlates with test data generated by other sources. Any test data

that cannot be validated or correlated with the test data from other sources shall be immediately brought to the attention of the COTR. This task also involves data analysis, and inputting all test data and results into the MAPTIS database.

2.1.7 Test Sample Verification and Preparation - The Contractor shall perform a complete analysis on each test sample received for the testing to ensure that the information is complete and accurate. The Contractor shall verify that each sample sent for testing has all of the information needed for identification, and that all of the information is accurate. This sometimes requires coordination with the test requester, the materials supplier, the manufacturer, and other sources. The Contractor shall also prepare each required test sample in the form in which it is needed, including substrate preparation, sample curing and sample sizing. The collected information shall be entered into the MAPTIS database. This database is currently used by the Government for the management and tracking of all work under PWS 2.1. The Contractor shall receive notification from the requester indicating if the sample and data are to be labeled as one of the following: Sensitive but Unclassified (SBU); Proprietary; International Trafficking in Arms (ITAR); Export Administration Regulations (EAR) or other security related classification. The data shall be appropriately labeled. The samples and data shall be tracked and protected in accordance with NASA guideline and procedures.

2.1.8 Engineering Analysis of Materials Testing, Data, and Results - The Contractor shall perform engineering analyses for the areas covered under this PWS element and any Task Orders developed. This effort includes analysis of test setups, test procedures, and data generated by the testing. These engineering analyses shall ensure that test data is generated using existing organizational instructions, and the data is either consistent with previous test data or valid explanations exist why anomalies have occurred. The Contractor shall receive instructions from the requester indicating if the sample and data are to be labeled as one of the following: Sensitive but Unclassified (SBU); Proprietary; International Traffic in Arms Regulations (ITAR); Export Administration Regulations (EAR); or other security related classification. The data shall be appropriately labeled. The samples and data shall be tracked and protected in accordance with NASA guideline and procedures.

2.1.9 Test Innovations - The Contractor will strive to provide innovations and improvements to the existing ways of performing tasks and interpreting data for the testing covered under this PWS. These tasks include analysis of MSFC produced test data, analysis of test data from other sources, application requests and systems evaluations. The Contractor shall maintain sufficient skill and knowledge of the test capabilities to provide technical expertise and guidance to MAPTIS database personnel for data approval and data entry.

2.1.10 Oxygen Compatibility Assessments - The Contractor shall perform oxygen compatibility assessments. These assessments are conducted for the safe operation of oxygen systems for NASA and/or private industries. The Contractor shall perform an Oxygen Compatibility Assessment, also known as Oxygen Hazards Analysis, for an oxygen system or component. Upon completion, the Contractor shall provide a complete analysis in final presentation form as agreed upon with the COTR. The Contractor shall maintain sufficient skill and knowledge of an Oxygen Compatibility Assessment to provide necessary technical guidance or expertise.

2.1.11 Development of Internal, Scientific and Data Documentation and Publications

The Contractor shall create scientific, technical and data documents, and internal documentation and publications as needed and as directed by the COTR. The documents required include research papers to be published by scientific organizations, periodical sections, newspaper articles, failure analyses, problem assessments, problem resolutions, anomaly investigations, preferred materials applications documents, data explanation documents, technical evaluation documentation, and other similar scientific and engineering documentation. The Contractor shall also create needed internal documentation, which include Organizational Instructions, safety documents and communications documentation. The Contractor shall work with the MSFC printing office to ensure that all documents are in the proper format, printed properly and delivered when required. The Contractor shall also be responsible for supporting the distribution effort of all documents created under this task.

2.1.12 Materials Research and Special Studies - The Contractor shall use supplemental research tasks to fill any available time when employees and equipment are not fully utilized for testing and analysis in WBS elements 2.1.1 through 2.1.11, or for commercial work. The Contractor shall conduct materials research in areas related to this PWS and have research tasks ongoing at all times. The Contractor shall also perform research and special studies for other materials and processes disciplines, when directed by, or with the approval of, the COTR. These research and special studies shall enhance the general knowledge base of the scientific community. The Contractor shall publish the research in readily available publications and in a format used by the specific publication or by the scientific community. Acceptable publications include periodicals and standards published by nationally recognized organizations, such as the Society of Automotive Engineers (SAE), ASTM International, the International Organization for Standardization (ISO), and the American Society for Materials (ASM) International, or other as approved by the COTR. The Contract shall, when directed by the COTR, present these publications at meetings, conferences, symposia, etc.

2.2 ETF/EFDTF Test Support. The Contractor shall operate and maintain MSFC's Environmental Test Facility (ETF) and Experimental Fluid Dynamics Test Facility (EFDTF). Environmental and fluid dynamics test activities are planned and executed in these facilities to support the design, development, certification, and operation of flight structures, payloads, systems, and components.

Testing performed at the ETF requires frequent, around-the-clock operations. During these periods, with approval of the COTR, alternate work schedules shall be established to support weekend and second and third shift operations.

2.2.1 Planning and Control - The Contractor shall ensure the planning, coordination, technical direction, and surveillance of all activities necessary to execute all Customer Test Requests (CTR) issued for these facilities. In doing so, the Contractor shall possess and provide technical expertise on all ETF test chambers and EFDTF facilities. Currently, the Government uses a Test Preparation Sheet (TPS) (reference ET01-PRO-OWI-003, Test Preparation Sheet Instructions) to direct the contractor to perform technician work. The Contractor shall:

a) Oversee test operations and perform personnel scheduling to maintain a sufficient number of Contractor employees overseeing the facilities and test equipment to complete testing safely and on schedule.

b) Coordinate contract personnel to ensure an adequate skill mix when supporting frequent, around-the-clock testing in the Environmental Test Facility.

c) Maintain and track a sufficient inventory of supplies, materials, tools and equipment required to perform the requirements of PWS 2.2.

d) Ensure all technician personnel have the autonomy to immediately report testing anomalies, chamber concerns, or operational concerns directly to the Civil Service Point of Contact (POC).

e) Support Civil Service personnel at all Test Readiness Reviews and other customer meetings as requested by the COTR.

f) Ensure the technical excellence, cost effectiveness, and timeliness of all required work and deliverable products.

g) Ensure that when performing second or third shift operations there is a senior, designated technical person in a position of authority.

The Contractor shall support MSFC personnel in planning facility maintenance and chamber, equipment, and facility upgrades to complement customer support. This shall include, but not be limited to, test facility, chamber, and equipment installation and modification, test facility, chamber, and equipment relocation, test facility, chamber, and equipment refurbishment, and test, chamber, and equipment facility teardown.

The Contractor shall be responsible for maintaining a clean and organized work environment within ETF and EFDTF work areas. This shall include supporting major, facility-wide cleaning actions.

2.2.2 Maintenance and Repair - The Contractor shall be responsible for implementation of the preventive maintenance program. It is anticipated that preventive maintenance will primarily be performed during non-test periods. The Contractor shall perform and document preventive maintenance per procedure requirements.

2.2.3 Test Coordination and Scheduling - The Contractor shall be responsible for scheduling tests and providing cost information necessary for the ETF and EFDTF business office to provide the customer with a cost estimate for testing. The Contractor shall be the initial point of contact for customers requesting testing in the ETF and serve as a liaison between customers and ETF POCs. The Contractor shall make an initial determination of which test chamber best fits the customer's needs, then coordinate testing arrangements between the MSFC chamber POC and the customer. The Contractor shall maintain all ETF test schedules and resolve any conflicts between test schedules. The Contractor shall be responsible for providing a Customer Test Request (CTR) to potential customers, receiving completed CTRs from the customers, and providing CTRs to chamber POCs. Using the CTR, the chamber POC generates a TPS to initiate the necessary work to conduct the test. The Contractor shall support Civil Service personnel at all Test Readiness Reviews and other customer meetings, as requested. The Contractor shall be responsible for coordinating access to MSFC between the customer and MSFC Security. The Contractor shall conduct guided tours for potential customers and tour groups as requested by Civil Service management.

The Contractor shall maintain a master ETF, EFDTF, and Structural Test Facility combined testing schedule. The Contractor shall give an oral presentation of the test schedule at weekly ETF and EFDTF team meetings.

The Contractor shall be responsible for coordinating, developing, and producing placards, brochures and leaflets describing the ETF's and EFDTF's technical capabilities. This includes, but is not limited to, working with MSFC Graphics in developing page layouts, generating computer graphics, and coordinating with MSFC photographers. All placards, brochures, and leaflets shall be approved by MSFC Graphics prior to production.

The Contractor shall develop presentation charts, as requested, by ETF and EFDTF personnel, and directed by the COTR.

The Contractor shall provide coordination support for onsite and off-site meetings and conferences. The Contractor shall escort foreign nationals and support all visits by foreign nationals. This will require special security training for Contractor personnel performing this function.

2.2.4 ETF Chamber Operations and Support - The Contractor shall perform all test chamber operations within the ETF and perform the mechanical, electrical, welding, machining, refrigeration (including cascade), helium leak detection and other work that supports testing. This includes, but is not limited to, chamber and support equipment installation and buildup, chamber and support equipment maintenance and preventive maintenance, instrumentation installation and checkout, test support fabrication and setup, data acquisition and reduction, equipment calibration, video monitoring, test article handling, and the installation and use of high-pressure and cryogenic systems. In the past, this work has required technicians with ancillary skills including, but not limited to, machining, welding, soldering, refrigeration, leak checking, electrical wiring (high and low voltage), pipe fitting, instrumentation, data acquisition, helium leak detection and sheet metal.

The Contractor shall provide engineering expertise, including guidance for, and operation of, the thermal chambers located in MSFC's ETF. The Contractor, as a minimum, shall maintain expertise in facility layout and design with an emphasis on electrical systems; create and maintain MicroStation® CAD drawings (electrical and mechanical) of all ETF test facilities; maintain the ETF's repository of specific facility engineering drawings; maintain proficiency in data acquisition and control systems for all thermal test systems with the ability to manage the data systems and retrieve data.

The Contractor shall, within 60 days of contract award, develop and maintain a certified Welding Program to include the ability/capability of Gas Tungsten Arc Welding (GTAW) in accordance with the American Welding Society (AWS). This requires the Contractor to be certified by an independent, third party. The program, as a minimum, shall include:

a) A Weld Procedure Specification (WPS), Procedure Qualification Record (PQR), and a Welding Operator Qualification (WPQ) Test (Welding Position 6G)) for each of the following:

   Base Metals P- No.1 to P- No.1 (Carbon Steel to Carbon Steel) and Base Metals P-No.8 to P- No.8 (Stainless Steel to Stainless Steel) for Pipe Diameters of 1.00" & Larger, Base Metal Groove of 0.0625"-0.436" (Wall Thickness).

b) A Welder/Welding Operator qualified and certified to the stated WPSs in the 6G Welding position.

2.2.5 EFDTF Facilities Operations and Support -The Contractor shall build-up models or test items in the EFDTF with instrumentation that is tested and measured in the facilities. The Contractor shall install and connect models to the test fixtures and record data during tests. The Contractor shall configure the chamber elements and facilities to accommodate the test requirements and perform maintenance between runs. In the past, this work has required technicians with ancillary skills including, but not limited to, CAD drafting, machining, welding, soldering, refrigeration, leak checking, electrical wiring (high and low voltage), pipe fitting, instrumentation, data acquisition, and sheet metal work.

2.3 Structural Test Support. The Structural Test Facility is a high bay facility complex that provides office space, laboratory space, test cells, machine shop, fabrication areas, material handling systems, load control systems, data acquisition systems, and utilities to support aerospace structural testing. Structural strength test and dynamic load test activities are planned and executed in this facility to support the design, development, certification, and operation of flight structures, payloads, systems, and components. Although Structural Strength Test and Structural Dynamics Test are regarded as separate engineering disciplines at MSFC, the personnel and facility resources for these engineering disciplines are co-located within the Structural Test Facility. In some cases, other facilities at MSFC may be utilized for structural testing operations when test article size, test hazards, or other specific test requirements preclude test operation at the Structural Test Facility.

Structural Strength testing is an engineering discipline involved primarily with the application of static or quasi-static loads (e.g., mechanical, thermal, pneumatic) to aerospace hardware in an effort to accurately determine the hardware response to such loading (e.g., deflection, stress, strain). Structural Strength testing is primarily performed in the Structural Test Facility located in Building 4619 at MSFC. There are numerous structural test positions within the Structural Test Facility. Each test position has specific test capabilities with regard to load application limits (tensile load, compressive load, shear load) and test article size. Structural Dynamics testing involves investigation into the dynamic response of structures during the application of various types of loads. The Structural Test Facility has dedicated test areas for vibration, acoustic, modal and shock testing.

2.3.1 Structural Test Facility Planning and Control - The Contractor shall be responsible for daily planning, coordination, and technical direction of Contractor activities performed at the Structural Test Facility. The Contractor shall be responsible for coordinating daily with Structural Test Facility engineers and management as required to ensure that Contractor personnel are utilized in a cost effective and productive manner to fully support Structural Test Facility priorities and objectives. Currently, the Government uses a Test Preparation Sheet (TPS) (reference ET01-PRO-OWI-003, Test Preparation Sheet Instructions) to direct the contractor to perform technician work.

2.3.2 Structural Test Facility Support - The Contractor shall provide technician support for all structural strength and structural dynamics work activities managed through the Structural Test Facility whether work is performed at the Structural Test Facility or at MSFC on-site test facilities. The scope of this WBS includes technician support required for maintenance, upgrade, modification and refurbishment of existing Structural Test Facility systems and equipment. This work also involves support during test buildup and test operations, and support

during buildup and fabrication of new facility capabilities required to accomplish the mission of the Structural Test Facility. Typical work activities include, but are not limited to:

- power hand tool operation (drills, metal cutting saws, etc.)
- power equipment/machining operations (drill press, table saws, CNC mills and lathe, manual mills and lathe, metal cutting band saw, etc)
- hydraulic pump maintenance, troubleshooting and operation
- load control system maintenance, troubleshooting and operation
- vacuum system maintenance, troubleshooting and operation
- pneumatic system maintenance, troubleshooting and operation (air, GN2, helium, hydrogen, etc.)
- cryogenic system maintenance, troubleshooting and operation (LN2, LH2, LHe)
- electrical wire termination
- electrical cable fabrication
- tensile test machine maintenance, troubleshooting and operation
- material handling, mobile crane operation, bridge crane operation, aerial lift operation, fork lift operation
- rigging operations required to support lift operations
- data system operations support (fabricating drag-on cables, wiring termination, etc)
- data sensor installation (pressure transducers, strain gages, temperature sensors, load cells, etc)
- welding operations (MIG, TIG, stick)
- digital audio/video equipment installation and operation

2.3.3 Master Schedule - The Contractor shall maintain a master Structural Test Facility, ETF, EFDTF combined testing schedule.

2.4 Fabrication and Assembly of R&D Space Flight and Associated Hardware. The Contractor shall perform fabrication and assembly of R&D products that are within MSFC's manufacturing capability. The manufacturing capability is defined as R&D hardware products and manufacturing processes for MSFC in-house designs that require close and continual collaboration with design personnel, development of manufacturing processes, or are schedule critical.

The Contractor shall perform tasks that will consist of manufacturing R&D space flight hardware and experiments, flight ground support hardware and equipment, test fixtures (dynamic, thermal vacuum, and structural), and prototype/mockup hardware or end items made from various materials. The tasks may also require refurbishment (re-machining, reprocessing, and/or cleaning) of existing hardware.

MSFC is transitioning to Digital Design to Fabrication (DDTF). The Contractor shall have knowledge of DDTF, which includes the ability to accept and read CAD models from a variety of CAD/Modeling systems housed in a common Product Data Management (PDM) configuration system, and understand the datum to cost and plan. The Contractor shall have expertise in geometric dimensions and tolerances (GD&T). The Contractor shall provide a skill mix that includes both traditional and DDTF cost estimating and planning to meet the technical requirements of this contract.

The Contractor shall establish, implement, and maintain a system for reporting performance in accordance with DRD1163MA-007, Monthly and Semi-Annually Performance Reports.

2.4.1 Precision and General Assembly - The Contractor shall perform precision and general assembly in the open shop and in environmentally controlled clean rooms on both flight experiment hardware and test hardware. Some assembly operations require adhesive bonding technology.

2.4.2 Machining - The Contractor shall perform machining processes which shall consist of, but not be limited to, operations performed on lathes, mills, grinders, shapers, and electrostatic discharge machines. Selected machines are computer numerically controlled (CNC) and can be programmed both off- and on-line. Machining and grinding operations frequently require dimensional control to less than .001 inch. Foam machining shall include operation of conventional or CNC equipment in the foam shop or controlled areas of the primary machine shop. As a minimum, the Contractor shall be capable of operating a four machining centers at one time and ensure the machining centers are manned while operating.

2.4.3 Sheet Metal - The Contractor shall perform sheet metal processes which shall consist of, but not be limited to, operations requiring shearing, bending, punching, and fastening. The Contractor shall fabricate high and low-pressure metal tubing and flexible hose systems.

2.4.4 Surface Treatment - The Contractor shall perform surface treatment operations which shall involve, but not be limited to, glass bead/sandblasting operations, acid and alkaline metal etching, painting (spray and brush), chemical passivation, and chemical phosphate metal treatment. Electrochemical metal processing shall involve, but not be limited to, anodizing and electroless nickel plating processes. Various other plating processes may be required but only at the direction of the Technical Monitor. Cleaning processes are conducted using special chemicals. Some precision cleaning processes require particulate and nonvolatile residue sample preparation. The Contractor shall be responsible for emptying containers of spent chemical into Government-furnished receptacles or into neutralization processing tanks. The Government shall be responsible for all disposal activity including waste/waste water permits. As a minimum, the Contractor shall have the capability to provide minimal services of surface treat, precision cleaning and painting at one time.

Dry-film lubrication application shall consist of all the functions necessary to pre-treat material and apply and burnish various solid (dry film) and liquid lubricants. These lubricants shall include, but not be limited to, un-bonded solids (granular or powdered) and resin-bonded solids.

2.4.5 Welding and Heat Treatment - The Contractor shall perform fusion welding operations which shall consist of, but not be limited to, metallic inert gas, tungsten inert gas, electron beam, and plasma arc and resistance and electrostatic discharge processes. Brazing processes shall consist of, but not be limited to, acetylene and vacuum oven techniques. The Contractor shall conduct heat treatment operations in electric and gas heated ovens and furnaces using controlled (vacuum and special gases) and non-controlled environments.

2.4.6 Fabric Shop - The Contractor shall provide, on a very limited basis, services that include a fabric shop. Fabric shop tasks primarily consist of, but are not limited to, fabrication of banners, curtains, safety harnesses, lifting slings, and multi-layer insulation (MLI) blankets. The Contractor shall lay-up, sew, ultrasonically weld, bond, and inspect as specified on the Customer Order. Some special items require fabrication in a clean room environment.

2.4.7 Maintenance - The Contractor shall provide mechanical and electrical/electronic maintenance to maintain shop equipment furnished by the Government. This shall include, but not be limited to, mechanical controls in the machine shop, sheet metal shop, heat treatment area, surface treatment area, precision cleaning area, and welding shop. The Contractor shall provide machine coolant servicing to consist of, but not limited to, replenishing, replacing, and reclaiming the machine coolants as required in the fabrication shops. Excessing, repair and/or replacement of equipment shall be approved by the Technical Monitor.

2.4.8 Calibration - The Contractor shall use Government-furnished software to track and maintain calibrated equipment. Onsite MSFC calibration service is available for use as needed. As directed by the COTR, the Contractor may utilize approved outsource calibration services. Records of contracted services shall be maintained in the Contractor's record center.

2.4.9 Chemical Analysis - The Contractor shall perform sample collection, analysis, and reporting as described below:

a) Monitor by chemical analysis all chemical tanks and rinse tanks in buildings 4760 and 4705 used in various plating, degreasing, etching, cleaning, and dye processes. These tanks shall be strictly monitored to assure that chemical parameters adhere to the requirements.

b) The Contractor shall analyze the various solvents/fluids used in the precision cleaning facility in building 4705 for non-volatile residue and particle count to certify cleanliness of the aerospace hardware.

c) The Contractor shall evaluate JP-8 fuel according to Military Specification, MIL-T-83133, Turbine Fuels, Aviation, Kerosene Types, NATO Code Numbers F-34 (JP-8) and F-35. The Contractor shall inspect for the presence of algae according to a demonstrably reliable method selected by the Contractor.

d) The Contractor shall analyze hydraulic oil per MIL-PRF-83282, Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Aircraft Metric, NATO Code Number H-537, moisture per Karl Fischer method or equal, and for particulate.

e) The Contractor shall ultrasonically clean liquid oxygen filters, run Nonvolatile residue (NVR) and particulate count, and report results prior to normal precision cleaning.

2.4.10 Quality Control -

a) The Contractor's quality department shall provide layout, in-process, and final inspection to ensure that all requirements are met.

b) The Contractor's quality department shall prepare an Acceptance Data Package (ADP) for each Deliverable End Item (DEI) products. The ADP shall provide the Government with the documentation necessary to determine the acceptability of products as specified in the DEI work request. The ADP shall be prepared, maintained, and/or delivered in accordance with the requirements of DRD 1163CM-001, Acceptance Data Package.

c) The Contractor's quality department shall be the primary interface with the Government quality assurance organization. The Government quality engineering organization shall provide project level quality inspection and test requirements prior to fabrication and assembly of quality sensitive hardware. The Government quality assurance organization will perform mandatory inspection points (MIPs) as specified by the Government quality engineering organization on quality sensitive Products.

d) For all shop operations of quality sensitive products, certification/qualification shall be required for all personnel controlling special processes and performing fabrication and inspection operations of a specialized nature. The Government will provide the requirements for applicable certifications.

e) The Contractor shall request, through the Technical Monitor, Government support for x-ray nondestructive evaluation (NDE) inspections when specialized inspection equipment already exists within other Government organizations.

All NDE inspections performed by NASA shall be verified by the NASA MSFC quality assurance organization or other work request designated personnel prior to return of the articles and materials for further processing by the Contractor.

The Contractor, when requested by the COTR, shall provide ultrasonic, magnaflux and dye penetrant for non-destructive evaluation (NDE) inspections.

f) The Contractor shall support a Functional Configuration/Physical Configuration Audit Documentation process. This process is known as FCA & PCA respectively and shall be governed by DRD 1163CM-002, Functional Configuration/Physical Configuration Audit Documentation.

The Contractor shall classify nonconformities for quality sensitive products as either "Minor" or "Major." Minor nonconformities shall be defined as a nonconformance that involves a single occurrence in failing to meet a requirement that does not affect a safety related characteristic or for equipment/tooling failure. Major nonconformities will consist of all other nonconformities, including nonconformities as a result of a trend analysis. A correction action process shall be required for all major nonconformities that shall be verified as effective in preventing the nonconformity from reoccurring. The Contractor shall document all product and Quality Management System (QMS) nonconformities in Contractor's QMS.

Discrepancies for quality sensitive products that are for "Rework" shall be documented as a SQUAWK in the Visual Quality (VQ) database. All other quality sensitive product nonconformities shall be documented in the nonconformance module of the VQ database.

For non-quality sensitive products, non-conformances shall be documented within VISUAL Manufacturing™.

All dispositions except "rework" shall be approved by NASA by submittal of a Deviation Approval Request (DAR), MSFC-FORM-847 and instructions; or through a Material Review Board (MRB) process on the Contractors discrepancy record, as specified by MPR 8730.3 and by the designated project level representative.

The Contractor shall be responsible, when applicable, for material certification of all materials used to fabricate quality sensitive hardware and other hardware when specified on the Customer Order. This shall include, but not be limited to, requests for Government certification, certification from commercial sources, or spectrographic analysis using Government-furnished equipment (GFE). The Contractor shall verify raw material test reports for both chemical composition and tensile strength in conjunction with SAE AS9100, paragraph section 7.4.3 and/or as requested by the NASA quality assurance organization through the COTR. The current raw material testing verification process shall be approved by NASA. When requested, material certification records shall be part of the acceptance data package maintained in the Contractor's record center. The Contractor shall investigate MSFC or vendor Alerts on materials and hardware when requested by the COTR.

The Contractor shall maintain an optical alignment, weight, and center of gravity capability.

The Contractor's subcontracts shall comply with the applicable portions of the Contractor's approved internal ANSI/ISO/ASQC Q9001:1994 or Q9001:2000 requirements. The Contractor shall utilize the MSFC Audited Vendor List (AVL).

1) All subcontracts let for quality sensitive products shall utilize the MSFC supplier listings as identified for use in MWI 5330.1, section 6.2 and the links herein:

   AVL: Audited Vendor List
   LVL: Limited Vendor List
   PSAL: Project Specific Approved Supplier List

   AVL: https://msfcsma3.msfc.nasa.gov/dbwebs/apps/lvl/default_avl.asp

   LVL: https://msfcsma3.msfc.nasa.gov/dbwebs/apps/lvl/default.asp

   PSASL: https://msfcsma3.msfc.nasa.gov/dbwebs/apps/lvl/default_psasl.asp

2) All non-quality sensitive products subcontracted proposed suppliers that are not on the above referenced supplier lists (AVL, LVL, PSAL) shall be evaluated for their ability to meet purchase requirements by the Contractor. If NASA product requester specifies a vendor, the Contractor shall evaluate specified vendor based on information provided by the requestor. If Contractor feels that the submitted supplier cannot meet the requirements of the purchase order, coordination for resolution shall be requested through the designated project level representative.

2.4.11 Planning and Control - The Contractor shall plan, schedule, track, and status manufacturing tasks through the fabrication shops.

The Contractor shall perform manufacturing planning to accomplish the requirements of the Customer Orders. The Contractor's planning department shall coordinate problems through the Technical Monitor and ensure "as-built" configuration agrees with the "as-designed" configuration. In addition, the Contractor's planning department shall be the primary interface between the Technical Monitor and the Contractor's other organizational departments for information, status, schedules, and estimates relative to the Customer Orders.

The Contractor shall use Government-owned "Micro" from Estimating Systems, Inc ™ to perform estimates for Customer Orders. The current Government provided seat subscriptions are fully subscribed in the fabrication shop area. Integrated with Micro is the CAD package SolidWorks ® by SolidWorks Corporation for CAD model acceptance. The current Government provided seat subscriptions are fully subscribed in the fabrication shop area.

The Contractor shall perform production control functions as necessary to accomplish the requirements of both the Customer Order and Work Order. The Contractor shall provide accurate and reliable Work Order status and schedule information when requested by the COTR. The Contractor's production control shall assign manpower allocations to all approved Customer Orders.

The Contractor shall operate and maintain the storeroom. This task shall include, but not be limited to, inventory control, receipt, issue, storage and handling of hardware, parts, and materials for both the Government and Contractor.

The Contractor shall not be responsible for any Program Critical Hardware (PCH) handling or moves. When PCH handling or moves becomes necessary, the Contractor shall be responsible for coordinating the move with the Government and the Government's contractors that provide this service. The Contractor shall also request assistance for oversized equipment moves from the Government when such moves are required. The Contractor shall provide certified forklift and crane operators for handling normal equipment and material moves in their areas of responsibility.

The Contractor shall provide proof-load capability for lifting slings and fixtures used in normal material and hardware handling operations within the Contractor's work area. The Contractor shall request through the Technical Monitor support from the Government for proof-loading of oversized lifting slings and fixtures when applicable.

The Contractor shall operate and maintain the tool crib and inventory system utilizing CribMaster™. The current Government provided seat subscriptions are fully subscribed in the fabrication shop area. This shall include, but not be limited to, the identification and bar coding of each tool room item, issuing and tracking tool withdrawals, purchasing supplies and materials for the tool crib including new and replacement tools, performing periodic inventories, and providing reporting.

The Government-owned online computer system is VISUAL Enterprise 6.3.8 software application. The Government is responsible for maintaining this software package with all seats currently fully subscribed in the managing of the fabrication shop area only. The current modules used within Visual Enterprise are: Manufacturing, Automated Material Tracking System, Automated Labor Tracking System, and Visual Quality Data Collection Seats.

The Contractor shall use VM to manage the planning, tracking, scheduling, procuring, and inventorying of parts and work flow through the fabrication shop. The VM major functional areas are Quotations, Customer Order Entry, Engineering Definition (Routing and Bill of Material), Production Planning, Material Planning, Scheduling, Shop Floor Barcode Control, Job Costing, Purchasing (both to the Work Order and Inventory), Inventory Control, Shipping, Invoicing, and Customer Inquiry.

The following details the work processing procedures currently used by the Government to request services from the Contractor and how the work is monitored and accepted.

Fabrication services receive requests for fabrication and assembly tasks on a MSFC Form 3751 (Fabrication Request). Once requirements are clearly identified, a Government Manufacturer Engineer (ME) will develop the requirements for and issue a Customer Order in Visual Manufacturing™ (VM). The Contractor utilizes the issued Customer Order and Form 3751 to define the hardware configuration, quantity, documentation, GFE, end-item disposition, any other special requirements, estimated cost and delivery date. All Customer Orders are approved by the Technical Monitor. The Technical Monitor may delegate authority to the MEs.

The Contractor reviews the Customer Order and documentation package, plans, coordinates, procures parts and materials, and generates a Work Order (WO) in VM. The Contractor's planning department is the primary interface between the MEs and the Contractor's other organizational departments for information, status, schedules, and estimates.

The WO package is routed to the Contractor's Production Control (PC) department, where work is assigned and scheduled with the proper manufacturing groups. The PC department monitors the fabrication and assembly work process, expedites moves from shop station to shop station, and coordinates inputs to accomplish the requirements of both the Customer Order and WO.

The Contractor fabricates and/or assembles, inspects and verifies that hardware meets the requirements of the Customer Order, WO and design drawing documentation.

Upon completion of the Customer Order requirements, the Contractor transfers the Deliverable End Item (DEI) along with the Acceptance Data Package (ADP) to the fabrication services storeroom. Storeroom personnel notify the customer and obtain the signature of the individual picking up the completed item(s).

The Contractor shall use the following Government provided software packages for job simulation and for "computer-aided manufacturing." Detailed specifics of suites and modules are to be verified by the Contractor.

a) Delmia — Machine Tool Builder
Machine Tool Path Simulation

b) ICAM Software — D-M5 CAM-POST

c) CATIA v5 — Manufacturing
(a) Design and Advanced Machinist
(b) Lathe Machining
(c) Prismatic Machining Preparation Assistant

2.5 Electrical Fabrication, Test, and Assembly.

2.5.1 Fabrication - The Contractor shall perform electrical fabrication, which typically involves, but is not limited to, hand soldering, printed circuit board population, automated assembly of surface mount technology, strain gage installation, coil winding, electrical cable harness assembly, potting, staking, conformal coating, fiber optics assembly, and electrical/mechanical "black box" assembly. Selected items of electrical work require electrostatic protection of electrically sensitive components during processing.

2.5.2 Testing - The Contractor shall perform electrical testing, which typically involves, but not limited to, various testing methods and techniques on Electrical, Electronic and Electromechanical (EEE) parts, components, sub-systems and systems. These tests include; functional acceptance tests of EEE parts before board population; electrical integrity tests of flight and Ground Support Equipment (GSE) cable assemblies to ensure proper wiring, isolation and workmanship; and the electrical acceptance tests of flight and engineering hardware. The Contractor shall perform fabrication and test of GSE and special test equipment (STE), operation of automated test systems, fabricate and test prototype circuit boards, interconnecting cables, control boxes and breakout boxes, with fabrication and testing supporting GSE and Flight Hardware.

2.5.3 Assembly - The Contractor shall perform precision and general assembly in the open shop and in environmentally controlled clean rooms on both flight experiment hardware and test hardware. Some assembly operations require adhesive bonding technology.

2.5.4 Calibration - The Contractor shall use Government-furnished software to track and maintain calibrated equipment. Onsite MSFC calibration service is available for use as needed. As directed by the COTR, the Contractor may utilize approved outsource calibration services. Records of contracted services shall be maintained in the Contractor's record center.

The Contractor shall ensure all non-quality items fabricated for commercial customers shall be inspected by non-contract personnel prior to customer delivery.

2.5.5 Quality Control - The Contractor shall ensure all quality sensitive items fabricated for commercial customers shall be procured and inspected through a Space Act Agreement.

The Contractor shall ensure all subcontracts comply with the applicable portions of the Contractor's approved internal ANSI/ISO/ASQC Q9001:1994 or Q9001:2000 requirements. The Contractor shall utilize the MSFC Audited Vendor List (AVL).

1) All subcontracts let for quality sensitive products shall utilize the MSFC supplier listings as identified for use in MWI 5330.1, section 6.2 and the links herein:

   AVL: Audited Vendor List
   LVL: Limited Vendor List
   PSAL: Project Specific Approved Supplier List

   AVL: https://msfcsma3.msfc.nasa.gov/dbwebs/apps/lvl/default_avl.asp

   LVL: https://msfcsma3.msfc.nasa.gov/dbwebs/apps/lvl/default.asp

   PSASL: https://msfcsma3.msfc.nasa.gov/dbwebs/apps/lvl/default_psasl.asp

2) All non-quality sensitive products subcontracted proposed suppliers that are not on the above referenced supplier lists (AVL, LVL, PSAL) shall be specified by the NASA product requester and evaluated for their ability to meet purchase requirements by the Contractor based on the information provided by the requester on the supplier. Supplier use for these products shall be limited to articles and materials purchased for the specific work request. If the Contractor feels that the submitted supplier cannot meet the requirements of the purchase order, coordination for resolution shall be requested through the designated project level COTR representative.

MSFC is transitioning to automated fabrication of surface mount assemblies. The Contractor shall provide a skill mix that includes both hand assembly and machine assembly experience to meet the technical requirements of this WBS.

All Contractor employees shall obtain certification to the requirements of NASA-STD-8739.

2.6 Reserved.

2.7 Space Environmental Effects Testing.

2.7.1 Contamination Control Support -The Contractor shall provide contamination control support for various programs to include review of program requirements, plans for implementation of those requirements, review of production processes and facilities, and participate in program audits as required. Processes that will require review include cleaning, cleanliness inspection, and contamination sampling. The Contractor shall operate laboratory instrumentation such as Fourier Transform Infrared (FTIR) spectrometers, contamination application systems, and vacuum test chambers for materials outgassing tests. A general knowledge of general laboratory protocol, basic spectroscopic techniques, materials analysis /characterization instrumentation operation, chemical solution mixing, sample preparation (cleaning, grit blast, contamination application, etc) and handling procedures is required. The Contractor shall interpret the results of testing, and provide written reports at the completion of each test. The Contractor shall attend meetings, present results and interact at the Program/Project level.

2.7.2 Space Environmental Effects Testing - The Contractor shall perform literature research and testing for materials exposed to space environments in order to accurately simulate a mission specific space environment within the laboratory, subject a material or system to that environment, and measure performance metrics after space environment exposure. The Contractor shall perform thorough literature research for past data and history on Space Environments Effects (SEE) including all data developed during Apollo, Skylab, other NASA missions, and missions of other agencies and countries whose data is available for public review. The Contractor shall also design, configure, modify, operate, and maintain the multiple and varied SEE test systems utilized for atomic oxygen (AO), ultraviolet (UV) radiation, charged particle radiation, plasma, and contamination including combined environments exposure testing. The Contractor shall also support Impact Test Facility operations including hypervelocity, ballistic, and environmental gun capabilities. The testing and operation includes performing the necessary calculations for accurate SEE irradiations, aid in the design and assembly of data acquisition systems, pre-test and post-test materials analyses, and impact assessments. The Contractor shall perform limited fabrication and assembly of test hardware, operate associated materials analysis/characterization instrumentation, interpret the results of testing, and provide written reports at the completion of each test. The Contractor shall attend meetings, present results and interact at the Program/Project level. Special training is required for radiation source, propellant and explosives handling as well as test system operation.

2.7.3 Electrostatic Levitator (ESL) System Operations - The Contractor shall provide ESL support to configure, modify, operate, and maintain the test systems and associated support equipment including vacuum hardware, operating control systems, data acquisition systems, and multiple class lasers. The Contractor shall prepare samples and operate laboratory instrumentation such as optical pyrometers and spectrometers. The Contractor shall interpret

the results of testing, and provide written reports at the completion of each test. The Contractor shall attend meetings, present results and interact at the Program/Project level.

2.7.4 Development of Internal, Scientific and Data Documentation and Publications - The Contractor shall create scientific, technical and data documents, and internal documentation and publications as needed and as directed by the COTR. The documents required include research papers to be published by scientific organizations, periodical sections, newspaper articles, failure analyses, problem assessments, problem resolutions, anomaly investigations, preferred materials applications documents, data explanation documents, technical evaluation documentation, and other similar scientific and engineering documentation. The Contractor shall also create needed internal documentation, which include Organizational Instructions, safety documents and communications documentation. The Contractor shall work with the MSFC printing office to ensure that all documents are in the proper format, printed properly and delivered when required. The Contractor shall also be responsible for supporting the distribution effort of all documents created under this task.

2.8 Reserved.

2.9 Environmental Gas Laboratory Support. MSFC has the requirement to verify the cleanliness of a variety of hardware and facilities that prevents the contamination of space flight hardware. These facilities and equipment include clean rooms at all cleanliness levels, flow benches, small hardware and equipment, and large hardware and cross-country cryogenic liquid and gas lines.

The cleanliness verifications are requested in two ways; (1) MSFC customer organizations request regularly scheduled verification checks, or (2) MSFC customers who do not need regular verifications request special one-time verifications performed within a specified time period. All data analyses and findings for the week are compiled into one Excel spreadsheet and sent to all customers for whom evaluations were performed.

The Contractor shall evaluate, as directed by the COTR, MSFC clean rooms, MSFC propellant lines and their components, and propellant storage vessels and their components to determine contamination or cleanliness levels. The Contractor shall follow a scheduled sampling routine to check the clean rooms and propellant systems at MSFC to determine contamination levels. The Contractor shall also perform any analysis not included on the routine checklist, if requested by the COTR. The Contractor shall develop and implement an effective electronic Special Test Order (STO) system, formerly called an Avoid Verbal Orders (AVO) system. This system will serve to request special or one-time only evaluations of clean rooms or lines. The Contractor shall track all data and evaluations from a central location, and provide a written report of all findings weekly. The Contractor shall inform the COTR immediately if any test result is out of the tolerance levels established by MSFC or by the COTR.

2.10 Computer-Aided Design (CAD) Drawing. The Contractor shall provide design, drafting, and library support services in order to prepare, maintain, reproduce and store detailed CAD drawings. The Contractor shall provide functional designs and design drawings utilizing state of the art Computer-Aided Design (CAD) software to numerous customers, both internal (NASA) and external (other Government Agencies and/or Industry Partners), in order to support the checkout and testing of various space flight systems and components, engine systems and

components, and ground support hardware through the application of static and/or dynamic loads, fluid flow tests involving water, cryogenic liquids, heated liquids, and their associated gasses, and hot fire tests of engines or engine components. The Contractor shall prepare the CAD drawings via verbal and written inputs from a Civil Servant engineer assigned as the design lead for projects that require special equipment designs to accomplish testing. The Contractor shall also use inputs from other government and non-government customer contacts, existing design drawings, and field and/or shop measurements, as necessary to accomplish the task assigned. The Contractor shall work with customers to prepare clear, complete and accurate working plans and detail drawings from rough sketches, detailed sketches, field and/or shop measurements, or notes. The Contractor shall produce final drawings showing the dimensions of parts, materials to be used, relationships of parts, and the relationship of various parts to the whole structure or project. The Contractor shall create detailed CAD format drawings from existing pencil drawings as required to accommodate testing on existing test stands or to allow for reuse of previously designed hardware to improve delivery dates of hardware and to reduce overall project cost. Designs shall be accomplished following approved standards as specified in the Branch's OWIs and accepted industry standards, such as, AISC – Steel Construction Manual, ASME Boiler and Pressure Vessel Code inclusive of all sections, ASME B31.1, Power Piping Systems, and ASME B31.3, Process Piping Systems, as well as other MSFC and Industry Partner generated documents as required to produce special equipment needed to satisfy test requirements. The test facilities and test positions at MSFC are active and include high pressure storage and run systems including pressure vessels, vacuum systems including vacuum chambers, large thrust reaction systems, static and dynamic load application systems, and personnel work and access platforms which must be worked on and around frequently requiring trips to the various test areas located at MSFC to make measurements, take photographs, and get visual confirmation related to the scope of the assigned design task. A number of the test stands and/or positions are large, with high elevations and open grating that must be accessed during the production of detailed design drawings, during hardware fabrication efforts, and during hardware installation to ensure proper fit up and to aide installation of the fabricated hardware.

The Contractor shall produce finished drawing prints and take the completed engineering drawings to MSFC organizations in order to acquire the required signatures after their design review has been completed and any modifications to the originally delivered drawings have been evaluated and applied to the drawing package.

2.11 Data Analysis and Database Entry for Material and Processes Technical Information System (MAPTIS). The Contractor shall obtain materials information and test data from manufacturers, suppliers, MSFC testing organizations, other NASA certified testing facilities, government agencies, and private companies. The Contractor shall perform engineering analyses on these for validity and enter the verified data into the MAPTIS database.

2.12 Optics Support. The Contractor shall perform optical coating, optical fabrication and metrology at MSFC, including support of JWST testing in the X-Ray Calibration Facility. The Contractor shall maintain and operate the vacuum coating facilities and coating deposition equipment, perform inspection, precision cleaning and handling of optics and vacuum hardware, and perform optical testing. The Contractor shall also perform optical fabrication, which includes, but is not limited to, resizing glass substrates via Blanchard or curve generator grinding. The Contractor shall perform optical metrology, which includes, but is not limited to, the use of the Coordinate Measuring Machine or ZYGO interferometer.

2.13 Tool Crib Operations. The Contractor shall operate the two MSFC Tool Cribs (unassociated with the tool crib supporting shop operations). The Contractor shall be responsible for the order preparation, receipt, storage, and restocking of all tools and materials, and the proper distribution of stock items to employees. The Contractor shall keep the tool cribs fully stocked by purchasing all items necessary to do so without depleting existing stock. Tool Crib items include hand tools, calibrated tools, reusable or returnable items, hazardous chemicals, controlled items and expendable items, both for flight and non-flight use. The Contractor shall also request supplies, enter into the existing inventory system any purchase order data on items received, utilize the existing bar coding system, and generate special reports on equipment usage.

3.0 IDIQ Support

Any of the following sections that do not have specific requirements will include the requirements for the respective function specified in 2.0.

3.1 Materials Testing.

3.2 ETF/EFDTF Test Support.

3.3 Structural Test Support.

3.4 Fabrication and Assembly of R&D Space Flight and Associated Hardware.

3.5 Electrical Fabrication, Test, and Assembly.

3.6 Calibration. The Contractor shall perform timely and accurate (1) servicing, repair, and calibration of inspection, measuring, and test equipment (IM&TE) assigned for calibration by authorized users of the MSFC Calibration Facility; (2) standards maintenance and certifications; (3) calibration procedure maintenance and preparation; (4) maintain calibration data in the Marshall Calibration Management Systems (MCMS) ensuring that the data stays current; (5) instrument pick-up and delivery; (6) resolution of measurement problems associated with the effort; and (7) maintenance of a dedicated metrology workforce.

3.7 Space Environmental Effects Testing.

3.8 Reserved.

3.9 Environmental Gas Laboratory Support.

3.10 Computer-Aided Design (CAD) Drawing.

3.11 Data Analysis and Database Entry for Material and Processes Technical Information System (MAPTIS).

3.12 Optics Support.

3.13 Tool Crib Operations.

3.14 Engineering Technician Support. The Contractor shall provide engineering technician services. This includes technician support needed to design, develop, analyze, and sustain space transportation systems, payloads, and spacecraft. This also includes technical support for mission operations, research investigations, and technology development initiatives.

3.15 Trade Service Support. The Contractor shall provide trade services. This includes technical support needed to design, develop, analyze, and sustain space transportation

systems, payloads, and spacecraft. This also includes technical support for mission operations, research investigations, and technology development initiatives.

3.16 Valve and Component Servicing. The Contractor shall provide support for operating the center's Valve and Component Shop (V&CS). The work shall involve servicing components from fluid systems throughout the center. This includes components used for hazardous fluids such as oxygen and hydrogen. Typically, components are removed from systems by others and delivered to the V&CS for servicing. Servicing involves disassembling the component, having the component parts properly cleaned by the Government, replacing the damaged parts and soft goods, reassembling the component, pressure testing for structural integrity and leaks, and packaging for pickup by the customer. Components range from small instrumentation hand valves to very large high pressure components weighing as much as several tons. In many cases, soft goods must be fabricated from properly tested raw material to ensure compatibility with hazardous fluids. Along with the work of disassembling, cleaning, repairing, assembling, and testing components, the Contractor will be required to manage a parts room to ensure parts necessary to routinely service all anticipated components are readily available.

3.17 Space Systems Integrated Test Facility Support. The Contractor shall provide support for operating the center's Space Systems Integrated Test Facility. System tests encompass those activities required for the development, qualification, and acceptance testing of components, subsystems, and integrated space systems. Such activities include: prototype hardware/software development and test; ground support equipment development, checkout, and operation; test fixture design, fabrication, and assembly; flight hardware assembly and integration; preparation and development of test plans and procedures; functional, performance, and environmental test and checkout operations; test data analysis; test reporting; test discrepancy resolution; post shipment test and integration support; and flight operations and post mission support.

3.18 Propulsion Test Support. The Contractor shall provide support for Propulsion Testing. Marshall has numerous facilities capable of all types of rocket space transportation testing. Propulsion Test encompasses those activities required for the development, qualification, and acceptance testing of components to full-up engine systems. Test data is developed to evaluate aerospace technologies and hardware. This involves, but not limited to, facility buildup and modification, facility drawing maintenance and updates, test preparation, test operation, facility and equipment maintenance, instrumentation installation and checkout, test support fabrication and set-up, data acquisition, equipment calibration, video monitoring, test article handling, and the installation and use of high-pressure and cryogenic systems.

3.19 Support Functions. The Contractor shall provide support services to execute the PWS. This includes technical support needed to design, develop, analyze, and sustain space transportation systems, payloads, and spacecraft. This also includes technical support for mission operations, research investigations, and technology development initiatives.

3.19.1 Chemical Analysis - The Contractor shall perform sample collection, analysis, and reporting. The Contractor shall monitor, by chemical analyses, all chemical tanks and rinse tanks in buildings 4760 and 4705 used in various plating, degreasing, etching, cleaning, and dye processes. These tanks shall be strictly monitored to ensure that chemical parameters adhere to the requirements.

3.19.2 Quality Systems Management - The Contractor shall perform quality functions to accomplish customer requirements.

3.19.3 Planning and Control - The Contractor shall perform manufacturing and test planning, including scheduling, to accomplish customer requirements.

3.19.5 Contamination Control - The Contractor shall provide support which includes, but is not limited to, requirements definition, requirements implementation, process controls, facilities controls, and testing techniques related to materials, processes and facilities. The Contractors shall provide support for a wide range of disciplines, from the ground processing of propulsion elements to the simulated on-orbit spacecraft exposure environments. Specific applications also include monitoring techniques, cleaning processes, cleanliness verification and foreign object debris program assessment.

3.19.8 Engineering - The Contractor shall provide engineering expertise necessary to support PWS area when requested.

3.19.9 Other Support Functions - There may be future requirements for support services that are not identified or implied in the PWS. If future additional support services are required, these requirements will be identified via Task Order. The Contractor shall perform and complete all technical requirements that meet the intent of the PWS and shall be provided adequate resources requested through this WBS.

Glossary

Acceptance: The activity performed on all production articles generally consisting of inspections, measurements, and tests that demonstrate that each article was manufactured as designed and with acceptable quality and workmanship, performs in accordance with specified requirements, and is acceptable for delivery.

Acceptance Review: The Acceptance Review examines the equipment, documentation, and date that support verification. An acceptance review is accomplished to assure that equipment (at any level of assembly) is ready for transfer of ownership or custody or is ready for integration into a next-higher assembly.

Acquisition: The acquiring, by contract, of supplies or services through purchase or lease, whether the supplies or services are already in existence or must be created, developed, demonstrated, or evaluated. Acquisition begins at the point when the Agency needs are established and includes the description of requirements to satisfy the Agency needs, solicitation and selection of sources, awards on contracts, contract financing, performance, administration, technical and management functions directly related to the process of fulfilling Agency needs by contract.

Adiabatic Compression Test (Pneumatic Impact Test): A test used to determine the propensity of a material to ignite when subjected to rapid confined pressurization which does not allow the dissipation of heat. The Marshall Space Flight Center (MSFC) Adiabatic Compression Tester uses oxygen gas to rapidly pressurize a small sample of material, which is then used to determine if the heat generated by the pressurization is sufficient to ignite the material.

Aerothermal Environment: Aerothermodynamic heat transfer associated with radiation or convection induced by supersonic flight or rocket plume flow fields.

Annual Operating Agreement: A NASA Center management plan which defines customer requirements, processes, and resources required to meet customer requirements, and the metrics defining effectiveness and efficiency of project processes.

Atomic Oxygen: Atomic Oxygen is formed by solar ultraviolet (UV) radiation dissociating oxygen molecules into free oxygen atoms in the outer ionosphere from altitudes greater than 100 km. Atomic oxygen reacts with many materials, eroding organic materials and oxidizing metals.

Autogenous Ignition Temperature Test is used to determine the temperature at which liquids and solids will spontaneously ignite. The material must ignite without the application of spark or flame in a high pressure oxygen enriched environment.

CAD Drawing: Computer Aided Design of systems and components typically using Microstation for 2-D designs, Solid Edge for 3-D designs, and other software packages as required by the customer.

Component End Item (CEI): Defined as the sub-assemblies and/or components data for measuring contractor's cost and schedule performance on a NASA Acquisition Contract.

Certification of Qualification (COQ): Provides a uniform method for design qualification and certification of US components and subsystems.

Clean Room: An environmentally controlled area in which temperature, humidity, particulate, molecular species, process and personnel controls are implemented to insure hardware exposure environments result in an acceptable level of cleanliness.

Commercial-Off-The-Shelf (COTS): Commercially available products that can be purchased and integrated with little or no customization.

Component: An aggregate of hardware and/or software that can be characterized by one specification, is designed by a single activity to be functionally tested, and is verified as a unit.

Contamination Control: Responsibilities encompassing materials and contamination control during all phases of hardware development including design, manufacturing, assembly, test, transportation, launch site processing, on-orbit exposure, return and refurbishment if required. Control also includes reducing the risk of hardware/system failure due to molecular or particulate contamination. Contamination is a concern in a wide range of areas including critical bondlines, reactive fluids (e.g. liquid oxygen) compatibility, and sensitive optics. Contamination control also addresses applications of a variety of facilities and instrumentation capable of contaminant detection, identification, and monitoring. Material applications dealing with environments, including production facilities, clean rooms, and on-orbit exposure area also included. Contamination control personnel advise on contamination and foreign object debris control programs as well as clean room operations by compliance with imposed standards.

Cost Performance Report: This report consists of five formats containing data for measuring contractor's cost and schedule performance on a NASA Acquisition Contract.

Critical Design Review (CDR): The CDR discloses the complete system design in full detail, ascertains that technical problems and design anomalies have been resolved, and ensures that the design maturity justifies the decision to initiate fabrication/manufacturing, integration, and verification of mission hardware and software.

Critical Processes (Quality Assurance): Are processes where uniform high quality cannot be ensured by inspection alone.

Critical Processes (Manufacturing Processes): An operation, treatment, or procedure used as a step in manufacturing, testing, or inspection that, if improperly or inadequately performed, can have a significant performance, including safety, or schedule impact on new or unique processes, hardware designed for fracture control or processes identified on the Critical Items List (CIL) or as safety hazard control items.

Demonstration Test Articles: Test articles that are used to demonstrate a manufacturing and/or assembly process or technique.

Design: The approach that engineering disciplines use to specify how to create or do something. A successful design must satisfy a functional specification, conform to the limitation s of the target medium, meets implicit or explicit requirements on performance and resource usage.

Design Definition Document: Provides a detailed description of the US at the end of a design analysis cycle.

Design for Manufacturability: The process of proactively designing products to (1) optimize all the manufacturing functions: fabrication, assembly, test, procurement, shipping, delivery, service, and repair, and (2) assure the best cost, quality, reliability, regulatory compliance, safety, time-to-market, and customer satisfaction.

Dynamic Test: Structural dynamics test technologies and facility capabilities are planned, developed, and applied to the requirements of structural analysis, flight criteria, and institutional objectives. Primary emphasis is on: certification testing to simulated flight levels; development tests to determine structural performance characteristics; experimental tests to derive structural dynamic properties, expand test technologies, and support related technology development; and experimental tests to evaluate control system technologies and concepts to mitigate structural, thermal, and control system interactions for large space structures. Test control and response data processing includes time, frequency, and spatial domain analysis formatted for compatibility with analytical models, certification criteria, and experimental objectives. A wide range of skills provide the customer with a rapid response for structural dynamics testing needs. Test engineers provide overall management and coordination of test activities. These engineering services span a wide variety of dynamics testing: modal survey, vibration, acoustics, control dynamics, and pyrotechnic shock. Force inputs are provided through electromagnetic shakers, instrumented hammers, pyrotechnic charge devices, and forced air horn loaded drivers. Measured responses are obtained through piezoelectric accelerometers, high-speed video, dynamic strain gauges, electronic speckle pattern interferometry, and non-contact laser vibrometry. Test data are provided to support correlation of the experimental results with the analytical structural models and to qualify and certify flight hardware.

Environmental Testing: Usage of thermal vacuum, thermal humidity, and thermal altitude chambers to simulate conditions related to ascent, descent, and on-orbit environments as well as conditions related to shipping and ground storage environments.

Equipment: A generic term used to refer to hardware at any level-of-assembly from a component up through an integrated system.

Evaluation Factors: Factors by which a contractor's proposal will be evaluated to make a contract award.

Export Control: United States export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), and the Export Administration Regulations (EAR.)

Export Licenses: Licenses or other approvals from the Department of State or the Department of Commerce related to export of hardware, technical data, or software, or provides technical assistance to a foreign destination or “foreign person.”

Flammability Test: A test method used to analyze the ignition potential of aerospace materials and small components, and to determine their burning characteristics. The MSFC Flammability test system is used to determine the ability of materials to resist ignition or to self-extinguish without transferring burning debris to adjacent materials.

Fluid Dynamics: Fluid mechanics or fluid dynamics is the study of the physical behavior of fluids. Fluids used at the cold flow facilities are liquids and gases - normally water and air. Testing of a fluid dynamic problem typically involves experimentally measuring various properties of the fluid, such as velocity, pressure, density, and temperature, as functions of space and time. The discipline has a number of sub disciplines, including aerodynamics (the

study of gases) and hydrodynamics (the study of liquids). Fluid mechanics has a wide range of applications engineering and aerospace. For example, it is used to determine forces and moments on spacecraft, the mass flow of fluid through turbopumps, and prediction of aerodynamic environment in turbines.

Full Time Equivalent (FTE): A FTE for civil service personnel working for NASA.

Government Furnished Equipment: Equipment used during the project lifecycle that is not property of the contractor (machine tools, test equipment, furniture, vehicles, and accessory and auxiliary items).

Government Furnished Property: Property in possession of the Government and subsequently made available to the contractor (facilities, materials, special tooling and special test equipment).

Guidance Document: A document that the Contractor will use as guidance in developing a Data Requirements Document (DRD) or a subsystem.

Inputs: A contractor provides "inputs" to a NASA document or study to allow NASA to produce a final product that may integrate the contractor's submission with submissions from various other sources. The format for inputs is defined in a contractual Data Requirements Document.

Levitation (Electrostatic): Charged specimens are maintained floating in the desired position between electrodes. Specimens are free from contact with any equipment or container. (Reference website: http://esl.msfc.nasa.gov/)

Materials and Processes Technical Information System (MAPTIS): MAPTIS is a NASA-wide materials database established for the purpose of recording and disseminating information about materials to help assure safe material selections for NASA produced space flight hardware.

Mechanical Impact Test: A test used to determine the propensity of a material to ignite when subjected to an impact by a free-falling weight. The MSFC Ambient and High-Pressure Mechanical Impact testers use a plummet to impact a disk of the sample material which is immersed in liquid or gaseous oxygen.

Metrology: Calibrated measurement or characterization of the fine dimensions, shape or surface roughness of precision manufactured hardware or optical components (lenses, mirrors and other specialized optics). Typically, government furnished equipment is provided for such tasks.

Material Usage Agreement (MUA): An agreement between the contractor and the government encompassing all agreed upon materials for use in the launch vehicle or spacecraft.

National Center for Advanced Manufacturing (NCAM): Located within Materials and Processes Laboratory, NCAM addresses the manufacturing requirements of space transportation systems. Through NCAM, partnerships between National Aeronautics and Space Administration (NASA), other government agencies, industry, and academia are formed that leverage assets and successfully meet the requirements of future aerospace systems-- systems that will ultimately provide safe and low-cost access to space.

Organizational Issuances (OI): Documents that provide procedures, instructions, etc., for internal use within an organization. OI's include Organizational Work Instructions (OWI's), procedures, plans, etc.

Organizational Work Instructions (OWI): Documents that provide detailed instructions stating how to perform specific Marshall Management System directed duties that apply to one or more Marshall Space Flight Center organizations, but not all. The OWI document type can be used when other document type designations do not apply.

Oxygen Index Test: A test used to determine the minimum oxygen concentration in a mixture of oxygen and nitrogen that will support flaming combustion of a material initially at room temperature.

Past Performance: Factual information about the performance of a contractor against the performance requirements in past contracts.

Performance Assessment Plan: Describes the Contractor's overall approach to contract performance assessment and the implementation process for accomplishing metric evaluation and reporting.

Performance Management Review: Integrated review of cost, schedule, and technical performance on the contract.

Plasma: A quasi-neutral gas of charged and neutral particles which exhibit collective behavior.

Promoted Ignition-Combustion Test: Promoted Ignition-Combustion Test is a test used to determine the flammability of materials, mainly metals, in 50 to 10,000 psi gaseous oxygen (GOX), through the utilization of a promoter material that adds supplemental heat in order to initiate combustion. The MSFC Promoted Ignition-Combustion tester uses a metal promoter to initiate the combustion of a rod of the sample material.

Prototype: An original engineering unit/model utilized early in the design process to resolve design issues.

Real-Time Support: Level of support that has the personnel, tools, and location necessary for a timely response.

Risk: The uncertainty of attaining a performance outcome or result and is the function of the probability and the consequence of failing to attain the performance outcome or result.

Risk Management: The processes for identifying, assessing, mitigating, and tracking risks.

Safety: Freedom from those conditions that can cause death, injury, occupational illness, damage or loss of equipment or property, or damage to the environment.

Space Act Agreement (SAA): Specifically, SAAs are those "agreements whose authority is derived from NASA`s "other transaction" authority of the NASA Space Act [of 1958]. It does not include Chiles Act (also known as the Federal Grant and Cooperative Agreement Act) cooperative agreements [31 U.S.C. § 6305] or grants [31 U.S.C. § 6304]. …these "other transaction" agreements (referred to as SSA) also do not include procurement contracts. Therefore, procurement laws and regulations are not applicable." {""Agreement" defined in the

broadest of contexts includes any agreement concluded under the authority of the NASA Space Act [of 1958] (contracts, leases, cooperative agreements, or other transactions). Generally, agreements establish a set of legally enforceable promises between NASA and another party to the agreement, requiring a commitment of NASA resources (including funding, services, equipment, expertise, information, or facilities to accomplish the objectives of the agreement."}

Space Environmental Effects (SEE): SEE provides valuable information to designers, engineers, and scientists on the behavior of materials in the space environment. Test facilities are utilized to evaluate materials optical, mechanical, and electrical property performance in atomic oxygen, ultraviolet radiation, charged particles, plasma, and thermal vacuum environments. Flight experiments such as those on the Long Duration Exposure Facility, the Passive Optical Sample Assembly, and the Optical Properties Monitor are also used for materials evaluation. The synergistic effects of these aspects of the space environment are still not completely understood and continue to be investigated. The data from these specialized test systems, combined with analytical results from material flight experiments, enable one to determine optimum materials for use on spacecraft.

Statement of Work (SOW): A document that expresses the tasks to be performed by the Contractor.

Structural Test: Structural strength testing is a simulation of a product's actual service life loads on a test article, the measurement and evaluation of the test article's response parameters, and the correlation of test data with analytical models. It involves imposing and controlling discrete loads, temperatures, and pressures to affect the interactive behavior of test articles to simulate actual service life conditions. Forcing functions are derived with hydraulic actuators, heating and/or cooling systems or fluids, and pressurization systems. Response characteristics are measured in terms of strain, temperature, and displacement. Measured data is processed to determine test article reactions to applied loads, to verify design concepts, and to correlate analytical models. Structural test systems can integrate audio, video, still photography, nondestructive evaluation techniques, and user-supplied measurement types into the overall test system.

A wide range of skills provide the customer with a rapid response for structural testing needs. Test engineers provide overall management and coordination of test activities. Instrumentation and load control engineers support test engineers in accomplishing all test requirements to ensure that all measurement and force loading profiles are properly addressed and performed. Mechanical technicians perform set-ups of mechanical reaction fixtures, hydraulic load application equipment, and test articles. Electrical technicians install and functionally verify (mechanically and electrically) test article instrumentation, strain gauges (including cryogenic applications), and other devices/sensors to measure displacements, loads, pressures, temperatures, etc.

Test Support: The diverse skills of the Environmental Test Facility (ETF) personnel can provide the customer with quick turnaround in test setup. Crafts include certified leak-check operators, certified welders, electricians, and machine shop operators. The ETF staff can develop the tooling and fixtures needed for tests such as cold plates and installation of special chamber feedthroughs.

Thermal Altitude Testing: Usage of test chambers to subject test articles to temperatures ranging from -70 degrees C to 190 degrees C and altitudes ranging from sea level to 100,000 feet.

Thermal Humidity Testing: Usage of test chambers to subject test articles to temperatures ranging from -70 degrees C to 190 degrees C and humidity ranging from 5% to 95%.

Thermal Vacuum Stability (Outgassing) Test: A test method used to evaluate the mass loss of materials being subjected to 125°C at a pressure less than 5 x 10^{-}5 psi for 24 hours. The test primarily is used to determine the tendency of a non-metallic material to release volatile compounds.

Thermal Vacuum Testing: Usage of test chambers to subject test articles to temperatures ranging from -170 degrees C to 200 degrees C and pressures ranging from ambient to 5 x 10^{-8} torr.

Toxic Offgassing (Toxicity) Test: A test method used to determine the identity and quantity of volatile compounds which are given off from materials and flight hardware. The compounds are then evaluated for their potential impact on human health. The MSFC Toxicity test is conducted at 120°F in order to allow the test material to give off the maximum amount of volatile compounds.

Vacuum Bakeout Facilities: Thermal vacuum bakeouts are preformed in the Sunspot, V4, V5, V6, V8, V9 and V11 Chambers. Vacuum bakeout cleans components before flights and prior to testing for certification to optical cleanliness specifications MSFC Specification 1238. Instrumentation includes thermocouples and ionization and convection pressure gauges.

Validation: Assessment of a set of requirements demonstrating that the requirements are feasible within allowable means (cost/schedule/technical capability), are verifiable, and if fully met, will produce a product that accomplishes the intended objectives. Proof that the product accomplishes the intended purpose. May be determined by a combination of test, analysis, and demonstration

Verification: Proof of compliance with specifications. May be determined by a combination of test, analysis, demonstration, and inspection.

Work Breakdown Structure: A product-oriented hierarchical division of the hardware, software, services, and data required to produce the program's/projects end product, structured according to the way the work will be performed, and reflective of the way in which program/project costs, schedule, technical and risk data are to be accumulated, summarized and reported.

Work Year Equivalent (WYE): Work year equivalent for contractors performing work on NASA contracts.

DATA NO.	PROCUREMENT DOC. ISSUE
1163	**Revision C**

NNM08AA20C
CONTRACT/RFP

EXHIBIT NUMBER

J-2
ATTACHMENT NUMBER

Marshall Engineering Technician and Trade Services (METTS)
PROJECT/SYSTEM

DATA PROCUREMENT DOCUMENT

InfoPro Corporation
CONTRACTOR

July 23, 2009
DATE

National Aeronautics and
Space Administration

MSFC - Form 3461 (Rev September 1989)

National Aeronautics and Space Administration **DOCUMENT CHANGE LOG**					DATA PROCUREMENT DOC. NO. ISSUE **1163 Revision C**	
INCORPORATED REVISIONS OUTSTANDING REVISIONS				AS OF: 07-23-09	SUPERSEDING: 02-25-09	PAGE: 1 of 1
AUTHORITY	PORTION AFFECTED - PAGE NO./NO.				REMARKS	
(DPD Revision)	INTRO	SGR	DRL	DRD		
Contract Mod. 0017				X	Added the following DRDs: 1163MA-010, Monthly Calibration Services Reports 1163MA-011, Monthly Valve and Component Shop (V&CS) Services Report 1163QE-002, Deficiency Corrective and Preventive Action Report 1163RM-001, Reliability Centered Maintenance (RCM) Plan	
				1163LS-001	Item 15.3: Added the following paragraph "In addition to the requirements above, the plan shall address identification and control of Government materials less than $5,000 in WBS 3.6".	
				1163QE-001	Item 15.3: Added the following paragraph "2. In addition to the requirements in 15.3, paragraph 1, each quality element of the Government approved release of ANSI/NCSL Z540 as defined in NPD 8730.1, the roles and responsibilities of MPR 8730.5 shall be addressed to describe the philosophy and approach for implementation. A copy of the Calibration Quality Manual shall be submitted.	
Contract Mod. 0025				1163LS-001	Item 15.3: Deleted the following last paragraph "In addition to the requirements above, the plan shall address identification and control of Government materials less than $5,000 in WBS 3.6".	
				1163MA-010	Item 15.3a: Deleted the following sentence "Quality Deficiencies and status for the reporting period". Added the following 15.3e through 15.3k: e. Calibration Content. f. Work Order Number. g. Equipment Control Number (ECN). h. Date Arrived at Calibration Laboratory. i. Estimated Completion Date. j. Actual Completion Date. k. Days Early/Days Late.	
Contract Mod. 0036			X	X	Deleted the following DRD due to the OPR cancellation: 1163CD-001, Contractor Information Technology Security Program Plan	
				1163MA-010	Item 15.3b: Changed "10 business days" to "20 business days". Item 15.3c: Changed "30, 60, and 90 calendar days" to "45 and 60 calendar days". Item 15.3d: Deleted in entirety.	
				X	Updated the following DRDs with the most current standard: 1163SA-001, Safety, Health, and Environmental (SHE) Plan 1163SA-003, Mishap and Safety Statistics Report	

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National Aeronautics and Space Administration

PAGE REVISION LOG

DATA PROCUREMENT DOC.
NO. ISSUE
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NOTE: The current revision is denoted by a vertical line in the outer margin adjacent to the affected text.

AS OF: 07-23-09

SUPERSEDING: 02-25-09

PAGE: 1 of 1

INSERT LATEST REVISED PAGES. DISCARD SUPERSEDED PAGES.

ITEM	PAGE	STATUS	ITEM	PAGE	STATUS
DPD	ALL	Revision C			

MSFC - Form 3461-2 (Rev August 1970)

1.0 INTRODUCTION

1.1 Scope: Subject to the Rights in Data clause, this Data Procurement Document (DPD) sets forth the data requirements in each Data Requirements Description (DRD) and shall govern that data required by the DPD for the contract. The contractor shall furnish data defined by the DRD's listed on the Data Requirements List (DRL) by category of data, attached hereto, and made a part of this DPD. Such data shall be prepared, maintained, and delivered to NASA in accordance with the requirements set forth within this DPD. In cases where data requirements are covered by a Federal Acquisition Regulation (FAR) or NASA FAR Supplement (NFS) clause, that clause shall take precedence over the DPD, consistent with clause FAR 52.215-8.

1.2 DPD Description: This DPD consists of a Document Change Log, a Page Revision Log, a Table of Contents, an Introduction, a Statement of General Requirements, DPD maintenance procedures, a DRL, and the DRD's.

1.2.1 General Requirements: The general requirements, as specified in paragraph 2.0 of this DPD, prescribe those requirements applicable to the preparation, maintenance, and delivery of data that are better defined in aggregate than in the individual DRD's.

1.2.2 Data Requirements List (DRL): Throughout the performance of the contract, the DRL provides a listing by data category of the data requirements of the DPD.

1.2.3 Data Requirements Descriptions (DRD's)

1.2.3.1 Each data requirement listed on the DRL is given complete definition by a DRD. The DRD prescribes content, format, maintenance instructions, and submittal requirements.

1.2.3.2 For the purpose of classification and control, DRD's of this DPD are grouped into the following broad functional data categories:

CATEGORY SYMBOL	DESCRIPTION
CD	Contractual Data
CM	Configuration Management
LS	Logistics/Support
MA	Management
QE	Quality
RM	Reliability Maintainability
SA	Safety

1.2.3.3 The symbols representing these data categories form part of the prefix of the DRD identification number. The first numerical characters reflect the DPD number.

1.2.3.4 To facilitate the usage and maintenance of the DPD, the DRD's have been sectionalized in accordance with the above data categories.

1.2.3.5 The DRD's are filed by data category and are in alpha-numeric sequence as listed on the DRL page (or pages) that precedes the DRD's.

1.2.4 Document Change Log (DCL) and Page Revision Log (PRL): The Document Change Log chronologically records all Revision Cctions that pertain to the DPD. The Page Revision Log describes the current revision status of each page of the DPD and thus, at all times, provides its exact configuration.

1.2.5 DPD Maintenance Procedures: Maintenance procedures define the detailed methods to be employed in maintaining the DPD. Detailed maintenance procedures are specified in paragraph 3.0 of this DPD.

1.3 Data Types for Contractual Efforts: The types of data and their contractually applicable requirements for approval and delivery are:

TYPE	DESCRIPTION
1*	All issues and interim changes to those issues require written approval from the requiring organization before formal release for use or implementation.
2*	NASA reserves a time-limited right to disapprove in writing any issues and interim changes to those issues. The contractor shall submit the required data to NASA for review not less than 45 calendar days** prior to its release for use. The contractor shall clearly identify the release target date in the "submitted for review" transmittal***. If the data is unacceptable, NASA will notify the contractor within 45 calendar days** from the date of submission, regardless of the intended release date***. The contractor shall resubmit the information for reevaluation if disapproved. The submittal is considered approved if the contractor does not receive disapproval or an extension request from NASA within 45 calendar days**.
3	These data shall be delivered by the contractor as required by the contract and do not require NASA approval. However, to be a satisfactory delivery, the data shall satisfy all applicable contractual requirements and be submitted on time.
4	These data are produced or used during performance of the contract and are retained by the contractor. They shall be delivered only when NASA requests in writing and shall be delivered in accordance with the instructions in the request. The contractor shall maintain a list of these data and shall furnish copies of the list to NASA when requested to do so.
5	These data are incidental to contract performance and are retained by the contractor in those cases where contracting parties have agreed that formal delivery is not required. However, the Contracting Officer or the Contracting Officer's Representative shall have access to and can inspect this data at its location in the contractor's or subcontractor's facilities, or in an electronic database accessible to the Government.

* Note: Type 1 and Type 2 data may be placed under NASA configuration management control when designated by NASA. CM control requires the contractor to submit Type 1 and Type 2 data updates through Engineering Change Proposals (ECPs).

** Note: This time limit may be tailored for individual DRD's to meet the requirements of the procuring activity.

*** Note: If the contractor does not identify a release target date or if the intended release date is shorter than 45 calendar days from the date of submission, the 45 calendar days review cycle stands (or the tailored Type 2 time limitation for the specific procurement).

2.0 STATEMENT OF GENERAL REQUIREMENTS

2.1 Applicable/Reference Documents: Documents included as applicable documents in this DPD are the issue specified in the Performance Work Statement (PWS), and form a part of the DPD to the extent specified herein. Applicable documents listed in Item 15.2 of a DRD are applicable only to the preparation of the deliverable documentation described by that DRD.

References to documents other than applicable documents in the data requirements of this DPD may sometimes be utilized, and shall be indicated in 13. Remarks of the DRD. These do not constitute a contractual obligation on the contractor. They are to be used only as a possible example or to provide related information to assist the contractor in developing a response to that particular data requirement.

2.2 Subcontractor Data Requirements

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

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

2.3 Data Distribution, Format, Data Restriction Marking, and Transmittal

2.3.1 Distribution: Distribution of required documentation shall be in quantities determined by the Contracting Officer. Recipient names and email (if applicable) addresses shall be noted on a separate distribution list to be furnished by the Contracting Officer. The Contracting Officer's letter may include other information pertinent to delivery of data, as required.

2.3.2 Format

2.3.2.1 Electronic Format: Electronic submission of data deliverables is required. Electronic deliverables shall be printable. Data deliverables shall be delivered to NASA in the format specified below unless a specific format is required by a DRD. Data submittals shall consist of a single Adobe Acrobat PDF file and the native format electronic file(s). The preferred native formats include Microsoft Word, Excel, PowerPoint or CAD drawing plot file, as appropriate. Where a single native format file is not possible, multiple files may be integrated into a single ZIP file for submission. The organization of the contents of the integrated ZIP file shall be made readily apparent to the reader, and each file within the integrated product shall be clearly identifiable and traceable within the organization of the integrated product. If files are fragmented, file names shall be labeled logically and contiguously, and the files shall be easily reassembled or merged (e.g. 1 filename, 2 filename, 2a filename, etc.). The software versions shall be confirmed prior to submittals.

2.3.2.2 Hardcopy Format: In addition to the electronic submittal, one hardcopy package of specific data deliverables shall be delivered to the NASA Contracting Officer for the Government contract file. This requirement is indicated in Item 15.4, Format of each DRD. The hardcopy package shall consist of the contractor's Transmittal Memo and one copy of the data deliverable.

2.3.3 Data Restriction Marking

2.3.3.1 Data Restriction Determination and Marking Requirements: The contractor shall determine the data restriction that applies to each data deliverable and mark the data restriction on the data coversheet, or indicate the data restriction in the data transmittal package if the data format precludes identification of data restriction directly in the data. The contractor shall make a determination for each individual data deliverable item, and shall not apply a default or blanket data restriction marking to all data deliverables (e.g., "data may be export restricted"). If NASA does not agree with the contractor applied data restriction, the NASA Contracting Officer shall return the data to the contractor, cancel the markings, or ignore the markings consistent with the procedures set forth in the "data rights" clause(s) contained in the contract.

2.3.3.2 Data Restriction Categories and Marking Statements: The contractor shall consider the following data restriction categories, as a minimum, and utilize specified marking statements.

If data delivered under this contract is subject to the International Traffic in Arms Regulations (ITAR), the data shall contain an "ITAR Notice" as follows:

International Traffic in Arms Regulations (ITAR) Notice

This document contains information which falls under the purview of the U.S. Munitions List (USML), as defined in the International Traffic in Arms Regulations (ITAR), 22 CFR 120-130, and is export controlled. It shall not be transferred to foreign nationals in the U.S. or abroad, without specific approval of a knowledgeable NASA export control official, and/or unless an export license/license exemption is obtained/available from the United States Department of State. Violations of these regulations are punishable by fine, imprisonment, or both.

If data delivered under this contract is subject to the Export Administration Regulations (EAR), the data shall contain the "EAR Notice" as follows:

Export Administration Regulations (EAR) Notice

This document contains information within the purview of the Export Administration Regulations (EAR), 15 CFR 730-774, and is export controlled. It may not be transferred to foreign nationals in the U.S. or abroad without specific approval of a knowledgeable NASA export control official, and/or unless an export license/license exception is obtained/available from the Bureau of Industry and Security, United States Department of Commerce. Violations of these regulations are punishable by fine, imprisonment, or both.

If the contract contains FAR 52.227-14 *Alternate II*, the "Limited Rights Notice" may be applicable to data (other than computer software) delivered under this contract.

If the contract contains FAR 52.227-14 *Alternate III*, the "Restricted Rights Notice" may be applicable to computer software delivered under this contract.

If the contract contains FAR 52.227-20, the "SBIR Rights Notice" may be applicable to SBIR data delivered under this contract.

If the contract contains NFS 1852.237-73, a sensitive information legend may be applicable to information delivered under this contract.

In accordance with the applicable data clause (e.g., FAR 52.227-14(c) or FAR 52.227-20(c)), the contractor may be able to assert a copyright claim in data delivered under this contract. When claim to copyright is made, the Contractor shall affix the applicable copyright notices of 17 U.S.C. 401 or 402 and acknowledgment of Government sponsorship (including contract number) to the data when such data are delivered to the Government.

2.3.4 Transmittal

2.3.4.1 Data shall be transmitted to NASA by email, CD or DVD, hardcopy, or other mechanism agreed to by the Contracting Officer, COTR, and Project representatives who are responsible to receive, index, and store the data deliverables.

2.3.4.2 If email is used to transmit data deliverables, the email size shall be 10 Megabytes or less to ensure receipt by the NASA email servers. Encrypted email format shall be used to transmit data which has been judged sensitive by the contractor (e.g., export controlled, limited rights data, SBIR, restricted computer software, copyrighted, etc.).

2.3.4.3 Data Transmittal Package: Each data transmittal package shall include:

a. Transmittal memorandum that specifies the meta-data below for each data transmittal:
    1. Contract number.
    2. Data Requirements Description (DRD) number.
    3. DRD data type (specified in Item 3 on the DRD).

4. Submission date or milestone being satisfied.
5. Document number and revision.
6. Document title.
7. File names of all files being delivered; file naming convention shall clearly identify the document being delivered.
8. Distribution (as defined by the Contracting Officer's letter).
9. Requested response date.
10. Contractor assigned data restriction (export controlled, limited rights data, SBIR, restricted computer software, copyrighted, etc.) if not marked on data.
11. NASA Records Retention Schedule (NRRS) number, if applicable. (See NPR 1441.1, NASA Records Retention Schedules).

b. Printable electronic files or hardcopy data.

2.3.5 Electronic data deliverables should be transmitted directly to the MSFC Repository through the Digital Asset Manager web interface. Instructions for electronic data submittals can be found at http://cio.msfc.nasa.gov/repository/repository_submittal.html. Document submitters must register for a Documentum user account through the NASA Account Management System (NAMS). Computer-Aided Design (CAD) drawings shall be submitted in the original native vector, Hewlett-Packard Graphic Language (HPGL), and raster image formats.

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

a. Method of reproduction – offset/xerography.
b. Finished size – 8 1/2" X 11".
c. Paper – 20-pound opaque bond.
d. Cover – Litho cover stock.
e. Pages shall be printed on both sides; blank pages shall be avoided when possible.
f. Oversize pages shall be avoided when possible, but if necessary shall be folded to 8 1/2" X 11".
g. Binding shall be the most economical method commensurate with the size of the report and its intended use.

2.5 Contractor's Internal Documents: The contractor's internal documents shall be used to meet the data requirements of this DPD unless a specific format is required by the applicable DRD.

2.6 Document Identification: Type 1 and 2 documents published by the contractor and submitted in response to the data requirements of this DPD shall be identified within an organized identification numbering system prescribed to NASA by the contractor and, if applicable, as approved by NASA. For all data types, the document number, change legend, date, and title constitute the minimum identification of the specific document and shall appear on the cover and title page. The contract number shall also appear on the cover and title page as separate markings. The originator and organization shall be included on the title page. The document number, change legend, and date shall appear on each page of the document. In the front matter of each document, identify the DPD number and applicable DRD number(s) required for document preparation. Successive issues or revisions of documents shall be identified in the same manner as the basic issue and shall have appropriate change identification. Drawings and ECP's are excluded from the marking provisions of this paragraph. All Type 1 documentation, excluding configuration management requirements, shall be marked "PRELIMINARY PENDING NASA APPROVAL," and once approved shall be reissued with "APPROVED BY NASA" and the date and approval authority annotated on the cover.

2.7 Reference to Other Documents and Data Deliverables in Data Submittals: All referenced documents shall be made readily available to the cognizant NASA organization upon request. The contractor should make sure that the references are available to NASA in a manner which does not incur delays in the use of the response document. Reference may be made, within one data submittal, to other data submittals delivered in response to this DPD in those cases where the data required by one DRD may have been delivered by the contractor in response to another DRD. The reference to previously-submitted data shall include the applicable DRD number, data submittal version date, and location within the referenced document.

2.8 Maintenance of Type 1 Document Submittals

2.8.1 Revisions of Type 1 documentation may be accomplished either by individual page revision or by a complete reissue of the document identified in accordance with requirements of 2.7 above, with the exception of drawings (which shall be revised in accordance with contract configuration management requirements).

2.8.2 Individual page revisions shall be made as deemed necessary by the contractor or as directed by the Contracting Officer.

2.8.3 A Type 1 document shall be completely reissued when, in the opinion of the contractor and/or NASA, the document has been revised to the extent that it is unusable in its present state, or when directed by the Contracting Officer. When complete reissues are made, the entire contents of the document shall be brought up to date and shall incorporate revised pages. All revisions shall be recorded. A revision log shall identify complete reissues except for periodic reports and documents which are complete within themselves as final.

2.8.4 Changes of a minor nature to correct obvious typing errors, misspelled words, etc., shall only be made when a technical change is made, unless the accuracy of the document is affected.

2.8.5 All revised pages shall be identified by a revision symbol and a new date. Each document shall contain a log of revised pages that identify the revision status of each page with the revision symbol. This list shall follow the table of contents in each document. The line or lines revised on a given page shall be designated by the use of vertical line in the margin of the page, and the change authority shall be indicated adjacent to the change.

2.8.6 Contractor Type 1 documents shall not be submitted containing pen and ink markups which correct, add to, or change the text, unless schedule problems exist and approval is obtained in writing from the Contracting Officer. Such markups, however, shall not exceed 20 percent of the page content and shall be acceptable provided that the reproduced copies are legible. In addition, hand-drawn schematics, block diagrams, data curves, and similar charts may be used in original reports in lieu of formally prepared art work, as long as legibility of copies is not impaired. Acceptability shall be determined by the Contracting Officer.

3.0 DPD MAINTENANCE PROCEDURES

3.1 NASA-Initiated Change: New and/or revised data requirements shall be incorporated by contract modification to which the new or revised portion of the DPD shall be appended. The contractor shall notify the Contracting Officer in the event a deliverable data requirement is imposed and is not covered by a DRD, or when a DRD is changed by a contract modification and for which no revision to DPD is appended. In such cases, the contractor shall submit the requested changes to NASA for approval. See paragraph 3.3.1 for change procedures.

3.2 Contractor-Initiated Change: Contractor-proposed data requirements, or proposed changes to existing requirements shall be submitted to NASA for approval.

3.3 DPD Change Procedures

3.3.1 Changes to a contractual issue of this DPD shall be identified by NASA on the Document Change Log and Page Revision Log. The actual revised material on the DPD page shall be identified by placing a heavy vertical line in the right-hand margin extending the entire length of the change. In addition, the numerical control number of the contractual direction authorizing the change shall be placed adjacent to the vertical revision line. These revision identifiers shall be used to reflect the current revision only; any previous symbols on a page shall be deleted by the current revision.

3.3.2 The date of the contractual direction paper, e.g., Change Order, Supplemental Agreement, or Contracting Officer's letter shall be entered under the "Status " column of the Page Revision Log adjacent to the affected page or DRD number, and in the "as of" block. The date that was in the "as of" block shall be entered in the "Superseding" block.

3.3.3 The Document Change Log entitled “Incorporated Revisions” shall be changed to indicate the number, portions affected, and associated Supplemental Agreement number, if applicable.

3.3.4 The Document Change Log entitled “Outstanding Revisions” is changed periodically to indicate outstanding Change Orders and Contracting Officer notification letters.

3.4 DPD Reissues

3.4.1 When conditions warrant, the DPD shall be reissued by NASA and shall supersede the existing DPD in its entirety. Reissues shall be issued by contractual direction.

3.4.2 All revision symbols (vertical lines and contractual direction control numbers) shall be removed from all pages; revision dates shall remain in the Date Revised block on DRD's that have been revised. The issue symbol, which shall commence with "A" and progress through "Z," shall be entered in the DPD identification block of each DRD page of the DPD.

Marshall Engineering Technician and Trades Services (METTS)

Data Requirements Lists

DRD	DATA TYPE	TITLE	OPR
CD - Contractual Data			
~~1163CD-001~~	~~2~~	~~Contractor Information Technology Security Program Plan~~	~~IS10~~
1163CD-002	3	Technology Reports	ED10
CM - Configuration Management			
1163CM-001	1	Acceptance Data Package	ED10
1163CM-002	2/3	Functional Configuration/Physical Configuration Audit Documentation	ED10
LS -Logistics			
1163LS-00l	2	Government Property Management Plan	AS41
MA - Management			
1163MA-001	1	Management Plan	ES01
1163MA-002	1	Task Order Plan (TOP)	ES01
1163MA-003	3	Financial Management Report (533M)	CS40
1163MA-004	3	Monthly Status Report	ES01
1163MA-005	3	Badged Employee and Remote IT User Listing	AS50
1163MA-006	3	Contractor Employee Clearance Document	AS50
1163MA-007	3	Position Risk Designation for Non-NASA Employee	AS50
1163MA-008	3	Monthly and Semi-Annually Performance Reports	ES01
1163MA-009	2	Organizational Conflict of Interest (OCI) Avoidance Plan	PS21
1163MA-010	3	Monthly Calibration Services Reports	ET02
1163MA-011	3	Monthly Valve and Component Shop (V&CS) Services Report	ET02
RM – Reliability and Maintainability			
1163RM-001	1	Reliability Centered Maintenance (RCM) Plan	ET02
QE - Quality			
1163QE-001	1	Quality Management System Plan	QD40
1163QE-002	3	Deficiency Corrective and Preventive Action Report	ET02
SA - Safety			
1163SA-001	2	Safety, Health, and Environmental (SHE) Plan	AS10/QD12
1163SA-002	1	Personnel Certification Plan	QD12/QD21 ED01
1163SA-003	3	Mishap and Safety Statistics Report	QD12

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163CD-002**
3. **DATA TYPE**: 3
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/3
6. **TITLE**: Technology Reports

7. **DESCRIPTION/USE**: Provides NASA with technical information concerning any invention, discovery, improvement, or innovation made by a contractor in the performance of work under this contract for the purpose of disseminating this information to obtain increased use. Also, to provide NASA with data to review for possible patentable items.

8. **OPR**: ED10 9. **DM**: ES01

10. **DISTRIBUTION**: Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: Disclosure of Invention and New Technology (NASA Form 1679): Within 2 months of identification of subject invention. Interim NASA New Technology Summary Report (NTSR) Form: 12 months from the date of the contract. Utilization Report: Upon Contracting Officer's request.

12. **SUBMISSION FREQUENCY**: Disclosure of Invention and New Technology (NASA Form 1679): For each subject invention. Interim NASA New Technology Summary Report (NTSR): Every 12 months. Final NASA New Technology Summary Report (NTSR): Three months after completion of contracted work. Utilization Report: No more frequently than annually.

13. **REMARKS**: Copies of NASA Forms 1679, and the NASA New Technology Summary Report Form (Interim and Final) may be obtained and filled out electronically at: http://www.webentre.nasa.gov/ . These forms may also be obtained from the New Technology Representative (mailto: Carolyn E.McMillan@nasa.gov).

14. **INTERRELATIONSHIP**: PWS paragraph 1.2.3

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Technology Reports include technical detail as is necessary to identify and fully describe a "Subject Invention". Per FAR 52.227-11, "Subject Invention" means any invention of the contractor conceived or first actually reduced to practice in the performance of work under this contract.

15.2 **APPLICABLE DOCUMENTS**:

FAR 52.227-11	Patent Rights - Retention by Contractor (Short Form) (June 1997) - As modified by NASA FAR Supplement 1852.227-11

15.3 **CONTENTS**: The Technology Reports consist of:

a. Disclosure of Invention and New Technology (Including Software): In accordance with FAR 52.227-11(c), the disclosure to the agency shall be in the form of a written report and shall identify the contract under which the invention was made and the inventor(s). It shall be sufficiently complete in technical detail to convey a clear understanding to the extent known at the time of the disclosure, of the nature, purpose, operation, and the physical, chemical, biological or electrical characteristics of the invention. The disclosure shall also identify any publication, on sale or public use of the invention and whether a manuscript describing the invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. In addition, after disclosure to the agency, the Contractor shall promptly notify the agency of the acceptance of any manuscript describing the invention for publication or of any on sale or public use planned by the Contractor. This reporting requirement may be met by completing NASA Form 1679 (latest revision) in hardcopy or online at: http://www.webentre.nasa.gov/. Use of this form or the online system is preferred; however, if the form is not used the following information should be provided in order to meet the reporting requirement:
   1. Descriptive title.
   2. Innovator(s) name(s), title(s), phone number(s), and home address(es).

DRD Continuation Sheet

TITLE: Technology Reports **DRD NO.**: **1163CD-002**
DATA TYPE: 3 **PAGE**: 2/3

15. **DATA PREPARATION INFORMATION (CONTINUED)**:

3. Employer when innovation made (name and division).
4. Address (place of performance).
5. Employer status (e.g., Government, college or university, non-profit organization, small business firm, large entity).
6. Origin (e.g., NASA grant number, NASA prime contract number, subcontractor, joint effort, multiple contractor contribution, other).
7. NASA Contracting Officer's Technical Representative (COTR).
8. Contractor/grantee New Technology Representative.
9. Brief abstract providing a general description of the innovation:
   (a) Description of the problem or objective that motivated the innovation's development.
   (b) Technically complete and easily understandable description of innovation developed to solve or meet the objective.
   (c) Unique or novel features of the innovation and the results or benefits of its application.
   (d) Speculation regarding potential commercial applications and points of contact (including names of companies producing or using similar products).
10. Additional documentation.
11. Degree of technological significance (e.g., modification of existing technology, substantial advancement in the art, major breakthrough).
12. State of development (e.g., concept only, design, prototype, modification, production model, used in current work).
13. Patent status.
14. Dates or approximate time period during which this innovation was developed.
15. Previous or contemplated publication or public disclosure including dates.
16. Answers to the following questions (for software only):
   (a) Using outsiders to beta-test code? If yes, done under beta-test agreement?
   (b) Modifications to this software continue by civil servant and/or contractual agreement?
   (c) Previously copyrighted (if so, by whom?)?
   (d) Were prior versions distributed (if yes, supply NASA or Contractor contract)?
   (e) Contains or is based on code owned by a non-federal entity (if yes, has a license for use been obtained?)?
   (f) Has the latest version been distributed without restrictions as to use or disclosure for more than one year (if yes, supply date of disclosure)?
17. Name(s) and signature(s) of innovator(s).

b. Interim NASA New Technology Summary Report: This report shall consist of a complete listing of subject inventions for the previous 12-month period or certification that there are none. Completion of Interim NASA New Technology Summary Report (NTSR) Form shall satisfy this reporting requirement. Use of the form utilizing the online system at http://www.webentre.nasa.gov/ is preferred; however an alternate format is acceptable provided all required information is provided.

c. Final NASA New Technology Summary Report: This report shall consist of a comprehensive list of all subject inventions for the duration of the contract or certification that there are none. Completion of Final NASA New Technology Summary Report (NTSR) Form shall satisfy this reporting requirement. Use of the form utilizing the online system at http://www.webentre.nasa.gov/ is preferred; however an alternate format is acceptable provided all required information is provided.

d. Report on utilization of subject inventions: This report provides information on the utilization of a subject invention or on efforts at obtaining such utilization that are being made by the contractor or its licensees or assignees. Per FAR 52.227-11, this report shall include information regarding the status of development, date of first commercial sale or use, gross royalties received by the contractor, and other data requested by the Contracting Officer.

DRD Continuation Sheet

TITLE: Technology Reports **DRD NO.**: **1163CD-002**

DATA TYPE: 3 **PAGE**: 3/3

15. **DATA PREPARATION INFORMATION (CONTINUED)**:

15.4 **FORMAT**: The Disclosure of Invention and New Technology (Including Software) report may use NASA Form 1679 (latest revision) or the online system at: http://www.webentre.nasa.gov/, or provide sufficient information to meet the reporting requirement.

The interim and final NASA New Technology Reports may use NASA NTSR Form, Interim or Final (whichever is applicable) utilizing the online system at: http://www.webentre.nasa.gov/, or provide sufficient information to meet the reporting requirement.

15.5 **MAINTENANCE**: None required

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163CM-001**
3. **DATA TYPE**: 1
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/2
6. **TITLE**: Acceptance Data Package
7. **DESCRIPTION/USE**: To provide the documentation needed by MSFC to establish the acceptability of equipment/software for deliverable products.
8. **OPR**: ED10 9. **DM**: ES01
10. **DISTRIBUTION**: Per Contracting Officer's letter
11. **INITIAL SUBMISSION**: Preliminary two weeks prior to each Acceptance Review (AR)
12. **SUBMISSION FREQUENCY**: Final with delivery of each Configuration Item (CI)
13. **REMARKS**:
14. **INTERRELATIONSHIP**: PWS paragraph 2.4
15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Acceptance Data Package (ADP) contains the elements of documentation required to establish the acceptability of DEI products as requested in each customer order.

15.2 **APPLICABLE DOCUMENTS**: None

15.3 **CONTENTS**:

a. The Acceptance Data Package shall include:
   1. Copy of Visual Manufacturing™ customer order and final work order.
   2. Copy of DD Form 250.
   3. Original work orders that specify Government mandatory inspection points (GMIPs).
   4. Final Deliverable End Item (DEI) configuration report/certification.
   5. DARs (waivers/deviations) and contractor MRB action discrepancy records.
   6. MSFC internal customer supplied product (ICPS) documentation submitted with articles and materials supplied by the customer, i.e. NASA MSFC parts tags (MSFC Form 312), log books (MSFC Form 3473), Temporary Installation Record (MSFC Form 4340), temporary red streamers (MSFC Tag 16) or other NASA Center or customer documentation.
   7. Generated log books when specified as an engineering requirement.
   8. Temporary Installation Record (MSFC Form 4340) as applicable for deliverable hardware products with attached Red Streamers (MSFC Tag 16).

b. Additional ADP to support specific customer requirements shall be specified on the customer order, which may include but are not limited to:
   1. Drawings, engineering orders, and engineering parts list.
   2. Results and draft of oven/furnace temperature survey.
   3. Results of processed representative sample specimens (hardness values and sketch) as required.
   4. Hardness values of each heat treated part, indicating the part number, serial number, and hardness.
   5. Material certification – chemical and/or physical test results.
   6. Nondestructive Evaluation (NDE) results and personnel certification.
   7. Welder's certification/weld procedures.
   8. Contractor miscellaneous inspection records.
   9. Copy of work orders.

DRD Continuation Sheet

TITLE: Acceptance Data Package **DRD NO.**: **1163CM-001**

DATA TYPE: 1 **PAGE**: 2/2

15. **DATA PREPARATION INFORMATION (CONTINUED)**:

10. Alignment and Center of Gravity (CG) data.
11. Limited life data.
12. Cleanliness data.
13. Assembly integration data.

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

15.5 **MAINTENANCE**: The ADP shall be maintained current for five (5) years.

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163CM-002**
3. **DATA TYPE**: 2/3
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/4

6. **TITLE**: Functional Configuration/Physical Configuration Audit Documentation

7. **DESCRIPTION/USE**: To support the Functional Configuration Audit (FCA) and Physical Configuration Audit (PCA). The FCA is an audit to verify performance of the CI against approved configuration documentation. The PCA is an audit of the configuration documentation and quality control records to ensure the as-built or as-coded configuration is defined in the documentation.

8. **OPR**: ED10 9. **DM**: ES01

10. **DISTRIBUTION**: See Attachment 2

11. **INITIAL SUBMISSION**: See Attachment 2

12. **SUBMISSION FREQUENCY**: Per configuration audit

13. **REMARKS**: MSFC will document audit planning and provide it to the contractor prior to the audit.

14. **INTERRELATIONSHIP**: PWS paragraph 2.4

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: Functional Configuration/Physical Configuration Audit Documentation contains the required documentation necessary to support the configuration audit for a configuration item (CI).

15.2 **APPLICABLE DOCUMENTS**:

MSFC-STD-3394 *Standard for Contractor Configuration Management MSFC Programs/Projects*

15.3 **CONTENTS**: Detailed content requirements shall be specified by MSFC to include Test and other required data for the FCA shall be that collected from the test of the configuration of the item that is to be formally accepted. The Physical Configuration Audit (PCA) is an audit to verify that the as-built configuration reflects the required physical characteristics documented in the as-designed configuration. Configuration and quality control records and other documents defining the as-built or as-coded configuration is defined in the documentation shall be provided.

MSFC-STD-3394 provides guidelines on documentation required for the FCA and PCA. See Attachment 1 for documentation required for the audits.

Additional documentation requirements to be provided are:

a. Agenda - The agenda shall specify the date, time and place for the scheduled audit, specific review items, supporting documentation, and key participants. Submit approved copies at the review. See Attachment 2.
b. Presentation Charts - Presentation charts shall be submitted at the start of the audit. They shall summarize the details contained in the data package and identify compliance with the contract requirements. See Attachment 2 for distribution and availability of data.
c. Plan – A plan shall be submitted prior to initiating the audit, stating configuration items to be reviewed; data required to perform the review; how open actions are tracked; defining success criteria; and providing for formal certification of the audit. The plan shall also define extent of contractor and government participation in the review.

DRD Continuation Sheet

TITLE: Functional Configuration/Physical Configuration Audit Documentation **DRD NO.**: **1163CM-002**

DATA TYPE: 3 **PAGE**: 2/4

15. **DATA PREPARATION INFORMATION (CONTINUED)**:

d. Minutes - The minutes shall contain a description of the audit with sufficient detail to enable the audit to be made a matter of record. The minutes shall include the presentation charts, a listing of Findings, action items with actionee and suspense (closure) data, and identification of the documents which describe the approved baseline established at the conclusion of the PCA. See Attachment 2 for distribution and availability of data.

e. Findings - showing action items, actionees, suspense dates and closure status shall be submitted. See Attachment 2 for distribution and availability of data.

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

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

Configuration Audit Required Data

Documentation required for FCA
(As applicable)

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

Documentation required for the PCA
(As applicable)

- Final version of all specifications.
- Product drawings and parts list.
- Configuration accounting and status reports.
- Final version of all software documents.
- Final version of software version description document.
- Copy of all FCA findings for each CI.
- List of approved and outstanding ECPs and DARs.
- Copies of ECPs and DARs as requested at the audit.
- Drawing and specification tree.
- Indentured parts list/as-designed configuration definition.
- As run test procedures (when applicable, include any test discrepancy records).
- Copy of parts tags or verification closure for verification items verified by inspection method.
- Manufacturing and inspection (build) records.
- Inspection records or inspection verification closures.
- As-built electronic data.
- Discrepancy Reports (DR's).
- Log Books.

ATTACHMENT 2

FCA/PCA Documentation
Distribution and Availability of Data

Document	Data Type	FCA Copies/Availability	PCA Copies/Availability
Agenda	2	One/15 days prior to audit, Approved copies at audit	One/15 days prior to audit, Approved copies at audit
Data Package	3	One/Two weeks prior to audit	One /Two weeks prior to audit
Presentation Charts	3	One for each attendee at audit	One for each attendee at audit
Minutes	2	One at audit/ copy to each attendee within two weeks	One at audit/one to each attendee within two weeks
Findings (generated at Reviews)	2	Provided as hard copy or electronically per the project specific Audit Plan.	Close out to be as specified in the project specific Audit Plan.

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163LS-001**
3. **DATA TYPE**: 2
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/1
6. **TITLE**: Government Property Management Plan
7. **DESCRIPTION/USE**: To describe the method of controlling and managing Government property and materials.
8. **OPR**: AS41
9. **DM**: ES01
10. **DISTRIBUTION**: Cognizant property administrator
11. **INITIAL SUBMISSION**: Preliminary three months after Authority to Proceed (ATP)
12. **SUBMISSION FREQUENCY**: Final one year after ATP, revise as required
13. **REMARKS**: This document shall be the official contract requirements document for the control and identification of all Government property.
14. **INTERRELATIONSHIP**: PWS paragraph 1.2.2
15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Government Property Management Plan defines the contractor's methods of care, accounting, and control of Government property and materials.

15.2 **APPLICABLE DOCUMENTS**:

FAR	*Federal Acquisition Regulation, Part 45*
NPR 5100.4B	*Federal Acquisition Regulation Supplement, (NASA/FAR Supplement) Part 18-45* and latest revisions thereto

15.3 **CONTENTS**: The Government Property Management Plan shall satisfy the requirements of the documents listed in 15.2, and the contract. This plan shall consist of those procedures which constitute the contractor's property management system and shall include the following categories:

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

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

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

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163MA-001**
3. **DATA TYPE**: 1
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/1
6. **TITLE**: Management Plan

7. **DESCRIPTION/USE**: To provide a description of the contractor's overall management system and organization for accomplishing the requirements set forth in the contract.

8. **OPR**: ES01 9. **DM**: ES01

10. **DISTRIBUTION:** Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: Thirty (30) days after Authority to Proceed (ATP), (including phase-in period)

12. **SUBMISSION FREQUENCY**: Revise as required

13. **REMARKS**:

14. **INTERRELATIONSHIP**: PWS paragraph 1.1

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Management Plan shall describe the contractor's concept plans, practice, and approach for accomplishing the requirements set forth in the contract, i.e., managing and controlling project tasks, experimental work, and management interfaces. The plan shall be in such detail as necessary to convey the contractor's internal procedures.

15.2 **APPLICABLE DOCUMENTS**: None

15.3 **CONTENTS**: The Management Plan shall include:

a. Description of the project tasks to be accomplished and an outline of methods by which the contractor proposes to accomplish each task down to the level III WBS task level.
b. Description of management concepts, plans, project management and task/control systems, organizational approach, and communication channels between the contractor and the Government. This shall include descriptions, flow charts, schedules, and other documentation necessary to give a comprehensive plan of organization and accomplishment.
c. Receiving, estimating and processing customer orders through the fabrication and assembly of Research and Development (R&D) Space Flight and Associated Hardware.
d. Issuing, receiving, and controlling work done by subcontractor(s) to augment the fabrication and assembly capability.
e. Fabrication process planning and production control (which includes scheduling and monitoring shop work loads, expediting hardware and status of work orders).
f. Description of how outside/commercial work will be solicited, procured, managed, and scheduled. Description of how cost to customer is determined.

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

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

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163MA-002**
3. **DATA TYPE**: 1
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/1
6. **TITLE**: Task Order Plan (TOP)

7. **DESCRIPTION/USE**: To provide a plan that satisfies the requirements set forth in a Task Order Request.

8. **OPR**: ES01 9. **DM**: ES01

10. **DISTRIBUTION:** Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: Draft submitted within Five (5) days of Task Order Request (TOR) or modification request of an existing Task Order Plan

12. **SUBMISSION FREQUENCY**: Five (5) days of Task Order Request (TOR) or modification request of an existing Task Order Plan

13. **REMARKS**:

14. **INTERRELATIONSHIP**: PWS paragraph 1.1.1

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Task Order Plan contains the elements of documentation necessary to determine the contractor's understanding of the requirements set forth in the Task Order Request.

15.2 **APPLICABLE DOCUMENTS**: None

15.3 **CONTENTS**: The Task Order Plan shall include:

a. Contract Number.
b. Task Order Title.
c. Task Order Plan Number.
d. Period of Performance.
e. PR Number.
f. Task Manager.
g. Task Order Lead (contractor).
h. Task Order Description.
i. Technical Approach (including required input, guidelines and assumptions).
j. Discussion of skills required.
k. Special tools required.
l. Milestones and Deliverables.
m. Schedule.
n. Special considerations (recruiting, consulting, etc.).

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

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

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163MA-003**
3. **DATA TYPE**: 3
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/1
6. **TITLE**: Financial Management Report (533M)

7. **DESCRIPTION/USE**: To provide monthly financial reports for monitoring program costs. The 533 reports are the official cost documents used at NASA for cost type, price redetermination, and fixed price incentive contracts.

8. **OPR**: CS40 9. **DM**: ES01

10. **DISTRIBUTION**: Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: Within 30 days after the incurrence of cost

12. **SUBMISSION FREQUENCY**: No later than 10 working days following the end of the contractor's accounting month

13. **REMARKS**:

14. **INTERRELATIONSHIP**: PWS paragraph 1.4

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Financial Management Report provides data on accumulated costs and funding projections for management of the contract.

15.2 **APPLICABLE DOCUMENTS**:

NFS 1852.242-73	*NASA Contractor Financial Management Reporting*, (November 2004)
NPR 9501.2D	*NASA Contractor Financial Management Reporting*

15.3 **CONTENTS**: The elements of cost for financial reporting shall be mutually agreed by the contractor and NASA project office and cover labor hours by function, direct labor cost, materials, subcontracts, interdivisional work, other direct rates, overhead by pool, fringe, G&A, and fee. Changes or additions to elements of cost shall be by mutual agreement between the contractor and the NASA project manager. The data contained in the reports shall be auditable using Generally Accepted Accounting Principles. The 533M Report shall include actuals and projections at the total contract level. A summary page at the contract level shall be included reflecting the cumulative since inception cost for the contract. The 533 shall list all costs by Employee & PWS/WBS.

15.4 **FORMAT**: The NASA Form 533M shall be prepared per NPR 9501.2D and NFS 1852.242-73. Contractor format is acceptable provided all necessary requirements are met. Electronic submission of contractor data is strongly encouraged.

15.5 **MAINTENANCE**: None required

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163MA-004**
3. **DATA TYPE**: 3
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/2
6. **TITLE**: Monthly Status Reports

7. **DESCRIPTION/USE**: To provide visibility to contractor and MSFC project management of actual and potential problems and progress toward meeting the cost, technical and schedule requirements.

8. **OPR**: ES01 9. **DM**: ES01

10. **DISTRIBUTION**: Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: First calendar month following the end of the first full month after Authority to Proceed (ATP), unless otherwise specified by the Contracting Officer

12. **SUBMISSION FREQUENCY**: 10 days following the end of each month

13. **REMARKS**:

14. **INTERRELATIONSHIP**: PWS paragraph 1.1.4

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Monthly Status Reports provides data for the assessment of monthly cost, technical and schedule progress and summarizes the results of the entire contract work.

15.2 **APPLICABLE DOCUMENTS**: None

15.3 **CONTENTS**: The Monthly Status Reports shall contain:

a. Work accomplished for current reporting period, including a report of overall cost, technical and schedule performance.
b. Cost breakdown spreadsheet providing all cost information by employee:
    1. Employee Name.
    2. PWS/WBS supported for each Employee PWS/WBS combination:
        (a) Hours on each PWS/WBS.
        (b) Overtime hours for each PWS/WBS.
        (c) Base Cost for hours.
        (d) Base Costs to government.
        (e) Overtime Costs to government.
        (f) Travel charged to government.
        (g) Training charged to government.
        (h) Procurement charged to government for PWS/WBS.
c. Work planned for next reporting period.
d. Current problems which impede performance or impact schedule or cost, and proposed corrective action.
e. Other information that assist the Government in evaluating the contractor's cost, technical and schedule performance, e.g., innovative processes and cost reduction initiatives.
f. Man-hours expended and cost in each Level I and II task per WBS for the current months and cumulative months, showing overtime hours separately.
g. Personnel statistical information, numbers by functional assignments, etc.
h. Provide minutes for each of the reviews that include copies of all presentation charts (including back-up charts). Minutes shall be signed by the Contractor and MSFC.
i. The Final Report shall contain an overview of the entire contract effort.
j. Additional requirements may be imposed within a Task Order for delivery to the Task Manager.

DRD Continuation Sheet

TITLE: Monthly Status Reports **DRD NO.**: **1163MA-004**

DATA TYPE: 3 **PAGE**: 2/2

15. **DATA PREPARATION INFORMATION (CONTINUED)**:

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

15.5 **MAINTENANCE**: None required

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163MA-005**
3. **DATA TYPE**: 3
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/1
6. **TITLE**: Badged Employee and Remote IT User Listing

7. **DESCRIPTION/USE**: To assist NASA in conducting contractor floor checks and to determine if the employees meet the minimum background investigation requirements.

8. **OPR**: AS50 9. **DM**: ES01

10. **DISTRIBUTION**: Per Contracting Officer's letter. One copy each shall go to MSFC's Protective Services Office and Facilities Planning and Business Management Office.

11. **INITIAL SUBMISSION**: No later than 10 working days after Authority to Proceed (ATP), (including phase-in period)

12. **SUBMISSION FREQUENCY**: Formal update quarterly and email changes as personnel changes occur to distribution. If deemed necessary by the Contracting Officer, the contractor shall submit the list at times other than stated.

13. **REMARKS**: Reference is made to Federal Acquisition Regulation (FAR) Clause, FAR 52.215-2, *Audit and Records--Negotiations* (June 1999), NPR 1600.1, *NASA Security Program Procedural Requirements*.

14. **INTERRELATIONSHIP**: PWS paragraph 1.2.7

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Badged Employee and Remote IT User Listing provides NASA with a list of all MSFC badged contractor employees, as well as, any contractor remote IT users who will have access to the MSFC IT system.

15.2 **APPLICABLE DOCUMENTS**: None

15.3 **CONTENTS**: The Badged Employee and Remote IT User Listing shall include the following information for each employee: employee's full name (first and middle names must be birth names), last four digits of the Social Security Number (SSN), date of birth, place of birth, duty position, duty location (building/room number), shift assignment, and supervisor's name. Additionally, if applicable, the type of security background check already completed (NACLC or SSBI) and the date it was completed.

15.4 **FORMAT**: Contractor format using Excel Spreadsheet is acceptable.

15.5 **MAINTENANCE**: None required

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163MA-006**
3. **DATA TYPE**: 3
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/1
6. **TITLE**: Contractor Employee Clearance Document
7. **DESCRIPTION/USE**: To ensure that badged contractor employees who no longer require Center access properly clear all accounts when the access is no longer needed.
8. **OPR**: AS50 9. **DM**: ES01
10. **DISTRIBUTION**: Per Contracting Officer's letter
11. **INITIAL SUBMISSION**: Immediately when the access is no longer needed
12. **SUBMISSION FREQUENCY**: As required
13. **REMARKS**:
14. **INTERRELATIONSHIP**: PWS paragraph 1.1.5
15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Contractor Employee Clearance Document provides verification that all badged employees have properly cleared all accounts when the access is no longer needed.

15.2 **APPLICABLE DOCUMENTS**: None

15.3 **CONTENTS**: The Contractor Employee Clearance Document shall contain all the information required by MSFC Form 383-1.

15.4 **FORMAT**: MSFC Form 383-1, “Contractor Employee Clearance Document”.

15.5 **MAINTENANCE**: None required

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163MA-007**
3. **DATA TYPE**: 3
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/1

6. **TITLE**: Position Risk Designation for Non-NASA Employee

7. **DESCRIPTION/USE**: To ensure that contractor employees are screened to an appropriate risk determination in accordance with NPR 1600.1, *NASA Security Program Procedural Requirements*, Chapter 4.

8. **OPR**: AS50 9. **DM**: ES01

10. **DISTRIBUTION**: Per Contracting Officer's letter. One copy shall go to MSFC Protective Services Office.

11. **INITIAL SUBMISSION**: No later than 10 working days after Authority to Proceed (ATP), (including phase-in period)

12. **SUBMISSION FREQUENCY**: Update as personnel or position changes occur

13. **REMARKS**:

14. **INTERRELATIONSHIP**: PWS paragraph 1.1.6

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Position Risk Designation for Non-NASA Employee provides information necessary to determine the type of investigation required and how closely an individual is screened for a position.

15.2 **APPLICABLE DOCUMENTS**:

NPR 1600.1 *NASA Security Program Procedural Requirements*

15.3 **CONTENTS**: The Position Risk Designation for Non-NASA Employee shall contain all the information required by NASA Form 1760 in accordance with NPR 1600.1, NASA Security Program Procedural Requirements.

15.4 **FORMAT**: NASA Form 1760, "Position Risk Designation for Non-NASA Employee", or as may otherwise be directed by the Contracting Officer.

15.5 **MAINTENANCE**: None required

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163MA-008**
3. **DATA TYPE**: 3
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/2
6. **TITLE**: Monthly and Semi-Annually Performance Reports

7. **DESCRIPTION/USE**: To provide visibility to contractor and MSFC technical monitor of actual and potential problems toward meeting established performance measurements in estimating, product delivery dates and quality of products.

8. **OPR**: ES01 9. **DM**: ES01

10. **DISTRIBUTION**: Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: First calendar month following the end of the first full month after Authority to Proceed (ATP), unless otherwise specified by the Contracting Officer.

12. **SUBMISSION FREQUENCY**: Monthly: 10 days following the end of each month. Semi-Annually: 10 days following the end of the reporting period.

13. **REMARKS**:

14. **INTERRELATIONSHIP**: PWS paragraph 2.4

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Monthly and Semi-Annually Performance Reports provides data for the assessment of monthly customer orders and summarizes the performance results of PWS 2.4.

15.2 **APPLICABLE DOCUMENTS**: None

15.3 **CONTENTS**: The Monthly and Semi-Annually Performance Reports shall include:

a. The first monthly report shall contain:
   1. Customer Order Number.
   2. Metric (Fixed Cost, Delivery w/Fixed Cost, Actuals).
   3. Order Date.
   4. Original Promised Date.
   5. Actual Completion Date.
   6. Duration.
   7. Days Early – Days Late.
   8. Hours Estimated.
   9. Actual Hours.
   10. Hours Deviation.
   11. % Deviation.
   12. Description of Customer Order.

b. The second monthly report shall contain:
   1. Identified jobs (by Customer Order) receiving a Non-Conformance.
   2. Number of total jobs completed during the month.
   3. Percentage of Non-conformance versus total jobs for the month (per job and hours).
   4. Identify jobs that receive “Rework”.
   5. Identify jobs that receive “Use As Is”.
   6. Identify jobs that receive “Scrap”.
   7. Identified Non-Conformance job’s original hours to complete.
   8. Number of hours to correct Non-Conformance (even if “Scrapped”).
   9. Percentage of correction versus original total hours.

c. The Semi-Annually Report shall contain a summary of first and second monthly reports.

DRD Continuation Sheet

TITLE: Monthly and Semi-Annually Performance Reports **DRD NO.**: **1163MA-008**

DATA TYPE: 3 **PAGE**: 2/2

15.3 **DATA PREPARATION INFORMATION (CONTINUED)**:

15.4 **FORMAT**: Microsoft Excel shall be utilized.

15.5 **MAINTENANCE**: None required

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C 2. **DRD NO.**: **1163MA-009**
3. **DATA TYPE**: 2 4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/2

6. **TITLE**: Organizational Conflict of Interest (OCI) Avoidance Plan

7. **DESCRIPTION/USE**: To demonstrate to the Government that the Contractor will mitigate organizational conflicts of interest and ensure that the contractor provides unbiased, impartial advice and adequately protects sensitive data.

8. **OPR**: PS21 9. **DM**: PS21

10. **DISTRIBUTION**: Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: 10 working days following Authority to Proceed (ATP) (including phase-in period)

12. **SUBMISSION FREQUENCY**: Update as required

13. **REMARKS**: Reference is made to Contract Clauses H.2, *Limitation of Future Contracting (NFS 1852.209-71*, H.3, *Organizational Conflicts of Interest*, I.7, *Access to Sensitive Information (NFS 1852.237-72)*, and I.8, *Release of Sensitive Information (NFS 1852.237-73).*

14. **INTERRELATIONSHIP**: PWS paragraph 1.1

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Organizational Conflicts of Interest Avoidance Plan demonstrates that no organizational conflict of interest exists or that any such potential conflicts have been adequately avoided or mitigated with any prime contractor or subcontractor performing or planning to propose on design, development, and/or delivery of space flight hardware, software, mission integration services or other critical systems related to MSFC. The Contractor should not assume that government performance of a contracted task is a form of mitigation.

15.2 **APPLICABLE DOCUMENTS**: None

15.3 **CONTENTS**: The Organizational Conflict of Interest Avoidance Plan shall include the following:

a. Organizational conflicts of interest pertaining to impaired objectivity shall be addressed as follows:
   1. Describe the nature of the conflict including any business relationships that might create a conflict with the performance of the work statement
   2. Describe the plan for avoiding, neutralizing, or mitigating the conflict, including the following with regard to subject matter experts/technical experts if applicable:
      (a) That the management reporting chains between this contract and the work performed by the subject matter experts/technical experts for the conflicting business relationship are separated from each other.
      (b) That the subject matter experts/technical experts when performing under this contract are physically separated from the portion of the company performing the work for the conflicting business relationships.
      (c) That each subject matter expert/technical expert performing under this contract signs an express, binding, written agreement setting forth all responsibilities and duties to avoid organizational conflicts of interest and to protect sensitive data provided under this order.
      (d) That techniques are in place to ensure that the contractor shall not favor the conflicting business relationships and will avoid the appearance of conflicts of interest.

DRD Continuation Sheet

TITLE: Organizational Conflict of Interest (OCI) Avoidance Plan **DRD NO.**: **1163MA-009**
DATA TYPE: 2 **PAGE**: 2/2

15. **DATA PREPARATION INFORMATION (CONTINUED)**:

b. With regard to access to nonpublic information, the avoidance plan shall contain a plan to safeguard all proprietary/sensitive data the contractor (including all employees and subject matter experts/technical experts) receives. This plan shall include:

1. A provision that the contractor shall not disclose or improperly use the proprietary/sensitive data received or accessed under this contract.
2. A provision that information, whether in hard copy or on electronic media, shall be marked, handled, stored, and destroyed in order to preclude an unauthorized disclosure of information.
3. A provision that information technology shall be protected to prevent unauthorized disclosure of information.
4. A provision that employees performing the effort must sign an express binding written agreement clearly agreeing to protect sensitive data.
5. A requirement that subcontractors have appropriate OCI avoidance procedures in place for the use of subject matter experts.
6. A requirement for periodic self-audits, the results of which shall be made available to the Government.
7. Initial and periodic refresher OCI training for the contractor employees/experts working on this contract.
8. A description of organizational and employee sanctions for violation of the OCI order clause or OCI Avoidance Plan provisions.
9. Provisions on record keeping requirements regarding OCI (e.g., training, written agreements). The contractor shall make these records available to and cooperate with any neutral third party the Government assigns to review adherence to their OCI mitigation plan.
10. A provision requiring the contractor to report any real, apparent, or potential conflict of interest that may arise to the Contracting Officer.
11. A provision requiring the contractor to update the OCI Avoidance Plan upon occurrence of any event that will cause a change to the plan.

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

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

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163MA-010**
3. **DATA TYPE**: 3
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/1

6. **TITLE**: Monthly Calibration Services Reports

7. **DESCRIPTION/USE**: To provide the Government insight into contractor performance in all areas of the contract and identify existing or potential problems.

8. **OPR**: ET02 9. **DM**: ES01

10. **DISTRIBUTION**: Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: First calendar month following the end of the first full month after Authority to Proceed (ATP), unless otherwise specified by the Contracting Officer.

12. **SUBMISSION FREQUENCY**: 10 days following the end of each month

13. **REMARKS**:

14. **INTERRELATIONSHIP**: PWS paragraph 3.6

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Monthly Calibration Services Reports provides data for the assessment of Calibration Services.

15.2 **APPLICABLE DOCUMENTS**: None

15.3 **CONTENTS**: The Monthly Calibration Services Reports shall contain the following as a minimum:

a. Government Authorized Priority: number of items performed over User Requested Due Date.
b. Outsourced Calibration Services: number of items performed over "total" of 20 business days Total = Cal lab receipt to vendor + receipt from vendor to customer.
c. Number of Outsourced Calibration Services items over 45 and 60 calendar days.
d. Calibration Content.
e. Work Order Number.
f. Equipment Control Number (ECN).
g. Date Arrived at Calibration Laboratory.
h. Estimated Completion Date.
i. Actual Completion Date.
j. Days Early/Days Late.

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

15.5 **MAINTENANCE**: None required

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163MA-011**
3. **DATA TYPE**: 3
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/1

6. **TITLE**: Monthly Valve and Component Shop (V&CS) Services Report

7. **DESCRIPTION/USE**: To provide Government insight into contractor performance in all areas of the TOR and existing or potential problems at the V&CS.

8. **OPR**: ET02 9. **DM**: ES01

10. **DISTRIBUTION:** Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: Thirty (30) days after Authority to Proceed (ATP)

12. **SUBMISSION FREQUENCY**: Revise as required

13. **REMARKS**:

14. **INTERRELATIONSHIP**: PWS paragraph 3.16

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Monthly Valve and Component Shop (V&CS) Services Report provides data for the assessment of V&CS for quality and timeliness.

15.2 **APPLICABLE DOCUMENTS**: None

15.3 **CONTENTS**: The Monthly Valve and Component Shop (V&CS) Services Report shall contain:

a. Listing of any quality discrepancies and status.
b. Timeliness of components that was refurbished and/or repaired.
c. Man-hours expended for month and cumulative months, showing overtime hours separately.

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

15.5 **MAINTENANCE**: None required

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163QE-001**
3. **DATA TYPE**: 1
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/2
6. **TITLE**: Quality Management System Plan

7. **DESCRIPTION/USE**: To define the contractor's planned methods for accomplishing the applicable tasks required to satisfy the quality requirements of NPD 8730.5 for the specific products and engineering technical support being procured.

8. **OPR**: QD40 9. **DM**: ES01

10. **DISTRIBUTION**: Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: Four (4) months after Authority to Proceed (ATP), (including phase-in period)

12. **SUBMISSION FREQUENCY**: Revise as required to address new or changed Task Orders with submission as agreed upon through the COTR.

13. **REMARKS**: A copy of the current Quality System Manual will be provided to the Contractor upon contract award

14. **INTERRELATIONSHIP**: PWS paragraph 1.1.7

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Quality Management System Plan shall identify, as applicable, the specific quality management system activities related to the procurement of materials/subcomponents, fabrication, assembly, and engineering technical support and services to assure the quality of the products delivered. The plan(s) will reference the contractor's quality manual and procedures as necessary to fully describe the contractor's quality system. Quality planning can be prepared as a single plan or a top level plan with separate task level planning, or any combination thereof. Updates to planning shall be addressed for any additional tasks added to the contract or for any changes if required.

15.2 **APPLICABLE DOCUMENTS**:

ANSI/NCSL Z540	*Government Approved Release*
NPD 8730.1	*Metrology and Calibration*
NPD 8730.5	*NASA Quality Assurance Program Policy*
NPR 8735.2	*Management of Government Safety and Mission Assurance Surveillance Functions for NASA Contract*
MPR 8730.5	*Control of Inspection, Measuring, and Test Equipment*
SAE AS9100	*Quality Management Systems - Aerospace – Requirements*

15.3 **CONTENTS**: The Quality Management System Plan shall include the following:

1. Each quality element of SAE AS9100 (excluding Section 7.3 "Design and Development") shall be addressed to describe the philosophy and approach for implementation of the quality management system. This can be satisfied by contractor's existing quality manual and procedures. The only exceptions allowed will be processes noted in Section 7 of SAE AS9100 and as specified in the contract Performance Work Statement (PWS) and/or in each task agreement. A copy of the Quality System Manual and 1st tier procedures shall be submitted with any required quality plan. As a minimum, the subparagraphs below shall be addressed by the quality plan to include details of responsibilities and controls to adequately describe the specific quality assurance and personnel resource activities related to hardware and technical support being procured by MSFC:
   a. NASA MSFC Performance Work Statement (PWS) Activities – describe how hardware specific quality requirements imposed by contract or component/equipment specification will be assured (i.e., traceability requirements, specific inspection points, specific quality activities).

DRD Continuation Sheet

TITLE: Quality Management System Plan **DRD NO.**: **1163QE-001**
DATA TYPE: 1 **PAGE**: 2/2

15. **DATA PREPARATION INFORMATION (CONTINUED)**:

b. Responsibilities – describe which contractor organizations will be responsible to perform the applicable quality management system activities which need to include how the Contractor will support the MSFC requirements specified in the Contract Surveillance Plan (Reference NPR 8735.2).

c. Article, Material, and Service Controls - describe the level of article, material, and service control including traceability requirements invoked by the contractor for the articles, materials, and/or services used in or performed as part of the hardware design and maintenance criteria, including how quality is assured for each material, part, assembly, and/or service performed.

d. Procurement – include the procurement quality requirements for all materials/parts/ components the contractor purchases. Define the level of control exercised over the suppliers including how suppliers are monitored, and maintained with controls for supplier non-conformances processing in reference to the requirements in section 4.2 of the PWS.

e. Milestone Reviews – describe how the contractor's quality system will support milestone reviews as requested by MSFC.

f. Configuration Assurance – describe how the configuration of the hardware build is compared and verified to the approved design baseline drawings and specifications as requested by NASA. Describe how the configuration of Government Furnished Property/Equipment is maintained.

g. Special Process Controls – describe special process controls implemented for in-house processes and, if applicable, for sub-tier supplier processes. Controls will include required training, certification, and maintenance of competency for technical personnel.

h. Inspection and Test (describe who will be responsible to perform inspections to include any limitations) – include: how the quality of purchased items is validated at receiving inspection or at sub-tier suppliers facilities, specific in-process (manufacturing) inspections performed, details of final inspection and pre-ship inspections.

i. Nonconformance Processing - describe how nonconformance will be documented and dispositioned as specified in the PWS, section 4.2.

j. Record retention – for those records not delivered to MSFC, specify which records are required to be kept, who keeps them, for how long, and how they are to be dispositioned at the end of the retention period, and/or as specified in the contract.

k. Personnel training and competency processes will need to be specified for all personnel who affect products and technical support delivered on this contract. Resources for training to the requirements of this contract, specified by special processes, will be provided by MSFC. Contractor training management communication with MSFC will need to be specified to assure adequate resources to maintain special process personnel competency.

2. In addition to the requirements in 15.3, paragraph 1, each quality element of the Government approved release of ANSI/NCSL Z540 as defined by NPD 8730.1, the roles and responsibilities of MPR 8730.5 shall be addressed to describe the philosophy and approach for implementation. A copy of the Calibration Quality Manual shall be submitted.

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

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

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163QE-002**
3. **DATA TYPE**: 3
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/1
6. **TITLE**: Deficiency Corrective and Preventive Action Report

7. **DESCRIPTION/USE**: To provide the Government with the corrective and preventive actions taken by the contractor to track the identification and resolution of an identified deficiency in the Calibration Facility or Valve & Component Shop. A deficiency is defined as any rework (to include data), customer complaints, or any issue that impacts quality, schedule, or cost.

8. **OPR**: ET02 9. **DM**: ES01

10. **DISTRIBUTION:** Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: Fist calendar month following the end of the first full month after Authority to Proceed (ATP), unless otherwise specified by the Contracting Officer.

12. **SUBMISSION FREQUENCY**: Monthly: 10 days following the end of each month. Semi-Annually: 10 days following the end of the reporting period.

13. **REMARKS**:

14. **INTERRELATIONSHIP**: PWS paragraph 3.6

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Deficiency Corrective and Preventive Action Report applies to all identified deficient processes, products, and services provided by the Calibration Facility or Valve and Component Shop.

15.2 **APPLICABLE DOCUMENTS**: None

15.3 **CONTENTS**: The Deficiency Corrective and Preventative Action Report shall include as a minimum:
- a. The deficiency.
- b. Assignment of responsibility for correcting the problem.
- c. Corrective Action.
- d. Preventative Action.

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

15.5 **MAINTENANCE**: None required

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163RM-001**
3. **DATA TYPE**: 1
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/1
6. **TITLE**: Reliability Centered Maintenance (RCM) Plan

7. **DESCRIPTION/USE**: To provide a description of the contractor's Reliability Centered Maintenance (RCM) plan and implementation schedule for accomplishing these requirements for the Calibration Facility and Valve & Component Shop.

8. **OPR**: ET02 9. **DM**: ES01

10. **DISTRIBUTION:** Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: Ninety (90) days after Authority to Proceed (ATP)

12. **SUBMISSION FREQUENCY**: Revise as required

13. **REMARKS**:

14. **INTERRELATIONSHIP**: PWS paragraph 3.6

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Reliability Centered Maintenance (RCM) Plan (which incorporates approaches such as routine maintenance, preventive maintenance, predictive maintenance, run to fail, etc.) shall describe the contractor's plan and approach for accomplishing overall maintenance requirements for the Calibration Facility and the Valve and Component Shop. The plan shall be in such detail as necessary to convey the contractor's internal procedures.

15.2 **APPLICABLE DOCUMENTS**: None

15.3 **CONTENTS**: The Reliability Centered Maintenance (RCM) Plan shall include:
a. Description of each type of maintenance plan (routine, preventive, etc.) and a method of tracking each.
b. Description of a schedule for each type of maintenance plan.

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

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

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163SA-001**
3. **DATA TYPE**: 2
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/5

6. **TITLE**: Safety, Health, and Environmental (SHE) Plan

7. **DESCRIPTION/USE**: A contractor generated document that describes the contractor's approach to assuring compliance with the Marshall Space Flight Center (MSFC) SHE core program requirements. The contractor's SHE Plan shall describe how the contractor will (1) prevent employee fatalities, (2) reduce the number of incidents, (3) reduce the severity of employee injuries and illnesses, and (4) protect the environment through the ongoing planning, implementation, integration and management control of the contractor's industrial safety, occupational health, and environmental program in accordance with NFS 1852.223-73.

8. **OPR**: AS10/QD12 9. **DM**: ES01

10. **DISTRIBUTION**: Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: Detailed Draft with proposal

12. **SUBMISSION FREQUENCY**: Ten days after Authority to Proceed (ATP) (including phase-in period); update as required

13. **REMARKS**:

14. **INTERRELATIONSHIP**: NFS 1852.223-70, *Safety and Health;* NFS 1852.223-73, *Safety and Health Plan*; NFS 1823.570, *Drug-and alcohol-free workforce*; FAR 52.223-3, *Hazardous Material Identification and Material Safety Data*; FAR 52.223-4, *Recovered Material Certification*; FAR 52.223-5, *Pollution Prevention and Right-to-Know Information*; FAR 52.223-7, *Notice of Radioactive Materials*; FAR 52.223-9, *Estimate of Percentage of Recovered Material Content for EPA-Designated Products*; FAR 52.223-10, *Waste Reduction Program*; FAR 52.223-11, *Ozone Depleting Substances*; FAR 52.223-12, *Refrigeration Equipment and Air Conditioners*; FAR 52.223-13, *Certification of Toxic Chemical Release Reporting*; and FAR 52.223-14, *Toxic Chemical Release Reporting*. DRD 1163SA-003, *Mishap and Safety Statistics Report*. PWS paragraph 1.3

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Safety, Health, and Environmental Plan describes the contractor's methods of planning, implementing and controlling industrial safety, occupational health, and environmental requirements to ensure compliance with the MSFC SHE program over the duration of this contract.

15.2 **APPLICABLE DOCUMENTS**: Code of Federal Regulations (CFR) and listed consensus standards are applicable to all contracts to the extent specified in the contract. NASA and MSFC documents are applicable to all contracts performed onsite to extent specified in the contract.

29 CFR Part 1910	*Department of Labor; Occupational Safety and Health Administration Standards for General Industry*
29 CFR Part 1926	*Department of Labor; Occupational Safety and Health Administration Standards for Construction Industry*
CFR Title 40 Parts 1-1068	*Protection of Environment*
ANSI Standards applicable to the scope of this contract	
NFPA Standards	*National Fire Codes*
NASA-STD-8719.11	*Safety Standard for Fire Protection*
NPR 3792.1	*Plan for a Drug-Free Workplace*
NPR 8715.3	*NASA General Safety Program Requirements*
MPR 1040.3	*MSFC Emergency Plan*
MPD 1800.1	*MSFC Smoking Policy*
MPR 1800.1	*Bloodborne Pathogens*
MPR 1800.2	*MSFC Ergonomics Program*

DRD Continuation Sheet

TITLE: Safety, Health, and Environmental (SHE) Plan **DRD NO.**: **1163SA-001**
DATA TYPE: 2 **PAGE**: 2/5

15. **DATA PREPARATION INFORMATION (CONTINUED)**:

MPR 1810.1	*MSFC Occupational Medicine*
MPD 1840.1	*MSFC Environmental Health Program*
MPR 1840.1	*MSFC Confined Space Entries*
MPR 1840.2	*MSFC Hazard Communication Program*
MPD 1840.3	*MSFC Respiratory Protection Program*
MPR 1840.3	*MSFC Hazardous Chemicals in Laboratories Protection Program*
MPR 1840.4	*MSFC Asbestos Program*
MPD 1860.2	*Radiation Safety Program*
MPR 1860.2	*Nonionizing Radiation Safety*
MPR 3410.1	*Training*
MWI 3410.1	*Personnel Certification Program*
MPD 8500.1	*MSFC Environmental Management Policy*
MPR 8500.1	*MSFC Environmental Management Program*
MPR 8500.2	*MSFC Environmental Management System (EMS) Manual*
MWI 1810.1	*Automated External Defibrillator (AED) Program*
MWI 8540.2	*Green Purchasing Program*
MWI 8550.1	*Waste Management*
MWI 8550.2	*Storm Water Management*
MWI 8550.3	*Wastewater Compliance*
MWI 8550.4	*Air Emissions Compliance*
MWI 8550.5	*Chemical Management*
MWI 8621.1	*Mishap and Close Call Reporting and Investigation Program*
MPR 8715.1	*Marshall Safety, Health and Environmental (SHE) Program*
MWI 8715.1	*Electrical Safety Program*
MWI 8715.2	*Lockout/Tagout Program*
MWI 8715.3	*Hazard Identification & Warning System*
MWI 8715.4	*Personal Protective Equipment (PPE) and Systems*
MWI 8715.5	*Area/Building Manager Program*
MWI 8715.9	*Occupational Safety Requirements for MSFC Contractors*
MWI 8715.10	*Explosives, Propellants, & Pyrotechnics Program*
MWI 8715.11	*Fire Safety Program*
MWI 8715.12	*Safety, Health, and Environmental-Finding Tracking System (SHEtrak)*
MWI 8715.13	*Safety Concerns Reporting System (SCRS)*
MWI 8715.15	*Operational Safety Assessment Program*
MPD 8900.1	*Medical Operations Responsibilities for Human Space Flight Programs* (NOTE: This document only applies to Space Station contracts)

15.3 **CONTENTS**: The contractor's Safety, Health, and Environmental (SHE) Plan shall provide a clear description of their approach and methods for ensuring their compliance with the following five (5) MSFC SHE Core Program Requirements (CPR) and the applicable documents listed in 15.2 to the extent specified as applicable to this contracted effort.

a. Management Leadership and Employee Involvement:
   1. A description of the contractor's policy and management's commitment to (1) provide a safe and healthful workplace for personnel (i.e., employees, customers, and public), (2) protect property and the environment, and (3) ensure compliance with EPA, OSHA, NASA, MPR 8715.1 and all MSFC SHE documents listed in 15.2 that contain requirements applicable to this contracted effort.
   2. A description of how the contractor employees participate and are involved in their SHE Program (e.g., safety committees, worksite inspections, accident investigations, employee hazard reporting/ suggestion program, job hazard analysis).

DRD Continuation Sheet

TITLE: Safety, Health, and Environmental (SHE) Plan **DRD NO.**: **1163SA-001**
DATA TYPE: 2 **PAGE**: 3/5

15. **DATA PREPARATION INFORMATION (CONTINUED)**:

3. A description of how the contractor ensures managers and employees (1) are held accountable to perform their jobs/tasks in a safe and healthful manner while also protecting property and the environment and (2) fully understand their roles and responsibilities in their SHE Program. Include how these accountabilities, roles and responsibilities are flowed-down to subcontractors or teammates, when applicable.
4. A description of how the contractor conducts and documents monthly SHE awareness training and/or meetings for employees. (**NOTE:** Onsite contractors and contractors located at MAF, when applicable, shall document their monthly SHE awareness training/meeting in the MSFC Supervisors Safety Web page (SSWP).
5. A description of how the contractor conducts and documents self evaluations of their SHE Program to determine its effectiveness. Include the frequency of when the contractor conducts these self evaluations.
6. Provide the identification, by title, of the individual assigned by the contractor to be responsible for implementing the contractor's SHE program elements and designated to serve as the day-to-day SHE Point of Contact (POC) for this contracted effort.
7. A description of how the contractor ensures their SHE plan is maintained current with contract, NASA and MSFC requirements, reviewed and updated as necessary.

b. Worksite Analysis:

1. A description of how the contractor documents the identification of hazards and evaluates the risks associated with the hazards to eliminate or recommend adequate controls to reduce the hazards and risks to an acceptable safe working level. Include how this is accomplished when significant changes are made to existing operations/processes. (e.g., hazard analysis, job hazard analysis, risk assessment, safety review, and safe operating procedures). (**NOTE**: This also includes the identification, evaluation and control of health hazards for the prevention of occupational disease.)
2. A description of how each contractor supervisor conducts and documents monthly worksite safety visits and/or formal worksite safety inspections to ensure safe and healthful working conditions are maintained in the work area and employees are **not** performing their jobs/tasks/operations in an unsafe manner in accordance with MPR 8715.1 and MWI 8715.12. (**NOTE**: Onsite safety visits shall be performed once per month per supervisor and documented in the MSFC SSWP. Offsite safety inspections shall be performed as required by OSHA. Include the frequency these safety inspections are conducted offsite, when applicable.)
3. A description of how employees are allowed to report conditions that appear hazardous without fear of reprisal and to receive a timely response to eliminate the hazard. Include how these reports are documented and tracked. (**NOTE**: Onsite contractors and contractors located at MAF, when applicable, can use MWI 8715.13 as their employee reporting system.)
4. A description of how the contractor ensures all mishaps and close calls are reported, documented, and investigated to the extent necessary to determine root cause in accordance with MWI 8621.1. (Reference DRD 1163SA-003, *Mishap and Safety Statistics Report*).
5. A description of the contractor's policy to conduct post-mishap drug and alcohol testing when the initial mishap investigation provides reason to believe an employee's actions or failure to perform a required action is reasonably suspected of having caused or contributed to the mishap in accordance with NPR 3792.1, "Plan for Drug-Free Workplace." (NOTE: In the event a mishap results in a fatality or serious injury requiring immediate hospitalization, or substantial damage to property estimated to exceed $10,000 post-mishap drug and alcohol testing can be required and the results of these tests shall be provided to the MSFC Contracting Officer.)

DRD Continuation Sheet

TITLE: Safety, Health, and Environmental (SHE) Plan **DRD NO.**: **1163SA-001**
DATA TYPE: 2 **PAGE**: 4/5

15. **DATA PREPARATION INFORMATION (CONTINUED)**:

c. Hazard Prevention and Control:

1. A description of how the contractor evaluates the severity of hazards and the risk the hazards pose to employees in determining the methods of hazard prevention, elimination and control (e.g., engineering or administrative controls, safety devices, safe work practices, personal protective equipment, generation of operating plans and procedures). (**NOTE**: MSFC Industrial Safety Branch concurrence is required for all onsite hazardous procedures. At MAF the MSFC S&MA representative located at MAF provides this concurrence. MSFC requires these procedures and plans to be reviewed annually and updated as necessary.)
2. A description of how the contractor intends to fully comply with the MSFC SHE documented programs listed in 15.2 that contain requirements applicable to this contracted effort while working onsite (e.g., Personal Protective Equipment (PPE), Respiratory Protection, Hazard Communication, Confined Space Entry, Lockout/Tagout, Bloodborne Pathogens). (**NOTE**: MSFC SHE documented programs listed in 15.2 are also applicable to work conducted at MAF. Include contractor programs for work conducted offsite, when applicable.)
3. A description of the actions taken or the disciplinary policy implemented by the contractor when management or employees are discovered (1) **not** performing their jobs/tasks in a safe and healthful manner, (2) **not** protecting property or the environment, or (3) **not** complying with MSFC SHE program requirements and (4) how this is clearly communicated and equitably enforced to managers and employees. Include how these actions or disciplinary program is flowed-down to subcontractors or teammates, when applicable.
4. A description of how the contractor intends to implement an emergency management program to respond to all types of emergencies (e.g., fire, chemical spill, accidents, natural disasters) at their worksite. When contractor is located onsite include a list of emergency points-of-contact that will be onsite. (**NOTE**: Onsite contractors and contractors located at MAF, when applicable, can use MPR 1040.3 as their emergency management program.)
5. A description of how the contractor intends to provide safety, health, and environmental services that are applicable to this contracted effort if they are **not** provided by MSFC or by MAF when applicable (i.e., hazardous waste disposal, industrial hygiene monitoring, emergency medical support, hearing conservation program, respiratory protection, and hazard communication, etc.). Provide a list of services that are **not** to be provided by MSFC or by MAF when applicable.

d. Safety, Health and Environmental Training:

1. A description of how the contractor ensures each contractor employee receives initial and refresher MSFC SHE training when required. (**NOTE**: This applies to onsite contractors and contractors located at MAF.)
2. A description of how the contractor ensures each contractor employees are trained (1) to be knowledgeable of hazards in the workplace, (2) to recognize hazardous conditions, signs and symptoms of workplace-related illnesses, (3) to suspend or stop work when they notice safety, health or environmental conditions that warrant such action, (4) in safe work practices, and (5) the disciplinary actions taken when safety and health policies, procedures and rules are violated in accordance with MPR 3410.1, and MPR 8715.1.
3. A description of how the contractor evaluates each job/task/operation to ensure employees are trained to perform the specific job/task/operation they are assigned and receive specific job related training in accordance with the applicable parts of 29 CFR 1910 or 29 CFR 1926, when applicable. Include how this specific job related training required by OSHA is documented. (**NOTE**: Onsite employee and employees located at MAF, when applicable, training assessments shall be performed using the SHE Training Assessment located on the MSFC SSWP and documented in the MSFC SSWP.)
4. A description of how the contractor ensures employees receives MSFC safety certifications for all operations performed by the contractor that require a MSFC Safety Certification in accordance with MWI 3410.1, "Personnel Certification Program." (**NOTE**: Onsite contractor and contractors located at MAF, when applicable, safety certifications required by MWI 3410.1 shall be tracked in the MSFC Certification Database (CERTRAK).

DRD Continuation Sheet

TITLE: Safety, Health, and Environmental (SHE) Plan **DRD NO.**: **1163SA-001**
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15. **DATA PREPARATION INFORMATION (CONTINUED)**:

5. Provide a copy of any training developed by the contractor to the MSFC Industrial Safety Branch that is intended for use by the contractor as training for a MSFC Safety Certification required by MWI 3410.1 in lieu of MSFC provided training for approval prior to use. Provide a copy to the MSFC S&MA representative located at MAF for approval prior to use for any contractor developed training for MAF, when applicable.

e. Environmental Compliance – A description of how the contractor ensures compliance with environmental laws and regulations CFR Title 40 Parts 1-1068, Alabama Department of Environmental Management (ADEM), and MPR 8500.1 for any hazardous or toxic substances that are procured, stored, issued, used, or generated under this contracted effort by:

1. Reporting hazardous and toxic substance use in accordance with MWI 8550.5.
2. Implementing and reporting green procurements in accordance with MWI 8540.2.
3. Reducing, reusing, and recycling of hazardous and toxic substances prior to disposal in accordance with MWI 8550.1.
4. Minimizing stormwater pollution in accordance with MWI 8550.2.
5. Ensuring equipment and processes permitted by applicable laws in accordance with MWI 8550.4.
6. Disposing of solid and liquid materials as permitted by applicable laws in accordance with MWI 8550.1.

15.4 **FORMAT**: Contractor format is acceptable, but it is recommended to follow the MSFC SHE CPR order as listed in 15.3 or provide a Matrix that clearly links where each MSFC SHE CPR sub-element is addressed in the contractor's SHE Plan.

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

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163SA-002**
3. **DATA TYPE**: 1
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/2

6. **TITLE**: Personnel Certification Plan

7. **DESCRIPTION/USE**: To provide the contractor and the Government a baseline document for the identification and definition of personnel certification criteria and the procedures to be implemented by the contractor to ensure a certification program is implemented.

8. **OPR**: QD12/QD21/ED01 9. **DM**: ES01

10. **DISTRIBUTION**: Per Contracting Officer's letter

11. **INITIAL SUBMISSION**: 30 days after Authority to Proceed (ATP), (including phase-in period)

12. **SUBMISSION FREQUENCY**: Revise as required

13. **REMARKS**: Where the contractor is operating under its own quality management system and processes, manufacturing special/critical process personnel qualification/certification controls are not included in this plan, they will be documented as specified in PWS paragraph 1.1.7, DRD 1163QE-001, and contract attachment J-20, NASA MSFC Safety & Mission Assurance Surveillance Plan.

14. **INTERRELATIONSHIP**: PWS paragraphs 1.1.2 and 1.1.3

15. **DATA PREPARATION INFORMATION**:

15.1 **SCOPE**: The Personnel Certification Plan provides for training, certification, and re-certification of personnel engaged in the performance of MSFC critical processes. The purpose of a certification program is to assure that all personnel are capable of performing these MSFC critical processes and work assignments without endangering themselves, fellow employees, equipment and/or facilities. It is mandatory that these MSFC critical processes are performed by experienced and certified personnel and that test facility operations activities be performed by certified personnel.

15.2 **APPLICABLE DOCUMENTS**:

MWI 3410.1	*Personnel Certification Program*
NPR 8715.3	*NASA Safety Manual*

15.3 **CONTENTS**: The Personnel Certification Plan shall provide insight to the contractor's certification program. The plan shall include criteria which the contractor can relate directly to work classifications and the required skills, education, experience, training, and other qualifications necessary to perform work in these classifications. The contractor shall assure work performed by these classifications is performed with high quality workmanship to produce a high quality produce in a safe and efficient manner. The plan shall include the contractor methods to track these certifications. The contractor can elect to track their certifications for critical MSFC owned process in MSFC CERTRAK database in accordance with MWI 3410.1. The plan shall fulfill the requirements of the applicable documents listed in 15.2 and include the following:

a. Certification program:
   1. General:
      (a) Program description.
      (b) Program administration.
      (c) Certification duration.
      (d) Definitions.
      (e) Job description summaries.
      (f) Task assignments per job description.
      (g) Skills required per job description.

DRD Continuation Sheet

TITLE: Personnel Certification Plan **DRD NO.**: **1163SA-002**
DATA TYPE: 1 **PAGE**: 2/2

15. **DATA PREPARATION INFORMATION (CONTINUED):**

2. Certification requirements/skills:
   (a) Education.
   (b) Experience/work history.
   (c) Specialized training.
   (d) Physical condition/attitude.
3. Certification process:
   (a) Supervision responsibilities.
   (b) Certifying authority.
   (c) Formal/informal examination.
   (d) Proficiency demonstration.

b. Certification documentation.

Specific critical MSFC owned process skills requiring certification and proficiency include the following:

a. High pressure tubing fabrication and assembly.
b. Welding:
   1. Carbon steel.
   2. Stainless steel.
   3. Aluminum.
c. Control system operations.
d. Schematic drawing comprehension.
e. Other processes identified by the Statement of Work (SOW).

The following certifications, if required, are obtained in accordance with MWI 3410.1.

a. Forklift, crane and hoist operators.
b. Cryogenic and other hazardous pressure system operators.
c. Propellant & Explosive Handlers.
c. Hazardous chemical/toxic material handling.
d. Confined space entry.
e. Electrical/instrumentation cable fabrication (including test articles):
   1. Crimping.
   2. Cabling, Harnessing, and Wiring.
   3. Soldering including Surface Mount Technology (SMT).
   4. Staking and Conformal Coating.
   5. ESD Control.
f. Welding inspection and nondestructive evaluation (NDE).
   1. Penetrant Testing.
   2. Magnetic Particle Testing.
   3. Eddy Current Testing.
   4. Radiographic Testing.
   5. Thermal/Infrared Testing.
   6. Visual Testing.

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

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

DATA REQUIREMENTS DESCRIPTION (DRD)

1. **DPD NO.**: 1163 **ISSUE**: Revision C
2. **DRD NO.**: **1163SA-003**
3. **DATA TYPE**: 3
4. **DATE REVISED**: 07-23-09
5. **PAGE**: 1/3
6. **TITLE**: Mishap and Safety Statistics Reports
7. **DESCRIPTION/USE**: To provide reporting of metrics, mishaps, close calls, and serious non-occupational injuries or illnesses.
8. **OPR**: QD12 9. **DM**: ES01
10. **DISTRIBUTION**: Per Contracting Officer's letter
11. **INITIAL SUBMISSION**:
    a. **Safety Statistics** for the previous month shall be submitted by the 10th of each month after contract award to the MSFC Industrial Safety Branch. Safety statistics for work performed at Michoud Assembly Facility (MAF) shall be submitted to the MSFC Safety and Mission Assurance (S&MA) representative located at MAF.
       1. Safety statistics shall be reported using MSFC Form 4371 or an equivalent electronic notification system.
       2. Safety statistics reports shall include: contract number, subcontractors, NAISC codes, number of employees, number of supervisors, hours worked, and number of injuries including days away from work and/or first-aide cases, number of incidents involving equipment or property damage, and number of supervisors and employees up-to-date with required MSFC Safety, Health, and Environmental (SHE) Training. (SHE training is only applicable to onsite contracts.)

    b. **Initial reporting for Type A, Type B, and Type C that involves a lost time injury or illness, and any High-Visibility Close Calls)** for **ALL** contractors working **onsite** shall be reported to MSFC Industrial Safety Branch as soon as possible after initiating emergency response, but **no later than 1 hour** of occurrence or awareness. For these types of mishaps the initial notification can be made by calling the Safety Hotline (256) 544-0046 then followed up within 24 hours with an entry into the NASA Incident Reporting Information System (IRIS) by the contractor designated IRIS representative. At MAF call (504) 257-2526.

    c. **Initial reporting for Type C that does not involve a lost time injury or illness, Type D, and Low-Visibility Close Calls** for **ALL** contractors working **onsite** shall be reported to the MSFC Industrial Safety Branch as soon as possible after initiating emergency response, but **no later than 4 hours** of occurrence or awareness by:
       1. Direct input through the "SHE Report" located on the Safety, Health & Environmental (SHE) webpage located on "Inside Marshall." On the SHE webpage select the "Mishaps, Questions and Concerns" pull-down menu, then select "Report Mishaps/Close Calls/Concerns." (At MSFC this is the preferred method of reporting), or
       2. Calling the Safety Hotline (256) 544-0046, [at MAF call (504) 257-2526] or
       3. Direct input into the NASA Incident Reporting Information System (IRIS) by the contractor designated IRIS representative. Access to IRIS database can be obtained from the MSFC S&MA IRIS administrator located in the MSFC Industrial Safety Branch after contract award.

    d. **Initial reporting for Type A and B mishaps and High-Visibility Close Calls** for contractors working **offsite** shall be reported to MSFC Industrial Safety Branch as soon as possible after initiating emergency response, but **no later than 1 hour** of occurrence or awareness by calling the Safety Hotline (256) 544-0046 then followed up within 24 hours with an entry into the NASA Incident Reporting Information System (IRIS) by the contractor designated IRIS representative.
       1. If a contractor employee has any type mishap while visiting a MSFC controlled site, they shall report immediately to their site sponsor in addition to other reporting requirements.

    e. **Initial reporting for Type C and D and Low-Visibility Close Calls** for contractors working **offsite** shall be reported via the Safety Statistics Report submitted monthly.

DRD Continuation Sheet

TITLE: Mishap and Safety Statistics Reports **DRD NO.**: **1163SA-003**
DATA TYPE: 3 **PAGE**: 2/3

11. **INITIAL SUBMISSION (CONTINUED)**:

f. **Initial reports for all mishaps and Close Calls** shall provide as much information as possible, but at a minimum include the following: location and time of incident, number of fatalities, number hospitalized, type of damage, estimated cost, brief description, and contact person's name and phone number in accordance with MWI 8621.1 and NPR 8621.1.

g. **Reporting of a non-work-related fatality or serious injury or illnesses that occur to contractor employee while working onsite shall be within 24 hours** of occurrence or awareness of injury by:

1. Notifying the Contracting Officer and MSFC Industrial Safety Branch. (For contractors working offsite reporting of a non-work-related injury or illness notification is at the discretion of the family.)

h. **Follow-up reporting for ALL contractors**:

1. **Type A or B mishaps, Type C that involves a lost time injury or illness, or High-Visibility Close Calls**: Follow-up report **within 24 hours** after the initial notification through IRIS entry by the contractor designated IRIS representative, or electronic submittal to MSFC Industrial Safety Branch.
2. **Type C that does not involve a lost time injury or illness, or D mishaps, or Low-Visibility Close Calls**: Follow-up report or update **within 6 days** after the initial notification through IRIS entry by the contractor designated IRIS representative, or electronic submittal to MSFC Industrial Safety Branch.
3. **Type A, B, and Close Calls with High-Visibility Type A or B potential Investigation Mishap Board Report**: submitted after completion of investigation. Corrective Action Plan submitted upon Endorsing Official approval.
4. **All Mishaps**: Follow-up Corrective Action Plan/Status 30 days after first mishap.

i. **Safety Concerns, Hazards, and non-reportable mishaps** for contractors working **onsite** shall be reported per MPR 8715.1 and MWI 8715.13.

j. Mishaps and Close Calls that occur at MAF shall be reported within the times specified in sections a thru g to the MSFC S&MA representative located at MAF by calling (504) 257-2526.

k. Follow-up reporting for mishaps and Close Calls reported at MAF shall be reported within the times specified in section h to the MSFC S&MA representative located at MAF.

12. **SUBMISSION FREQUENCY**: Safety Statistics (MSFC Form 4371, IRIS entry, or an equivalent electronic submittal) - By the 10th of each month to MSFC Industrial Safety Branch or for work performed at MAF to the MSFC S&MA representative located at MAF. All Mishaps: Monthly Follow-up Corrective Action Plan/Status until corrective actions implemented and closure received by updating record in IRIS data base (preferred) or electronic submittal to MSFC Industrial Safety Branch or for work performed at MAF to the MSFC S&MA representative located at MAF.

13. **REMARKS**:

14. **INTERRELATIONSHIP**: DRD 1163SA-001, *Safety, Health, and Environmental (SHE) Plan*. PWS paragraph 1.3

15. **DATA PREPARATION INFORMATION:**

15.1 **SCOPE**: The Mishap and Safety Statistics Reports document all mishaps and close calls as required in NPR 8621.1.

15.2 **APPLICABLE DOCUMENTS**:

NPR 8621.1	*NASA Procedural Requirements for Mishap and Close Call Reporting, Investigating, and Recordkeeping*
MPR 8715.1	*Marshall Safety, Health, and Environmental (SHE) Program*
MWI 8621.1	*Mishap and Close Call Reporting and Investigation Program*
MWI 8715.13	*Safety Concerns Reporting System (SCRS)*

15.3 **CONTENTS**: The Mishap and Safety Statistics Reports shall contain the information required by NPR 8621.1 and MWI 8621.1.

DRD Continuation Sheet

TITLE: Mishap and Safety Statistics Reports **DRD NO.**: **1163SA-003**
DATA TYPE: 3 **PAGE**: 3/3

15. **DATA PREPARATION INFORMATION (CONTINUED)**:

15.4 **FORMAT**: The following formats or electronic equivalent shall be submitted:

a. MSFC Form 4371, "MSFC Contractor Accident and Safety Statistics" or an equivalent electronic notification system that provides all necessary information listed in a.2.
b. Mishap Board Report using the format provided in NPR 8621.1.
c. Additional Information Submittal per MWI 8621.1.

15.5 **MAINTENANCE**: None required

15.6 **DEFINITIONS**: NASA Mishap. An unplanned event that results in at least one of the following:

a. Injury to non-NASA personnel, caused by NASA operations.
b. Damage to public or private property (including foreign property), caused by NASA operations or NASA-funded development or research projects.
c. Occupational injury or occupational illness to NASA personnel.
d. NASA mission failure before the scheduled completion of the planned primary mission.
e. Destruction of, or damage to, NASA property except for a malfunction or failure of component parts that are normally subject to fair wear and tear and have a fixed useful life that is less than the fixed useful life of the complete system or unit of equipment, provided that the following are true: 1) there was adequate preventative maintenance; and 2) the malfunction or failure was the only damage and the sole action is to replace or repair that component.

Close Call. An event in which there is no injury or only minor injury requiring first aid and/or no equipment/ property damage or minor equipment/property damage (less than $1000), but which possesses a potential to cause a mishap.

High Visibility (Mishaps or Close Calls). Those particular mishaps or close calls, regardless of the amount of property damage or personnel injury, that the Administrator, Chief/OSMA, CD, AA/OIA, or the Center SMA director judges to possess a high degree of programmatic impact or public, media, or political interest including, but not limited to, mishaps and close calls that impact flight hardware, flight software, or completion of critical mission milestones.

Type A Mishap. A mishap resulting in one or more of the following: (1) an occupational injury or illness resulting in a fatality, a permanent total disability, or the hospitalization for inpatient care of 3 or more people within 30 workdays of the mishap; (2) a total direct cost of mission failure and property damage of $1 million or more; (3) a crewed aircraft hull loss; (4) an occurrence of an unexpected aircraft departure from controlled flight (except high performance jet/test aircraft such as F-15, F-16, F/A-18, T-38, OV-10, and T-34, when engaged in flight test activities).

Type B Mishap. A mishap that caused an occupational injury or illness that resulted in a permanent partial disability, the hospitalization for inpatient care of 1-2 people within 30 workdays of the mishap, or a total direct cost of mission failure and property damage of at least $250,000 but less than $1,000,000.

Type C Mishap. A mishap resulting in a nonfatal occupational injury or illness that caused any days away from work, restricted duty, or transfer to another job beyond the day or shift on which it occurred, or a total direct cost of mission failure and property damage of at least $25,000 but less than $250,000.

Type D Mishap. A mishap that caused any nonfatal OSHA recordable occupational injury and/or illness that does not meet the definition of a Type C mishap, or a total direct cost of mission failure and property damage of at least $1,000 but less than $25,000.

Offsite. Location or facility **not** owned or controlled by MSFC.

Onsite. Location or facility owned or controlled by MSFC.