SOLICITATION, OFFER AND AWARD	1. THIS CONTRACT IS A RATED ORDER ➢ UNDER DPAS (15 CFR 350)	RATING D0-C9	PAGE 1 OF 178

2. CONTRACT NO.	3. SOLICITATION NO.	4. TYPE OF SOLICITATION	5. DATE ISSUED	6. REQUISITION/PURCHASE NO.
TBD	**NNC15ZFD007R**	☐ SEALED BID (IFB) ☒ NEGOTIATED (RFP)	**April 24, 2015**	42000xxxxx

7. ISSUED BY CODE CHC

NASA Glenn Research Center
Attn: Eunice J. Adams-Sipp
21000 Brookpark Rd., MS 60-1
Cleveland, OH 44135-3127

8. ADDRESS OFFER TO *(If other than Item 7)*
SAME ADDRESS AS BLOCK 7.

NOTE: In sealed bid solicitations "offer" and "offeror" mean "bid" and "bidder"

SOLICITATION

9. Sealed offers in original and (**See Provision L.8**) copies for furnishing the supplies or services in the Schedule will be received at the place specified in Item 8, or if hand carried, (**See Provision L.15**) until **4:30 PM** local time, on May 28, 2015.

CAUTION - LATE Submissions, Modifications, and Withdrawals: See Section L, Provision No. 52.214-7 or 52.215-1. All offers are subject to all terms and conditions contained in this solicitation.

10. FOR INFORMATION CALL: ➢	A. NAME	B. TELEPHONE NO. *(NO COLLECT CALLS)*		C. EMAIL ADDRESS
	Eunice J. Adams-Sipp	AREA CODE / NUMBER **(216) 433-6644**	EXT. N/A	Eunice.J.Adams-Sipp@nasa.gov

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OFFER *(Must be fully completed by offeror)*

NOTE: Item 12 does not apply if the solicitation includes the provisions at 52.214-16, Minimum Bid Acceptance Period.

12. In compliance with the above, the undersigned agrees, if this offer is accepted within See Provision L. 15 calendar days *(60 calendar days unless a different period is inserted by the offeror)* from the date for receipt of offers specified above, to furnish any or all items upon which prices are offered at the price set opposite each item, delivered at the designated point(s), within the time specified in the schedule.

13. DISCOUNT FOR PROMPT PAYMENT ➢ *(See Section I, clause No. 52-232-8)*	10 CALENDAR DAYS %	20 CALENDAR DAYS %	30 CALENDAR DAYS %	CALENDAR DAYS %

14. ACKNOWLEDGMENT OF AMENDMENTS *(The offeror acknowledges receipt of amendments to the SOLICITATION* For offerors and related documents numbered and dated:	AMENDMENT NO	DATE	AMENDMENT NO	DATE

15. NAME AND ADDRESS OF OFFEROR	CODE	FACILITY	16. NAME AND TITLE OF PERSON AUTHORIZED TO SIGN OFFER *(Type or print)*

15B. TELEPHONE NO. *(Include area code)*	15C. CHECK IF REMITTANCE ADDRESS IS DIFFERENT FROM ABOVE – ENTER ☐ SUCH ADDRESS IN SCHEDULE	17. SIGNATURE	18. OFFER DATE

AWARD *(To be completed by Government)*

19. ACCEPTED AS TO ITEMS NUMBERED	20. AMOUNT	21. ACCOUNTING AND APPROPRIATION

22. AUTHORITY FOR USING OTHER THAN FULL AND OPEN COMPETITION
☐ 10 U.S.C. 2304(c) ( ) ☐ 41 U.S.C. 253(c) ( )

23. SUBMIT INVOICES TO ADDRESS SHOWN IN: ➢ *(4 copies unless otherwise specified)* ITEM

24. ADMINISTERED BY *(If other than Item 7)* CODE

25. PAYMENT WILL BE MADE BY CODE
NASA Shared Services Center (NSSC)
Accounting and Financial Analysis Division (AFAD) – Accounts Payable
Bldg. 1111, C. Road
Stennis Space Center, MS 39529
Email: NSSC-AccountsPayable@nasa.gov
Fax: 866-209-5415

26. NAME OF CONTRACTING OFFICER *(Type or print)*	27. UNITED STATES OF AMERICA *(Signature of Contracting Officer)*	28. AWARD DATE

IMPORTANT – Award will be made on this Form, or on Standard Form 26, or by other authorized official written notice.

PART I - THE SCHEDULE

SECTION B - SUPPLIES OR SERVICES AND PRICE/COSTS

B.1 SUPPLIES AND/OR SERVICES TO BE FURNISHED (MAY 2002)

The Contractor shall provide all resources (except as may be expressly stated in this contract as furnished by the Government) necessary to perform the requirements for Central-Process Recertification, Operations, and Maintenance (CROM) contract delineated in the Statement of Work incorporated in Section C.

(End of clause)

B.2 ESTIMATED COST AND FIXED FEE (NFS 1852.216-74)(DEC 1991)

The total estimated cost and fixed fee terms are as follows:

	30 Day Phase-In	**2 Year Base**	**Option Years**				**Total**
			(Year 3)	**(Year 4)**	**(Year 5)**		**(All Years)**
Contract Type	**FFP**	**CPFF**	**CPFF**	**CPFF**	**CPFF**		
Estimated Cost	$	$	$	$	$		$
Fixed Fee	$	$	$	$	$		$
Total Cost Plus Fee	$	$	$	$	$		$

(End of clause)

B.3 AVAILABILITY OF FUNDS (FAR 52.232-18) (APR 1984)

Funds are not presently available for this contract. The Government's obligation under this contract is contingent upon the availability of appropriated funds from which payment for contract purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this contract and until the Contractor receives notice of such availability, to be confirmed in writing by the Contracting Officer.

(End of clause)

B.4 CONTRACT FUNDING (NFS 1852.232-81) (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 $TBD. This allotment is for TBD and covers the following estimated period of performance: Two (2) Year Base and three one (1) year options.

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

(End of clause)

[END OF SECTION]

PART I - THE SCHEDULE

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STATEMENT OF WORK (GRC 52.211-106) (JULY 2014)

C.1 INTRODUCTION

The NASA Glenn Research Center (GRC) encompasses two sites: Lewis Field (LF) in Cleveland, Ohio and Plum Brook Station (PBS) in Sandusky, Ohio. The majority of the services required under this solicitation are for the GRC LF campus, but there are selected services required at GRC PBS.

GRC LF is comprised of 298 acres and includes 79 active buildings and 92 structures and systems (electrical substations, cooling towers, underground utilities, etc.). The buildings on the Center enclose a total of 2.25 million square feet of floor area which consists of Propulsion & Aerospace R&D Test Facilities (63%), Administrative Offices (27%) and Warehouse/Storage/Shop Area (10%). Currently, 70% of these facilities are 60 years old or older.

GRC PBS is comprised of 6,377 acres and includes 130 active buildings and 39 structures and systems. The buildings on the Center enclose a total of 584,000 square feet of floor area which consists of Propulsion and Aerospace R&D Test Facilities (42%), Administrative Offices (14%) and Warehouse/Storage/Shop Area (44%).

This solicitation is for a cost-plus, fixed-fee contract. The Contractor shall provide the following services located at Lewis Field; (1) the operation, maintenance and repair of the Central Process Systems (CPS) equipment, (2) the maintenance and repair of High Voltage Electrical Substations control equipment, (3) the maintenance and repair of Cryogenic Systems, and (4) the certification services for all Pressurized Vessels & Systems. At Plum Brook, the Contractor shall provide the following services (1) the maintenance and repair of Cryogenic Systems, and (2) the certification services for all Pressurized Vessels & Systems. Historic workload data for theses required services is provided in Section J Attachment J-C-1a and J-C-1b.

This Statement of Work (SOW) is structured to describe overall contract management and business requirements in Sections C.1 through C.6 and the technical requirements in Sections C.7 through C.14. Section J Attachment J-C-1c, GRC Lewis Field Real Property List, describes the buildings, structures and systems that will require services offered under contract.

C.2 SCOPE OF WORK AND SYSTEMS OVERVIEW

C-2.1 General. The Contractor shall furnish all management, labor, supervision, tools, materials, equipment, and transportation necessary to address all elements outlined within this SOW.

C-2.1.1 Latest version of NASA Policy Requirement NPR 8831.2 *Facilities Maintenance and Operations Management* is as a required document for all maintenance and repair services identified in this SOW. See link: (http://nodis3.gsfc.nasa.gov/displayDir.cfm?t=NPR&c=8831&s=2E)

C-2.1.2 Latest versions of NASA Policy Directive NPD 8710.5 *Policy for Pressure Vessels and Pressurized Systems,* (http://nodis3.gsfc.nasa.gov/displayDir.cfm?Internal_ID=N_PD_8710_005D_&page_name=main), and NASA Standard NASA-STD-8719.17 *NASA Requirements for Ground-Based Pressure Vessels & Pressurized Systems (PVS), (*http://www.hq.nasa.gov/office/codeq/doctree/871917.pdf*)* are advisory documents for all Certification services identified in the SOW.

C-2.2 Work Scopes. This contract consists of a Base Work Scope and an Indefinite Delivery, Indefinite Quantity (IDIQ) Work Scope.

C-2.2.1.1 Base Work Scope. The Base Work Scope for this contract consists of the following:

C-2.2.1.1 Contract Management (including program management, business functions, work control functions, safety, health & environmental functions, etc.) for both the Base & IDIQ Work Scopes.
C-2.2.1.2 Minor Repairs, Maintenance and Operations of the GRC LF Central Process Systems.
C-2.2.1.3 Minor Repairs, Maintenance, Operation and design modifications for the GRC LF & PBS Cryogenic Systems.
C-2.2.1.4 Minor Repairs, Maintenance of the GRC LF High Voltage Electrical System Controls.
C-2.2.1.5 Certification services for the GRC LF & PBS Pressurized Vessels & Systems.
C-2.2.1.6 Minor Design modifications and analysis for the GRC LF & PBS Pressurized Vessels & Systems.
C-2.2.1.7 All technical staff to support the functions listed above.

C-2.2.2 IDIQ Work Scope. The IDIQ Work Scope for this contract consists of the following:

C-2.2.2.1 Major Repairs and Upgrades to the GRC LF Central Process Systems and associated Research equipment in LF & PBS.
C-2.2.1.2 Major Repairs and Design for the GRC LF & PBS Cryogenic Systems.
C-2.2.1.3 Major Repairs and Upgrades to the GRC LF High Voltage Electrical System Controls systems.
C-2.2.1.4 Major finite element analysis, flexibility analysis and design for hardware modifications for the GRC LF & PBS Pressurized Vessels & Systems.
C-2.2.1.5 All technical staff to support the functions listed above.

C-2.3 Central Process Systems (CPS) Operations, Maintenance & Repair. The GRC LF Central Process Systems (CPS) consists of a series of critical utilities that support aerospace research ground test facilities throughout the campus. Many of these aerospace test facilities conduct "real time" testing of air-breathing engines, rocket engine components and other related systems. To replicate the conditions encountered in flight such as high speed and/or high altitudes, GRC utilizes very large centralized compressed air system (called the Combustion Air System) and a large centralized vacuum system (called the Altitude Exhaust System). In addition, these systems require a multitude of subsystems to heat, cool, or dry air as required for specific tests.

Most of the GRC LF CPS equipment and subsystems are located in the Central Air Equipment Building, No. 64, or in the Engine Research Building (ERB) Complex which consists of Building Nos. 5, 23, 37 and 38. Large overhead piping delivers the Combustion Air or Altitude Exhaust to various aerospace ground test facilities

located throughout the Central Campus of GRC LF. Control of equipment and dispatching services are provided from control rooms located in B64 and B5.

The CPS consists of the following systems and subsystems:

C-2. 3.1 Combustion Air (CA) System. To simulate speed, large electric motor driven compressors produce pressurized air ranging from 40 to 1250 psig. Typically, air at ambient conditions is gradually pressurized, using staged compressor systems, in increments from 40 psig, 150 psig, 450 psig and 1250 psig. Each stage includes equipment to cool, heat or dry the air as required for specific test conditions. Maintenance, repair and upgrade implementation of the Combustion Air System and the interface to the Central Process Systems Distributed Control (CPSDC) is part of the work scope of this contract.

C-2. 3.2 Altitude Exhaust System. To simulate high altitude conditions, large electric motor-driven compressors (typically called "exhausters") create conditions that simulate altitudes up to 90,000 feet above sea level. Much like the Combustion Air System, the Altitude Exhaust System is staged, and each stage requires subsystems to cool the air. Maintenance, repair and upgrade implementation of the Exhaust System and the interface to the Central Process Systems Distributed Control (CPSDC) is part of the work scope of this contract.

C-2. 3.3 Service Air (SA) . The Service Air System provides a center-wide continuous supply of clean, dry 125 psig compressed air. Three Ingersoll-Rand Compressors (SA20, SA21 and SA22) located in the basement of the Engine Research Building (Building 5) serve as a primary source of compressed air. A fourth identical compressor (SA23) is located in the Special Projects Laboratory (Building 24). A new fifth centrifugal compressor (SA24) is planned to be installed in 2016, and located in Central Air Equipment Building (Building 64), will serve as an additional source of 125 psig compressed service air. Once SA24 is operational, SA23 is planned to be decommissioned. Maintenance, repair and upgrade implementation of the Service Air System and the interface to the Central Process Systems Distributed Control (CPSDC) is part of the work scope of this contract.

C-2. 3.4 Centralized Cooling Tower (CT) Water System. Cooling of CPS equipment and systems is accomplished using water from four (4) cooling towers located on the Central Campus. Specifically, the Centralized Cooling Tower Water System includes Cooling Tower No. 1 (Property No. 10), Cooling Tower No. 3 (Property No. 70), Cooling Tower No. 4 (Property No. 82), Cooling Tower No. 5 (Property No. 93), and Cooling Tower No. 6 (Property No. 126). Maintenance, repair and upgrade implementation of the Cooling Tower System and the interface to the Central Process Systems Distributed Control (CPSDC) is part of the work scope of this contract.

C-2. 3.5 Variable Frequency (VF) Electrical Power System. The Variable Frequency Electrical Power System at the Engine Research Building West Wing (Building 23 basement) is an electrical power supply that is connected to various test cells (W1, W6, W7, W8, CE-18). The output frequency is adjustable from 10 to 120 cycles per second (Hz) with voltage proportional to frequency (54 V/Hz). It can deliver or absorb power to the full rating of the equipment. Complete flexibility of set-up and operation is obtained through paralleling and switching of converter combinations to the ring bus switchgear. Maintenance, repair and upgrade implementation of the Variable Frequency System and the interface to the Central Process Systems Distributed Control (CPSDC) is part of the work scope of this contract.

C-2. 3.6 Central Process System Distributed Control (CPSDC). The Central Process System Distributed Control uses remote processors and programmable logic controllers communicating via 13 miles of coaxial data highway cable to operator workstations in Buildings 143, 64, 23 and 5. The remote processors and programmable logic controllers (with over 14,000 I/O points) are used for control and data acquisition of equipment in the areas of Electrical Power Dispatch, Central Air Dispatch, Engine Research Building (ERB) and Central Air Equipment Building (CAEB) and the Variable Frequency Power Facility (VF). This equipment includes Compressors, Exhausters, Dehydrators, Chillers, Cooling Towers, Valves,

Substations, Uninterruptible Power Systems (UPS), Electrical Motors, and Generators for backup power and variable frequency power generation. The CPSDC Data Archive System provides historical data for all 14,000 data points. Data playback format can be in graphic trend or operator process screen playback. All data from Feb. 7, 1999 is available on line for recall and playback. Standard time resolution of data is one second, but 100 msec playback is available for particular Sequence of Event information. Maintenance, repair and upgrade implementation of the Control System are part of the work scope of this contract.

C-2. 3.7 Central Air Distribution (CAD) System. The CAD system encompasses five CPS services; Combustion Air, Service Air, Refrigerated Air, Altitude Exhaust and Atmospheric Exhaust. The distribution system routes airflows at different pressures to the various test facilities located within Lewis Field and is comprised of over 9 miles of piping, 730 remotely controlled valves, and a multitude pressure relief and monitoring devices. Historically operations of the CAD systems were performed within the Central Control Building. The Contractor shall be responsible for providing CAD systems dispatching operations; operations consist of dealing with the various researchers to determine the daily equipment requirements, directing equipment operators in setting up equipment and systems configurations, and routing the air services to the customers. The maintenance of this equipment is part of this contract as well. The Contractor shall not create research schedules or assign lock-out/tag-out numbers. These functions are done by others.

C-2.3.8 Associated Research and Institutional Equipment. Associated Research and Institutional equipment consists of various Research assets similar to CPS assets that are repaired or maintained as part of an IDIQ Task. These assets are located in LF and PBS.

C-2.4 Cryogenic & High Pressure Gas Systems Operations, Maintenance & Repair. The Cryogenic Systems include various high-pressure gases and cryogenic liquids including: air, methane, nitrogen, hydrogen, oxygen, helium and argon mediums. These mediums are delivered to GRC LF & PBS by outside vendors and stored in stationary or mobile pressure vessels and cryogenic Dewars. Cryogenics may be used in the liquid form or transformed into high pressure gases through vaporizers\cryo pumps for research applications. Mobile equipment includes approximately: 32 Tube Trailers, 19 Dewar and 6 Liquid Vaporizers. Stationary equipment include approximately: 21 Dewars, 35 High Pressure Vessel locations, 22 mobile Liquid Vaporizer Connections, 28 Tube Trailer Connections, 38 Distributed Systems and 71 non-Distributed Systems. The scope of work for cryogenic systems includes maintenance, operations, and engineering.

C-2.5 High Voltage Electrical Substation Control Maintenance & Repair. High voltage electrical power for both institutional and research testing needs is supplied to GRC LF through four (4) 138 kV lines from First Energy to GRC Substation A, Property No. 200. This power is subsequently routed to twelve (12) additional Substations located throughout the Center. Maintenance, repair and upgrade implementation of the substation controls and the interface to the Central Process Systems Distributed Control (CPSDC) is part of the work scope of this contract.

C-2.6 Pressurized Vessels & Systems (PVS) Certification. In addition to Central Process Systems, various gases and cryogenic liquids including nitrogen, hydrogen, oxygen, helium and argon are delivered to GRC LF & PBS by outside vendors and stored in pressure vessels and cryogenic dewars. Complex piping systems distribute these gases and cryogenic fluids to various test cells and research facilities. These pressure vessels and piping systems must be regularly certified to various National Consensus Codes and Standards (NCS) such as ASME Boiler and Pressure Vessel Code, ASME B31 series Piping Codes, NFPA fire codes, CGA guidelines, and API recommended practices. The certification process requires regular In-Service Inspection (ISI) of PVS by qualified personnel, engineering analysis to assess remaining life, and formal documentation. A formal Pressure Systems Database (PSD) is maintained under this Contract. Associated repairs necessary to bring PVS into code compliance are also within the scope of this contract.

The GRC certification program includes roughly 1,400 systems (with over 30,000 associated components), 1,100

pressure vessels, 140 Dewars, 200 heat exchangers, 5,000 relief devices, and 2,200 Flex Hoses. These systems convey over 50 different commodities such as air, cryogens (LOX, LH2, LCH4, inerts), fuels, water, steam, Freon, and toxics (Ammonia, Hydrogen Chloride, Silane, Propane, Oxygen, Nitrous Oxide, etc.). Pressurized systems include wind tunnels, vacuum vessels, dryers, dehydrators, coolers, filters, separators, piping and other components. Required inspection, certification, maintenance, and repair of these vessels, piping and components are included in the scope of this contract. The Contractor is responsible for certifying institutional systems at GRC LF & PBS as identified in Section J Attachment J-C-2.6.

C-3. SPECIFIC ACTIVITIES NOT CONTAINED WITHIN THE SCOPE OF THIS CONTRACT

C-3.1 General. The functions listed below are not part of this Contract.

C-3.2 CPS Engineering. The Contractor shall not be responsible for providing any CPS engineering; all CPS engineering will be provided by the Facilities Division.

C-3.3 Institutional Responsibilities. The Contractor is not responsible for institutional systems, equipment or areas, such as but not limited to: structural and cosmetic damage; leaking roofs; inoperable or backed up floor, toilet, and/or sink drains and plumbing; overfilled liquid reservoirs; leaking pipes; electrical or mechanical damage; fire or overheated equipment, area lighting, telephones, alarm systems, intercom systems and room temperatures.

C-3.4 Electrical Power Dispatching Operations. The maintenance and repair of substations and the underground cabling, the dispatching of electrical power throughout the Center, and the operation of breakers associated with the High Voltage Distribution Systems are also not part of the scope of work for this contract. All lock-out/tag-out number assignment and scheduling of research operations is not part of the scope for this contract.

C-3.5 Software Modifications. The Contractor shall not modify any software.

C-3.6 Cooling Tower (CT) Fire Protection and CT Water Treatment. CT Fire Protection and CT Water Treatment is not part of the scope of work for this contract.

C-3.7 Fuel Dispatching Services. Fuel dispatching, maintenance on fuel trailers, above and below ground fuel storage tanks, and fuel distribution systems are not part of the scope of work for this contract.

C-3.8 Excavation Services. Routine excavation services are not part of the scope of work for this contract. Any non-routine excavation shall be approved by the COR.

C.4 GENERAL REQUIREMENTS, PRACTICES AND PROCEDURES

C.4.1 General. The following are general GRC requirements, practices and procedures that apply to all aspects of the work specified in this SOW.

C.4.2 Interfaces with Government Personnel and Other Government Contractors. The execution of the SOW will require this Contractor to interface with a wide variety of Government personnel and other Government contractor personnel. These interfaces are as follows:

C.4.2.1 Contracting Officer (CO). The CO is the primary Government individual with the authority to enter into, administer, and/or terminate this contract and make related determinations and findings. The CO will be the Contractor's single POC for changes to scope, schedule, or contract value. No other individual has the authority to make formal contract modifications on behalf of the Government regarding this contract.

C.4.2.2 Contracting Officer's Representative and Alternate (COR/ACOR). The COR acts as an advisor to the CO regarding technical, schedule, financial, and quality matters associated with the contract. The Contractor's Program Manager and Business Office personnel will have daily interactions with the COR regarding the status of on-going work and the financial aspects of the contract.

In the absence of the COR, the ACOR will assume the above duties.

C.4.2.3 Technical Representatives (TR). GRC's civil servant System Manager, Facility Manager or Facility Engineer responsible for Technical oversight of Contractor Performance. The Contractor's field technicians may have daily interactions with the TR on Technical issues.

C.4.2.3.1 Systems Managers (SMs). A SM is a senior-level civil servant engineer who provides management and oversight for operations, maintenance, and defines requirements for modifications and/or systems upgrades. The SMs are considered to be subject matter experts of their respective systems. Specifically, the SM is responsible for:

C.4.2.3.1.1 Defining equipment and system requirements
C.4.2.3.1.2 Establishing operating policies and procedures
C.4.2.3.1.3 Maintaining the system knowledge on system capability and capacity
C.4.2.3.1.4 Maintaining configuration control

In addition, the SM is responsible for approving Area Clearances for system outages, Facility Change Requests (FCR), Operational Safety Permits, and Dig Permits.

C.4.2.3.2 Facility Managers (FMs). The FM is senior-level civil servant engineer who provides management and oversight for test facility systems and equipment. The FMs are considered to be subject matter experts of their respective facility.

C.4.2.3.3 Facility Engineers (FEs). The FE is engineer who provides engineering and oversight for test facility systems and equipment.

C.4.2.5 Building Managers. The GRC Building Managers are responsible for overseeing and communicating all building related issues, which impact building occupants and/or stakeholders, to the appropriate entity or person for issue resolution. These responsibilities include capturing and tracking building related issues and facilitating a resolution with the appropriate SM, and the Institutional Facilities Maintenance contractor and/or the COR. The goal of a Building Manager is to foster cooperative

relationships with building occupants and to ensure that building services are adequately maintained. Building Manager also accompany SHeD inspectors in performing safety inspections and walk-throughs. GRC has assigned a Building Manager for all of the "institutional" properties at GRC Lewis Field. The Contractor shall have Building Manager type responsibilities for all areas and building that are associated with the Central Process Systems.

C.4.2.6 Safety & Mission Assurance Organization. The GRC Safety and Mission Assurance organization ensures that a safe, and healthful, and environment is available for all GRC on-site personnel and contractors. This organization includes a Reliability and System Safety group, Occupational Health group (which includes the Chemical Management group), and an Operational Safety group.

Process System Safety Committee (PSSC): At GRC, LF and PBS, all CPS operations are assessed and are under the jurisdiction of the PSSC. The PSSC, as well as other safety committees, conduct independent reviews of proposed operations in their assigned areas to ensure that the proposed operations are consistent with sound engineering principles and applicable safety and health requirements and standards. The PSSC Chair, with the support of committee members, confirms that all operational hazards and risks are identified, assessed, and sufficiently mitigated to acceptable levels. The Contractor submits to the PSSC, via the GRC electronic safety permit process, a safety permit request and supporting documentation to ensure this independent assessment takes place. Upon completion of the PSSC assessment, the PSSC Chair issues a safety permit, including conditions for conducting the activity. It is the responsibility of the Contractor to operate the equipment assigned under a prescribed safety permit. The permits are usually issued for one or two years. Sixty days prior to the expiration of the permit, the Contractor shall request a renewal request and supporting documentation with any changes since the last permit. The Contractor is not allowed operate any CPS equipment with an expired safety permit, unless approved and notified by the PSSC Chair in writing. No changes to the operations, design, alarms, or shutdowns can be made without the approval of the safety committee. Details of the Safety Permit process and the Safety Permits required by this Contract can be obtained in Section J Attachment J-C-4.2.6.

C.4.2.7 Authority Having Jurisdiction (AHJ). At GRC, the AHJ is the individual responsible for implementing the fire safety provisions of NPR 8715.3, NASA General Safety Program Requirements. The AHJ has been delegated the authority by the Center Director for approving all life safety and fire protection system installations, procedures, equipment selections, testing, and maintenance at both GRC Lewis Field and Plum Brook Station. In addition, the AHJ is authorized to enforce the provisions of the applicable fire and building codes and shall have the authority to render interpretations of these codes, to adopt policies, to establish procedures and regulations in order to clarify the application of its provisions.

C.4.2.8 Pressure Systems Manager (PSM). The PSM is responsible for implementing the pressure systems compliance program required under NPD 8710.5 and STD 8719.17. The PSM has been delegated the authority by the Center Director for approving pressure system installations, procedures, equipment selections, testing, and maintenance at both GRC Lewis Field and Plum Brook Station. The PSM is charged with interpreting and assuring compliance with all applicable National Consensus Codes and Standards (NCS) such as ASME B31 series piping Code, ASME Boiler and Pressure Vessel Code, API Recommended Practices, CGA standards, etc. The PSM has authority to render interpretations of these codes, to adopt policies, to establish procedures and regulations in order to clarify the application of it NCS and agency policy provisions.

C.4.2.9 Energy & Environmental Management Organization. The GRC Energy & Environmental Management Office provides overall coordination and integration of the Center's energy and environmental efforts. This office is responsible for establishing energy and environmental metrics, in compliance with federal, state and local government regulations and mandates, and in alignment with Agency sustainability policies. The office oversees the planning and implementation of institutional initiatives to ensure synergy, environmental benefits and energy savings.

C.4.2.10 Configuration Control Organization. This organization has the responsibility to provide direction, management and assistance of facility drawings to GRC civil servant and contractor personnel. The GRC Configuration Control organization provides the following services:

C.4.8.10.1 Facility Drawings Configuration Control
C.4.8.10.2 Facility Drawings Reproduction Services
C.4.8.10.3 Facility Engineering Drawings Retrieval & Assistance Program (FEDRAP)
C.4.8.10.4 Glenn Drawing Information System (GDIS)
C.4.8.10.5 Facilities Electronic Data Management System (FEDMS)
C.4.8.10.6 Facilities Drawing Central Web Site (FDC)

C.4.2.11 Waste Management and Disposal Contract. Anyone who generates, stores, manages, handles or transports hazardous waste is required to take RCRA Training. RCRA Training records shall be kept on-site. GRC has an existing contract for the disposal of solid, liquid, and hazardous wastes. The Center's general goal is to divert collected recyclables and waste from the waste stream by collecting and redirecting materials to an appropriate recycling facility. Those waste materials that cannot be recycled are segregated and directed to an approved disposal facility. Waste management and disposal services are currently available from 7:00 a.m. to 3:30 p.m., Monday through Friday.

Project derived recyclables and wastes are defined as any unused, spent or waste materials resulting from activities at GRC. Solid Waste is defined in 40 CFR 261.2. Examples of Solid Waste include all municipal waste, compostable, recyclable and non-recyclable, including paper, cardboard, aluminum cans, metal, glass, plastic, landscaping debris, wood, wood pallets, polystyrene, electronic waste, toner cartridges, asphalt (street sweepings) and other miscellaneous debris both inside containers and in the immediate vicinity of the containers. All solid waste, identified by the Government as recyclable, is recycled. All landfills and receivers of material (scrap metal, wood, plastic, and glass) are approved by the Energy and Environmental Management Office at GRC.

The Contractor shall work with the COR to utilize the existing contract for the disposal of solid, liquid, or hazardous wastes associated with this contract through coordination with GRC Waste Management using Work Requests or IDIQ tasks. This includes the handling and disposal of any project derived recyclable or waste materials such as: CFC refrigerants, PCBs, asbestos, lead, petroleum-based wastes, storm and sanitary effluent, storm water debris from structures, sediment, slurries, paint related materials, debris, hydraulic fluids, containerized gasses and chemicals.

C-4.2.12 Janitorial Contract. GRC LF has a stand-alone janitorial contract for office trash pickup, restroom cleaning, floor cleaning, and other miscellaneous cleaning services that can be ordered on an IDIQ basis. These services will be furnished for all Government-furnished office space provided under this contract at no cost to the Contractor.

Janitorial services for other Government-Furnished Facilities (GFF) provided under this contract (e.g., shop space, material storage space, etc.) are not provided. In these instances, the Contractor shall provide housekeeping type services to ensure areas that comprise the CPS and house Cryogenic work areas associated with this contract are free of clutter, dirt, debris and hazards.

C-4.2.13 Facilities Operations, Repair & Maintenance (FORM II) Contract. GRC LF has a stand-alone contract for the operations, repair and maintenance of all institutional equipment and systems at the Center. This includes HVAC, plumbing, underground utilities, centralized plants (steam and chilled water), fire detection & suppression systems, chemical treatment of water systems, low & high voltage electrical, electrical dispatch services, life safety systems, and security systems.

Typical CROM/FORM interfaces include the following:

C-4.2.13.1 Work Involving Underground Systems. For work requiring maintenance or repair of underground piping or conduit (e.g., underground Combustion Air piping, Service Air piping, etc.), the FORM Contract will provide the excavation services.

C-4.2.13.2 High Voltage Electrical System Switching, Scheduling & Isolation. Work under this contract may require switching, scheduling and/or isolation of high voltage electrical systems (600 V and greater). These services are provided by the FORM Contractor through the Power Dispatch Office. The Power Dispatch Office is located within the Central Control Building No. 143.

C-4.2.13.3 Cooling Tower Services. As is indicated in this SOW, the CROM Contractor is responsible for operations, maintenance & repair of five large GRC cooling towers. However, the FORM Contractor is responsible for maintenance and repair of the cooling tower fire detection/suppression systems and for the chemical treatment of the cooling tower water systems. Therefore, there must be coordination of these activities between the two Contractors.

C-4.2.14 Test Facilities Operations, Maintenance & Engineering (TFOME). GRC has a stand-alone contract for the operations, maintenance, repair and engineering of aerospace ground test facility equipment and systems. Many of these facilities utilize CPS services for simulating high speed, high altitude, or for air-breathing engine combustion requirements. Consequently, there may be coordination required between the CROM and TFOME Contracts.

C.4.2.15 Electrical Power Switching, Scheduling and Outages. For any work involving electrical voltages in excess of 600 V, the Contractor shall coordinate and schedule work with the Government's Power Dispatch Office, located in the Central Control Building No. 143.

C-4.2.16 Interfaces with Other Contractors. The CROM Contractor shall interface and cooperate, when required, with GRC's institutional support contractor, as well as, research test cell maintenance, janitorial, waste disposal, security, logistics, construction, environmental contractors, and all other contractors and avoid conflicts with the other contractors' performance and work schedules. Under no circumstances shall additional work be performed at the request of another contractor without the approval of the COR. In the event of conflicts with other contractors that cannot be satisfactorily resolved, the matter shall be referred to the COR for a decision.

C-4.3 CPS Engineering Requirements. The Contractor shall notify the COR and/or the appropriate Facilities Division's System Manager when engineering services are required for troubleshooting. The Contractor shall notify the COR and/or the appropriate Facilities Division's System Manager of any system or components upgrade or modification that needs to be implemented to enhance the performance of the CPS.

C-4.4 Institutional Requirements. The Contractor shall immediately report to the COR and/or the Facilities Division Work Control Office any institutional type abnormalities they identify within any building or facility that contains CPS equipment or systems or in which they occupy.

C-4.5 Software Modifications. The Contractor shall notify the COR and the appropriate Systems Manager when a software modification should be made.

C-4.6 Work Schedules. The Contractor shall utilize the NASA Research Facility Test/Central Process Systems Requirement Schedule, which is created by Power Dispatch when planning any work activities. The Contractor shall ensure that there is non-tagged (LO/TO) equipment available to meet the needs and schedules of the research community. The Research Facility Test/Central Process Systems Requirement Schedule is published every Thursday by the Power Dispatchers and is normally available over the IDE network by 2:00 p.m. The schedule may be updated periodically throughout the week to reflect schedule changes. The Contractor shall develop a weekly staffing chart per facility/discipline based on the Research Facility Test/Central Process Systems Requirement Schedule. Typical Schedule is given in Section J Attachment J-C-4.6.

C-4.6.1 System and Equipment Maintenance Shutdown (Annual Maintenance Shutdown) Work Schedule. Annual Maintenance Shutdowns historically range between two (2) weeks and nine (9) weeks depending on research activities, large capital repair/improvement projects, system upgrades or other factors. Another maintenance shutdown occurs near the Christmas / New Year timeframe, other minor shutdowns may occur at any time during the year. The Contractor shall develop a schedule detailing all the activities the Contractor plans to accomplish during the Annual Maintenance Shutdown or other minor shutdowns. The schedule shall be submitted to the COR for review. The schedule shall be submitted to the COR no later than the sixty (60) calendar days before the start of the Annual Maintenance Shutdown, and no later than fifteen (15) calendar days before the start of minor shutdowns. The schedule shall be divided into sections and identified by building or area location and by work category; OCMR, PM, PGM, PT&I, IDIQ, I&R, and so forth. The schedule shall indicate all work to be accomplished by the negotiated completion dates. Deviations from the schedule must be approved by the COR.

C-4.7 Performance. The Contractor's work performance shall comply with the approved and accepted standards of the industry, equipment manufacturers, applicable local, state, federal standards and all applicable GRC NASA Policy Requirements (NPR), NASA Policy Directives (NPD) Safety and Health and Environmental policies.

C-4.7.1. Workmanship. The Contractor shall ensure that during the execution of work tasks, debris shall not be allowed to accumulate on the jobsite or spread into adjacent areas. The Contractor shall ensure that at the completion of a job, debris, excess material, and parts are cleaned up and removed from the job site and that any waste is placed in the appropriate container(s) in compliance with GRC Waste Management standards. The Contractor shall be responsible for maintaining good housekeeping of all equipment as well as work and storage areas they occupy or utilize.

C-4. 7.2 Cleanliness. The Contractor shall ensure that during the execution of work tasks, debris shall not be allowed to accumulate on the jobsite or spread into adjacent areas. The Contractor shall ensure that at the completion of a job, debris, excess material, and parts are cleaned up and removed from the job site and that any waste is placed in the appropriate container(s) in compliance with GRC Waste Management standards. The Contractor shall be responsible to maintain good housekeeping in all equipment, electrical, mechanical, and storage areas they occupy or utilize.

C-4.8 Equipment Under Warranty. The Contractor shall not remove or replace any new equipment, components, and/or parts installed by other contractors that are found to still be under warranty by the manufacture or the installer without approval of the COR. All defects in material or workmanship, defective parts, or improper installation and adjustments found by the Contractor shall be reported to the COR so that necessary action may be taken. Available warranty information will be furnished to the Contractor by the COR or be indicated within the Maximo system (Contracts Module).

C-4.9 Configuration Management. The Contractor shall obtain Government approval prior to making configuration changes to any existing system. If deviations are identified from the approved documentation, the Contractor shall obtain government approval prior to implementation. All red-line documentation shall be returned to the COR for incorporation into the official records, maintained by the Facilities Configuration Control Office. In addition, the Contractor shall conform to the following configuration management requirements:

C-4.9.1 For CPS. The Contractor shall be responsible for providing red-lined drawings that capture changes. The red-lined drawings shall be transferred to the COR. A copy of the Red-lines shall be kept in the field until the As-Builds are returned to the Contractor for filing.

C-4.9.2 For non-CPS. The Contractor shall be responsible for creating as-built drawings from red-lined drawings via AutoCAD that capture changes. The as-built drawings shall be transferred to ADEPT for signatures.

C-4.9.3 New Assets. If new Assets are added as a result of SR or ROI work, official Maximo asset numbers must be obtained from the COR.

C-4.9.4 Pressure Systems Database. The Contractor will be given access to the Pressure Systems Database (PSD) and will be charged with continually updating and maintaining accuracy of all data contained within. The PSD is web-based database operating on the Oracle platform. It is used to track Pressure Vessel and System data at both the component and system levels. Data maintained includes physical configuration data (component brand, make, model, size, and capacity information, etc.) as well as In-Service Inspection (ISI) status information. Maintaining an accurate PSD is considered a necessary and essential discipline of Configuration Management.

C-4.10. Access To Government Drawings & Records. The Contractor will have accesses to the roughly 120,000 facility record drawings managed by the GRC Configuration Control Office. This includes access to hard-copy stick files (located in Building No. 21) and access to the following database systems:

C-4.10.1 Adept (Synergis Software, a Division of Synergis Technologies, Inc.). The Contractor will be given read-only access to the GRC Adept system, which is used to help locate, manage, share, and control native AutoCAD documents throughout their lifecycle. Adept integrates with AutoCAD data files and any CAD-related support files. Many Adept folders also contain PDF versions of operations & maintenance manuals, data sheets, and project information. Adept has been active at GRC since 2007, and is the official repository of controlled documents for GRC Lewis Field and Plum Brook Station.

C-4.10.2 Glenn Drawing Information System (GDIS). The Contractor will be given access to GDIS, which is a web-based database used to track and search for drawings and drawing-related items. Unlike Adept, GDIS cannot display or control native AutoCAD files (DWG files). GDIS can display PDF files of drawings and of stored Facility Change Requests (FCRs).

C.4.11 Area Clearance Process. The Contractor shall utilize the GRC Area Clearance process when work requires the interruption of a utility or service. This process ensures that the work can be accomplished safely and that there is adequate notification of the timing, duration and nature of the impact to building occupants and/or facilities. The GRC Area Clearance Procedure is provided in Chapter 9 of the GRC Safety Manual see Section Attachment J-C-Safety Manual, and the Area Clearance Form, NASA Standard Form C-978, is provided in Section J Attachment J-C-FORMS.

C-4.12 Operations & Maintenance Personnel Participation in GRC Projects. Large repair, rehabilitation and new construction projects at GRC are typically accomplished outside the scope of this contract and are issued as Invitation for Bid (IFB) packages. Often, there is a need to include CPS operations and maintenance and/or Pressure Systems personnel participation during the final design, construction and turnover phases of these projects. This participation ensures that equipment and systems are designed and installed with considerations for maintainability.

As directed by the COR, the CROM Contractor shall provide personnel to participate in the final design kickoff meeting and the 30%, 60%, and 90% progress meetings for these projects. These services shall be included as part of the Base Work scope for this contract.

If CROM services are required during the construction and/or turnover phases of these projects, these services shall be covered under the IDIQ portion of this contract.

C-5. GOVERNMENT FURNISHED PROPERTY AND SERVICES

C-5.1 General. The Government will provide the Contractor the use of certain Government-owned facilities, equipment, materials, and information technology (IT) equipment. This property and these services shall be used only for activities associated with this SOW. The use of Government property for other purposes is prohibited. The use of Government Property must be in accordance with relevant Federal laws and regulations and all Agency and Center procedures. All such facilities, equipment, and materials will be provided at the start of the contract in "as is" condition.

C-5.2 Joint Inventory. The Contractor and the COR shall conduct a joint inventory during the phase in period but not later than five (5) days after commencing work under this contract to determine the exact number and serviceability of GFF, GFE & GFM (tools, equipment and materials, etc.) offered to the Contractor. Within thirty (30) days of this inventory, the Contractor shall provide the COR with a written listing of all facilities, equipment, tools and materials that the Contractor shall use and for which the Contractor shall assume accounting responsibility. Government furnished items shall not be removed from the NASA Glenn Research Center, unless approved in advance by the COR.

The Contractor and the COR shall conduct a joint inventory once a year and the Contractor shall provide an inventory list at any time throughout the life of the Contract upon request by the COR.

C-5.3 General Inventory. The Contactor shall maintain an inventory list of all electrical and mechanical parts and materials, including spare parts over $500. The Contactor shall maintain an inventory of all electronic and control equipment, regardless of the dollar amount. In addition, the Contractor shall report on all changes to inventory once a month to the COR.

> **C-5.3.1 Quarterly Spare Part Inventory Reports.** The Contractor shall provide a quarterly report detailing the current spare parts inventory list, highlighting the critical spares that are below the minimum quantity required, along with changes to the inventory and proposed purchase requirements for replacement parts to maintain inventory at required operational backup level. The Contractor shall provide this report to the COR by the 15th of each September, December, March and June. Included in the report shall be a list of equipment out for repair along with estimated return to service date. The Contractor shall use one standard program for managing and reporting on the status of all spare parts inventories used to support all the systems, equipment, and components covered under this contract.

C-5.4 Government Furnished Equipment (GFE). The Government will provide the Contractor the use of existing and available Government owned tools and equipment in the performance of the contract. Upon completion or termination of the contract, all Government-furnished tools and equipment, including specialized PT&I equipment and tools, shall be returned to the Government in the same condition as received, except for normal wear and tear. Tools and equipment that become worn out due to normal wear and tear shall be returned to the Government and their replacement shall be determined by the COR. The Contractor shall be held responsible for the cost of any repairs in accordance with the "Government Property" Clause of this Contract, FAR 52.245-1(Alt 1), Subsection (h). GFE shall not be removed from GRC Lewis Field unless approved in advance by the COR. At no time shall the Contractor dispose of GFE. Property disposal shall be coordinated through the logistic and technical information division's (LTID) Supply and Equipment Management Officer/Property Disposal Officer in accordance with the requirements in NASA Policy Document (NPD) 4200.1, Equipment Management, NPD 4300.1, NASA Personal Property Disposal Policy, NPR 4200.1, NASA Equipment Management Procedural Requirements, and NPR 4300.1, NASA Personal Property Disposal. All property and equipment shall be processed through LTID in accordance with NASA procedures referenced in the previous section. A current listing of Government furnished tools and equipment is in the Section J Attachment J-C-5.4a and J-C-5.4b.

> **C-5.4.1** All software and maintenance licenses shall remain property of the Government and shall be acquired under a Government name.

C-5.5 Government Furnished Material (GFM). Government owned material previously purchased to support the equipment and systems included in this contract, will be furnished to the Contractor on a "one-time" basis for use exclusively at the Glenn Research Center. The Contractor shall certify the findings of the joint inventory as

described in Section C-5.2, assume accounting responsibility for all materials supplied, and shall provide documentation supporting issue/use of such material. On depletion of material provided to the Contractor by the Government, the Contractor shall purchase necessary material to perform the work of the contract, except as otherwise specified herein.

C-5.6 Government Furnished Facilities (GFF). Government-Furnished Facilities (GFF). The Government will furnish or make available to the Contractor the facilities (buildings, structures and systems, etc.). Facilities provided to the Contractor include office areas, conference rooms, shop areas, equipment storage areas, and materials storage areas. Should the Contractor choose to use the Government-furnished facilities, adequate precautions shall be taken by the Contractor to prevent fire hazards, odors, and the infestation of vermin. The Contractor shall obtain written approval from the Contracting Officer prior to making any modifications or alterations to GFF. Any such modifications or alterations approved by the Government will be made at the expense of the Contractor. At the completion of the contract, all facilities shall be returned to the Government in the same condition as received, except for reasonable wear and tear, and approved modifications and alterations. The Contractor shall be held responsible for the cost of any repairs caused by negligence or abuse on the Contractor's or on the Contractor's employees' part.

Basic janitorial services will be provided within GFF at no additional cost to the Contractor. These include trash collection, occasional floor cleaning and/or sweeping, and cleaning of restroom facilities. Recycling of office paper, aluminum cans, and plastic bottles will also be provided.

C.5.7 Government-Furnished Utilities (GFU). The Government will furnish the following utility services for the Contractor's use within the GFF at no additional cost to the Contractor (i.e., utilities will not be separately metered within GFF and back-charged to the Contractor):

C.5.7.1 Low voltage electricity for lighting and power.

C.5.7.2 Low pressure steam or heating hot water for HVAC (as required).

C.5.7.3 Natural gas for HVAC and hot water (as required).

C.5.7.4 Hot & cold potable water.

C.5.7.5 Sanitary and Storm sewage service.

C.5.7.6 Service Air/Shop Air (125 psig) for shop tools.

C-5.8 Government Furnished Information Technology (IT) Systems. The Contractor will be provided the number of Government-furnished land-line telephones and computer seats as defined below.

C.5.8.1 Land-line telephones. Land-line phones provide access to on-site GRC employees and contractors (Lewis Field and Plum Brook Station) and include unlimited local and long-distance calling capabilities. Telephone maintenance and repair services are also provided at no additional cost to the Contractor. Use of these land-line phones for non-business purposes is strictly prohibited.

C.5.8.1 Computer Seats. Computer seats (currently ACES seats) connected to the NDC computer domain will enable Contractor employees to access NASA information systems and personnel within the NASA Active Directory. Computer stations are loaded with Microsoft Office software including Microsoft Outlook for e-mail and calendar services. In addition, these seats can be used to access the world-wide web. ACES seats will be furnished with software and hardware maintenance services and periodic hardware updates. Use of the ACES seats for non-business purposes is strictly prohibited. All ACES seat key strokes are monitored by an on-site surveillance group, and misuse of this equipment will be addressed by GRC IT Security personnel and the COR.

C-5.9 Equipment Lists. Lists of assets and components to be operated, maintained and repaired under this Contract are loaded in the Computerized Maintenance Management System (CMMS) or the Pressure Systems Database (PSD). See Section C-8.1 for further details.

C-6. CONTRACTOR ACQUIRED MATERIALS (CAM)

C-6.1 General. Other than provided Government Furnished Property and Services in Section C-5, the Contractor shall be responsible for acquiring material, parts, tools, and supplies for the performance of all work under this contract. All such CAM shall be considered cost reimbursable items under this contract. All Contractor employees are responsible for providing their own personal hand tools appropriate for their particular trade. The Contractor shall not charge the Government for any of their employees' personnel hand tools including tools damaged while providing services to the Government.

C-6.2 CAM Purchases. The Contractor shall contact the COR and obtain written COR approval for all CAM purchase requests in excess of $3,000.00 prior to purchase. The Government will not be obligated to reimburse the contractor for items exceeding $3,000.00 when prior approval has not been obtained. The Contractor shall provide a real-time program that reports to the COR detailing all purchases made under this contract regardless of cost. The Contractor shall obtain competitive quotes for material purchased in accordance with the Contract clause entitled "Competition in Subcontracting". The Government will periodically review the purchases and may, at its discretion, lower the Contractor's purchasing authority if abuses are discovered.

C-6.2.1 Approved Sources. The Government may, at its discretion, direct the Contractor to purchase the required material and equipment from Government approved sources.

C-6.2.2 Refunds. Any refunds, rebates, credits, or other amounts (including any interest) accruing to or received by the Contractor or any assignee shall be paid or passed to the Government by the Contractor, to the extent they are properly allocable to costs for which the Contractor has been reimbursed by the Government under the contract.

C-6.2.3 End of Contract. At fifteen (15) days before the Contract End Date, the Contractor shall provide a report to the COR, detailing all CAM currently in possession of the Contractor and shall turn over all CAM to the Government. All CAM purchased under this contract remains the property of the Government.

C-6.3 Parts, Components, Equipment, Vehicles and Materials/Supplies. The Contractor shall provide new or factory reconditioned direct replacement parts and components when providing maintenance, repair, and minor construction services as described herein. All replacement units, parts, components and materials installed by the Contractor shall be compatible with that existing equipment on which it is installed; shall be of equal quality to the original equipment specifications; shall be used in accordance with the original design and manufacturer intent and shall comply with the applicable specifications. The Government shall approve the procurement of replacement parts including those which the original manufacturer has updated the quality of parts for current production.

C-6.4 Documentation. The Contractor shall obtain and maintain manufacturer's operating instructions and maintenance manuals on all new equipment installed by the Contractor. All documentation shall be stored in the TRL.

C-6.5 Material Certificates, Descriptive Data and Samples. When requested by the COR, the Contractor shall submit applicable certificates of compliance, manufacturers' descriptive data, and product samples for evaluation.

- Material certificates and samples (where applicable) shall be obtained from material manufacturers attesting that materials meet minimum design specifications.
- Manufacturers' descriptive data shall include the name of the manufacturer, model number, catalog cut, and other identifying data and information describing the performance, capacity, rating, and application/installation instructions which clearly illustrate that the proposed item meets applicable standards.
- Product samples shall include a sufficient quantity of material to allow for complete analysis and evaluation by the Government.

C-6.6 Equipment Manufacturer's or Installer's Warranty. Equipment, components, and parts with existing warranties shall not be removed or replaced without prior approval of the COR. All defects in material or workmanship, defective parts, or improper installation and adjustments found by the Contractor shall be reported to the COR so that necessary action may be taken. The Contractor shall maintain and keep an electronic record of the equipment, parts, and components that are covered by warranty and the duration of such warranties.

C-7. CONTRACTOR MANAGEMENT AND ADMINISTRATIVE REQUIREMENTS

C-7.1 General. The Contractor shall manage the total work effort associated with Central Process System Recertification, Operations, Maintenance, Repair, and all other services required herein to assure successful and timely completion of services in this contract. Included in this function are the full range of management and administrative responsibilities.

C-7.2 Required Personnel and Functions

C-7.2.1. Staffing. The Contractor shall provide a staff of personnel with the necessary expertise and qualifications to assure the work is performed in accordance with the standards specified herein. The Government defines the required functions within this SOW. The Contractor shall define the Key Personnel and the workforce to meet the requirements of the SOW.

C-7.2.1.1 Project Manager. The Contractor shall appoint a full-time, on-site Project Manager with the authority for all coordination and direction of activities.

C-7.2.2. Essential Personnel Listing. The Contractor shall provide to the COR a list of the Contractor's essential personnel and a means of contacting these individuals in the event of an emergency or during off-hours. The Contractor shall provide the COR the list of the Contractor's essential personnel within three (3) working days after the start of the Contract and when changes are made.

C-7.2.3. Contractor Licensing, Certification, Qualification and Specific Experience Requirements. The Contractor shall provide personnel that have the appropriate skills for that trade. The degree of skills shall be commensurate with that required for the work. Those personnel working in trades, whose performance requires license or certification or both, shall be so licensed/certified and said documentation shall be made available to the COR upon request. The Contractor shall have all necessary licensing, certification, qualification and training requirements for performing work under this contract remain current. Training classes shall be approved by the Government.

C**-7-2.3.1 CPS Equipment Operator Qualification.** For qualifications of the CPS Equipment Operators see Section C.8.

C-7-2.3.2 PSO certification requirements. For certification and qualification for the PSO personnel see Section C.11.

C-7.2.4 Security Access. The Contractor may be required to work in secured areas at GRC. Contractor employees needing regular access to these areas to perform their jobs shall be trained by the Government for access and the Contractor shall obtain proper badges to allow easy access for accomplishing work.

C-7.2.5 Training. The Contractor shall provide the necessary training to insure that personnel have the appropriate skill levels to perform their trade. This includes training to maintain or acquire additional skills. The Contractor shall be required to submit a Training Plan to the COR for review and approval on a semi-annual basis.

C-7.3 Computerized Maintenance Management System (CMMS). The Contractor shall utilize the Government's CMMS (currently MAXIMO) and Pressure Systems Database (PSD) to manage activities required by this contract. Other mandatory CMMS entries include observed operating conditions, assessment of equipment, deficiencies detected, corrections made, and quantities and types of material repaired or replaced. The Contractor shall adhere to Federal, NASA and GRC Information Technology (IT) policies. Specific requirements for the use of the Government's CMMS and PSD are outlined in Chapter C-13 of this SOW.

C-7.3.1. The Contractor shall be able to perform the required CMMS functions at the start and for the duration of this contract. The Contractor shall not log or record any proprietary information on the MAXIMO system.

C-7.3.2. The Contractor shall continually update the CMMS and PSD database and is responsible for its accuracy as it relates to this SOW. All documents shall be filed or entered within seven (7) working days after completion of each preventive maintenance, inspection, recertification, etc. event.

C-7.3.3. The Contractor shall follow the procedures to ensure CMMS is current and that all of the

equipment and tasks are accurately entered.

C-7.4 PSD Pressure Systems Database (PSD). The Contractor shall update and maintain information within the PSD. Data to be maintained includes physical configuration data (component brand, make, model, size, and capacity information, etc.) of components and systems, as well as In-Service Inspection (ISI) status information of components and systems. The contractor shall occasionally be required to coordinate updates or repairs to the PSD application by working with GRC IT staff separately assigned to administer/program the application. The contractor shall perform regular audits and error checks of PSD to assure data integrity and shall participate in the development and implementation of all IT Security Plans and requirements.

C-7.5 Risk Management Assessment Function. The Contractor shall perform Risk Management and Assessment to identifying the top risks that may impact performance on this contract, as viewed by the Contractor, and the proposed mitigating strategies for those risks identified to the COR as required. Such risks might include budget deficiencies, personnel shortage, lack of training, unavailability of equipment to meet demand, etc.

C-7.6 Contractor Quality Control (QC) Function. The Contractor shall provide a Quality Control Plan within 30 days of award. The Contractor shall establish and maintain a Quality Control Program to ensure that the work performed under the contract conforms to the contract requirements.

C-7.6.1 Preventive Maintenance. As part of the Contractor's QC plan, the Contractor shall provide to the COR a Monthly PM Work Schedule Report, on or about the 20th of each month, that details all Preventive Maintenance tasks completed in the previous month, all backlog PM tasks, and all the PM tasks scheduled for the upcoming month. Reference section C-8.2.6.

C-7.6.1.1 Random Sample. At a minimum, the Contractor shall choose, at random, 10% of the work orders completed and submitted them for inspection by the Contractor's own Quality Assurance Manager.

C-7.6.2 IDIQ Tasks. As part of the Contractor's QC plan, the contractor shall indicate how they shall provide quality inspections with each IDIQ Task, which includes but is not limited to Final walk-throughs with TR and COR.

C-7.7 Government Quality Assurance (QA) Function. All services performed by the Contractor are subject to Government inspection. The Government's Quality Assurance Surveillance Program (QASP) is not a substitute for quality control by the Contractor. The Government reserves the right to choose the inspection method and vary the inspection methods utilized during the work, without notice to the Contractor.

C-7.8 Safety & Health Function. The Contractor shall utilize proactive and innovative safety practices on a continual basis throughout the contract period. The Contractor's Safety and Health Program shall comply with Occupational Safety and Health Administration (OSHA) Regulations and the GRC Safety & Mission Assurance (SMA) Requirements which are defined in the Glenn Safety Manual. See Section J Attachment, J-C-Safety Manual and the Glenn Occupational Health Programs Manual Attachment J-C-Occupational Health Program Manual.

The Contractor's personnel and subcontractors shall only perform work for which they are specifically trained. In addition, the Contractor's staff shall maintain a safe and clean worksite and report all incidents or close calls to Contractor supervisors. Within 24 hours of the incident, the Contractor shall input the initial mishap or close call report into the NASA Mishap Information System (NMIS). The Contractor shall implement effective job hazard analyses that will document, control, and communicate hazards identified during the execution of tasks performed under this SOW that are not covered under the site-specific Health and Safety Plan.

C-7.9 Work Control Function. The Contractor shall implement all necessary work control procedures to ensure timely and successful completion of work requirements, as well as to permit tracking of work in progress. The Contractor shall plan and schedule work to assure material, labor, and equipment are available to complete

work requirements within the specified time limits and in conformance with the quality standards established herein. Upon the request from the COR, schedule and status reports shall be provided within the time frame specified in the request.

C-7.10 Operations Plan. The Contractor shall provide to the COR within thirty (30) days following award of the contract their Operations Plan which describes how the operational requirements included in this contract will be accomplished. The Contractor's Operations Plan shall be submitted in writing and in an acceptable electronic format. The Operations Plan shall include written procedures, check sheets, and define the qualifications and duties of assigned equipment and system operators.

C-7.10.1 As a minimum, the Operations Plan shall define how the Contractor shall: [1] manage, operate, control, monitor and inspect the CPS, instrumentation, control, mechanical, electrical, and electronic equipment, associated ancillary and auxiliary equipment and systems for proper operation; [2] perform OCMR and PMs; [3] report problems; [4] troubleshoot equipment or system failures; [5] make minor adjustments to equipment located throughout the research support facilities and; [6] perform cross-training.

C-7.11 Progress Review Meetings. The Contractor shall conduct monthly progress meetings with the Government. The monthly meeting will review overall contract status, work completed versus work scheduled, problems, issues and concerns. The meeting shall be held during the third week of the month. Typical meetings include OCR/MCR work order review meeting, IDIQ Task review meeting, Condition Monitoring meeting, PSO prioritization meeting, etc..

C-7.11.1 Participation in Other Meetings. The Contractor shall participate in other meetings, such as but not limited to, FD's Continuous Improvement and Lessons Learned meetings and Facilities Test Division monthly Facility Managers' meeting, and other meetings as requested by the COR and other Work Order/Task Order requirements.

C-7.12 Communication with other Government personnel. The Contractor shall communicate and inform other Government personnel including CORs, ACORs, TRs, Systems Managers, Facilities Managers, Building Managers, and System Engineers in emergency situations and when deemed necessary based on the situation.

C-7.13 Documentation. The Contractor shall maintain a Technical Reference Library (TRL) consisting of manuals and documents needed for CPS and Pressure Systems. The Contractor shall be responsible for updating and maintaining all record drawings, electrical and mechanical one-line wiring and elementary drawings, schematics, manuals, reports, check-sheets, and all other documentation (including software documentation) which comprise the CPS and associated PVS for all work performed under this contract, and work by others as directed by the COR. The Contractor shall utilize NASA specified software packages, as appropriate, to update documentation.

C-7.13.1 The Contractor shall have up to 45 days, depending upon the complexity and magnitude of an IDIQ task, to submit to the Government all related Red Lined drawings and documentation. The Contractor and the Government will jointly determine a realistic date for the Contractor to complete all required drawings and documentation; all red lined documentation shall be completed and released to the Government before the end of this contract. The Contractor shall follow the GRC configuration control guidelines regarding the configuration control of drawings and components.

C-8 CENTRAL PROCESS SYSTEMS (CPS) OPERATIONS, MAINTENANCE & REPAIR

C-8.1 BASE WORK OPERATIONS, & ELECTRICAL/CONTROLS MAINTENANCE AND REPAIR

C-8.1.1 General. Operations, is defined as day to day services required to operate the CPS equipment and systems and all the services required to maintain and repair these systems including the electrical/controls systems and equipment used to monitor and control the equipment and systems. The Contractor shall perform work in accordance with the existing operations and maintenance manuals, procedures and manufacturers' literature. The Contractor shall ensure that all equipment remains clean and free of oil and dirt. The Contractor shall also employ good-housekeeping practices and ensure that all equipment, and facilities under their jurisdiction are ready for tours and inspection at all times. The majority of the equipment is operated remotely from control rooms using automated process control systems. The Contractor shall not modify any CPS Systems without Government approval unless it is a "like kind" replacement that requires no field or drawing modifications. However, all replacement shall undergo a functional check prior to becoming operational.

C-8.1.2 Equipment Operation. The Contactor shall operate the following:

- 10 psig Refrigerated Air Systems and Expanders (TE-3,4,5 & 6),
- 40 psig Air Compressors (C-1,2,10,11,12,13),
- 150 psig Air Compressors (C-3,7,16 & 17),
- 450 psig Air Compressors (C-4,5 & 18),
- 1250 psig Air Compressor (C-6),
- 125 psig Service Air Compressors (SA-20,21,22,23),
- Altitude Exhausters (E-38, 39,40,41,42,43,44,45,46 & 47),
- Atmospheric Blowers (AEF-19 & 20),
- Variable Frequency Power System (Converters C,D,E,F,G,H,J,K,L & M), and the
- Cooling Towers (CT 1, 3, 4, 5 & 6).

C-8.1.2.1 The Contractor shall operate the Center's service air and cooling tower water systems ensuring that these services are available on a 24-hours, 7-days-a-week, 365 days-per-year basis.

C-8.1.2.2 The Contractor shall operate all the auxiliary and/or ancillary systems associated with the equipment identified such as, but not limited to, oil and hydraulic systems, exciter sets/excitation units, High and Low Voltage electrical systems and/or switchgear, Cooling Tower Water systems, and de-watering systems.

C-8.1.3. Central Air Dispatch Functions (CAD).

C-8.1.3.1 Central Air Distribution Valve Routing. The Contractor shall provide qualified personnel to support the CAD valve routing function. Presently, the CAD valve routing function is staffed by Civil Servants and one contractor technician, provided by the current CPS Contractor on an individual IDIQ task basis. At the start of this Contract, this staffing allotment will remain the same. During the life of this Contract, the Contractor shall assume additional valve routing responsibility upon the attrition of any Civil Servant. This work will be provided for on an individual IDIQ basis. The Contractor shall be prepared to be responsible for all the valve routing functions using the operator consoles in Buildings 5 or 64. The Contractor shall be responsible for providing the additional training to their appropriate level operators. The Contractor shall then be capable of routing air services from the equipment areas to the end users. The Contractor shall keep the Government up-to-date on equipment availability. The Contractor shall be responsible for providing and/or implement lock-out/tag-out activities on all CPS valves and mechanical systems following all safety requirements as defined in the GRC Safety Manual, Chapter 9. The Contractor shall not create research schedules or assign lock-out/tag-out numbers: this function is done by others.

C-8.1.4 Operation of the CPS

C-8.1.4.1 Operation Procedures. The Contractor shall update and maintain all operating procedures, such as, Operations check sheets, hardwired shutdown procedures, calibration procedures, LO/TO procedures, and all other related procedures located in the Operator's Console or elsewhere. The Contractor shall obtain the SM approval prior to making any changes to the procedures. The Contractor shall maintain all these procedures on the Operator Consoles. See Section J Attachment J-C-8.1.4.1 for procedures.

C-8.1.4.2 The Contractor shall provide the COR documentation verifying an annual review of all the CPS operators' sequence check sheets. The Contractor shall provide documentation before September 30th for each year of this contract.

C-8.1.4.3 The Contractor shall maintain communications with the Electric Power Dispatch personnel. Communications shall include, but are not limited to: daily operational requirements, changes made throughout the course of the day that effect operations, coordination of operational activities, troubleshooting of control and operational problems, preparation of equipment for inspections and testing, and conducting necessary system isolation and safety Lockout/Tag-out (LO/TO) activities.

C-8.1.4.4 The Contractor shall issue an accurate daily run report that identifies all tagged out equipment, all equipment used throughout the day, any anomalies and corrective actions taken. Example of daily run report is given in Section J Attachment J-C-8.1.4.4.

C-8.1.4.5 The Contractor shall communicate any issues and concerns related to the CPS to the Government personnel including CORs, ACORs, Systems Managers, Facilities Managers, Building Managers, and System Engineers when deemed necessary based on the situation.

C-8.1.4.6 In certain testing configurations the Contractor shall be required to maintain communications with the test researcher. These testing configurations shall be made known to the Contractor as soon as they are identified by the Government.

C-8.1.4.7 The Government may modify/add/delete systems in the future.

C-8.1.5 Operations Personnel Functions and Qualifications. The Contractor shall provide qualified personnel to accomplish Operations and Maintenance activities associated with the CPS, the CPSDC and its support systems and equipment in the performance of this contract. Contractor qualified personnel shall possess the ability to perform:

- Electrical Equipment Operations and Maintenance,
- Mechanical Machinery Operations and Maintenance, and
- Electronic Device Maintenance

C-8.1.5.1 Operator Levels of Qualification. Currently, there are four levels of qualified individuals (Operators) who operate and maintain the equipment and systems that comprise the CPS.

C-8.1.5.1.1 Field Equipment Operation (FEO). FEO consists of individuals who are capable and qualified of providing watch-standing and rover duties during start-up, equipment operations and systems shutdown. These individuals are customarily entry-level individuals or other individuals new to CPS operations. The FEO function includes the field pre-runs and post-runs for the equipment being operated that day. Qualified FEO personnel shall have sufficient electrical/controls, electronic and/or mechanical skills to perform day-to-day watch-standing operations, maintenance and troubleshooting.

Watch-standing and tending is defined as attendance type work requiring the presence of qualified persons to perform specific duties during a specific or scheduled time period.

C-8.1.5.1.2 Field Console Operation (FCO) Level I. The FEO function is a prerequisite for a FCO Level I function. FCO Level I consists of individuals who are capable and qualified of configuring, starting, stopping, controlling and monitoring of the CPS equipment from the field consoles.

Qualified FOC Level I operators shall remain present at the console during operations to make adjustments, monitor conditions for alarms and any anomalies and orchestrate any corrective actions.

C-8.1.5.1.3 Field Console Operation (FCO) Level II (previously SCO). The FCO Level I function is a prerequisite for a FCO Level II function. The FCO Level II function consists of being proficient in troubleshooting and identifying problems with CPSDC and the associated controls equipment and instrumentation, as well as, being able to route air services from the equipment areas to the end user (a CAD Function).

C-8.1.5.1.3.1. Examples of Control equipment and instrumentation include:

- Operator Consoles,
- ABB Company's Bridge Controllers programmed with languages such as Function Code software,
- Programmable logic controller (PLC) sequence logic, process controls,
- CCC pressure and Surge Controllers,
- Input/Output devices,
- S800 I/O,
- Field devices such as Exciters, Multilin/PQM/IQs, Servo-amplifiers, transmitters, and any other devices used for monitoring and control.

C-8.1.5.1.3.2 The FCO Level II function also includes maintaining and troubleshooting all computer related hardware such as, but not limited to, computers, computer servers, routers, switches and all other network related hardware.

C-8.1.5.1.3.3 The FCO Level II function does not include CPS engineering or modifying the System Software.

C-8.1.5.1.3.4 Troubleshooting is defined as identifying and resolving an anomaly. To conduct troubleshooting, the Contractor's staff shall have sufficient knowledge of the overall system; this knowledge shall enable an operator to resolve problems within the CPSDC starting with the operator console, and everything in between all the way to the field device. The Contractor shall make every attempt to troubleshoot and resolve issues utilizing their staff. If problem persists, the Contractor shall contact the COR and the appropriate TR and appropriate engineers within the Facilities Division for troubleshooting assistance and engineering support.

C-8.1.5.1.3.5 Each shift of operation in each building shall consist of FCO Level II functions as a minimum during operation along with the necessary FEO and FCO Level I functions.

C-8.1.2.4 Field Console Operation (FCO) Level III (previously SSCO). The FCO Level II function is a prerequisite for a FCO Level III function. The Contractor's FCO Level III operators shall have full understanding of how all components of CPS, including CPSDC, work together to deliver CPS Services to the research facilities. This involves performing first line end-to-end troubleshooting without Government or engineering assistance.

C-8.1.7 Operations Corrective Repair (OCR). An OCR is a sub-category of a Repair task within the Government's CMMS to correct an anomaly that develops within the CPS. An OCR can be identified by either the Contractor or the Government before, during, or after operations, as necessary to correct problems that would interfere with scheduled operations or to prevent injury to people, equipment or the environment.

C-8.1.7.1 The Contractor shall report any and all equipment problems, malfunctions, breakdowns, and related repair deficiencies in the Daily Run Report.

C-8.1.7.2 The Contractor shall inform the appropriate TR, the COR and ED when the problem has been identified and corrective action planned. All OCR work shall be reported in CMMS in the form of a Work Order.

C-8.1.7.3 The Contractor shall not alter any hardware or equipment without the approval of the COR. The Contractor shall be allowed to replace defective parts found during the troubleshooting process with like kind components

C-8.1.8 OCR Work Orders. The Contractor shall perform the OCR Work Orders as soon as possible in order to ensure that CPS equipment is available for the next run and to ensure that all operational requirements are met.

C-8.1.8.1 OCR Work Order Cost Limits. The Contractor shall perform and complete OCR Work Orders as soon as possible in order to maintain equipment availability and to ensure that all operational requirements are met. The Contractor shall not incur total costs (labor and material) greater than $10,000 for any single OCR Work Order. The Contractor shall immediately notify the COR if they anticipate the cost of an OCR to exceed $10,000. The Contractor shall obtain COR approval before implementing an OCR greater than $10,000. The Contractor shall during their monthly review meeting report all OCR's identified and/or corrected during the previous month.

C-8.1.8.1.1 The Contractor shall plan and schedule this work to assure that materials, labor, and equipment are available to complete repairs within the specified time limits and in conformance with established quality standards.

C-8.1.8.1.2 The Contractor shall schedule work to minimize interference with the normal occurrence of Government business and mission, particularly CPS operations scheduled on the weekly Research Facility Test/Central Process Systems Requirement Schedule. Any repair task or replacement of obsolete item task (in-like kind) done by the Contractor shall be tested prior to operations.

C-8.1.8.1.3 The Contractor shall meet with the Government to discuss all open OCRs on a monthly basis to set priorities and scheduled finish dates.

C-8.1.9 Operation of CPS Control Equipment Hardware.

The Contractor shall be responsible for day-to-day operation of the Central Process DCS hardware; this includes troubleshooting to resolve an anomaly. The Contractor shall notify the COR of any and all problems found and/or corrected action taken. The Contractor shall have the capability to troubleshoot and correct problems with the computer/network hardware such as:

- DEC Alpha,
- IBM PC-compatibles,
- Bridge Controllers (BRC),
- Programmable Logic Controllers (PLC),
- PLC I/O,
- Compressor Control Corporation (CCC) Controllers,
- Solid-State Exciters,
- Static Frequency Converters (SFC),
- Uninterruptible Power Supplies (UPS)
- Hardware added during the life of the Contract.

C-8.1.10 Central Process Services Schedule (CPSS). The Contractor shall follow NASA Research Facility Test/Central Process Systems Requirement Schedule, which is published every Thursday by 2:00 pm. This schedule is provided over the Integrated Desktop Environment (IDE) and is created by others. The Contractor shall be responsible for providing equipment and personnel to meet the daily schedule requirements. The Contractor shall also attend the daily morning conference call. Examples of the CPSS schedule are given in Section J Attachment J-C-8.1.10.

C-8.1.10.1 The Government retains the right to update the schedule throughout the week, as research requirements, equipment problems, and changing priorities among research and maintenance groups occur.

C-8.1.10.2 The "start" and "stop" times indicated on the schedule refer to the times that the specified test cells are scheduled for CPS services to begin and end. The Contractor shall ensure that pre-run checks, setups, starts, synchronization, loading, coupling, paralleling operations, etc. are completed within a time frame that allows those start and stop times to be met.

C-8.1.11 Specialized Operations Requirements.

The Contractor shall provide the operator services to transfer, vaporize, cascade and/or pump liquid and gaseous hydrogen when required on a work order basis.

The Contractor shall be responsible for day-to-day operation of the Central Process DCS hardware. This includes the ability to troubleshoot and identify problems and take corrective action with the hardware for computer/network such as the DEC Alpha, IBM PC-compatibles, Bridge Controllers (BRC), Programmable Logic Controllers (PLC), PLC I/O, Compressor Control Corporation (CCC) Controllers, Solid-State Exciters, Static Frequency Converters (SFC), Uninterruptible Power Supplies (UPS), etc. Any Software issues identified shall be reported to the COR and TR. Such software issues include operating systems, networking protocols, languages and database management systems such as VAX/VMS, UNIX System V, MS-DOS, MS Windows, TCP/IP, DECnet, NETBIOS, BASIC, Visual BASIC, C, SQL, dBase III+ and compatibles, Function Code Software, Batch 90 software, "C" utility program (FDI), human-machine interface graphics display software, PLC software and other hardware and software added during the life of the Contract.

C-8.1.12 Controls/Electrical Preventive Maintenance

C-8.1.12.1 Scheduling of All Maintenance Activities. The Contractor shall document a completion date for all PM work on the monthly PM Work Schedule Report and shall complete all scheduled PM's during the period specified in the work order.

C-8.1.12.2 Monthly Preventative Maintenance Work Schedule Report. The Contractor shall provide to the COR a Monthly PM Work Schedule Report, on or about the 20th of each month, that details all Preventive Maintenance tasks completed in the previous month, all backlog PM tasks, and all the PM tasks scheduled for the upcoming month.

C-8.1.12.3 Preventive Maintenance (PM) Requirements. The maintenance schedule shall accommodate PM procedures as defined in the CMMS database and include routine scheduled items.

C-8.1.12.3.1 Procedures. PM procedures are defined in the Job Plans resident in CMMS, and provided for reference in the Technical Reference Library. The Contractor shall use CMMS to manage its PM program. The Contractor's activities shall include updating records, procedures, instruction codes, and nameplate data, scheduling, and recommending improvements to GRC's PM program. The data entered in CMMS becomes the property of the Government.

C-8.1.13 Hardwire Shutdown Verifications & Calibrations. The Contractor shall verify the Hardwire Shutdowns and Calibrations on any system or piece of equipment which has been taken out of service for major repair or rehabilitation or has been replaced due to component failure or wear.

C-8.1.14 Safety Permits. The Contractor shall be responsible for obtaining and maintaining all Safety Permits needed to operate CPS equipment. The Safety Permit process is described in the Glenn Safety Manual, chapter 1A, provided in Section J Attachment J-Safety Manual.

C-8.1.15 Design Field Support. The Contractor shall provide field electrician support during the design phase of a task. Historically, Contract electricians have assisted CPS engineers in the design phase of an IDIQ task. Example of assistance includes verifying the accuracy of the field conditions to the drawings and red-lining any discrepancies found. The Contract electricians also may be asked to create drawings from field conditions when previous drawings do not exist. All CPS engineering services are provided by others.

C-8.1.15.1 Design Review. The Contractor shall attend Design Reviews held by others and provide comments and feedback of the design drawings submitted to the Contractor for field verification.

C-8.2 BASE WORK MECHANICAL MAINTENANCE AND REPAIR

C-8.2.1 General. The Contractor shall ensure that all the equipment, systems and components that comprise the Central Process System and the Pressure Vessels and Systems are maintained in working order throughout the life of this contract. The Contractor shall perform maintenance and repair activities that include, but are not limited to, maintain, inspect, repair, supply, replace, recondition, install, modify, disassemble, lift, relocate, assemble, align, balance, test, and calibrate. The Contractor shall, upon request by the COR, provide their services to the research community to repair their similar types of equipment on an as needed basis as part of IDIQ. The Contractor shall ensure that their maintenance activities don't interfere with the research run schedule.

C-8.2.2 Equipment. The Contractor shall perform maintenance and repair activities on electrical/controls, mechanical, pneumatic, hydraulic, electro-pneumatic and electro-hydraulic components and systems. CPS components and systems include, but are not limited to, valves (whether large or small gate, butterfly or globe type, either powered, hand operated or control, relief, solenoid, servo or vacuum), other components include actuators, hoses, pressure regulators, accumulators, pressure pumps, vacuum pumps (mechanical, diffusion, ionization, turbo-molecular, and Roots blowers), light and heavy duty equipment, plant or research machinery, drive equipment, and all other ancillary equipment.

C-8.2.3 Maintenance Personnel Qualifications. The Contractor shall provide qualified personnel to accomplish maintenance and repair activities. Maintenance personnel shall have experience in their respective technical fields. The Contractor's maintenance personnel shall be experienced and capable of working on the above-described components and experienced in mechanical machinery maintenance, electrical/electronic device maintenance, and piping systems maintenance.

C-8.2.4 Maintenance Standards. Using the guidelines set forth in NASA's Maintenance and Operations of Institutional and Program Facilities and Related Equipment document, NPD 8831.1E and NASA's, Facilities Maintenance Management document NPR 8831.2E, the Contractor shall partner with the Government to improve their maintenance program by recommending additions, deletions, or modifications to the current maintenance activities defined within this SOW.

C-8.2.4.1 All recommendations made by the Contractor shall be cost effective and geared to increase the overall reliability and ensure continuous improvement to the health of the CPS and PVS.

C-8.2.4.2 The Government will provide preventative maintenance procedures, which will be available in the Technical Reference Library and otherwise will be listed in the Government's CMMS.

C-8.2.4.3 Copies of NASA NPD 8831.1E, Maintenance and Operations of Institutional and Program Facilities and Related Equipment, and NPR 8831.2E, Facilities Maintenance Management, can be found in the Technical Reference Library.

C-8.2.4.4 Based on the principles within NPD 8831.1E and NPR 8831.2E the Contractor shall develop and provide the Government their annual maintenance plan. The Contractor's plan shall be provided to the COR before the end of each calendar year.

The Maintenance and Operations of Institutional and Program Facilities and Related Equipment document, NPD 8831.1E, can also be found at the following URL address: http://nodis.hq.nasa.gov/displayDir.cfm?t=NPD&c=8831&s=1E.

The NASA's, Facilities Maintenance Management document NPR 8831.2E can also be found at the following URL http://nodis.hq.nasa.gov/displayDir.cfm?t=NPR&c=8831&s=2E.

C-8.2.5 Reliability Centered Maintenance. The Contractor shall perform maintenance and repairs using the Reliability Center Maintenance (RCM) based maintenance philosophy that is currently implemented and to be continued using the guidelines set forth in NASA NPD 8831.1E.

C-8.2.5 Reliability Centered Maintenance (RCM) Program. The RCM program is primarily the responsibility of the Government. The Contractor shall be knowledgeable in implementing a RCM based maintenance program and shall follow the principles and guidelines as set forth and defined within NPR 8831.1E. The Contractor shall partner with the Government in revising the currently implemented RCM based maintenance program. The current program uses a blend of RCM based maintenance practices; these practices include, preventive and programmed maintenance tasks, proactive predictive testing and inspections activities, conditioned based monitoring tasks, maintenance corrective repair (MCR) tasks and run-to-failure measures. The Contractor shall acquire system manager approval before implementing any modifications to the RCM program.

C-8.2.6 Preventive (and Programmed) Maintenance (PM/PGM). The Contractor shall perform all the preventative and programmed maintenance tasks as currently defined within the Government's CMMS. The Contractor shall use CMMS to manage its PM program. The majority of the equipment and components (assets) that comprise the CPS are in the Government's CMMS. PM frequencies and the instructions to complete PM tasks (job plans) have already been established within the CMMS. The Contractor shall partner with the Government to maintain the accuracy of the CMMS. The Contractor shall be responsible for ensuring that they document within the CMMS all activities performed when conducting a PM task, including updating records, procedures, job plans, and nameplate data and other findings. The data entered into the CMMS by the Contractor becomes the property of the Government. See the Section on CMMS requirements for further CMMS details and Contractor responsibilities.

C-8.2.6.1 Monthly Preventative Maintenance Work Schedule Report. The Contractor shall provide to the COR a Monthly PM Work Schedule Report, on or before the 20th of each month, that details all Preventive Maintenance tasks completed in the previous month, all backlog PM tasks, and all the PM tasks scheduled for the upcoming month. The Contractor shall document a completion date for all PM work on the monthly PM Work Schedule Report and shall complete all scheduled PM's during the period specified in the work order. The Contractor shall report all anomalies uncovered during the previous month and their recommendations to correct the finding.

C-8.2.6.2 Preventive Maintenance (PM) Requirements. The Contractor shall follow the PM instructions (job plans) currently within MAXIMO when performing maintenance tasks. The Contractor shall partner with the Government in improving the accuracy and relevance of the instructions, the frequency of the task etc. The Contractor shall report their finding during their monthly maintenance review meeting with the Government.

C-8.2.7 Predictive Testing and Inspection (PT&I). The Contractor shall have capabilities to perform PT&I maintenance activities. The Contractor shall have employees who are trained to utilize PT&I equipment and who can conduct ultrasound, thermography, oil analysis, vibration analysis, motor circuit evaluation, motor power monitoring, acoustical leak detection, and other PT&I techniques. PT&I activities are used to monitor and trend asset conditions with the intent of minimizing maintenance activities while maintaining equipment reliability and as a basis for the consideration in eliminating certain PM tasks. The Contractor shall use PT&I techniques on all of the major rotating equipment and systems, these techniques shall also be used in validating new or repaired equipment. The Contractor shall notify the COR immediately if though their PT&I activities they determine a failure is imminent. The Contractor shall partner with the Government in seeking PT&I process improvements. The Contractor shall make all test data results available to the Government.

C-8.2.7.1 Condition Based Monitoring (CBM). On a monthly basis, the Contractor shall collect and review the information from their PT&I activities and from condition monitoring equipment installed throughout the CPS. The Contractor shall conduct a monthly meeting on or about the 20th of the month, with the Government's System Managers to go over their most recent PT&I results and findings. The Contractor shall correct any minor problems found during the performance of this activity as soon as practical, the Contractor shall documented their findings in the CMMS and notify the COR. The Contractor shall partner with the Government in seeking PT&I process improvements and in performing corrective actions. The Contractor shall make all test data results available to the Government.

C-8.2.7.2 Equipment Baseline Data Checks. The Contractor shall perform the necessary checks to verify baseline data for such criteria as alignments, vibrations, clearances, flows, electrical signatures, temperatures, and other observable conditions on any system or piece of equipment which has been taken out of service for major repair or rehabilitation or has been replaced due to component failure or wear.

C-8.2.7.3 Field Surveys. The Contractor shall conduct field surveys and document findings of systems and components to verify configuration and component information.

C-8.2.8 Run to Failure. The Government has determined some CPS assets are run-to fail. Any equipment not under PM/PGM or PT&I are considered run-to-fail. The Contractor shall partner with the Government to review the current assets and determine whether or not this philosophy is currently applicable for each asset; other assets can be added or subtracted from the list if determined applicable by both the Contractor and the Government.

C-8.2.9 Mechanical Repairs & Maintenance Corrective Repair (MCR). A MCR is a sub-category of a Repair task within the Government's CMMS. A MCR is used for unplanned work that occurs unexpectedly during the course of the day or before, during, or after operations or when maintenance and inspection activities were performed, that require immediate attention. MCR is identified by the Contractor, or the Government, and is necessary to repair problems that would interfere with scheduled operations, prevent injury to people, equipment or the environment. The Contractor shall be responsible for repairing all mechanical systems and components within the CPS. The Contractor shall report any and all equipment problems, malfunctions, breakdowns, and related repair deficiencies to COR via the daily run report.

C-8.2.9.1 MCR Work Order Cost Limits. The Contractor shall perform and complete MCR Work Orders as soon as possible in order to maintain equipment availability and to ensure that all operational requirements are met. The Contractor shall not incur total costs (labor and material) greater than $10,000 for any single MCR Work Order. The Contractor shall immediately notify the COR if they anticipate the cost of a MCR to exceed $10,000. The Contractor shall obtain COR approval before implementing an MCR greater than $10,000. The Contractor shall during their monthly review meeting report all MCR's identified and/or corrected during the previous month.

8.2.9.1.1 The Contractor shall plan and schedule this work to assure that materials, labor, and equipment are available to complete repairs within the specified time limits and in conformance with established quality standards.

8.2.9.1.2 The Contractor shall schedule work to minimize interference with the normal occurrence of Government business and mission, particularly CPS operations scheduled on the weekly Research Facility Test/Central Process Systems Requirement Schedule. Any repair task or replacement of obsolete item task (in-like kind) done by the Contractor shall be tested prior to operations.

8.2.9.1.3 The Contractor shall meet with the Government to discuss all open MCRs on a monthly basis to set priorities and scheduled finish dates.

C-8.2.10. Design Field Support. The Contractor shall provide Field Mechanic support during the design, implementation and testing phases of a task which is done by others.

C-8.2.10.1. Design Review. The Contractor shall attend Design Reviews held by others and provide comments and feedback on the design drawings submitted to the Contractor for field verification.

C-8.3 Service Agreements.

C-8.3.1 The Contractor shall obtain the following Service Agreements to be used by Others.

- ABB
- Hummingbird Exceed X-Windows
- OSISoft PI Server
- Ipswitch WhatsUp Network Monitor
- GFI LANGuardSecurity Patching Software

- Solarwinds
- Data South Systems
- DBDOC
- EventSentry
- SymantecBackup,Antivirus,System Recovery
- SYMC Backup Exec Sys Rcvry Srvr 7.0 WIN

C-8.3.2 The Contractor shall obtain the following Service Agreements to be used by the Contractor.

- IRD 885 Maintenance Service
- DLI Vibration Analyzer
- Uninterruptible Power Supply Service Agreement

C-8.3.3 PSO Software Maintenance Upgrade Notices. The Contractor shall obtain Service Agreements as required to perform the requirements of the SOW.

The Contractor shall provide an annual report to the COR which lists all anticipated service agreements, their renewal dates and costs by September 15th of every contract year.

C-8.4 IDIQ TASKS

C-8.4.1 General. IDIQ tasks are defined as build-up, repair, upgrade, and testing activities of specific CPS systems and components; including Program Maintenance Tasks. In certain cases, the Contractor shall be tasked to perform repairs on associated Research and Institutional equipment consisting of various Research and Institutional assets similar to CPS assets. These assets are located in LF and PBS.

C-8.4.1.1 The Contractor shall provide to the COR a cost estimate for each Implementation Request within fifteen (15) working days of receipt of the request or renegotiate an acceptable date with the COR. The estimate shall provide detail on costs, materials, labor hours, and applicable fees.

C-8.4.2. IDIQ Personnel Function.

C-8.4.2.1 Mechanical Task Coordination Function. The Mechanical Coordination Function consists of coordination of all mechanical tasks performed by the Contractor.

C-8.4.2.1.1 The Mechanical Coordination shall be done in conjunction with the Electrical/Controls coordination if the task in an Electro-mechanical Task.

C-8.4.2.1.2 The Mechanical Coordination includes verification of all equipment that is being purchased for all the tasks.

C-8.4.2.2 Electrical/Controls Task Coordination Function. The Electrical/Controls Coordination Function consists of coordination of all electrical tasks performed by the Contractor.

C-8.4.2.2.1 The Electrical/Controls Coordination includes verification of all equipment that is being purchased for all the tasks.

C-8.4.3 Red Line Drawings and Documentation. The Contractor shall have between 15 and 45 working days, depending upon the complexity and magnitude of an IDIQ task, to submit to the Government all related Red Lined drawings and documentation. The Contractor and the Government will jointly determine a realistic date for the Contractor to complete all required drawings and documentation.

C-8.4.3.1 The Contractor shall keep a copy of all Red-Lines turned in to the COR in the general area of the equipment until the As-Builts are returned to the Contractor for filing.

C-8.4.3.2 The Contractor shall update operating procedures associated with each IDIQ task, if applicable. The Contractor shall obtain COR/TR approval before uploading any modified or new operating procedure.

C-8.4.4 Workmanship. The Contractor shall ensure that all installation and connections of all equipment are in accordance with all applicable codes and standards.

C-8.4.4.1 The Contractor shall ensure that all equipment provided will be arranged or installed as to provide unobstructed access to existing equipment or items requiring maintenance.

C-8.4.4.2 The Contractor shall ensure that all installation projects shall be implemented in a manner that minimizes interference with CPS operations.

C-8.4.5 Acceptance Testing. The Contractor shall provide the COR with all factory acceptance testing documents for all replaced or new equipment prior to installation.

C-8.4.5.1 When specific tests are required, the Government shall provide the Contractor a list of such tests. The Contractor shall prepare a test plan outlining the procedures to be followed for conducting such tests. The Contractor's test plan shall define, at a minimum, each step of the test to be performed in detail, participant responsibilities, documentation for tests, duration of tests, and procedures for dealing with discrepancies and failures during the test.

C-8.4.5.2 The Contractor shall prepare a test report document certifying successful completion of each field acceptance test. The Contractor shall submit these test reports to the COR along with all the required reports as specified in the task SOW.

C-8.4.6 Training. The Contractor shall develop operational procedures and provide appropriate training as required to support new and existing equipment as covered under this contract. In addition to training their own staff, the Contractor shall provide training to various personnel including Government and other GRC support service contractors. The Contractor shall upon request of the COR provide a training report that details the training requirements and training activities of all their employees.

C-8.4.6.1 The Contractor shall document and store all their training records electronically in such a way as to pass spot audits. The Contractor shall be required to submit their training records to the COR upon request.

C-9. CRYOGENIC AND HIGH PRESSURE GAS SYSTEMS OPERATIONS, MAINTENANCE & REPAIR

C-9.1 General. The Contractor shall be responsible for operating, trouble-shooting, and providing watch-standing and inspection duties on various cryogenic devices and systems. The Contractor shall ensure that all operations are conducted with appropriately qualified staff members. Operations include the transfer of various amounts of commodity to and from stationary or mobile high-pressure gas and cryogenic systems. Purging of components may also be required. These systems provide hydrogen, oxygen, methane, helium, nitrogen, argon and air in both liquid and gas to users in the Glenn research community both at Lewis Field and Plum Brook Station. The contractor shall be responsible for implementing minor technical solutions which address day-to-day operations, the maintenance of components and/or minor system upgrades. Operational activities include the daily monitoring of automated systems and facilities such as verifying pressures, testing for leaks, making adjustments and checking for anomalies. Operations include operating and maintaining relief valve and flex hose testing station(s) and performing relief valve and flex hose certification; some of which includes code stamped components. The flex hose test station will be provided by the Government. Operational activities also include preparation activities required to renew existing and new safety permits, i.e. liquid hydrogen transfer and storage, compressed gas tube trailer systems maintenance, relief valve and flex hose testing.

C-9.2 Personnel Qualification

C-9.2.1 General Qualifications of Cryogenic Personnel. The Contractor shall ensure that all cryogenic technicians have the minimum qualifications as defined by the Department of Labor (DOL) as an engineering technician. Cryogenic Technicians are classified according to skill level and ability in three classifications, as described below. As cryogenics is a specialized field, new personnel are employed primarily as a Cryogenic Technician I (Cryo Tech I) unless prior experience dictates otherwise. A Cryo Tech I may only advance upon successful completion of the conditions for advancement to Tech II.

C-9.2.2 Cryogenic Work Lead (CWL). Supervises the maintenance and operation of stationary and mobile high pressure gas and cryogenic systems that provide hydrogen, oxygen, helium, nitrogen, argon, methane and air in both liquid and gas form to users in the Glenn research community.

C-9.2.2.1 This is the third in a series of three classifications. The CWL is distinguished from the Cryogenic Technician I and Cryogenic Technician II by supervisory and administrative responsibilities in support of the Glenn Research Center's Cryogenics Program. The Cryogenic Work Lead has the responsibility of managing cryogenic and high-pressure systems equipment maintenance and repair. The CWL reviews and makes recommendations for the safe filling and transferring procedures for mobile and stationary dewars and other cryogenic and high pressure gas system equipment. The CWL works with the NASA task managers, facility managers, building managers, responsible engineers, the Pressure Systems Office, and the Process Systems Safety Committee to correct discrepancies with cryogenic and high pressure gas systems, components, and equipment.

C-9.2.2.2 Knowledge, Skills and Abilities: The CWL shall have:

- Intimate knowledge of safety concerns associated with cryogenic and high pressure gas systems.
- Intimate knowledge of mobile and stationary cryogenic and high pressure gas systems.
- Knowledge of the physical properties of cryogenic liquids and gases.
- Knowledge of mechanical and electrical principles.
- Knowledge of codes and regulations as they pertain to cryogenic and high pressure gas systems.
- Training in cryogenics safety.
- Training in oxygen and hydrogen safety.
- Skills in the installation, adjustment and repair of mechanical and electrical equipment.

- Skills in reading, understanding and red-lining piping and instrumentation diagrams (P&IDs) of cryogenic and high pressure gas systems.
- Skills in supervising and coordinating the work of others.
- Ability to communicate effectively.

C-9.2.3 Cryogenic Tech II (CT2). Performs maintenance and operation of stationary and mobile high pressure gas and cryogenics systems that provide hydrogen, oxygen, helium, nitrogen, argon, methane and air in both liquid and gas form to users in the Glenn research community.

C-9.2.3.1 This is the second in a series of three classifications. The CT2 is distinguished from the Cryogenic Technician 1, by an advanced experience level over that of the Cryogenic Technician I classification. The Cryogenic Technician II has the responsibility of maintaining and repairing cryogenic and high pressure gas systems and equipment. The CT2 reviews and makes recommendations for the safe filling and transferring procedures for mobile and stationary Dewars and other cryogenic and high pressure gas equipment.

C-9.2.3.2 Knowledge, Skills and Abilities: The CT2 shall have:

- Intimate knowledge of the safety concerns associated with cryogenic and high-pressure gas systems.
- Intimate knowledge of mobile and stationary cryogenic and high-pressure gas systems.
- Knowledge of the physical properties of cryogenic liquids and gases.
- Knowledge of mechanical and electrical principles.
- Knowledge of codes and regulations as they pertain to cryogenic and high-pressure gas systems.
- Skills in the installation, adjustment and repair of mechanical and electrical equipment.
- Skills in reading, understanding and red-lining piping and instrumentation diagrams (P&IDs) of cryogenic and high pressure gas systems.
- Proof of completed training in cryogenic systems safety
- Proof of completed training in oxygen and hydrogen safety

C-9.2.4 Cryogenic Tech I (CT1). A CT1 performs maintenance and operation of stationary and mobile high pressure gas and cryogenics systems that provide hydrogen, oxygen, helium, nitrogen, argon, methane and air in both liquid and gas form to users in the Glenn research community.

C-9.2.4.1 This is the first in a series of three classifications. The CT1 is distinguished from the Cryogenics Technician II, and Cryogenics Work Lead by an entry level type position for experienced mechanics; training in the specialized cryogenics field. The Cryogenics Technician I has the responsibility of maintaining and repairing cryogenic/high-pressure gas systems and equipment.

C-9.2.4.2 Knowledge, Skills and Abilities: The CT1 shall have:

- Basic knowledge of the safety concerns associated with cryogenic and high-pressure gas systems.
- Basic knowledge of mobile and stationary cryogenic and high-pressure gas systems.
- Basic knowledge of the physical properties of cryogenic liquids and gases.
- Knowledge of mechanical and electrical principles.
- Skills in the installation, adjustment and repair mechanical and electrical equipment and compressors.
- Skills in reading and understanding piping and instrumentation diagrams (P&IDs) of high pressure gas and cryogenic systems.

C-9.3 Base Work Operations

C-9.3.1 Cryogenics Operation Function. The Contractor shall perform operational functions; operate,

inspect, adjust, drain, purge, and monitor facilities that contain cryogenic systems.

The Contractor shall perform the duties listed below:

C-9.3.1.1 Check, inspect and monitor all automated facilities. Historically, this automated equipment is located at buildings 5, 77, 24, 35 and 301. During periods of liquid hydrogen activity; inspect hydrogen area for leaks and abnormal conditions. Conduct equipment adjustments as necessary.

C-9.3.1.2 Develop/review priority list for scheduled activities for the day, often revised upon completion of daily inspections.

C-9.3.1.3 Building 35 ACS area cylinder pressures are monitored and filled by request of the facility personnel. During periods of continuous operations, daily replenishment is required. The cylinders are refilled utilizing the Cryogenics Paul Pump. The Paul Pump requires manual start up and shut down with continuous monitoring, Equipment adjustments are required during pumping process.

C-9.3.1.4 During periods of liquid hydrogen activity. All mobile equipment associated with the hydrogen activity is monitored, particularly for leaks and proper containment. Liquid levels and vessel pressures are critical indicators and need to be monitored and maintained. Liquid hydrogen transfers are usually conducted on a schedule of every other day. During heavy periods of hydrogen demand, transfers can occur every day. Hydrogen is off loaded from a commercial vender and stored in various mobiles. Transfers then are conducted between various sized mobile Dewars. Liquid hydrogen is ordered as necessary by testing facility personnel.

C-9.3.1.5 Conduct rework of problem areas including non-code compliance that are discovered during recertification and inspections conducted by the Pressure System Office.

C-9.3.1.6 Prepare High Pressure stationary vessels and Cryogenic Dewars for recertification. Provide necessary temporary services during recertification activity.

C-9.3.1.7 Prepare Tube Trailer's for certification which may include transferring, draining, and purging with inert gases. Upon return from recertification facility, trailer components are inspected and sometimes additional repair or component replacement is required. Trailers are prepared for proper commodity which the trailer is designed for which includes: evacuating, purging and pressurizing, placarding, and placing back into service.

C-9.3.1.8 Mobile Dewars and mobile Liquid Vaporizers (LV's) are recertified when required by NASA, on a 5 year cycle. Mobiles are prepped for testing, safety devices are removed and sent to repair facility. Transportation is arranged and the unit is transported to Plum Brook and set up for pneumatic testing. Upon successful completion of pressure testing the Dewar is returned to Glenn. All components are re-inspected, safety devices are installed and a leak check is conducted. Dewar is painted and relabeled as necessary and placed into service.

C-9.3.1.9 Prepare and submit various safety permits and pneumatic test permits. Historically safety permits have included:

- Liquid Hydrogen Transfer and Storage.
- Compressed Gas Tube Trailer System Maintenance.
- Flex hose testing.

C-9.3.1.10 Provide general support for various facilities as requested, i.e. flex hoses, relief valves, fittings, tube trailers, and temporary services for testing, piping and tubing of cryogenic and high pressure gas systems modifications and repairs.

C-9.3.1.11 After completing repairs or testing provide PSO with updated information for entry into the PSD.

C-9.3.1.12 Maintain lock-out/tag-out log (red lock and non-red locks and tags) of cryogenic systems, Mobile equipment, high pressure gas systems, tube trailer direct connect systems, and stationary Dewars and vessels.

C-9.4. Base Work Maintenance and Repair

C-9.4.1. Preventative Maintenance (PM) & Repair Requirements. The Contractor shall perform preventive maintenance, programmed maintenance, inspections, and calibrations on all Pressure Vessels and Systems and Cryogenic components and equipment listed in the CMMS and the PSD. The list of Preventative Maintenance Tasks covered under the span of this Contract is located in Section J Attachment J-C-9.4.1 and in the Technical Reference Library. The Contractor shall as part of its own quality assurance program, randomly inspect the quality of work it performs on at least 10% of the PM tasks it completes per month.

C-9.4.2 PM Scheduling and Documentation. The contractor shall use the Government's CMMS in scheduling and documenting their maintenance and repair activities. The Contractor shall document all pertinent task related data, including the names of the individuals who performed the activity and their labor hours for each task in the CMMS. The Contractor shall update the CMMS within seven days after completion of any task, or as necessary.

C-9.4.2.1 PM Tasks are generated for Tube Trailers, Mobile Dewars, Stationary Dewars, Mobile LV's, Stationary LV's, Stationary high pressure gas storage vessels, Fuel Trailer relief components, and the Time Capsule. Any discrepancies discovered from the PM inspection are documented and corrected in a timely manner. Major discrepancies are brought to the attention of the COR and are evaluated on a case-by-case basis. Additional work orders are generated to correct the discrepancies.

C-9.4.2.2 PM Tasks are also generated for Recertification of relief valves and flex hoses. Components must be verified with the PSD, scheduled outages are coordinated with facility and building managers. Systems are tagged out of service and drained of commodity. The Relief valves are removed and delivered to repair facility for repair, testing and certification. Upon completion of certification, the components are reinstalled and the system is returned to normal service. The contractor shall perform routine repairs that are discovered during daily inspections, and notification by other departments along with PM discrepancies. Historically, most repair needs are discovered during routine maintenance and repair activities.

C-9.4.3 Preventative Maintenance Procedures. PM procedures are defined in the job plans or job instruction codes resident in CMMS, and provided for reference in the Technical Reference Library. The Contractor shall use CMMS to manage its PM program. The Contractor activities shall include updating records, procedures, job plans tasks nameplate data, scheduling, and recommending improvements to GRC's PM program. The data entered in CMMS becomes the property of the Government. Samples of PM Work Instructions are attached in Section J Attachment J-C-9.4.3.

C-9.4.3.1. Inherent Reliability Problems. The Contractor shall identify and report to the COR any inherent reliability problems, ineffective maintenance requirements, and ineffective work instructions they uncover and shall make recommendations on how to enhance maintenance approaches.

C-9.4.4 Maintenance Standards. The Contractor shall follow the guidelines set forth in latest edition of NASA NPD 8831.1 Maintenance and Operations of Institutional and Program Facilities and Related Equipment and NPR 8831.2 Facilities Maintenance Management. The Contractor shall recommend additions, deletions, and modifications to the current maintenance activities to the Government;

C-9.4.5 Scheduling of Preventive Maintenance Activities. The Contractor shall plan and schedule maintenance work to assure that materials, labor, and equipment are available to complete requirements within the specified time limits and in conformance with established quality standards. The Contractor shall schedule PM, as well as all other types of maintenance and repair work, in such a way as to minimize the impact on the end user. The Contractor shall not perform scheduled maintenance on overtime without approval from the COR. The Contractor shall document a completion date for all PM work on the monthly PM Work Schedule Report and shall complete all scheduled PM's during the period specified in the work order.

C-9.4.5.1 Monthly Preventative Maintenance Work Schedule Report. The Contractor shall provide to the COR a Monthly PM Work Schedule Report, on or about the 20th of each month, that details all Preventive Maintenance tasks completed in the previous month, all backlog PM tasks, and all the PM tasks scheduled for the upcoming month.

C-9.4.6 Scheduling Unplanned Maintenance and Repairs. Unplanned maintenance and repair are equipment problems or malfunctions that occur unexpectedly during the course of the day that require immediate attention by the Contractor to ensure equipment availability to meet the research and test schedule.

C-9.4.6.1 The Contractor shall plan and schedule this unexpected work to assure that materials, labor, and equipment are available to complete repairs within the specified time limits and in conformance with established quality standards.

C-9.4.6.2 The Contractor shall schedule work to minimize interference with the normal occurrence of Government business and mission.

C-9.4.7 Cryogenic Systems Corrective Maintenance and Repair (CSCMR). CSCMR is a sub-category and the name given to a Repair Task inherent to equipment and systems maintenance. It includes work identified by the Contractor, or the Government, during the performance of normal maintenance and repair work activities, as necessary to correct problems that would interfere with scheduled operations or to prevent injury to people, equipment or the environment. The Contractor shall inform the COR and other applicable Government personnel when a problem has been identified and corrective action planned. The Contractor shall perform the CSCMR Work Orders on cryogenic systems as defined by the government. These tasks shall include, but are not limited to, material purchases and installations. The Contractor shall create a new work order identifying any CSCMR work they discover utilizing the CMMS.

C-8.2.9 Cryogenic Systems Corrective Repair (CSCR). A CSCR is a sub-category of a Repair task within the Government's CMMS. A CSCR is used for unplanned cryogenic system work that occurs unexpectedly during the course of the day or during certification activities. CSCR is identified by the Contractor, or the Government, and is necessary to repair problems that would interfere with scheduled operations, prevent injury to people, equipment or the environment. The Contractor shall report any and all equipment problems, malfunctions, breakdowns, and related repair deficiencies to COR.

C-8.2.9.1 CSCR Work Order Cost Limits. The Contractor shall perform and complete CSCR Work Orders as soon as possible in order to maintain equipment availability and to ensure that all operational requirements are met. The Contractor shall not incur total costs (labor and material) greater than $10,000 for any single CSCR Work Order. The Contractor shall immediately notify the COR if they anticipate the cost of a CSCR to exceed $10,000. The Contractor shall obtain COR approval before implementing an CSCR greater than $10,000. The Contractor shall during their monthly review meeting report all CSCR's identified and/or corrected during the previous month.

8.2.9.1.1 The Contractor shall plan and schedule this work to assure that materials, labor, and equipment are available to complete repairs within the specified time limits and in conformance with established quality standards.

8.2.9.1.2 The Contractor shall schedule work to minimize interference with the normal operations. Any repair task or replacement of obsolete item task (in-like kind) done by the Contractor shall be tested prior to operations.

8.2.9.1.3 The Contractor shall meet with the Government to discuss all open CSCRs on a monthly basis to set priorities and scheduled finish dates.

C-9.4.8 Confined Space Entry Requirements. The Contractor shall follow all NASA, GRC and OSHA confined space entry regulations and prepare confined spaces for entry by others.

C-9.4.9 Relief Valve and Flex Hose Testing. The Contractor shall maintain, inspect, repair, recondition, supply, replace, install, modify, test, and calibrate relief valves. The contractor shall conduct this activity in accordance with the requirements set forth in ASME Section VIII, Div. I, and NBIC NB-23. Relief Valve certification requirements shall include, but are not limited to, relief valve removal, testing, repair, reinstallation, formal documentation, and update of the PSD. Note that the contractor is not required to possess ASME VR repair shop accreditation, and may procure commercial VR shop services as required to adjust set point and/or repair ASME code-stamped relief valves. In any case, set point adjustments and repairs to code-stamped relief valves shall only be performed by a shop with VR accreditation.

The contractor shall provide flex hose recertification as required to satisfy agency policy requirements. Flex hose certification varies depending on circumstances, and typically includes: external inspection, internal inspection (special cases), hydrostatic or pneumatic pressure test, formal documentation, and update of the PSD.

C-9.4.10 Tube Trailer, Mobile Dewar and Mobile LV Recertification. The Contractor shall manage the refurbishment process of tube trailers, mobile Dewars and mobile LV's to meet the applicable Department of Transportation (DOT) requirements for tube trailer recertification.

C-9.5 IDIQ TASKS

C-9.5.1 General. IDIQ tasks are defined as build-up, repair, and testing activities of specific Research RV's and Research cryogenic systems.

C-9.5.1.1 The Contractor shall provide to the COR a cost estimate for each Implementation Request within fifteen (15) working days of receipt of the request or renegotiate an acceptable date with the COR. The estimate shall provide detail on costs, materials, labor hours, and applicable fees.

C-9.5.2 Drawings and Documentation. The Contractor shall have between 15 and 45 working days, depending upon the complexity and magnitude of an IDIQ task, to submit to the Government all related drawings and documentation. The Contractor and the Government will jointly determine a realistic date for the Contractor to complete all required drawings and documentation.

C-9.5.3 Workmanship. The Contractor shall ensure that all installation and connections of all equipment are in accordance with all applicable codes and standards.

C-9.5.3.1 The Contractor shall ensure that all equipment provided will be arranged or installed as to provide unobstructed access to existing equipment or items requiring maintenance.

C-9.5.3.2 The Contractor shall ensure that all installation projects shall be implemented in a manner that minimizes interference with CPS operations.

C-9.5.4 Acceptance Testing. The Contractor shall provide the COR with all factory acceptance testing documents for all replaced or new equipment prior to installation.

C-9.5.4.1 When specific tests are required, the Government shall provide the Contractor a list of such tests. The Contractor shall prepare a test plan outlining the procedures to be followed for conducting

such tests. The Contractor's test plan shall define, at a minimum, each step of the test to be performed in detail, participant responsibilities, documentation for tests, duration of tests, and procedures for dealing with discrepancies and failures during the test.

C-9.5.4.2 The Contractor shall prepare a test report document certifying successful completion of each field acceptance test. The Contractor shall submit these test reports to the COR along with all the required reports as specified in the task SOW.

C-9.5.5 Training. The Contractor shall develop operational procedures and provide appropriate training as required to support new and existing equipment as covered under this contract. In addition to training their own staff, the Contractor shall provide training to various personnel including Government and other GRC support service contractors. The Contractor shall upon request of the COR provide a training report that details the training requirements and training activities of all their employees.

C-9.5.5.1 The Contractor shall document and store all their training records electronically in such a way as to pass spot audits. The Contractor shall be required to submit their training records to the COR upon request.

C-10. HIGH VOLTAGE SUBSTATION CONTROLS REQUIREMENTS

C-10.1 General. The Contractor shall maintain, repair and upgrade substation controls and the interfaces to the Central Process Systems Distributed Control (CPSDC) as part of the work scope of this contract.

C-10.2 Base Work Operation. The Operation of the High voltage electrical power distribution is not part of this Contract.

C-10.2.1 Troubleshooting. The Contractor shall provide troubleshooting of High Voltage Substations Control Equipment as part of this Contract.

C-10.3 Base Work Maintenance, Repair and Upgrade. The maintenance, repair and upgrade of the Substation is also not part of this Contract, however, maintenance, repair and upgrade of the substation controls and the interface to the Central Process Systems Distributed Control (CPSDC) is part of this contract. The Contractor shall work with the COR in acquiring support services from the FORM-II high-voltage substation crew. The Contractor shall notify the COR twenty-two (22) work days in advance of any scheduled maintenance, repair or upgrade work they plan on completing so that FORM-II support can be provided.

C-10.3.1 Preventive Maintenance (PM)

C-10.3.1.1 Scheduling of All Maintenance Activities. The Contractor shall document a completion date for all PM work on the monthly PM Work Schedule Report and shall complete all scheduled PM's during the period specified in the work order.

C-10.3.1.2 Monthly Preventative Maintenance Work Schedule Report. The Contractor shall provide to the COR a Monthly PM Work Schedule Report, on or about the 20th of each month, that details all Preventive Maintenance tasks completed in the previous month, all backlog PM tasks, and all the PM tasks scheduled for the upcoming month.

C-10.3.1.3 Preventive Maintenance (PM) Requirements. The maintenance schedule shall accommodate PM procedures as defined in the CMMS database and include routine scheduled items.

C-10.4 IDIQ TASKS

C-10.4.1 General. IDIQ tasks are defined as build-up, repair, and testing activities of specific Substation Controls.

C-10.4.1.1 The Contractor shall provide to the COR a cost estimate for each Implementation Request within fifteen (15) working days of receipt of the request or renegotiate an acceptable date with the COR. The estimate shall provide detail on costs, materials, labor hours, and applicable fees.

C-10.4.2. IDIQ Personnel Function.

C-10.4.2.1 Electrical/Controls Task Coordination Function. The Electrical/Controls Coordination Function consists of coordination of all electrical tasks performed by the Contractor.

C-10.4.2.1.1 The Electrical/Controls Coordination includes verification of all equipment that is being purchased for all the tasks.

C-10.4.3 Red Line Drawings and Documentation. The Contractor shall have between 15 and 45 working days, depending upon the complexity and magnitude of an IDIQ task, to submit to the Government all related Red Lined drawings and documentation. The Contractor and the Government will jointly determine a realistic date for the Contractor to complete all required drawings and documentation.

C-10.4.3.1 The Contractor shall keep a copy of all Red-Lines turned in to the COR in the general area of the equipment until the As-Builts are returned to the Contractor for filing.

C-10.4.3.2 The Contractor shall update operating procedures associated with each IDIQ task, if applicable. The Contractor shall obtain COR/TR approval before uploading any modified or new operating procedure.

C-10.4.4 Workmanship. The Contractor shall ensure that all installation and connections of all equipment are in accordance with all applicable codes and standards.

C-10.4.4.1 The Contractor shall ensure that all equipment provided will be arranged or installed as to provide unobstructed access to existing equipment or items requiring maintenance.

C-10.4.4.2 The Contractor shall ensure that all installation projects shall be implemented in a manner that minimizes interference with CPS operations.

C-10.4.5 Acceptance Testing. The Contractor shall provide the COR with all factory acceptance testing documents for all replaced or new equipment prior to installation.

C-10.4.5.1 When specific tests are required, the Government shall provide the Contractor a list of such tests. The Contractor shall prepare a test plan outlining the procedures to be followed for conducting such tests. The Contractor's test plan shall define, at a minimum, each step of the test to be performed in detail, participant responsibilities, documentation for tests, duration of tests, and procedures for dealing with discrepancies and failures during the test.

C-10.4.5.2 The Contractor shall prepare a test report document certifying successful completion of each field acceptance test. The Contractor shall submit these test reports to the COR along with all the required reports as specified in the task SOW.

C-10.4.6 Training. The Contractor shall develop operational procedures and provide appropriate training as required to support new and existing equipment as covered under this contract. In addition to training their own staff, the Contractor shall provide training to various personnel including Government and other GRC support service contractors. The Contractor shall upon request of the COR provide a training report that details the training requirements and training activities of all their employees.

C-10.4.6.1 The Contractor shall document and store all their training records electronically in such a way as to pass spot audits. The Contractor shall be required to submit their training records to the COR upon request.

C-11. PRESSURIZED VESSELS & PRESSURIZED SYSTEMS (PVS) CERTIFICATION

C-11.1 General Scope of work for PVS Certification. Certification of PVS includes review of existing documentation, preparation for inspection, visual and non-destructive examinations, engineering evaluation, formal risk assessment, recommendations to meet Fit-For-Service requirements, supporting documentation/reports as detailed below, and approval by the Pressure Systems Manager. Actual repairs necessary to meet Fit-For-Service requirements are also part of the certification process, but are frequently initiated as a separate IDIQ task, and may be completed by others. The Contractor shall review all related existing documentation, generate new drawings if required, make all necessary preparations for inspection, perform all visual and non-destructive examinations, conduct all engineering evaluations, develop risk assessment documentation, develop a statement of work for repairs (if applicable), and submit documentation to PSM for certification approval. Upon completion of any repairs, the contractor shall review and approve all supporting documentation involved with the repairs. The contractor shall be responsible for periodic in-service inspections and shall be responsible for maintaining accuracy of the pressure systems database. Certification is defined as all activities including recertification, repairs, documentation, PSM approval, and periodic in-service inspections. Detail on the type and number of PVS to be certified is contained in Section J-C-2.6.

C-11.2 Personnel Qualifications

C-11.2.1 General Personnel Requirements. Safety is of paramount importance in all issues related to the activities covered under this SOW. Due to high pressure and/or temperatures, as well as cryogenic conditions, knowledge of, and strict adherence to, NASA, GRC, ASME, ANSI, DOT and other applicable national codes and standards is imperative. The Contractor shall ensure that personnel performing this work possess a comprehensive understanding of their duties and all applicable codes and standards. The Contractor shall provide a report to the COR that provides proof of certification and qualifications of their employees who perform PV/S certification work. The proof of certification and qualifications report is due 15 days after Contract start date, then on the 1st day of every September and March. See Section J Attachment J-C-11.2.1 for further general personnel requirements details. The following specialized skills will be required to perform pressure system certification.

C-11.2.2 Pressure Systems Engineers (PSE)

C-11.2.2.1 Chief Principal Pressure System Engineer (PSE). Completion of a ABET accredited engineering degree, requiring four or more years of full-time study. Experienced in overseeing and managing fitness-for-service analysis, inspection and failure analysis, or design, evaluation, construction, repair, and operation of pressure vessels, piping and tanks in the cryogenic/gas, aerospace, chemical, nuclear, refining and/or petrochemical industry. The Contractor's Chief Principal PSE shall be a registered Professional Engineer.

C-11.2.2.2 Principal PSE. Completion of a ABET accredited engineering degree, requiring four or more years of full-time study. Experienced in fitness-for-service analysis, inspection and failure analysis, or design, evaluation, construction, repair, and operation of pressure vessels, piping and tanks in the cryogenic/gas, aerospace, chemical, nuclear, refining and/or petrochemical industry. The Contractor's Principal PSEs shall be registered Professional Engineers.

C-11.2.2.3 Senior PSE. Completion of a ABET accredited engineering degree, requiring four or more years of full-time study. Experienced in fitness-for-service analysis, inspection and

failure analysis, or design, evaluation, construction, repair, and operation of pressure vessels, piping and tanks in the cryogenic/gas, aerospace, chemical, nuclear, refining and/or petrochemical industry. Senior PSEs should be registered Professional Engineers

C-11.2.2.4 PSE. Completion of a ABET accredited engineering degree, requiring four or more years of full-time study, some experience in fitness-for-service analysis, inspection and failure analysis, or design, evaluation, construction, repair, and operation of pressure vessels, piping and tanks in the cryogenic/gas, aerospace, chemical, nuclear, refining and/or petrochemical industry. Formal classroom training in the following courses is highly recommended for practicing PSEs: ASME B&PV Section VIII Div 1 and 2, ASME B31.3, ASME / NBIC NB-23, API RP-579, and API RP-520.

C-11.2.3 Inspectors, Examiners and Draftsman

C-11.2.3.1 NDE Level III Technician. Completion of related classroom training in accordance with ASNT SNT-TC-1A, plus experience in the inspection and examination of pressure vessels, piping and tanks in the cryogenic/gas aerospace, chemical, nuclear, refining and/or petrochemical industry; and ASNT certification to perform visual, leak testing, liquid penetrant, magnetic particle, radiography, ultrasonic shear wave, and ultrasonic thickness testing.

C-11.2.3.2 Senior NDE Technician (NDE Level II). Completion of related classroom training in accordance with ASNT SNT-TC-1A, plus experience in the inspection and examination of pressure vessels, piping and tanks in the cryogenic/gas aerospace, chemical, nuclear, refining and/or petrochemical industry; and ASNT certification to perform visual, leak testing, liquid penetrant, magnetic particle, radiography, ultrasonic shear wave, and ultrasonic thickness testing.

C-11.2.3.3 NDE Technician (Examiners). The Contractor shall create an examiner training program in accordance with the guidelines set forth in ASNT SNT-TC-1A. New Contractor NDE Technicians (Examiners) shall successfully complete the Contractor's training; any required refresher training shall be conducted by the Contractor as well.

C. 11.2.3.4 Draftsman DRAFTER/CAD OPERATOR IV. This person works closely with design with Pressure Systems Engineers and Technicians preparing drawings or computer models of Pressure Systems and components found throughout GRC's Lewis Field and Plum Brook Station. These individuals shall be proficient in the latest version of AutoCAD and Solidworks for 3D modeling of pressure vessels and systems.

C-11.3 Base Work Requirements

C-11.3.1 Pressurized Systems Certifications Process. The following paragraphs are provided for reference on how the certification process is currently conducted and the minimum qualifications of the key personnel involved. The technical certification personnel shall be comprised of Pressure Systems Engineers, Inspectors & Examiners and Drafters as described within this section.

The Contractor shall perform all PV/S certifications as described in the following chart:

C-11.3.1.1 Certification Process and Flowcharts. The current certification process, including flowcharts, is attached in the GPSC Certification Process Dated April 2012, see Section J Attachment J-C-11.3.1.

C-11.3.2 Certification Services. The Contractor shall determine the requirements necessary for the certification of systems and or components by interpreting the NASA requirements documents and applicable national codes and standards. Specific NASA policy documents specifying certification requirements are NPD-8710.5, "Policy for Pressure Vessels and Pressurized Systems", and STD-8719.17, NASA Requirements for Ground-Based Pressure Vessels and Pressurized Systems". The Contractor shall be responsible for determining what equipment needs certification and how best to certify at minimum cost.

C-11.3.3 Certification Tasks. For each specific certification task, the Contractor shall; review all related existing documentation, generate new drawings if required, make all necessary preparations for inspection, perform all visual and non-destructive examinations, conduct all engineering evaluations, develop risk assessment documentation, develop a statement of work for repairs, and upon completion of the repairs, review and approve all supporting documentation involved with the repairs. The Contractor shall use qualified engineers and technicians in the performance of certification work. There are five major steps used in the certification process at GRC, they are outlined below.

C-11.3.3.1 Documentation retrieval and review. The Contractor shall gather existing documentation (or create new documentation in some cases) and other information that is necessary in performing the certification to the current standards. These documents shall include, but are not limited to, the design drawings, materials identification, fabrication information, NDE records, code/design calculations and engineering analysis, code certification data, etc. The Contractor shall establish appropriate recertification files and PSD/CMMS data to provide a permanent recertification record that includes all follow-on In Service Inspection (ISI) requirements.

C-11.3.3.2 Initial Engineering Assessment. The Contractor shall review existing documentation to identify and determine the adequacy of the pressure system components with respect to the NASA requirements and current codes and standards. This includes review of maximum allowable working pressure and temperature, remaining life evaluation, etc. In most cases, simple code calculations or evaluations using commercial codes are adequate. However, in some cases a finite element analysis, and/or fatigue and fracture life assessment may be required. The Contractor shall have demonstrated capabilities to perform all types of engineering assessment; and in addition to the above calculations, shall provide relief valve sizing calculations and piping system flexibility analyses of piping systems, as required.

C-11.3.3.3 Determination of Conditions and Identification of Defects. The Contractor shall determine the best suitable method to evaluate the current condition of the pressure systems and components based on the code requirements, risk assessments, and cost considerations. This will require review of past operating history, operating conditions, understanding of possible damage mechanisms and review of past in service inspection records. The Contractor shall, based on this evaluation, determine and specify non-destructive examination (NDE) requirements for systems and components.

C-11.3.3.4 NDE Evaluation. The contractor shall perform NDE based on the above determination and document all findings. The Contractor shall be capable of providing all types of NDE testing, including visual examination, liquid penetrant examination, magnetic particle examination, radiographic examination, ultrasonic examination, ultrasonic thickness testing, eddy current inspection, hardness testing, acoustic emission examination, positive material identification and replication testing. The Contractor may use in-house staff or outside qualified (sub) contractors as appropriate.

C-11.3.3.5 Final Engineering, Evaluation and Recommendations. The Contractor shall, based on the results of the NDE evaluation, determine the current condition of the pressure system and all of its components and shall update all preliminary calculations to reflect the current conditions. The Contractor shall establish required corrective actions (repairs), depth and schedule of future in-service inspections (ISI), re-certification schedule, operating restrictions if any and re-rating or de-rating required prior to releasing the system for operation. In many cases, there are choices between making modifications and performing detailed engineering evaluation using ASME section VIII, Div. II and finite element analysis. The contractor shall make the recommendation.

C-11.3.3.6 Risk Assessment. The Contractor shall perform a Risk Analysis and establish risk assessment code determinations based on NASA standard 8719.17, Section 4.9._

C-11.3.3.7 Certification Report. The Contractor shall prepare initial certification reports documenting results of all the steps outlined above for approval by the PSM. The Contractor shall provide the COR a completed Certification Report, thirty (30) calendar days after the task completion. The contractor shall also upload final certification documents to the CMMS within thirty (30) calendar days after the task completion. These documents shall minimally include Certification certificate, formal RAC statement, NDE reports, and pertinent calculations. A copy of the report shall be placed in the Technical Reference Library.

C-11.3.4 In-Service Inspection. The Contractor shall perform scheduled inspections in accordance with in-service inspection requirements identified in the data books, PSD, and CMMS for those pressure systems, vessels, and components that have been certified and are currently being used. The Contractor shall include post inspection reports and documentation to reflect inspection completion and recommended future inspection actions and requirements. The Contractor shall update as necessary the data books, databases, and drawings.

C-11.3.5 Database Maintenance and Updates. The Contractor shall identify systems and components through tagging, bar coding, and documentation utilizing the PSD and CMMS. The Contractor shall document all recertification work, results, and recommendations in recertification data books, PSD, and CMMS. The Contractor shall complete all documentation updates thirty (30) calendar days after the task is completed.

C-11.3.6 Certification Repairs and Analyses. The Contractor shall have capabilities to make required modifications to existing PV/S and make engineering assessments of the modified PV/S. The Contractor may use in-house staff or outside qualified (sub) contractors as appropriate. Government approval is required before any repairs are done. The Contractor shall follow all FAR requirements when subcontracting repair efforts; as a minimum the Contractor shall acquire three independent bids when the cost of the repairs are expected to exceed $3,000. The Contractor shall oversee, manage and perform all applicable assessments and analysis on all repair efforts that they

implement. The Contractor shall ensure all modifications meet the current code requirements and all modifications are made using code certified welders, welding procedures and NASA safety procedures. The Government reserves the right to make repairs using other contractors. When this happens the Contractor shall not have any involvement or responsibility in these repairs except for final inspection and documenting into the PSD.

C-11.3.7 Owners Inspection Services. The Contractor shall have capabilities of providing Owner Inspection services to assure code-compliant construction as needed on government construction projects. The Contractor may use in-house staff or outside qualified (sub) contractors as appropriate. In this function, the contractor shall provide staff to act as the Governments Owner Inspector to assure compliance with ASME B31 series Piping Codes and ASME Section VIII Boiler and Pressure Vessel Code. The qualifications and responsibilities of Owner Inspectors are identified in respective ASME codes.

C-11.4 IDIQ TASKS

C-11.4.1 General. This includes, but is not limited to major finite element analysis, flexibility analysis and design for hardware modifications for the GRC LF & PBS Pressurized Vessels & Systems.

C-11.4.1.1 The Contractor shall provide to the COR a cost estimate for each Implementation Request within fifteen (15) working days of receipt of the request or renegotiate an acceptable date with the COR. The estimate shall provide detail on costs, materials, labor hours, and applicable fees.

C-11.4.2 Drawings and Documentation. The Contractor shall have between 15 and 45 working days, depending upon the complexity and magnitude of an IDIQ task, to submit to the Government all related drawings and documentation. The Contractor and the Government will jointly determine a realistic date for the Contractor to complete all required drawings and documentation.

C-11.4.3 Workmanship. The Contractor shall ensure that all installation and connections of all equipment are in accordance with all applicable codes and standards.

C-11.4.3.1 The Contractor shall ensure that all equipment provided will be arranged or installed as to provide unobstructed access to existing equipment or items requiring maintenance.

C-11.4.3.2 The Contractor shall ensure that all installation projects shall be implemented in a manner that minimizes interference with CPS operations.

C-11.4.4 Acceptance Testing. The Contractor shall provide the COR with all factory acceptance testing documents for all replaced or new equipment prior to installation.

C-11.4.4.1 When specific tests are required, the Government shall provide the Contractor a list of such tests. The Contractor shall prepare a test plan outlining the procedures to be followed for conducting such tests. The Contractor's test plan shall define, at a minimum, each step of the test to be performed in detail, participant responsibilities, documentation for tests, duration of tests, and procedures for dealing with discrepancies and failures during the test.

C-11.4.4.2 The Contractor shall prepare a test report document certifying successful completion of each field acceptance test. The Contractor shall submit these test reports to the COR along with all the required reports as specified in the task SOW.

C-11.4.5 Training. The Contractor shall develop operational procedures and provide appropriate training as required to support new and existing equipment as covered under this contract. In addition to training their own staff, the Contractor shall provide training to various personnel including Government and other GRC support

service contractors. The Contractor shall upon request of the COR provide a training report that details the training requirements and training activities of all their employees.

C-11.4.5.1 The Contractor shall document and store all their training records electronically in such a way as to pass spot audits. The Contractor shall be required to submit their training records to the COR upon request.

C-12. HEALTH, SAFETY AND ENVIRONMENTAL

C-12.1 General. The Contractor shall utilize proactive and innovative safety practices on a continual basis throughout the contract period. The Contractor's Safety and Health Program shall comply with Occupational Safety and Health Administration (OSHA) Regulations and the GRC Safety & Mission Assurance (SMA) Requirements which are defined in the Glenn Safety Manual and the Glenn Occupational Health Programs Manual.

C-12.2 Personnel Requirements. The Contractor's personnel and subcontractors shall only perform work for which they are specifically trained. In addition, the Contractor's staff shall maintain a safe and clean worksite and report all incidents and close calls to Contractor supervisor and the COR. The Contractor shall implement an effective job hazard analysis program to document, control, and communicate hazards identified during the execution of tasks performed under this SOW.

C-12.2.1 Requirements for Safety Personnel. The Contractor shall have on-site Safety and Health Key Person as part of their Safety & Health function within thirty (30) days from the contract award date. A qualified safety and health professional is defined as an individual having at least one of the following industry-recognized safety certifications:

C-12.2.1.1 Certified Safety Professional (CSP)

C-12.2.1.2 Certified Industrial Hygienist (CIH)

C-12.2.1.3 Bachelor's or Associate's degree in safety, industrial hygiene, engineering, or in a related field with at least ten (10) years of full-time safety and health experience.

C-12.3 Safety Inspections & Plans. The Contactor shall conduct and document periodic safety and health inspections of all job sites, tasks, and work activities. All findings from these inspections shall be documented and addressed utilizing a closed loop corrective action process and be available to the Government for review.

The Contractor shall provide an initial draft of their GRC Site-Specific Health and Safety Plan (HASP) fifteen (15) business days after the contract award date that covers operations, recurring maintenance and IDIQ activities. The GRC Site-Specific Health and Safety Plan shall comply with all GRC health, safety and environmental requirements and the requirements of the Occupational Safety Health Administration (OSHA). Specifically, the plan shall identify the methods and procedures that will be used to ensure a safe and healthful work environment and the methods the Contractor will use to protect both Contractor employees, GRC employees and the environment. The Contractor shall assume safety responsibilities in all subcontracts and shall monitor their subcontractors' activities to ensure compliance with the approved health and safety plan.

The Government will review the draft HASP submittal and provide comments back to the Contractor. The Contractor shall revise the plan and resubmit for final approval within ten (10) working days. Upon the Government's approval of the final plan, the Contractor shall schedule a conference between the Government, the Contractor's safety personnel, and any subcontractors to ensure mutual understandings of the Contractor's approved GRC Site-Specific HASP. This conference shall occur no later than thirty (30) days after contract award.

IDIQ Task Specific HASPs shall be provided for specified non-recurring activities where unique hazards are identified and require mitigation and/or control (not covered under the GRC Site-Specific HASP. Section J Attachment J-C-12.3 contains the requirements for a typical IDIQ Task Specific HASP). GRC Site-specific HASPs are not required when Contractor employees are performing a job hazard analysis of a workplace condition prior to the actual start of the work or after all the work has been completed (typically covered under the GRC Site-Specific HASP).

C-12.4 Safety Equipment. The Contractor shall provide its employees all safety equipment necessary to meet the requirements of OSHA and all elements of this SOW. Equipment covered under these requirements includes, but is not limited to: work platforms, trailers, basket trucks, cranes, slings, pressure vessels and hoses, boilers, transformers, switchgear, chillers, generators, and meters. The Contractor shall ensure the all their equipment be calibrated as recommended by the manufacturer and inspected before each use by trained and competent employees. The costs for safety equipment and calibration shall be included under the Base portion of the contract.

C-12.5 Personal Protective Equipment (PPE). The Contractor shall provide PPE for all personnel assigned to this contract. PPE shall include, but not limited to, fall protection equipment, disposable protective clothing, respiratory protection, hearing protection, eye protection, head protection, face protection, hand protection, high visibility clothing, and electrical safety clothing. The costs for PPE and the associated training for the use of PPE shall be included under the Base portion of this contract.

C-12.6 Work Area Access. The Contractor shall coordinate with the COR all operations that involve safe access to hazardous work areas, shutdowns of mechanical, electrical and controls equipment, shutdown of utilities, and shutdown of all on-going research testing. For hazardous operations, the Contractor shall define hazard areas and exclusion zones that protect participating and non-participating personnel in the event of a mishap. The Contractor shall establish and implement personnel limits in areas where hazardous operations occur. The Contractor shall also control access into these areas during the execution of hazardous operations and shall ensure that only active, essential personnel are in these areas during hazardous operations.

The GRC Safety Manual provides guidance for establishing exclusion zones and requirements for safe operations in hazardous locations.

C-12.7 Standard Forms & Procedures. The Contractor shall complete standard GRC forms and comply with established operation procedures as required. These forms and procedures are listed below, and can be found in Section J Attachment J-FORMS:

C-12.7.1 Hot Work Authorization Permit (Standard Form C-7A)

C-12.7.2 Hot Work Pre-Operations Checklist (Standard Form C-7B)

C-12.7.3 Confined Space Entry Permit (Standard Forms C-199, C-199B & C-199C)

C-12.7.4 Impairment Plan, Fire Protection (Standard Form C-316)

C-12.7.5 Lock-Out Tag-Out Procedures (Standard Form C-787C&D)

C-12.7.6 GRC Safety Permit (Standard Form C-919)

C-12.7.7 GRC Safety Permit Request (Standard Form C-923)

C-12.7.8 Digging, Trenching, and Excavating Permit (Standard Form C-927)

C-12.7.9 Security Forms, Badge Application (Standard Form C-969A)

C-12.7.10 Area Clearance Authorization (Standard Form C-978)

C-12.7.11 Fall Prevention Plan* (Standard Form C-979)

C-12.7.12 Critical Lift Determination (Standard Form C-195)

C-12.7.13 Pneumatic Test Request (GRC 802)

C-12.7.14 Pneumatic Test Permit (GRC 804)

C-12.7.15 Pressure Vessel Pneumatic Test Checklist (GRC 4026)

C-12.7.16 Pressure Vessel Pneumatic Test Report (GRC 4010)

C-12.7.17 Piping System Pneumatic Test Checklist (GRC 4020)

C-12.7.18 Piping System Pneumatic Test Report (GRC 4014)

C-12.7.19 Weld Request Form (GRC 4025)

C-12.7.20 Pressure Vessel Hydrostatic Test Checklist (GRC 4022)

C-12.7.21 Pressure Vessel Hydrostatic Test Report (GRC 4016)

C-12.7.22 Piping System Hydrostatic Test Checklist (GRC 4018)

C-12.7.23 Piping System Hydrostatic Test Report (GRC 4012)

C-12.7.24 Pressure Relief Device On-Stream Functional Test Report (GRC 4030)

C-12.7.25 Pressure Relief Device Non-Code Maintenance Record (GRC 4031)

(*Note: NASA Procedural Requirement (NPR) 8715.3 requires all contractors wearing fall protection equipment to have a competent person develop the fall prevention plans. The Contractor's competent person must have fall protection competent person training from an industry recognized source)

C-12.8 Support for GRC Safety, Health, and Environmental Audits and Audit Related Activities. The Contractor shall provide qualified and competent personnel to support all regulatory audits, inspections, internal audits, external audits, investigations, record requests, data pulls, and assessments for work and tasks identified in this SOW. The contractor shall cooperate with the Incident Commander during any event or post event follow-up or investigations for work and tasks identified in this SOW. Typical audits include, but are not limited to, GRC and Agency Office of Safety and Mission Assurance (OSMA) audits and inspections, NASA Institutional Facilities & Operations (IFO) SMA Audits, OCHMO reviews, OSHA Inspections, and Ohio EPA Inspections and Audits, Environmental Functional Review (EFR), Environmental Management System (EMS) Audits, US EPA inspections and audits, City of Cleveland inspections and audits, North East Ohio Regional Sewer District (NEORSD) inspections and audits, environmental investigations, inspections, audits, sampling and surveillance, storm water and waste water investigations inspections, audits, sampling and surveillance, and waste site inspections. The IFO Audit is scheduled every four years, but the frequency of the other audits is typically unknown. The Contractor shall, by utilizing a closed-loop corrective action process, document, address and correct all specific finds or violations generated by audits. The Contractor shall provide the Government with a monthly status of all corrective actions associated with findings or violations generated through the audits.

C-12.9 Training. The Contractor shall ensure that all employees receive required training, for their specific work assignments, that meets regulatory requirements in accordance with current GRC, OSHA, EPA and other applicable federal, state, or local regulatory agency standards**.** The Contractor shall maintain a safety and environmental training database for all its employees. The Contractor's database shall include, as a minimum, name of employee, position or title, required or unique training, certifications, licenses and status (i.e. completion and expiration dates). At all times, this database shall be immediately available for review upon request by the Government.

C-12.10 Safety Reporting. The Contractor shall report all accidents, including close calls, to the COR using the NASA Mishap Information System (NMIS) and shall initiate an investigation within twenty-four (24) hours in accordance with the Glenn Safety Manual, Chapter 21, Mishap and Close

Call Reporting, Investigating, and Recordkeeping. The Contractor shall provide an annual OSHA 300A log (not including names or personal identification information). The contractor shall conform to the new OSHA Recordkeeping Rule for Reporting Fatalities and Severe Injuries effective Jan. 1, 2015.

C-12.11 Environmental Compliance.

C-12.11.1 Environmental Protection and Policies. The Contractor shall comply with all applicable Federal, State, and local environmental laws and regulations and all policies and standards listed in the GRC Environmental Programs Manual 2015 (EPM) shown in Section J Attachment J-C-12.11.1. The Contractor shall contact the COR and the appropriate person within Code FE, the Energy and Environmental Management Office, for the clarification of any activities that could have an environmental impact. The Contractor shall provide any data needed to support environmental permits when requested by the cognizant GRC FE representative. All environmental protection matters shall be coordinated with the COR and the representative from Code FE, the Energy and Environmental Management Office. Support from the existing environmental support contract may be utilized for environmental related tasks using Work Requests. The Contractor shall maintain current environmental records and training records for facilities operated by the Contractor. The Contractor shall maintain a list detailing when their employees have completed environmental related training. The Government or individual(s) authorized by the Government may inspect these records/facilities, at any time without notice. Sustainability, waste reduction, and recycling data required by environmental policy shall be reported to the COR who will relay it to Code FE. In the event that a regulatory agency assesses a monetary fine or penalty against the Government for violations which directly result from performance by the Contractor in carrying out their responsibilities under this contract, the Contractor shall reimburse the Government for the amount of that fine or penalty and other related costs incurred by the Government. Any such reimbursement shall be accomplished by a contract credit. The Contractor shall use certified personnel when cleaning up an environmental spill and gain GRC FE approval for the methods used to remediate the condition. If hazardous waste or material is spilled, the Contractor shall respond according to the Center's Emergency Preparedness Plan (EPP – Note this document is Sensitive-But-Unclassified (SBU) and only provided through a request to the GRC Emergency Management Coordinator). In the event of a sizable spill, the Contractor shall follow the Incident Commander's direction. The Contractor shall comply with the instructions of the cognizant GRC FE personnel with respect to avoidance of conditions which create a nuisance or which may be hazardous to the health and safety of on-site personnel or the environment. The Contractor shall observe and adhere to all requirements for properly handling and storing combustible supplies, materials, waste, and trash. Any oils and lubricants resulting from work of the Contractor (i.e., PM), including those removed from Government owned equipment, shall be disposed of in accordance with GRC instructions. The Contractor shall notify the appropriate GRC FE personnel before any equipment requiring an environmental permits is modified, renovated or removed.

The Contractor's technicians who handle refrigerants shall be required to have the appropriate EPA Section 608 Technician Certification. Refrigerant venting is not allowed. It is GRC Policy to use only non-ozone depleting substances and to not operate equipment leaking refrigerants. Any exemptions require a waiver from the GRC Code FE Energy and Environmental Management Office. The Contractor shall obtain approval of GRC Waste Management before venting any containerized gasses.

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C-12.11.1.1 Requirements for Asbestos Containing Material (ACM). The Contractor shall have either an in-house capability or a subcontracted capability with a licensed asbestos abatement firm to perform asbestos abatement for maintenance activities to include abatement, sampling, removal, and third party inspection. In addition, all Contractor employees shall have Asbestos Awareness Training with an annual refresher. Asbestos Awareness Training is offered at GRC and Contractor attendance is dependent upon availability of seats. At no time shall existing building materials be disturbed or impacted without being assessed for asbestos content. All existing materials shall be assumed to be ACM until proven otherwise by sampling and analysis. The Government will provide the Contractor with any existing bulk asbestos sampling and analysis data for determining the asbestos content of an unknown material. If the existing data is insufficient, the contractor will be required to provide further sampling and analysis.

Only Ohio Department of Health (ODH) licensed Asbestos Hazard Abatement workers shall handle or remove ACM in any quantity. In addition, all asbestos abatement work shall be supervised by a competent person licensed by the Ohio Department of Health (ODH) as an Asbestos Hazard Abatement Specialist. All certification/licensing records are to be readily available for inspection.

Small scale-short duration asbestos tasks must be added to the Center's Asbestos Blanket Permit prior to work task implementation. The Permit is maintained by SHeD.

GRC maintains an active database called the Facility Asbestos Survey System. This database contains ACM sampling data for every property at the Center. The Contractor can access the Facility Asbestos Survey System using the GRC intranet.

C-12.11.1.1.1 Federal Regulations. All asbestos abatement work shall be performed in accordance with the following Federal Regulations:

C-12.11.1.1.1.1 OSHA 29 CFR 1926.1101

C-12.11.1.1.1.2 US Environmental Protection Agency (USEPA) National Emissions Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 61

C-12.11.1.1.2 State of Ohio Regulations. All asbestos abatement work shall be performed in accordance with the following State of Ohio Regulations:

C-12.11.1.1.2.1 Ohio Department of Health (ODH) OAC 3701-34

C-12.11.1.2 Requirements for Managing Lead-Based Materials. Onsite support service contractors and construction contractors are responsible for developing and implementing their own Lead compliance programs in accordance with OSHA and NASA requirements. All Contractor employees shall have GRC Lead Awareness Training with an annual refresher. Lead Awareness Training is offered at GRC. At no time shall paints or sealers be disturbed or impacted without being assessed for lead content. All existing paints and sealers shall be assumed to be lead-containing until proven otherwise by sampling and analysis or by direction of the COR. The Government will provide the Contractor with any existing lead sampling and analysis data for determining lead content of an unknown material. If the existing data is insufficient, the contractor will be required to provide further sampling and analysis.

Only Contractor employees having appropriate Lead hazard abatement specific training and Resource Conservation & Recovery Act (RCRA) Work Methods Training (provided by GRC) shall handle, remove, or dispose of lead-based materials. All such work shall be performed in accordance to GRC Local Specification 02 83 00.98 Lead Paint Abatement. See Occupational

Health Program Manual (OPHM) Chapter 5. See Section J Attachment J-C-Occupational Health Program Manual. Workers removing lead-based materials shall use respiratory protection as required in this specification.

C-12.11.1.3 Requirements for Managing Hazardous or Solid Waste Soils. At no time shall any soils be disturbed, relocated, or removed from GRC Lewis Field without the soils being assessed for solid or hazardous waste content and the approval of the COR. Any areas of soil disturbance shall also include the use of Municipal Separate Storm Sewer System (MS4) Best Management Practices (BMP) and depending on area of disturbance the Contractor may be required to obtain an Ohio EPA-permit. The Government will provide the Soil Determination, if sufficient data exists to characterize the soils. If there is insufficient data to characterize the area the contractor shall provide the additional sampling and analysis data to complete the Soil Determination.

If the Contractor uses Sub-Contracted Services in the excavation of solid or hazardous waste soils, a responsible individual shall have completed the forty (40) hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training. HAZWOPER Training is offered at GRC and Contractor attendance is dependent upon availability of seats. The requirements for soil excavation include:

C-12.11.1.3.1 The Contractor shall not stockpile hazardous or solid waste soil. Waste soils shall be placed directly into lined containers for disposal. Any disposal shall be coordinated with the COR and the GRC Waste Management and Disposal contractor.

C-12.11.1.3.2 Hazardous or solid waste soils shall never be placed back into an excavation.

C-12.11.1.3.3 Requirements for the handling of contaminated soils are covered in GRC Local Specification 02 61 00.98 Removal and Disposal of Contaminated Soils. See Section J Attachment J-C-Waste Disposal Requests By Agency ID for specification.

C-12.11.1.3.4 The onsite reuse or relocation of clean non-contaminated soils must be coordinated through the Government. The offsite reuse or disposal of non-contaminated soils will be coordinated through GRC Waste Management.

C-12.11.1.4 Accidental Spills of Chemical Substances. GRC requires an immediate response to all accidental spills of chemical substances regardless of the volume of the spilled material. In the event of a spill, the Contractor's staff shall call the GRC Dispatch Office at 911 (from an internal phone) or when using a cellphone at GRC, (216) 433-8888 - LF or (419) 621-3222 when at Plum Brook Station. If possible, the caller shall inform the Dispatcher of the identity and volume of the material spilled.

The Contractor shall supply and maintain a variety of spill kits that are approved by the Government. These kits shall include provisions for spills in both interior and exterior spaces. In addition, the Contractor's staff will be required to receive Spill Countermeasures and Control Plan (SCCP) annual training provided by the GRC Training Organization. All spills shall be documented on a Spill Occurrence Report, and provided to the COR. The Contractor shall also work with the COR to complete a NASA Mishap Information System (NMIS) Report.

For small spills of nontoxic, nonflammable materials (one gallon or less), the Contractor's staff shall attempt to contain and clean up the material with the approved spill kit. For large spills of nontoxic, nonflammable materials inside buildings, the Contractor shall take immediate action to contain the spill through the use of absorbent materials and drain covers to stop the flow prior to entering the environment. For spills of this nature in outdoor areas, the Contractor shall use absorbent booms and pads to prevent the materials from entering storm sewer catch basins or

areas containing large amounts of surface water. In all cases, the Contractor's staff shall remain on site until the GRC Emergency Response Team (ERT) arrives, to provide technical information to the incident commander.

If the spilled material is a flammable or toxic substance, the Contractor's staff shall immediately notify the Fire Dispatch, evacuate the area and establish a safe zone around the spill. Cleanup activities of this nature shall be performed only by ERT personnel who are trained in the handling of flammable and/or toxic materials.

Upon containment and cleanup of the spill, the Contractor shall work with the COR to dispose of the saturated absorbent materials through the GRC Waste Management and Disposal Contract.

There shall be adequate spill kit materials available when recertifying fuel and oil systems to contain spills and protect sewer inlets.

C-12.11.1.5 Standard Forms & Procedures. The Contractor shall complete standard GRC forms and comply with established operation procedures. These forms and procedures are listed below, and can be found in Section J Attachment J-C-FORMS.

C-12.11.1.5.1 See Section J Attachment J-C-Waste Disposal Requests By Agency ID for specification.

C-12.11.1.5.2 Soil Relocation and Authorization Form (See Section J Attachment J-C-12.11.1.5.2)

C-12.11.1.5.3 Spill Occurrence Report (See Section J Attachment J-C-12.11.1.5.3 Spill Occurrence Report)

C-12.11.1.5.4 NASA Mishap Information system (NMIS) Report (See Section J Attachment J-C-12.11.1.5.4 NMIS)

C-12.12 Lockout/Tag-out (LO/TO). The Contractor shall provide all LO/TO service in support of the Contractor's own work. In addition the Contractor shall provide isolation service on CPS equipment for work to be done by others and provide access to and explanation of how the isolation has been accomplished so that LO/TO can be applied by the personnel performing the task. GRC-946a Danger (LO/TO) tags shall be provided to other performing contractors, to be used, in order to be compliant with the Glenn Safety Manual.

C-12.12.1 Qualified LO/TO Personnel. Within fifteen (15) calendar days after Contract start date, and as requested by the COR, the Contractor shall provide the COR a listing of all employees and their LO/TO roles, responsibilities, qualification and titles, including but not limited to: Area Supervisor(s), Authorized Employee(s), and personnel qualified to perform electrical high and/or low voltage, or mechanical switching and energy isolation of systems related to the CPS as a result of the LO/TO activity.

C-12.13 Software Lockout/Tag-out (LO/TO). The Contractor shall place and remove operator console "screen tags" on all components associated within their area of control when LO/TO activities dictate. The Contractor shall "Out-of Service" (OOS) all points that provide nuisance alarms to the Operators.

C-12.14 Confined Space Entry Requirements. The Contractor shall follow all NASA, GRC and OSHA confined space entry regulations and prepare confined spaces for entry by others.

C-12.15 System Outages.

C-12.15.1 Planned System Outages. When planned maintenance or repair requires a break or reduction in services, the Contractor shall make the following notifications for all activities performed under this contract requiring system or building outages, the Contractor shall provide advance notice to the COR, affected BM, SM, TR, PM (if applicable) and FM. A list of FM or customers for each facility will be provided by the Government upon request. Customer notification shall include the length of time and type of work to be performed. Should work progress temporarily halt before job completion, the Contractor shall provide the customer with the reason for delay and the projected date or time they shall return to complete the work. The COR will make every attempt to approve the requested outage; however, as a general rule priority is given to scheduled research activities. The Contractor shall fully cooperate with other contractors and Government employees and shall carefully adapt scheduling and performance of work under this contract to accommodate the work by others.

C-12.15.2 Area Clearance. The Contractor shall execute an "Area Clearance Authorization" request that shall provide, as a minimum, the following specifications or information to the affected individuals: the equipment or system involved; reason for the outage; date and time the Contractor would like the outage to occur; and an estimate of when normal services are to be resumed. A sample Area Clearance is shown in Section J Attachment J-C-FORMS.

C-12.16 Hardwire Shutdown Verifications & Calibrations. The Contractor shall verify the Hardwire Shutdowns and Calibrations on any system or piece of equipment which has been taken out of service for major repair or rehabilitation or has been replaced due to component failure or wear.

C-12.17 Safety Permit Documentation and Support. The Contractor shall utilize the GRC on-line software to assemble and submit required documentation for safety approvals and/or permits. The contractor shall use the safety permit request, permit renewal, or modification process using the safety permit website (https://safetypermit.grc.nasa.gov). Within fourteen (14) calendar days after the start of the contract, the Contractor shall review and update the information in all CPS related Safety Permits. A list of CPS related Safety Permits is provided in Section J-C-12.17.

C-12.17.1 Annual Documentation. The Contractor shall prepare and submit the required documentation necessary for submittal to the NASA GRC Electrical Applications and/or Process Systems Safety Committees as part of the safety permit renewal request process. An example is provided in Section J Attachment J-C-12.17.1. This shall include notification of all procedural changes being considered, reporting on significant irregularities that impact safety, listing of qualified operators, hosting and conducting walk-through inspections by the safety committee membership, answering specific questions posed by safety committee members verbally and in written form and additional requirements are described in Section C 4.2.6 – Safety and Mission Assurance Organization.

C-13 COMPUTERIZED MAINTENANCE MANAGEMENT SYSTEM (CMMS)

C-13.1. General. GRC's Computerized Maintenance Management System (CMMS) is MAXIMO Asset Management Version 7.5, a product of IBM, Incorporated. Whenever the term CMMS is used in this SOW, it refers to GRC's Maximo software. A single installation of Maximo is utilized by all four (4) of GRC's current Operations & Maintenance (O&M) contractors at both Lewis Field and Plum Brook Station for managing Assets, Preventative Maintenance, and Work Orders. All of the Institutional (IN), Research Test (TS), Central Process Systems (CP) and Pressure Systems (PS) Assets are loaded into this single installation of Maximo. The CP and PS asset inventory represents the majority of assets to be managed under this contract. On occasion, the pressure systems certification requirements of this contract will require maintaining or repairing IN or TS assets.

GRC will provide the Contractor with controlled access to Maximo and reserves the right to upgrade the version of Maximo at any time during the life of this contract. Since the Maximo software used by GRC has been customized from the vendor's standard version, local training will be provided to the Contractor's personnel by the Government at no additional cost to the Contractor.

The Contractor is prohibited from using an electronic interface between any other CMMS system (including an external Maximo system) and the GRC Maximo system for purposes of Asset Management, Preventative Maintenance, and Work Order processing. Contractors can use company-owned software for inventory management, purchasing and other business functions as required to execute this contract.

GRC's Maximo is the "System of Record" for IN, TS and CP Assets at both Lewis Field and Plum Brook Station. GRC's "System of Record" for PS Assets at both Lewis Field and Plum Brook Station is the Pressure Systems Database (PSD), which is a customized Oracle database. The Government has created interfaces between the PSD and the Maximo System for multiple purposes including the generation of Work Orders. These interfaces will be further defined within this section.

Both Government O&M personnel and Contractor personnel have responsibilities for entering data into the GRC Maximo and PSD systems and to monitor trends and produce reports. This section will clearly describe the Contractor's Maximo responsibilities for various types of work. In addition, this section describes the current configuration and the established processes and procedures used for the GRC Maximo and PSD Systems. This description is not meant to restrict future innovations that may be recommended by the Contractor. The Government understands that the current configuration may not be optimal, and following award, the Contractor is encouraged to recommend changes and modifications. Since other O&M contractors at GRC are also using the Maximo System, any modifications and changes must be analyzed and tested to ensure that others are not adversely impacted.

C-13.2 GRC Maximo Definitions, Processes & Module Information. Basic definitions and terminology for the GRC Maximo System are listed in Attachment J-C-13.2a. Maximo process flowcharts are provided in Attachment J-C-13.2b. The GRC Maximo System Module Information & Status is provided in Attachment J-C-13.2c.

C-13.3 GRC Maximo Security Group and Person Group Structures. A selected number of Contractor employees will be furnished with an ACES computer seat and a NDC domain account. Anyone at GRC with an NDC account can initiate a Work Request in Maximo without having a

Maximo seat license. However, a seat license is required to view, add or change data within the Maximo System. The Government will issue Maximo seat licenses to the Contractor's management, supervisors, and Work Group Leads. Typically, field technicians provide data (e.g., time spent on tasks, field comments, etc.) to the Work Group Leads or the Work Control Office for uploading into Maximo.

At GRC, there is a Maximo Security Group and a Person Group structure that establishes what Maximo users can and cannot do within the database system. By definition, a Security Group identifies which persons can enter specific types of data into Maximo and a Person Group identifies specific crafts and limits persons as to what type of data can be viewed in Maximo.
Security and Person Group Structures are further defined below.

C-13.3.1 Security Groups. Licensed users will be issued a Security Group classification by the GRC Maximo Administrator in accordance with their job responsibilities. The Security Group assigned will dictate if the user is capable of adding, changing or decommissioning data, or if the user is limited to "read only" capabilities. Established Security Groups are listed in Attachment J-C-13.3.1. For this Contract, there are Security Groups reserved for both Government and Contactor employees. Those available to Contractor personnel are Functional Area Administrators, Functional Area Mangers, Read-Only Guests, Work Controllers/Schedulers, Work/Person Group Leads, and Work/Person Group Technicians.

C-13.3.2 Person Groups. For this contract, there are also Person Groups available for both Government and Contract personnel as listed in Attachment J-C-13.3.2. Currently, there are eleven (11) CP Person Groups, four (4) are reserved for Government employees, and seven (7) may be assigned to Contractor personnel. In addition, there are ten (10) PS Person Groups, three (3) are reserved for Government employees, and seven (7) may be assigned to Contractor personnel.

Each Person Group assigned to the Contractor shall have a Lead (although a single individual may be assigned as a Lead for multiple Person Groups). The Lead will have the ability to view, add, or change data only for Work Orders assigned to their Person Group. In addition, each Person Group assigned to the Contractor shall include Technicians. These Technicians will only be able to view, add, or change data for Work Orders to which they are assigned. If other Person Groups are required, the Contractor shall contact the GRC Maximo Administrator.

C-13.4 Mobile Technology. The GRC Maximo system is located within the Center's firewall and is accessible only with a NDC domain account. Although GRC has wireless IT capability throughout the Lewis Field Campus, mobile technology is currently not being utilized to support the functions required under this SOW.

Options for mobile technology are currently being evaluated by the Government. Once the Government selects a mobile solution, a plan will be established and the contract will be modified to include the testing and implementation of mobile technology. The Government will also provide training for Contractor personnel on the selected mobile solution.

C-13.5 Maximo Asset Module. Configuration control of CP and PS Assets in Maximo is the responsibility of the Government. Although the Contractor will have the capability of adding/decommissioning assets and modifying asset information, the Contractor shall not perform these functions without obtaining approval from the Government.

C-13.5.1 Maximo and PSD Asset Inventory. The Contractor shall partner with the Government to manage the CP and PS Asset inventory in Maximo and the PSD. This shall be accomplished through the field verification of Assets during standard PM/PGM/PT&I cycles, repairs, or IDIQ tasks to capture any anomalies or omissions. Upon approval by the Government, the Contractor shall update the Maximo Assets Module to reflect any findings.

C-13.5.2 Assets Installed by Other Contractors. New system construction and major rehabilitation of existing Central Process Systems or Pressurized Vessels and Systems is often accomplished through independent construction contracts (not under the scope of this contract). In most cases, these projects install new or decommission existing CP and PS Assets. As part of the scope of work, the construction contractor is required to provide Asset information to the Government for input into Maximo.

At a point between 70 and 80% construction completion, the Government will initiate an IDIQ task to this contract requesting that personnel be assigned to walk the site with a Government POC to physically apply tags to newly installed Assets.

C-13.5.3 New Assets Installed/Existing Assets Removed Under This Contract. If the Contractor installs new Assets as part of this contract, the following information shall be provided to the Government in an electronic format for approval prior to uploading into Maximo. The GRC Maximo Administrator will provide a Microsoft EXCEL template for the Contractor's use to capture the following data:

- Description of Asset
- Manufacturer
- Vendor information
- Model Number
- Serial Number (must be verified by Contractor Personnel upon delivery)
- Acquired date
- Installed date
- Purchase price (equipment cost)
- Operating status (operating, not ready, or decommissioned)
- Asset Classification Code
- Location of Asset (building number, floor, room)
- Digital picture (JPEG, etc.) of Asset in its installed location
- Scanned information such as O&M manual, parts lists, and consumables (PDF or JPEG)
- Reference drawing numbers (if applicable)
- NASA Condition Code (numerical value from 1 to 5)
- Warranty information (if applicable)

The Contractor will receive an official Asset number and tag from the Government and shall be responsible for installing the tag in a visible location on the Asset. For assets associated with the GRC Pressurized Vessels and Systems, the Contractor will receive a Pressure Systems Database (PSD) system code from the Government.

If existing Assets are removed under this contract, the Contractor shall obtain approval from the Government to decommission the removed assets in Maximo.

The Contractor shall provide a semi-annual report of all new Assets that they install and any existing Assets that they decommission under this contract.

C-13.6 Maximo Work Order Module, PM/PGM/PT&I Work for CP Assets. The GRC Maximo System is currently loaded with PM/PGM/PT&I job plans, frequencies and PMs for CP Assets. The Contractor shall collaborate with the Systems Managers to establish an optimal preventative maintenance program, and upon formal approval from the Government, make the changes in Maximo accordingly. Changes and alterations to job plans and frequencies must be approved by of the Government prior altering the information in Maximo.

At the beginning of each month, the Contractor's Work Control Office (WCO) shall generate a Maximo query or report that specifies which PMs for CP Assets are due for the next month (e.g., a January query/report would indicate the PMs for CP Assets due in February). The WCO shall then review the workload with the Government, and upon approval, manually generate the PM Work Orders accordingly. The Contractor shall then ensure that the appropriate outages are scheduled and parts ordered in time for the execution of the PMs the following month.

The Contractor shall follow the procedures below for PM/PGM/PT&I Work on CP Assets:

C-13.6.1 Once the PM/PGM/PT&I Work Order is generated, the Target Start Date will be automatically populated in Maximo. By definition, the Target Start Date is the *desired* start date, but not necessarily the date that the Contractor actually started work on the task.

C-13.6.2 Once the Work Order is started and time is ready to be entered for the task, the Work Group Lead shall enter the Actual Start Date under the Work Order Tab.

If the CP Asset for which the PM/PGM/PT&I activity is scheduled is not available (e.g., a research test is ongoing within a facility) and the work cannot be accomplished, the WCO shall check the "inactive" box within the PM Module. When testing is completed and the facility is available, the inactive box shall be unchecked which will enable the PM Work Order to proceed. The WCO shall review the inactive PM/PGM/PT&I activities monthly with the Government to identify areas where maintenance is stalled due to test activities.

C-13.6.3 Once the work has started, a feedback form will automatically be generated by Maximo. Work Group Technicians shall utilize this form to track their Labor Hours (regular hours for which only eight hours can be added per day) and their Premium Hours (for any approved overtime hours) worked for the task. In addition, the Technicians can add comments (e.g., verification of Asset bar code, need for special tools, data corrections, field observations, etc.) on the feedback form. The data captured on this form shall then be uploaded into Maximo by the Work Group Lead or the WCO.

As mentioned above, GRC plans to implement the use of mobile technology to help facilitate the capturing of the above data at some point during this contract.

C-13.6.4 The Work Group Technician shall either assign a Facility Condition Index (FCI) or update the FCI of the equipment being maintained (if applicable). This information shall be entered by the Work Group Lead in the Asset Module, Asset Tab as a numerical value between 1 and 5.

C-13.6.5 At the completion of the work, the Work Group Technician (or the Work Group Lead) shall enter the Actual Finish Date and change the Status Field to Work Complete for the PM/PGM/PT&I task in the Actuals Tab.

C-13.6.6 The WCO shall enter the hours worked and any comments, then change the status of the overall Work Order to Ready Close.

C-13.6.7 The COR will perform surveillance on approximately 10% of the completed PM/PGM/PT&I Work Orders, and generate an associated evaluation. If the COR determines that the work is not complete, the status will be changed to Rework, and the Work Group Lead will be notified. If the COR determines that the work is complete, the Work Order will be Closed.

C-13.6.8 If equipment malfunctions or system issues are identified during the execution of a preventative maintenance activity, the Work Group Lead shall issue a Work Request in accordance with the procedures listed below.

C-13.7 Maximo Work Order Module, Repair, ROI, and SR Work for CP Assets. For Repairs (including the Repair sub-categories OCR, MCR and CSCR as defined Section C-8 and C-9 of this SOW), ROI and SR activities, a requestor will generate a Maximo Work Request by either calling or e-mailing the WRO or by accessing Maximo directly through the GRC Intranet, Facilities Division Website.

The Contractor shall follow the procedures below for entering Maximo data for Repair, ROI, and SR work:

C-13.7.1 When a Requestor generates the work request, the Reported Date is automatically populated in Maximo. The Requestor will also enter the Target Start Date and the Target Finish Date.

C-13.7.2 The Government's WRO will determine the nature of the work request, and populate the Work Order Type. The Requestor (or the COR) will also enter the financial WBS number and the Requestor's name.

C-13.7.3 All Work Orders are directed to GRC's Work Order Prioritization Meetings, which are currently held twice per week. Work Orders that receive a high priority are forwarded to the appropriate COR for further action.

C-13.7.4 The COR will change the Work Order status from Waiting for Approval to Waiting for Estimate.

C-13.7.5 The Contractor's WCO shall assign the Work Group in accordance with the appropriate trade. This directs the Work Order to the appropriate Work Group Lead.

C-13.7.6 The Work Group Lead, in conjunction with the Contractor's Business Office, shall create a cost estimate for the work if required.

C-13.7.7 Once the estimate is approved and funding is obtained, the COR will change the Work Order status to Approved. The COR will also enter the Scheduled Start Date (which is the date

funding is received) and the Scheduled Finish Date. The COR, the Contractor, and the Requestor will negotiate the Scheduled Finish Date based on material availability and work access restrictions.

C-13.7.8 If a task-specific safety plan is required, the Contractor's Safety & Health representative shall check the Job Hazard Analysis (JHA) box, and attach a WORD, PDF, or IFM version of the plan to the Work Order.

C-13.7.9 Once the work has started, a feedback form will automatically be generated by Maximo. Work Group Technicians shall utilize this form to track their Labor Hours (regular hours for which only eight hours can be added per day) and their Premium Hours (for any approved overtime hours) worked for the task. In addition, the Technicians can add comments (e.g., verification of Asset bar code, need for special tools, data corrections, field observations, etc.) on the feedback form. The data captured on this form shall then be uploaded into Maximo by the Work Group Lead or the WCO.

As mentioned above, GRC plans to implement the use of mobile technology to help facilitate the capturing of the above data at some point during this contract.

C-13.7.10 For a Repair activity, the equipment failure is identified, under the Failure Reporting Tab, the Work Group Lead shall chose the Failure Class from the drop-down menu, a Problems and Causes from the drop-down menu, and provide a Remedy in the free-form text section in the Work Order.

C-13.7.11 The Work Group Technician shall either assign a Facility Condition Index (FCI) or update the FCI of the equipment being repaired or replaced or if the SR includes the addition of new equipment. This information shall be entered by the Work Group Lead in the Asset Module, Asset Tab as a numerical value between 1 and 5.

C-13.7.12 At the completion of the work, the Work Group Technician (or the Work Group Lead) shall enter the Actual Finish Date and change the Status Field to Work Complete for the Repair, ROI or SR task in the Actuals Tab.

C-13.7.13 The WCO shall enter the hours worked and any comments. In addition, the WCO shall obtain a signed completion report cover sheet for the task from the COR. The WCO can then change the status of the overall Work Order to Ready Close.

C-13.7.14 The COR will evaluate the Repair, ROI or SR work to determine the completion status. If the COR determines that the work is not complete, the status will be changed to Rework, and the Work Group Lead will be notified. If the COR determines that the work is complete, the Work Order will be closed and the Requestor will generate a survey.

C-13.8 Routine Reports. The Contractor shall use Maximo to produce various reports. The type and number of reports will determined by the COR. The Contractor shall download this information from Maximo and provide this to the Government by electronic means such as EXCEL spreadsheets.

The Contractor shall ensure that all of the data fields described in the above sections are consistently and accurately populated to ensure that reporting is accurate.

C-13.9 Pressure Systems Database (PSD). For over twenty-five years, the management of Pressure Systems (PS) Assets at GRC has been accomplished using a customized database. This database has evolved with IT technology, and is currently an Oracle database that resides on a server in GRC Building No. 142.

The PSD was developed to store information on all PS Assets such as manufacturer, model number, serial number, and all engineering data required to perform a periodic pressure certification process for the component. The database was also used to keep track of the last certification date and the next required date for future certifications.

In 2011 when the GRC Maximo System was established, several decisions were made regarding legacy PSD system. First, it was decided that the PSD would continue to be used as the "System of Record" for PS Assets, but the PS Asset data would also be stored in the Maximo Asset Module. Therefore, newly installed PS assets, removed PS assets, relocated PS assets, or changes to existing PS asset data are entered into the PSD, and a regular synchronization process ensures that PS Asset data within the Maximo System is subsequently updated. Currently, the Asset data is synchronized four (4) times per day. Following the synchronization process, an error log is generated by Maximo. The Contractor shall monitor this log and make any corrections that are identified.

Pressure Systems activities that must be carefully tracked include In-Service Inspections (ISI) and Certifications. Much like a Program Maintenance (PGM) activity for other types of assets, ISI activities are periodic inspections of PS Assets at a frequency of greater than one year. Certifications are a repair activity required to return an asset to its original design parameters.

At the beginning of each Contract Year, the Contractor's WCO shall generate a PSD report to specify which ISI activities for PS Assets are due for the next Contract Year. The WCO shall then review the workload with the Government, and upon approval, generate the ISI Work Orders accordingly (note that the ISI job plans reside in Maximo). The Contractor shall then ensure that the appropriate outages are scheduled and parts ordered in time for the execution of the ISIs the following Contract Year. If a test is ongoing within a facility, and a scheduled ISI cannot be accomplished, the ISI Work Order shall still generated by the WCO and placed "on hold" until the work can be accomplished.

If Certifications of PS Assets are required, the Contractor shall follow procedures similar to a Repair activity as outlined in Section C-13.7 above.

If the Contractor requires modifications to the PSD (e.g., if new database programming is required), the Contractor shall notify the Government, and a Work Order will be generated to the on-site GRC IT contractor to perform the work.

C-14 APPRENTICE PROGRAM

C-14.1. General. The Contractor shall provide an Apprenticeship program that meets the demands of the FD need for qualified Mechanics, Electricians and Electronics Technicians to augment or replace technicians leaving the various trades. Apprentice technicians shall augment and provide a feeder system to the support services that are necessary to meet the test schedules and requirements as determined by the test programs and the FD's vision. Applicants need to meet an acceptable two year associate degree prerequisite level of competency. Deviations from perquisite competency must be discussed with the COR.

C-14.2. Scope. The Apprenticeship program shall include a four year State of Ohio Certification of a completed Apprentice Program in the Mechanical, Electrical or Electronics trades. The program shall consist of four one year evaluations of expected milestones and deliverables established at the beginning of each year of the program for each trade with a sequence of progression through each year and a required approval from supervision for advancement. Apprentices not meeting established milestones, metrics and deliverables shall be evaluated immediately to determine suitability for retention in the program. The Contractor is expected to replace individuals not meeting evaluation criteria immediately. Independent of supervision and technical guidance at the completion of the Apprenticeship Program, Apprentices shall be able to provide: operations, maintenance and preventative maintenance (PM's), and a full range skills inclusive of all Systems described in this SOW.

C-14.2.1 Description of Work. Apprentices will rotate through each appropriate CROM Functional Area in 6 month cycles. Apprentices will move to a different assignment in the same Functional Area in 3 month intervals within the 6 month cycle. Apprentices will perform tasks that are assigned. Journeyperson will determine apprentice task and guide apprentices to task completion. Apprentices will use hand, power tools and diagnostic equipment to complete task.

C-14.2.1.1 CROM Functional Area CROM Functional areas include CPS, Cryogenic & High Pressure Gas Systems, High Voltage Electrical Substation Control and Pressurized Vessels & Systems (PVS) Certification

C-14.2.2. Quality Standards. "Quality" shall be defined and measured for each apprentice period performed to assure apprentices stay on pace to complete the Program within the required four years.

C-14.2.3. Schedule Standards. Each apprentice shall complete all scheduled requirements for the period evaluated.

C-14.2.4. Documentation Standards. Validated level of proficiency documentation showing each apprentice completing the assigned portion of the program.

C-14.3. Milestones and Deliverables.

C-14.3.1. The Contractor shall provide documentation that demonstrates that the Program meets the Ohio State Apprentice Program requirements.

C-14.3.2. The Contractor shall provide documentation showing a four year plan that describes the efforts to train apprentices on the various tools, equipment and systems required to provide qualified personnel on NASA Glenn's research systems.

C-14.3.3. The Contractor shall conduct eight, six (6) month evaluations that validate acceptable apprentice progress with management signed oversight.

C-14.3.4. The Contractor shall meet quarterly with the COR to ensure the Apprentice Program is meeting milestones and deliverables.

C-14.3.5. The Contractor shall track the apprentice work efforts using the Maximo system.

C-14.3.6. The Contractor shall identify a process for selection/replacement of new apprentices. The Contractor shall replace unsuccessful or terminated apprentices immediately within 90 calendar days. The Contractor shall keep the COR informed of all aspects of their program on a monthly basis.

C-15 FINANCIAL REPORTING (533) REQUIREMENTS

C-15.1 533 Reporting. The Contractor shall submit monthly financial reports on NASA Form 533 in accordance with the instructions on the reverse side of the form, and as published in the NASA Policy Regulation NPR 9501.2, see Section J-C-15.1, "NASA Contractor Financial Management Reporting". The Contractor shall, by the 15th of each month, provide to the COR the previous month's financial 533 report. The 533 shall contain the following information in the specified format.

C-15.1.1 Major Sections

Section 1 Overall Contract Summary

Section 2. CLIN 1 Operation Cost Summary

Subsection 1.
Overall Test Service Pool Cost Summary
Subsection 2.
CPS Operations Costs
Subsection 3.
CPS (Operations) Preventative Maintenance Costs
Subsection 4.
CRYO Operations Costs
Subsection 5.
CRYO (Operations) Preventative Maintenance Costs

Section 3. CLIN 2 Maintenance Cost Summary

Subsection 1.
Overall CM&O Cost Summary
Subsection 2.
CPS Maintenance Costs
Subsection 3.
CPS (non-operations) Preventative Maintenance
Subsection 3.
PSO (Office) Costs
Subsection 4.
PSO In-Service Inspection Costs
Subsection 5.
PSO Preventative Maintenance Costs

Section 4. CLIN 3 IDIQ Cost Summary

Subsection 1.
Overall IDIQ Cost Summary
Subsection 2.
Individual IDIQ Job Costs

Section 5. CLIN 4 Capital IDIQ Summary

Subsection 1.
Individual Capital IDIQ Job Costs

C-16. REPORTS AND DELIVERABLES

C-16.1 Technical Reports. A summary of all technical reports, schedules, and other documents that the Contractor shall submit to the COR is provided below. This list is an addition to any administrative reports otherwise specified in the contract.

Approval: An (A) indicates that the data is furnished for review and approval by the Government

Information: An (I) indicates that the data is furnished for information to the Government.

Title	SOW Reference	A/I	Due Date (Calendar Days)
CMMS Task Completion	7.3.2	A	7 Days after Task Completion
Annual Maintenance Shutdown Work Schedule Minor Maintenance Shutdowns	4.6.1	A	60 Days before the beginning of the Annual Maintenance Shutdown 15 days prior to beginning of minor shutdowns
Daily Run Report	8.1.4.4	I	Daily
Annual Update of CP-DCS Operations Procedures & Check Sheets	8.1.4.2	A	Annual, September 30th of each Contract year
Condition Based Monitoring	8.2.7.1	I	Monthly
Monthly PM Work Schedule	7.6.1, 8.2.6, 9.4.5.1	I	Monthly, 20th of each month
Service Agreement	8.3	A	As Required
GRC Site-Specific Health and Safety Plan (HASP)	12.3	A	15 business days after the Contract award
IDIQ Cost Estimates	8.4.1.1	A	Within fifteen (15) working days of receipt of the request
Red Line Drawing Updates	7.13.1, 8.4.3	A	As Required
Training Records	7.2.5	I	As Requested
Contractor Qualifications	7.2.3	I	As Requested
Essential Personnel Listing for Emergencies	7.2.2	I	3 Days after Contract Start Date, then as needed
Training Plan	7.2.5	I	Semi-Annual or as Required
Technical Reference Library	7.13, 8.2.4.4	I	As Requested

Title	SOW Reference	A/I	Due Date (Calendar Days)
Status			
Quality Control Plan	7.6	A	30 Days after Award Date
NIMS Report	7.8	I	With 24 hours of incident
Qualified LO/TO Personnel Roles and Responsibilities	12.12.1	I	15 Days after Contract Start Date, then as Requested
System Outages Notification/Area Clearance Requests	4.11, 12.15.2	A	As Required
Safety Permit Renewal Documentation	8.1.14	A	As Required
Financial Reports	15	A	Monthly (by the 15th of each month)
Operations Plan	7.10	I	30 Days after Contract Start Date
Technical Progress Meetings (OCR/MCR, IDIQ, Prioritization)	7.11	I	Monthly
Joint Inventory Listing (includes facilities, equipment, tools and materials)	5.2	I	30 Days after Contract Start Date
General Inventory Exception Report	5.3	I	Once a Month
Critical Spare Parts Inventory Report	5.3.1	I	15 Day after Contract Start Date then Quarterly by the 15th of September, December, March & June
Contractor Acquired Materials	6.2.3	I	15 Days prior to End of Contact
Risk Management Plan	7.5. 11.3.3.6	A	As Required
Final Drawings	4.9.1	A	As Specified in SOW

C-17 ACRONYMS AND DESCRIPTION

Name	Description
A	Annual – Services performed once during each 12-month period of the contract at intervals of 335 to 395 days.
ABS	Absolute
ACM	Asbestos Containing Material
AEF	Atmospheric Exhaust Fan
AFP	Authorized Field Personnel (AFP)
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineer
AWS	Annual Work Schedule
BA	Biennial – Services performed six (6) times each 12-month period of the contract intervals of 58 to 63 days.
BRC	Bridge Controller
BW	Biweekly – Services performed 26 times during each 12- month period of the contract at intervals of 13 to 15 days
CADS	Central Air Distribution System
CADPS	Central Air Distribution Piping System
CAEB	Central Air Equipment Building
CAM	Contractor Acquired Materials
CCB	Central Control Building
CCC	Compressor Controls Corporation
CCD	Configuration Control Database
CFR	Codified Federal Regulations
CMMS	Computerized Maintenance Management System
CO	Contracting Officer
CoF	Construction of Facilities
COR	Contracting Officer’s Representative
CPSDC	Central Process System Distributed Control
CPSDC-DB	Central Process System Distributed Control - Database
CPS	Central Process System
CROM	Central-Process Recertification, Operation and Maintenance
CT	Cooling Towers
CTW	Cooling Tower Water
D	Daily – Services performed 261 times during each 12-month period of the contract, once each day, Monday through Friday, including holidays unless otherwise noted
DBF	Data Base File

Name	Description
DCS	Distributive Control System
DEC	Digital Equipment Corporation
DOS	Disk Operating System
ED	Electrical Dispatcher
EDM	Engineering Data Manager
EPA	Environmental Protection Agency
EPL	Electric Propulsion Laboratory
ERB	Engine Research Building
EWS	Engineering Workstation
FAR	Federal Acquisition Regulations
FCO	Field Console Operator (FCO)
FCR	Facility Change Request
FDI	Foreign Device Interface
FEO	Field Equipment Operator
FLSA	Federal Labor Standards Act
FMEA	Failure Mode and Effect Analysis
GFE	Government Furnished Equipment
GFF	Government Furnished Facilities
GFM	Government Furnished Material
GFY	Government Fiscal Year
GMI	Glenn Management Instructions
GRC	Glenn Research Center
I&R	Inspection and Recertification
I/O	Input/Output
IDE	Integrated Desktop Environment
IRT	Icing Research Tunnel
ISI	In-Service Inspections
IT	Information Technology
LAN	Local Area Network
LOTO	Lockout/Tag-out
M	Monthly – Services performed 12 times during each 12-month period of the contract at intervals of 28 to 32 days.
M&R	Maintenance and Repair
MADR	Maximum Allowable Defect Rate
MAXIMO	Current CMMS database program used at GRC
MODP	Mechanical Operator Duplex Panel
NASA	National Aeronautics and Space Administration
NEC	National Electric Code

Name	Description
NEMS	NASA Equipment Management System
NHB	NASA Handbook
NIS/NPM	Network Internet Slaves/Network Processing Modules
NPD	NASA Policy Directive
OCMR	Operation Corrective Maintenance and Repair
ODM	Open Data Manager
OIS	Operator Interface Station
OSHA	Occupational Safety and Health Administration
PBS	Plum Brook Station
PCU	Process Control Units
PGM	Program Maintenance
PID	Proportional Integral Derivative
PLC	Programmable Logic Controllers
PM	Preventative Maintenance
PPE	Personal Protective Equipment
PRS	Performance Requirements Summary
PSD	Pressure Systems Database
PSPV	Pressure Systems and Pressure Vessels
PSSC	Process System Safety Committee
PT&I	Predictive Testing and Inspections
PWS	Performance Work Statement
Q	Quarterly – Services performed four (4) times during each 12-month period of the contract at intervals of 80 to 100 days.
QA	Quality Assurance
QAE	Quality Assurance Evaluator
QASP	Quality Assurance Surveillance Program
QC	Quality Control
RCM	Reliability Centered Maintenance
RFP	Request for Proposal
RTF	Run-to-Failure
SA	Semi-annual – Services performed twice during each 12-month period of the contract at intervals of 160 to 200 days
SAC	Service Air Compressor
SAD	Service Air Drier
SCCB	Software Configuration Control Board
SCO	Senior Console Operator
SDB	System Data Books
SHeD	Safety Health Division
SLDG	Software Logging Database Graphics

Name	Description
SMACS	Synchronized Motor Auxiliary Control System
SOW	Statement of Work
SSA	Source Selection Authority
SSR	Special Service Request
SW	Scheduled Work
TD	Trane Dehydrator
TIN	Taxpayer Identification Number
TRL	Technical Research Library
UPS	Uninterruptible Power Supply
VF	Variable Frequency
VMS	Virtual Memory System
W	Weekly – Services performed 52 times during each 12-month period of the contract at intervals of 6 to 8 days
WDPF	Westinghouse Distributive Processing Family
WWS	Weekly Work Schedule
100 HRS	PM to be performed every 100 hours of operations
300 HRS	PM to be performed every 300 hours of operations

[END OF SECTION]

SECTION D - PACKAGING AND MARKING

D.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE

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

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

None included by reference.

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

None included by reference.

(End of clause)

[END OF SECTION]

SECTION E - INSPECTION AND ACCEPTANCE

E.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE

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

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

CLAUSE NUMBER	DATE	TITLE
52.246-5	APR 1984	INSPECTION OF SERVICES—COST-REIMBURSEMENT

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

CLAUSE NUMBER	DATE	TITLE
1852.246-72	AUG 2003	MATERIAL INSPECTION AND RECEIVING REPORT *In paragraph (a), insert 2 in the first blank and 1 in the second blank.*

(End of clause)

E.2 INSPECTION AND ACCEPTANCE (GRC 52.246-92) (JAN 1987)

Final inspection and acceptance of all work performed under this contract, including all deliverable items will be performed at destination.

(End of clause)

[END OF SECTION]

SECTION F - DELIVERIES OR PERFORMANCE

F.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE

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

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

CLAUSE NUMBER	DATE	TITLE
52.242-15	AUG 1989	STOP-WORK ORDER (ALTERNATE I) (APR 1984)
52.247-34	NOV 1991	F.O.B. DESTINATION

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

None included by reference.

(End of clause)

F.2 PERIOD OF PERFORMANCE

The period of performance shall consist of the following: A Phase-In period not to exceed thirty (30) days; a Base period of two (2) years commencing October 1, 2015 and ending September 30, 2017; three (3) one-year option periods that can be executed in accordance with clause F.4, *Option to Extend the Term of the Contract*.

(End of clause)

F.3 PLACE OF PERFORMANCE - SERVICES

The services to be performed under this contact shall generally be performed at the following locations or other locations as specified by the Government:

NASA Glenn Research Center
21000 Brookpark Rd.
Cleveland, OH 44135

NASA Plum Brook Station
6100 Columbus Ave.
Sandusky, OH 44870

(End of clause)

F.4 OPTION TO EXTEND THE TERM OF THE CONTRACT (FAR 52.217-9) (MAR 2000)

(a) The Government may extend the term of this contract by written notice via unilateral contract modification to the Contractor at any time prior to the end of the current contract period; provided that the Government gives the Contractor a preliminary written notice of its intent to extend at least thirty (30) calendar days before the contract expires. The preliminary notice does not commit the Government to an extension.

(b) If the Government exercises this option, the extended contract shall be considered to include this option clause.

(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed five years.

(End of Clause)

[END OF SECTION]

SECTION G - CONTRACT ADMINISTRATION DATA

G.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE

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

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

None included by reference.

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

CLAUSE NUMBER	DATE	TITLE
1852.216-75	DEC 1988	PAYMENT OF FIXED FEE
1852.223-71	DEC 1988	FREQUENCY AUTHORIZATION
1852.242-70	SEP 1993	TECHNICAL DIRECTION
1852.242-73	NOV 2004	NASA CONTRACTOR FINANCIAL MANAGEMENT REPORTING

(End of clause)

G.2 SUBMISSION OF VOUCHERS FOR PAYMENT (NFS 1852.216-87) (GRC JUNE 2014)

(a) The Contractor shall submit interim and final cost vouchers electronically using the DOD Wide Area Work Flow (WAWF) system. Vouchers will be reviewed by DCAA based upon a risk-based sampling review process.

(1) To access the DOD WAWF system, the contractor shall be required to have a designated electronic business point of contact in the System for Award Management at https://www.acquisition.gov and be registered to use the DOD WAWF at https://wawf.eb.mil following the step-by-step procedures for self-registration available at this web site.

(2) NASA voucher payment information can be obtained at the NASA Shared Services Center (NSSC) Vendor Payment information web site at: https://www.nssc.nasa.gov/vendorpayment. For technical WAWF help, contact the WAWF helpdesk at 1-866-618-5988. Please contact the NSSC Customer Contact Center at 1-877-NSSC123 (1-877-677-2123) or nssc-contactcenter@nasa.gov with any additional questions or comments.

(3) For interim cost voucher submission the vendor shall use the “Cost Voucher” document type in WAWF. In addition, the vendor shall

change the contract type to "Non-DoD Contract (FAR)." The Activity address codes to be populated in WAWF for submission of vouchers under this contract are *(extension fields will not be populated)*:

a. Paying Office Activity Address Code: 803112 (NSSC)
b. Admin Office Activity Address Code: 805536 (GRC)
c. Ship To Code: 805537 (GRC) or 805538 (PBS) as applicable
d. DCAA DoD Activity Address Code: Contractor shall access the WAWF system and utilize the "Lookup" drop-down menu to determine the appropriate Activity Address Code for their cognizant DCAA office. Cognizant DCAA offices may be identified via http://www.dcaa.mil/conus.html
e. Service Approver DoDAAC: 805536

(4) The Contractor shall ensure that the payment request includes appropriate contract line item descriptions of the work performed or supplies delivered, unit price/cost per unit, and all relevant back-up documentation to support each payment request.

(5) The Contractor shall enter the e-mail address identified below in the "Send Additional Email Notifications" field of WAWF once a document is submitted in the system:

GRC-EINVOICES@NASA.GOV

(b) Vouchers for payment of fee resulting from contract performance or provisional fee (if authorized under this contract) shall be prepared using an SF 1034.

(1) Each SF 1034 shall be submitted electronically to the following address for payment:

E-mail address:	NSSC-AccountsPayable@nasa.gov
Mailing address:	NSSC - FMD Accounts Payable Bldg. 1111, C Road Stennis Space Center, MS 3952
Fax Number:	1-866-209-5415

(2) A concurrent copy of the fee voucher shall be provided electronically to the NASA Contracting Officer. The Contracting Officer may designate other recipients as required.

(c) The NSSC is the designated billing office for cost and fee vouchers for purpose of the Prompt Payment clause of this contract.

(d) In the event that amounts are withheld from payment in accordance with provisions of this contract, a separate voucher for the amount withheld will be

required before payment for that amount may be made.

(End of clause)

G.3 NASA CONTRACTOR FINANCIAL MANAGEMENT REPORTING (NFS 1852.242-73) (NOVEMBER 2004)

(a) The Contractor shall submit NASA Contractor Financial Management Reports on NASA Forms 533 in accordance with the instructions in NASA Procedures and Guidelines (NPR) 9501.2, NASA Contractor Financial Management Reporting, and on the reverse side of the forms, as supplemented in the Schedule of this contract. The detailed reporting categories to be used, which shall correlate with technical and schedule reporting, shall be set forth in the Schedule. Contractor implementation of reporting requirements under this clause shall include NASA approval of the definitions of the content of each reporting category and give due regard to the Contractor's established financial management information system.

(b) Lower level detail used by the Contractor for its own management purposes to validate information provided to NASA shall be compatible with NASA requirements.

(c) Reports shall be submitted in the number of copies, at the time, and in the manner set forth in the Schedule or as designated in writing by the Contracting Officer. Upon completion and acceptance by NASA of all contract line items, the Contracting Officer may direct the Contractor to submit Form 533 reports on a quarterly basis only, report only when changes in actual cost occur, or suspend reporting altogether.

(d) The Contractor shall ensure that its Form 533 reports include accurate subcontractor cost data, in the proper reporting categories, for the reporting period.

(e) If during the performance of this contract NASA requires a change in the information or reporting requirements specified in the Schedule, or as provided for in paragraph (a) or (c) of this clause, the Contracting Officer shall effect that change in accordance with the Changes clause of this contract.

(End of clause)

G.4 NASA CONTRACTOR FINANCIAL MANAGEMENT REPORTING - SUPPLEMENTAL REQUIREMENTS (GRC 52.242-96)(NOV 2012)

(a) The following reporting requirements are associated with those stated in the NASA Contractor Financial Management Reporting clause (1852.242-73) of this contract, and NPR 9501.2, NASA Contractor Financial Management Reporting. NPR 9501.2 may be accessed through the NODIS Library at http://nodis3.gsfc.nasa.gov/.

(1) Approved Contract Baseline

(i) Within thirty (30) working days after the contract effective date, the Contractor shall provide a summary page(s) to the Contracting Officer (CO) and Contracting Officer's Representative (COR), showing each reporting category as budgeted on a month-by-month basis for the duration of the work effort (Optional work efforts shall be separately summarized and Fiscal Years shall be subtotaled).

(ii) The corresponding monthly amounts on this summary shall be the amounts appearing in the "Planned" columns (7b and 7d) of each month's NF 533 as reported during the duration of the work effort.

(iii) The following cost categories are required to appear in the "Contract Value" column (9b) of the NF 533. No amounts shall accrue against any cost category not listed herein, unless authorized in writing by the CO (Email is sufficient). Variations in format or organization are authorized, as long as they conform to the contract reporting requirements.

Direct Labor Hours	_____
Direct Labor Dollars	_____
Labor Overhead/Fringe Dollars	_____
Material Dollars	_____
Material Overhead Dollars	_____
Other Direct Cost Dollars	
- Travel	_____
- Freight	_____
- Equipment	_____
- Training	_____
Subcontract Dollars	_____
Other Indirect Dollars	_____
G&A Dollars	_____
COM Dollars	_____
Fee Dollars	_____

Total Cost Plus Fee _____

(iv) In the event of a revision to the work effort, the Contractor shall provide a revised month-by-month summary within 15 working days after the revision is approved.

(2) Monthly and Quarterly NF 533 Reports

(i) The Contractor shall submit the following financial reports:

(A) NF 533M (Monthly Contractor Financial Management Report)

(B) NF 533Q (Quarterly Contractor Financial Management Report)

(ii) NF 533M, shall be submitted monthly not later than the 15th of the month or the next business day in accordance with NPR 9501.2. Teaming and Major Subcontractors' reports shall be submitted at the same time. Subcontractor reports shall use the same accounting calendar as used by the prime. Subcontractor reports shall balance to the prime Contractor report. Paper copies shall be distributed in accordance with the distribution list provided by the COR. An electronic version shall be provided for electronic filing.

(iii) Work areas shall be reported at the task area level including actual and estimates as identified in the instructions for preparation of Financial Management Reports, NASA Form 533M. Total contract summary shall add together all work areas reporting total contract costs and estimates.

REPORTING CATEGORIES

Section 1. Overall Contract Summary

Section 2. CLIN 1 Operation Cost Summary

Subsection 1.
Overall Test Service Pool Cost Summary
Subsection 2.
CPS Operations Costs
Subsection 3.
CPS (Operations) Preventative Maintenance Costs
Subsection 4.
CRYO Operations Costs
Subsection 5.
CRYO (Operations) Preventative Maintenance Costs

Section 3. CLIN 2 Maintenance Cost Summary

Subsection 1.
Overall CM&O Cost Summary
Subsection 2.
CPS Maintenance Costs
Subsection 3.
CPS (non-operations) Preventative Maintenance
Subsection 3.
PSO (Office) Costs
Subsection 4.
PSO In-Service Inspection Costs
Subsection 5.
PSO Preventative Maintenance Costs

Section 4. CLIN 3 IDIQ Cost Summary

Subsection 1.
Overall IDIQ Cost Summary
Subsection 2.
Individual IDIQ Job Costs

Section 5. CLIN 4 Capital IDIQ Summary

Subsection 1.
Individual Capital IDIQ Job Costs

(iv) A single page shall be submitted for each of the reporting categories identified above as well as for the total contract.

(v) A summary report by work area shall be submitted with the 533M.

(vi) Upon written request, the CO may authorize an alternative format that provides substantially the same level of detail as the required NF 533(s), but is more compatible with the Contractor's standard accounting/reporting format.

(vii) The report(s) shall be prepared in accordance with the instructions contained in contract clause 1852.242-73 and NPR 9501.2, and on the reverse of the forms. Additionally, any contract requirements identified as Capital Assets have special reporting requirements, which are specified in the “Capital Asset Acquisition” clause of this contract. Column 7b Cost Incurred/Hours Worked During Month Planned and 7d Cost Incurred/Hours Worked Cum. to Date Planned of the NF 533 M represent the negotiated baseline plan plus authorized changes for the contract. There may not be a direct relationship between the estimates provided in section 8 (Estimated Cost/Hours to Complete) of the NF 533 M and columns 7b and 7d. Columns 7b and 7d represent the

negotiated baseline plan plus authorized changes, unlike the estimates provided in columns 8a, 8b, and 8c. Data in section 8 should not be simply a restatement of the baseline values.

(viii) The cost categories for the monthly and quarterly reports are the same as those specified in paragraph (a)(1)(iii) above.

(ix) The Contractor shall provide a narrative explanation for any variance listed in the table below that exceeds the listed threshold. The explanation shall be provided as a footnote on the NF 533 report page, or included in a variance explanation table attached to the NF 533 report, and shall be detailed by cost category. The explanation shall include the cause of the variance, its impact on contract completion within the estimated cost, and the corrective action taken or proposed to be taken by the Contractor.

VARIANCE REPORTING REQUIREMENTS

Title of Variance	Definition	Threshold +/-
Actual vs. Estimated Cost	Any variance at the total contract level between a previous estimated month-specific expenditure and the actual expenditure reported for the same month. For example: The March 533M reported an estimated total contract expenditure for April of $100K, and subsequent April 533M reported actual total contract costs of $88K, which is a variance of 12%	10%
Actual vs. Planned to Date	Any variance at the total contact level between the planned cost to date and the actual cost to date	The lesser of 10% or $100K
Contractor Final Estimate vs. Contract Value	Any variance at the total contract level between the contractor's current final cost estimate and the current contract value.	The lesser of 5% or $100K

(x) IF THIS IS A TASK ORDER CONTRACT:

(A) The Contractor shall submit one set of monthly reports that summarize the entire contract at the Task Order Level (total hours/dollars per Task Order), and monthly reports showing cost detailed by the individual cost categories identified in paragraph (a)(1)(iii) above, for each active Task Order and for the total contract effort.

(B) If the contract includes identified capital asset expenditures, each capital asset shall be reported on its own report page. The level of reporting detail for capital assets shall be equal to the separate reporting for Task Orders under the contract.

(xi) Report periods and submittal dates shall be in accordance with the instructions contained in NPR 9501.2. All reports shall include the signature of the Contractor party responsible for the information on the reports.

(xii) Reports shall be submitted electronically and/or in hardcopy format, in the number of copies, and to the individuals/areas indicated in Clause J.2.

(xiii) Late, Inaccurate, or Incomplete Reports may result in the following penalties:

(A) Payment withheld until compliance is demonstrated,

(B) Negative Contractor Performance Assessment ratings, and/or

(C) Reduction in award fee.

(b) The following reporting requirements are in addition to those stated in the NASA Contractor Financial Management Reporting clause (1852.242-73) of this contract, and NPR 9501.2, NASA Contractor Financial Management Reporting.

(1) Contractor Headcount Reports

(i) Each fiscal year quarter (December 31, March 31, June 30 and September 30), the contractor shall prepare a report that shows, for each reporting category that includes labor costs, the total onboard headcount (including WYEs) by labor category. Program management staff shall be listed separately. The headcount is total staffing including recurring subcontract support included as direct labor in the NF533.

(ii) The report shall be submitted electronically to the CO no later than fifteen (15) work days after the close of the fiscal year quarter end date.

(2) Contractor Accounting Calendar

(i) The contractor shall prepare an accounting calendar for the life of the contract (base period plus all option periods).
(ii) The accounting calendar shall be submitted electronically to the CO within fifteen (15) working days after the contract effective date.

(End of clause)

G.5 CONTRACTOR REQUESTS FOR GOVERNMENT-PROVIDED EQUIPMENT (NFS 1852.245–70) (JANUARY 2011)

(a) The Contractor shall provide all property required for the performance of this contract. The Contractor shall not acquire or construct items of property to which the Government will have title under the provisions of this contract without the Contracting Officer's written authorization. Property which will be acquired as a deliverable end item as material or as a component for incorporation into a deliverable end item is exempt from this requirement. Property approved as part of the contract award or specifically required within the statement of work is exempt from this requirement.

(b)(1) In the event the Contractor is unable to provide the property necessary for performance, and the Contractor requests provision of property by the Government, the Contractor's request shall—

(i) Justify the need for the property;

(ii) Provide the reasons why contractor-owned property cannot be used;

(iii) Describe the property in sufficient detail to enable the Government to screen its inventories for available property or to otherwise acquire property, including applicable manufacturer, model, part, catalog, National Stock Number or other pertinent identifiers;

(iv) Combine requests for quantities of items with identical descriptions and estimated values when the estimated values do not exceed $100,000 per unit; and

(v) Include only a single unit when the acquisition or construction value equals or exceeds $100,000.

(2) Contracting Officer authorization is required for items the Contractor intends to manufacture as well as those it intends to purchase.

(3) The Contractor shall submit requests to the Contracting Officer no less than 30 days in advance of the date the Contractor would, should it receive authorization, acquire or begin fabrication of the item.

(c) The Contractor shall maintain copies of Contracting Officer authorizations, appropriately cross-referenced to the individual property record, within its property management system.

(d) Property furnished from Government excess sources is provided as-is, where-is. The Government makes no warranty regarding its applicability for performance of the contract or its ability to operate. Failure of property obtained from Government excess sources under this clause is insufficient reason for submission of requests for equitable adjustments discussed in the clause at FAR 52.245–1, Government Property, as incorporated in this contract.

(End of clause)

G.6 INSTALLATION-ACCOUNTABLE GOVERNMENT PROPERTY (NFS 1852.245-71) (ALTERNATE I)(JAN 2011)

(a) The Government property described in paragraph (c) of this clause may be made

available to the Contractor on a no-charge basis for use in performance of this contract. This property shall be utilized only within the physical confines of the NASA installation that provided the property unless authorized by the Contracting Officer under (b)(1)(iv). Under this clause, the Government retains accountability for, and title to, the property, and the Contractor shall comply with the following:

See NASA Procedural Requirements (NPR) 4200.1, "NASA Equipment Management Procedural Requirements", NPR 4200.2, "NASA Equipment Management User's Guide for Property Custodians", NPR 4300.1, "NASA Personal Property Disposal", and NPR 4310.4, "Identification and Disposition of NASA Artifacts", for applicable user responsibilities.

Property not recorded in NASA property systems must be managed in accordance with the requirements of the clause at FAR 52.245-1, as incorporated in this contract. The Contractor shall establish and adhere to a system of written procedures to assure continued, effective management control and compliance with these user responsibilities. In accordance with FAR 52.245-1(h)(1) the contractor shall be liable for property lost, damaged, destroyed or stolen by the contractor or their employees when determined responsible by a NASA Property Survey Board, in accordance with the NASA guidance in this clause.

(b)(1) The official accountable recordkeeping, financial control, and reporting of the property subject to this clause shall be retained by the Government and accomplished within NASA management information systems prescribed by the installation Supply and Equipment Management Officer (SEMO) and Financial Management Officer. If this contract provides for the Contractor to acquire property, title to which will vest in the Government, the following additional procedures apply:

(i) The Contractor shall not utilize the installation’s central receiving facility for receipt of contractor-acquired property. However, the Contractor shall provide listings suitable for establishing accountable records of all such property received, on a monthly basis, to the SEMO**.**

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

(iii) The Contractor shall establish a record for Government titled property as required by FAR 52.245-1, as incorporated in this contract, and shall maintain that record until accountability is accepted by the Government.

(iv) Contractor use of Government property at an off-site location and off-site subcontractor use requires advance approval of the Contracting Officer and notification of the Industrial Property Officer. The property shall be considered Government furnished and the Contractor shall assume accountability and financial reporting responsibility. The Contractor shall establish records and

property control procedures and maintain the property in accordance with the requirements of FAR 52.245-1, Government Property (as incorporated in this contract), until its return to the installation. NASA Procedural Requirements related to property loans shall not apply to offsite use of property by contractors.

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

(c) The following property and services are provided:

(1) Office space, work area space, and utilities. Government telephones are available for official purposes only.

(2) Office furniture.

(3) Property listed in Section J, Attachment A.

(i) If the Contractor acquires property, title to which vests in the Government pursuant to other provisions of this contract, this property also shall become accountable to the Government upon its entry into Government records.

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

(4) Supplies from stores stock.

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

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

(7) Installation service facilities: None.

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

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

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

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

Contracting Officer.

(12) Library.

(13) Equipment calibration.

(14) Government-owned motor pool vehicles. There are a limited amount of vehicles available for GRC employees; this inclusion may affect the Center's motor pool availability.

(15) Airport shuttle.

(16) Vehicle maintenance and fuel.

(17) Child care (Under similar terms and conditions applied to GRC civil servants).

(18) Fitness center (Under similar terms and conditions applied to GRC civil servants).

(End of clause)

G.7 IDENTIFICATION AND MARKING OF GOVERNMENT EQUIPMENT (NFS 1852.245–74) (JANUARY 2011)

(a) The Contractor shall identify all equipment to be delivered to the Government using NASA Technical Handbook (NASA–HDBK) 6003, Application of Data Matrix Identification Symbols to Aerospace Parts Using Direct Part Marking Methods/Techniques, and NASA Standard (NASA–STD) 6002, Applying Data Matrix Identification Symbols on Aerospace Parts or through the use of commercial marking techniques that: (1) are sufficiently durable to remain intact through the typical lifespan of the property: and, (2) contain the data and data format required by the standards. This requirement includes deliverable equipment listed in the schedule and other equipment when no longer required for contract performance and NASA directs physical transfer to NASA or a third party. The Contractor shall identify property in both machine and human readable form unless the use of a machine readable-only format is approved by the NASA Industrial Property Officer.

(b) Equipment shall be marked in a location that will be human readable, without disassembly or movement of the equipment, when the items are placed in service unless such placement would have a deleterious effect on safety or on the item's operation.

(c) Concurrent with equipment delivery or transfer, the Contractor shall provide the following data in an electronic spreadsheet format:

(1) Item Description.
(2) Unique Identification Number (License Tag).
(3) Unit Price.
(4) An explanation of the data used to make the unique identification number.

(d) For equipment no longer needed for contract performance and physically transferred under paragraph (a) of this clause, the following additional data is required:

(1) Date originally placed in service.

(2) Item condition.

(e) The data required in paragraphs (c) and (d) of this clause shall be delivered to the NASA center receiving activity listed below:

grc-contracts@mail.nasa.gov

(f) The contractor shall include the substance of this clause, including this paragraph (f), in all subcontracts that require delivery of equipment.

(End of clause)

G. 8 PROPERTY MANAGEMENT CHANGES (NFS 1852.245–75) (JANUARY 2011)

(a) The Contractor shall submit any changes to standards and practices used for management and control of Government property under this contract to the assigned property administrator prior to making the change whenever the change —

(1) Employs a standard that allows increase in thresholds or changes the timing for reporting loss, damage, or destruction of property;

(2) Alters physical inventory timing or procedures;

(3) Alters recordkeeping practices;

(4) Alters practices for recording the transport or delivery of Government property; or

(5) Alters practices for disposition of Government property.

(End of clause)

G.9 PHYSICAL INVENTORY OF CAPITAL PERSONAL PROPERTY (NFS 1852.245–78) (JANUARY 2011)

(a) In addition to physical inventory requirements under the clause at FAR 52.245–1, Government Property, as incorporated in this contract, the Contractor shall conduct annual physical inventories for individual property items with an acquisition cost exceeding $100,000.

(1) The Contractor shall inventory—

(i) Items of property furnished by the Government;

(ii) Items acquired by the Contractor and titled to the Government under the clause at FAR 52.245–1;

(iii) Items constructed by the Contractor and not included in the deliverable, but titled to the Government under the clause at FAR 52.245–1; and

(iv) Complete but undelivered deliverables.

(2) The Contractor shall use the physical inventory results to validate the property record data, specifically location and use status, and to prepare summary reports of inventory as described in paragraph (c) of this clause.

(b) Unless specifically authorized in writing by the Property Administrator, the inventory shall be performed and posted by individuals other than those assigned custody of the items, responsibility for maintenance, or responsibility for posting to the property record. The Contractor may request a waiver from this separation of duties requirement from the Property Administrator, when all of the conditions in either (1) or (2) of this paragraph are met.

(1) The Contractor utilizes an electronic system for property identification, such as a laser bar-code reader or radio frequency identification reader, and

(i) The programs or software preclude manual data entry of inventory identification data by the individual performing the inventory; and

(ii) The inventory and property management systems contain sufficient management controls to prevent tampering and assure proper posting of collected inventory data.

(2) The Contractor has limited quantities of property, limited personnel, or limited property systems; and the Contractor provides written confirmation that the Government property exists in the recorded condition and location;

(3) The Contractor shall submit the request to the cognizant property administrator and obtain approval from the property administrator prior to implementation of the practice.

(c) The Contractor shall report the results of the physical inventory to the property administrator within 10 calendar days of completion of the physical inventory. The report shall—

(1) Provide a summary showing number and value of items inventoried; and

(2) Include additional supporting reports of—

(i) Loss in accordance with the clause at 52.245–1, Government Property;

(ii) Idle property available for reuse or disposition; and

(iii) A summary of adjustments made to location, condition, status, or user as a result of the physical inventory reconciliation.

(d) The Contractor shall retain auditable physical inventory records, including records supporting transactions associated with inventory reconciliation. All records shall be subject to Government review and/or audit.

(End of clause)

G.10 GOVERNMENT PROPERTY MANAGEMENT INFORMATION (NFS 1852.245–80) (JANUARY 2011)

(a) The offeror shall identify the industry leading or voluntary consensus standards, and/or the industry leading practices, that it intends to employ for the management of Government property under any contract awarded from this solicitation.

(b) The offeror shall provide the date of its last Government property control system analysis along with its overall status, a summary of findings and recommendations, the status of any recommended corrective actions, the name of the Government activity that performed the analysis, and the latest available contact information for that activity.

(c) The offeror shall identify any property it intends to use in performance of this contract from the list of available Government property in the provision at 1852.245–81, List of Available Government Property.

(d) The offeror shall identify all Government property in its possession, provided under other Government contracts that it intends to use in the performance of this contract. The offeror shall also identify: The contract that provided the property, the responsible Contracting Officer, the dates during which the property will be available for use (including the first, last, and all intervening months), and, for any property that will be used concurrently in performing two or more contracts, the amounts of the respective uses in sufficient detail to support prorating the rent, the amount of rent that would otherwise be charged in accordance with FAR 52.245–9, Use and Charges (June 2007), and the contact information for the responsible Government Contracting Officer. The offeror shall provide proof that such use was authorized by the responsible Contracting Officer.

(e) The offeror shall disclose cost accounting practices that allow for direct charging of commercially available equipment, when commercially available equipment is to be used in performance of the contract and the equipment is not a deliverable.

(f) The offeror shall identify, in list form, any equipment that it intends to acquire and directly charge to the Government under this contract. The list shall include a description, manufacturer, model number (when available), quantity required, and estimated unit cost. Equipment approved as part of the award need not be requested under NFS clause 1852.245-70,

(g) The offeror shall disclose its intention to acquire any parts, supplies, materials or equipment, to fabricate an item of equipment for use under any contract resulting from this solicitation when that item of equipment:

Will be titled to the government under the provisions of the contract; is not included as a contract deliverable; and the Contractor intends to charge the costs of materials directly to the contract. The disclosure shall identify the end item or system and shall include all descriptive information, identification numbers (when available), quantities required and estimated costs.

(h) Existing Government property may be reviewed at the following locations, dates, and times: TBD

(End of Clause)

G.11 LIST OF AVAILABLE GOVERNMENT PROPERTY (NFS 1852.245–81) (JANUARY 2011)

(a) The Government will make the following Government property available for use in performance of the contract resulting from this solicitation, on a no-charge-for-use basis in accordance with FAR 52.245–1, Government Property, included in this solicitation. The offeror shall notify the Government, as part of its proposal, of its intention to use or not use the property.

(b) The Government will make the following Government property available for use in performance of the contract resulting from this solicitation, on a no-charge-for-use basis in accordance with FAR 52.245–2, Government Property Installation Operation Services, as included in this solicitation. The offeror shall notify the Government of its intention to use or not use the property.

(c) The selected Contractor will be responsible for costs associated with transportation, and installation of the property listed in this provision.

(End of Clause)

G.12 OCCUPANY MANAGEMENT REQUIREMENTS (NFS 18.52.245–81) (JANUARY 2011)

(a) In addition to the requirements of the clause at FAR 52.245–1, Government Property, as included in this contract, the Contractor shall comply with the following in performance of work in and around Government real property:

(1) NPD 8800.14, Policy for Real Property Management.
(2) NPR 8831.2, Facility Maintenance Management

(b) The Contractor shall obtain the written approval of the Contracting Officer before installing or removing Contractor-owned property onto or into any Government real property or when movement of Contractor-owned property may damage or destroy Government-owned property. The Contractor shall restore damaged property to its original condition at the Contractor’s expense.

(c) The Contractor shall not acquire, construct or install any fixed improvement or structural alterations in Government buildings or other real property without the advance, written approval of the Contracting Officer. Fixed improvement or structural alterations, as

used herein, means any alteration or improvement in the nature of the building or other real property that, after completion, cannot be removed without substantial loss of value or damage to the premises. Title to such property shall vest in the Government.

(d) The Contractor shall report any real property or any portion thereof when it is no longer required for performance under the contract, as directed by the Contracting Officer.

(End of clause)

G.13 REAL PROPERTY MANAGEMENT REQUIREMENTS (NFS 1852.245–83) (JANUARY 2011)

(a) In addition to the requirements of the FAR Government Property Clause incorporated in this contract (FAR 52.245–1), the Contractor shall comply with the following in performance of any maintenance, construction, modification, demolition, or management activities of any Government real property:

(1) NPD 8800.14, Policy for Real Property Management.
(2) NPR 8831.2, Facility Maintenance Management.

(b) Within 30 calendar days following award, the Contractor shall provide a plan for maintenance of Government real property provided for use under this contract. The Contractor's maintenance program shall enable the identification, disclosure, and performance of normal and routine preventative maintenance and repair. The Contractor shall disclose and report to the Contracting Officer the need for replacement and/or capital rehabilitation. Upon acceptance by the Contracting Officer, the program shall become a requirement under this contract.

(c) Title to parts replaced by the Contractor in carrying out its normal maintenance obligations shall pass to and vest in the Government upon completion of their installation in the facilities. The Contractor shall keep the property free and clear of all liens and encumbrances.

(d) The Contractor shall keep records of all work done to real property, including plans, drawings, charts, warranties, and manuals. Records shall be complete and current. Record of all transactions shall be auditable. The Government shall have access to these records at all reasonable times, for the purposes of reviewing, inspecting, and evaluating the Contractor's real property management effectiveness. When real property is disposed of under this contract, the Contractor shall deliver the related records to the Government.

(e) The Contracting Officer may direct the Contractor in writing to reduce the work required by the maintenance program authorized in paragraph (b) of this clause at any time.

(End of clause)

G.14 CAPITAL ASSET ACQUISITION (GRC 52.245-100) (SEP 2009)

A. The following contract line items have been designated by NASA as capital assets*:

Line Item No.	Description	Quantity	Unit Price	Total Price

*A capital asset is an item: 1) With a total acquisition cost of $100,000 or more, 2) With a useful life of 2 years or more, 3) Not intended for sale in the contractor's ordinary course of operations, 4) Acquired and/or fabricated by the contractor and to which NASA will or intends to take title, and 5) With an alternative future use (not research and development related). *(Note: Items and/or services with values less than $100,000 that contribute to the acquisition or increased value of a capital asset (e.g. surveys for real property or components for capital equipment) are also subject to capitalization rules. Generally, NASA will inform the contractor if such items and/or services are classified as capital assets.)*

B. During contract performance, if the contractor determines a need to acquire or fabricate items that may meet the criteria for capital assets beyond those specified above, the contractor shall submit a written request for approval to the contracting officer. Based on internal review, if the items are determined necessary for contract performance and determined to be capital assets, the contracting officer will modify the contract to: 1) Add separate line items to the contract appropriately, and 2) reference those items in paragraph (A) of this clause.

C. If NASA Contractor Financial Management Reports (NASA Form (NF) 533's) are required under this contract, the contractor shall report all costs incurred against each identified capital asset on its own report page on the NF 533's.

D. The costs incurred for each item designated as a capital asset shall be identified separately on any invoice, voucher, progress payment request, or other authorized payment request submitted by the contractor under this contract.

(End of clause)

[END OF SECTION]

SECTION H - SPECIAL CONTRACT REQUIREMENTS

H.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE

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

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

None by reference.

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

CLAUSE NUMBER	DATE	TITLE
1852.208-81	NOV 2004	RESTRICTIONS ON PRINTING AND DUPLICATING
1852.223-70	APR 2002	SAFETY AND HEALTH
1852.223-75	FEB 2002	MAJOR BREACH OF SAFETY OR SECURITY
1852.223-76	JUL 2003	FEDERAL AUTOMOTIVE STATISTICAL TOOL REPORTING
1852.242-72	AUG 1992	OBSERVANCE OF LEGAL HOLIDAYS (ALTERNATE I) (SEP 1989) (ALTERNATE II) (OCT 2000)

(End of clause)

H.2 LIMITATION OF FUTURE CONTRACTING (NFS 1852.209-71) (DEC 1988)

(a) The Contracting Officer has determined that this acquisition may give rise to a potential organizational conflict of interest. Accordingly, the attention of prospective Offerors is invited to FAR Subpart 9.5 - Organizational Conflicts of Interest.

(b) The nature of this conflict is: By performance of the contract individuals may gain access to information which, if used for nongovernmental purposes by the contractor or other entity, could create an unfair competitive advantage in seeking future contracts.

(c) The restrictions upon future contracting are as follows:

(1) If the Contractor, under the terms of this contract, or through the performance of tasks pursuant to this contract, is required to develop specifications or statements of work that are to be incorporated into a solicitation, the Contractor shall be ineligible

to perform the work described in that solicitation as a prime or first-tier subcontractor under an ensuing NASA contract. This restriction shall remain in effect for a reasonable time, as agreed to by the Contracting Officer and the Contractor, sufficient to avoid unfair competitive advantage or potential bias (this time shall in no case be less than the duration of the initial production contract). NASA shall not unilaterally require the Contractor to prepare such specifications or statements of work under this contract.

(2) To the extent that the work under this contract requires access to proprietary, business confidential, or financial data of other companies, and as long as these data remain proprietary or confidential, the Contractor shall protect these data from unauthorized use and disclosure and agrees not to use them to compete with those other companies.

(End of clause)

H.3 EXPORT LICENSES (NFS 1852.225-70) (FEB 2000)

(a) The Contractor shall comply with all U.S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, in the performance of this contract. In the absence of available license exemptions/exceptions, the Contractor shall be responsible for obtaining the appropriate licenses or other approvals, if required, for exports of hardware, technical data, and software, or for the provision of technical assistance.

(b) The Contractor shall be responsible for obtaining export licenses, if required, before utilizing foreign persons in the performance of this contract, including instances where the work is to be performed on-site at NASA Glenn Research Center, where the foreign person will have access to export-controlled technical data or software.

(c) The Contractor shall be responsible for all regulatory record keeping requirements associated with the use of licenses and license exemptions/exceptions.

(d) The Contractor shall be responsible for ensuring that the provisions of this clause apply to its subcontractors.

(End of clause)

H.4 OBSERVANCE OF LEGAL HOLIDAYS (NFS 1852.242-72)(AUG 1992) (ALTERNATE I)(SEPT 1989)(ALTERNATE II)(OCT 2000)

(a) The on-site Government personnel observe the following holidays:
New Year's Day

Martin Luther King, Jr.'s Birthday
President's Day
Memorial Day
Independence Day
Labor Day
Columbus Day
Veterans Day
Thanksgiving Day
Christmas Day

Any other day designated by Federal statute, Executive order, or the President's proclamation.

(b) When any holiday falls on a Saturday, the preceding Friday is observed. When any holiday falls on a Sunday, the following Monday is observed. Observance of such days by Government personnel shall not by itself be cause for an additional period of performance or entitlement of compensation except as set forth within the contract.

(c) On-site personnel assigned to this contract shall not be granted access to the installation during the holidays in paragraph (a) of the clause, except as follows: the Contractor shall provide sufficient on-site personnel to perform round-the-clock requirements of critical work already in process, unless otherwise instructed by the Contracting Officer or authorized representative. If the Contractor's on-site personnel work during a holiday other than those in paragraph (a) of this clause, no form of holiday or other premium compensation shall be reimbursed as either a direct or indirect cost. However, this does not preclude reimbursement for authorized overtime work that would have been overtime regardless of the status of the day as a holiday.

(d) The Contractor shall place identical requirements, including this paragraph, in all subcontracts that require performance of work on-site, unless otherwise instructed by the Contracting Officer.

(e) When the NASA installation grants administrative leave to its Government employees (e.g., as a result of inclement weather, potentially hazardous conditions, or other special circumstances), Contractor personnel working on-site should also be dismissed. However, the contractor shall provide sufficient on-site personnel to perform round-the-clock requirements of critical work already in process, unless otherwise instructed by the Contracting Officer or authorized representative.

(f) Whenever administrative leave is granted to Contractor personnel pursuant to paragraph (e) of this clause, it shall be without loss to the Contractor. The cost of salaries and wages to the Contractor for the period of any such excused absence shall be a reimbursable item of cost under this contract for employees in accordance with the Contractor's established accounting policy.

(End of clause)

H.5 PERSONAL IDENTITY VERIFICATION (PIV) CARD ISSUANCE PROCEDURES (GRC 52.204-96)(AUG 2006)

"PIV Card Issuance Procedures", posted on the World Wide Web at http://www.grc.nasa.gov/WWW/Procure/PIVCardIssuanceProcedures.doc, are incorporated herein by reference and made a part hereof.

These PIV Card Issuance Procedures are in accordance with FAR clause 52.204-9, "Personal Identity Verification of Contractor Personnel" and NASA Procurement Information Circular (PIC) 06-01 entitled "Personal Identity Verification of Contractors," dated January 18, 2006.

(End of clause)

H.6 EMERGENCY PREPAREDNESS AND RESPONSE (GRC 52.218-90) (SEP 2007)

(a) The Contractor's obligation may include resolution of unusual or emergency situations. The Contractor may be required to assist NASA, within the general scope of work, but in currently unidentified ways, in preparation for, or in response to emergencies.

(b) Obligations under this requirement shall only arise when one or more of the criteria at FAR 18.001, enabling NASA to utilize "Emergency Acquisition Flexibilities", are met.

(c) If the emergency preparedness and response requirements result in changes to the contract, all contract adjustments will be processed in accordance with the Changes clause of this contract.

(End of clause)

H.7 WASTE REDUCTION REPORTING (GRC 52.223-98) (JUL 2014)

In addition to the requirements of FAR clause 52.223-10, Waste Reduction Program, the Contractor's program shall also comply with the NASA Glenn Research Center Environmental Program Manual. Both the FAR 23.403 and NPR 8530.1 require that Government purchases of products designated in the EPA's Comprehensive Procurement Guideline (CPG) contain the specified amount of recovered materials unless a request for waiver or justification documentation has been processed.

The Contractor shall submit an annual report about its progress in promoting and implementing cost effective waste reduction and sustainable acquisition practices under this contract, for the applicable products designated in CPG. A complete listing of all categories and products can be found at http://www.epa.gov/cpg/products.htm. The reporting period shall be from October 1 of each year through September 30 of the

following year. The report shall be submitted by December 15. The report shall be submitted at the address listed at https://netsdata.grc.nasa.gov. Copies of the report shall also be provided to the Contracting Officer and the GRC Energy and Environmental Management Office.

(End of clause)

H.8 SAFETY AND HEALTH PLAN – GRC SUPPLEMENTAL REQUIREMENTS TO NFS 1852.223-73 (GRC 52.223-100)(NOV 2013)

The Contractor's general safety and health plan description, in accordance with solicitation requirements, is hereby incorporated by reference.

The Contractor shall submit a final, detailed, site-specific Safety and Health Plan to the Contracting Officer (CO) within 30 calendar days of contract award for concurrence by the GRC Safety and Health Division (SHeD), and approval by the CO.

If the contract is for services and/or operations, the final Safety and Health Plan shall be prepared in accordance with NASA Procedural Requirements (NPR) 8715.3 NASA General Safety Program Requirements, Appendix E.

If the contract is for construction, the final Safety and Health Plan shall be prepared in accordance with: 1) Chapter 17 of GLM-QS-1700.1, Glenn Research Center Safety Manual, and 2) the General Safety Specification 01 35 26.98.

If the contract statement of work or specification includes site-specific and/or unique safety and health plan requirements, they shall be addressed in the final Safety and Health Plan as well.

Upon approval, the final Safety and Health Plan will be incorporated as an Attachment to the contract via modification, and will replace the general safety and health plan description. Upon its incorporation, the Contractor shall comply with the requirements of the final Safety and Health Plan.

(End of Clause)

H.9 RECOVERED MATERIAL REPORTING (GRC 52.223-97)(OCT 2014)

In addition to the requirements of FAR clause 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Products, the Contractor shall submit an annual report, estimating the percentage of the total recovered material used in contract performance, including, if applicable, the percentage of post-consumer material content. A complete listing of all categories and products the EPA has designated as required to meet recycled/reclaimed percentages can be found at http://www.epa.gov/cpg/products.htm . The reporting period shall be from October 1 of each year through September 30 of the following year. The report shall be submitted by

December 15. The report shall be submitted at the address listed at https://netsdata.grc.nasa.gov. Copies of the report shall also be provided to the Contracting Officer and the GRC Energy and Environmental Management Office

H.10 CONTRACTORS' DUTIES AND RESPONSIBILITIES ON-SITE (GRC 52.237-91)(MAR 2014)

(a) BADGES AND PASSES

(i) Badge and Pass Issuance

Support Service Contractor personnel having a need to enter areas of the Glenn Research Center Lewis Field or Plum Brook Station shall have an identification badge or pass. This badge or pass shall be obtained at the Badge Control Office or Visitor Control Office located at the Main Gate of either Lewis Field or Plum Brook Station.

(1) Permanent Badge (Personal Identify Verification (PIV) Credential) Requirements

a. It is recommended that the contractor complete the new employee hiring process at least 10 work days prior to the employee's start date.
b. Upon the selection of a new employee, the contractor's Human Resource (HR) representative shall create an identity in the Identity and Access Management Tool (IdMAX).
c. The contractor's HR representative shall also complete NASA Form 1760, Position Risk Designation for Non-NASA Employee and GRC 1760, Position Risk Designation Cover sheet. Once completed, both forms shall be signed by the NASA COTR and sent to the Office of Protective Services POC for Non-Government Investigations.
d. At the time of the Center visit or the Entry-on-Duty appointment, the new employee shall complete the Enroll for PIV credential process at the Main Gate Badge Control Office.
e. During this activity the new employee shall provide verification of their identity by providing two forms of I-9 documentation and fingerprints.
f. Upon Entry-on-Duty, the employee shall be issued a temporary credential (badge) for access to the Center until a Permanent Credential (badge) is created.

Please reference the GRC Office of Protective Services web site for the Permanent Support Service Contractor (SSC) New Hire Identity Creation Process (https://security.grc.nasa.gov/im_ssc_new_hire.cfm), and for additional information.

(2) Temporary Pass Requirements

- Short Term Visitors (1-29 days) shall receive a Visitor Pass. Please reference the GRC Office of Protective Services web site (https://security.grc.nasa.gov/form_visit_information.cfm) to complete the on-line visitor request form.

- NASA GRC Service and Vendor Personnel shall receive a Service / Vendor Personnel Pass which will allow only physical access to NASA GRC. Please reference the GRC Office of Protective Services web site (https://security.grc.nasa.gov/crm_grc_serv_vend_pers.cfm) for complete information.

The contractor shall ensure that, for badging purposes, each contractor employee is in possession of GRC 9975 (Construction Contractor Registration & ID Badge), prior to reporting to work. Contractor employees not in possession of the above mentioned form will be delayed at the gate until the contractor supervisor/foreman or that individual's representative reports to the Main Gate with the appropriate paperwork for badging

- Temporary workers are defined as those employees that are on Center for more than 29 days and less than 180 days. Please reference the GRC Office of Protective Services web site (https://security.grc.nasa.gov/crm_temporary_worker.cfm) for complete information.

All lost or stolen badges or passes shall be reported immediately to the GRC Office of Protective Services.

(ii) Employee Separation

(1) When an employee terminates and/or resigns employment, the contractor shall issue to the employee GRC 10087, Non-NASA Separation Clearance Record. The contractor shall be responsible for making an inquiry of all offices listed on the form to see if the employee has any outstanding Government items. The employee shall then take this form to all offices that list he/she as having outstanding items. The employee's last stop is for the return of their Government issued I.D. badge. The contractor is also required to send a notice to the Grc-Ssc-Separations@Lists.Nasa.Gov within 1 day of employees' separation.

(2) The contractor shall ensure that the terminated and/or resigned employee has returned his/her badge to the Main Gate Badge Clerk. Final clearance of a contractor upon completion of a contract will depend in part upon accounting for all badges issued to employees during the performance of the contract. Security badges are Government property and any alteration or misuse of these badges may be prosecuted as a violation of Section 499, Title 18, U.S. Code.

(3) The contractor's on-site manager shall comply with the Badge and Property Regulations a copy of which will be given to the contractor's supervisors at the time of the Construction Site Showing.

(4) Upon termination of duties, each employee's badge will be collected and returned to the Main Gate by the contractor. Final clearance of a contractor upon completion of a contract will depend in part upon the accounting for all badges issued to employees during the performance of the contract. Security badges are Government property and any alteration or misuse of these badges may be prosecuted as a violation of Section 499, Title 18, U.S. Code.

(b) PERSONNEL LOCATION AND IDENTIFICATION

The contractor shall:

(1) Ensure that office space occupied by its personnel is clearly labeled with the name of the company.

(2) Ensure, to the extent practicable, that external correspondence signed by its personnel is on company letterhead. Internal correspondence, including e-mail and memoranda, must include the name of the company in the signature line or in another clearly identifiable location.

(3) Ensure that its onsite personnel, when receiving or placing telephone calls, identify their employer, in addition to whatever other appropriate greeting is used.

(4) When participating in meetings with Government and/or other contractor personnel, ensure that its personnel properly identify themselves as contractor employees so that their actions will not be construed as acts of Government officials.

(c) EMERGENCY PREPAREDNESS

(1) Emergencies are defined as incidents involving serious personal injury or damage, incidents that cause possible hazardous conditions, or incidents that require immediate attention of the Plant Protection Department or Security. The contractor shall ensure that its employees are informed that Emergency, Fire, Medical, Safety, and Security assistance can be summoned by Dialing "911" on the Center's PABX telephone system.

(2) For incidents not classified as an emergency, contractor personnel shall be instructed to immediately notify the Contracting Officer's Representative (COR) (rather than dialing "911").

(3) In the event of any accident investigation activity, the contactor shall cooperate fully with the Government Accident Investigator and the Center Accident Investigation Board. This cooperation shall include interviews at the accident site and/or at a Board meeting.

(4) The contractor shall provide written guidance to its employees in the event of an emergency, an incident other than an emergency, a Center closure, a building closure, a fire alarm, or tornado alarm. The contractor is encouraged to include in this guidance pre-established instructions, when feasible, to employees such that unnecessary delays and confusion may be avoided by employees who may otherwise be awaiting management instructions. For example, the contractor is encouraged to address what actions employees should immediately take in the event of fire, building closure, Center closure (i.e. late Center opening or early center dismissal) for snow or other causes.

(d) TRAFFIC

The contractor agrees to comply, and agrees to require that all of its personnel will comply with all posted traffic signs, signals and instructions of personnel assigned for traffic control and parking purposes and with the provisions of the NASA Glenn Research Center Safety Manual (GLM-QSA-1700.1), Chapter 19, Vehicle & Pedestrian Safety, incorporated herein by reference and made a part hereof.

(e) PROHIBITION OF FIREARMS

Firearms or weapons of any kind are strictly prohibited at the Glenn Research Center.

(f) SECURITY INCIDENTS

Theft of Property, Bomb threats, malicious damage and any other threat or violent situations shall be immediately reported to the GRC Office of Protective Services.

(g) AFTER-HOUR ACCESS

During normal working hours, 6:00 a.m. to 6:00 p.m. Monday through Friday, the guards at the gates will permit contractor entrance and departure. At any other time, advance clearance is required. Advance clearance may be obtained through the Glenn/Plum Brook COR, who will make the request to the Main Gate Officer (PABX 3-2204 at Glenn and 3-3221 at Plum Brook). After-hour clearances, as approved by the COR, are certification to the guards as authority for admittance of a contractor during off hours, including Saturdays, Sundays, and Holidays. This procedure ONLY applies to temporary contractors who are on-site at Glenn for 1 - 179 days within 365 day timeframe and are issued temporary badges(non-smartcard credentials) NOTE: Per Plum Brook management ALL Plum Brook Station employees are required to follow the after-hour access procedures.

(h) GOVERNMENT PROPERTY ACCOUNTABILITY

(1) Government property and material is subject to the requirements of Federal Acquisition Regulation (FAR) Part 45 and NASA FAR Supplement (NFS) Part 1845. All NASA contractors are required to follow all applicable FAR and NFS regulations as well as applicable NASA Directives. Removal of NASA property from GRC and Plum Brook Station without prior authorization is strictly prohibited and is subject to denial of Center access and criminal prosecution. Contractors shall ensure that their employees are familiar with the requirements of the contract with regard to Government Property, including the disposal and removal of scrap and residual materials. The removal of scrap and residual job materials from GRC requires written approval from the NASA COR or authorized representative. The appropriate documentation must be completed and signed by the COR or authorized representative before exiting the Center. Each driver is required to surrender the completed documentation to the security officer at the security control point upon departure. Each vehicle is then subject to inspection prior to departure from the Center to check the contents of the respective vehicle against the information listed on the documentation authorizing removal of the property.

(2) In addition to the above, Municipal Waste, Recyclables, and Hazardous Materials must also be properly disposed of utilizing the appropriate containers and collection points for each type of scrap and residual material. Failure to adhere to the proper disposal of these materials or unauthorized use of municipal waste or recycling containers may result in the denial of Center access and possible civil or criminal prosecution for the offender.

(3) At least sixty (60) calendar days before the beginning of the phase-in of the follow-on contract, the Contractor shall review all property/materials <u>under</u> the threshold for tagging. This includes property/materials in the Contractor's possession either provided to them from a previous award or acquired during the life of the contract. The purpose is to determine if the property is usable or should be disposed of through the Property Disposal Officer <u>while the contract remains open.</u>

(4) Property movement and disposal shall be coordinated through the Logistic and Technical Information Division's (LTID) Supply and Equipment Management Officer/Property Disposal Officer in accordance with the requirements in NASA Policy Document (NPD) 4200.1, Equipment Management, NPD 4300.1, NASA Personal Property Disposal Policy, NPR 4200.1, NASA Equipment Management Procedural Requirements, and NPR 4300.1, NASA Personal Property Disposal.

(5) Questions concerning the proper removal and disposal of property, scrap, waste or other residual job materials should be forwarded to the NASA COR, or the GRC Supply and Equipment Management Officer (SEMO).

(End of Clause)

H.11 FEE DEDUCTION FOR NON-SATISFACTORY WORK PERFORMANCE

Non-satisfactory work performance during contract performance may result in contract/task fee reduction. Non-satisfactory work performance is considered to be performance that does not comply with SOW specifications or contract/task order terms and conditions as outlined below.

The Government reserves the right to deduct from monthly invoices or the final fee payment an amount as indicated below. Final determination of the violations and associated penalties/reprimands will be made at the discretion of the Contracting Officer.

Deductive amounts are not negotiable

Violations	Application	Source of Evaluation Data	Notes
LEVEL I VIOLATION ($1000 Deduction Value)			
Health and Safety Violations	Deduct for each occurrence after three incidents per calendar year	Incident Reports, CPAR's, Safety/ Health Inspection Findings, other Government Inspection Reports, or Contractor Activity Reports	Violations would be work activity or worksite conditions that are in nonconformance or failure to comply with contract requirements
Environmental Violations	Deduct for each occurrence after three incidents per calendar year	Incident Reports, CPAR's, Environmental Inspection Findings, Government Inspection Reports, Contractor Activity Reports, or written communications to the Contractor from the CO/COR.	Violations would be work activity or worksite conditions that are in or contract requirements for environmental aspects of the task.
Schedule Updates	Deduct for each monthly occurrence per WO	Communications to the CO/COR from the Contractor via e-mail or monthly meeting.	Violations would be a failure to officially provide update to the Scheduled Completion Date per WO. Updated completion date not accepted by the COR would count as a violation.

On-Time Starts	Deduct for each occurrence after two on each month	Review Data from Central Process System Office	On-Time Starts is defined as Central Process Systems equipment being on line and ready to provide services to the customer when the testing is scheduled to begin/start. Violations would be the contractor's inability to meet the required start times. Any Government action that causes a delay of a scheduled start shall not impact the Contractor's fee.
PM Surveillance	Deduct if 10% is not met each month	Review Contractor, COR and ACOR Data	Contractor shall perform surveillance on 10% of PM's scheduled for each period as defined in the SOW. Violations would be the Contractor not surveying 10% of the PMs.
In-Service Inspections Surveillance	Deduct if 10% is not met each month	Review Contractor, COR and ACOR Data	Contractor shall perform surveillance on 10% of ISI's scheduled for each period as defined in the SOW. Violations would be the Contractor not surveying 10% of the ISI's.
LEVEL II VIOLATION ($2,000 Deduction Value)			
Recurring/ Unresolved Level I Violations	Deduct for each occurrence	Written communications to the contractor from the CO/COR, meeting minutes, or CPAR's	Violations would be a failure to apply corrective actions within a timeframe specified by the government and agreed upon by the Contractor or three recurring Level I violations on any task.

Unapproved Installations	Deduct for each occurrence per task	CPAR's, Meeting Minutes, Government Inspection Reports, Contractor Activity Reports, or written communications to the contractor from the CO/COR	Violations would be modification or installation of any material or equipment without an approved submittal or drawings that is not replacement of identical kind.
IDIQ completion and Cost Violation	Deduct for each occurrence	Review 533	The main function of Implementation of IDIQ Tasks is to execute specific tasks given to the Contractor. The Contractor shall provide a cost estimate and schedule to implement the task with allocated time in the Requirements Document. The contractor shall complete the tasks by the scheduled completion date and at the estimated cost. Violations would be, if during performance, the contractor realizes that there is delay in estimating or a cost and/or schedule variance during the performance, the Contractor does not contact the COR within 3 working days.
LEVEL III VIOLATION ($5,000 Deduction Value)			
Recurring/ Unresolved Level II Violations	Deduct for each occurrence	Written communications to the contractor from the CO/COR, meeting minutes, or CPAR's	Violations would be a failure to apply corrective actions within a timeframe specified by the government and agreed upon by the Contractor or three recurring Level II violations on any task.

Incident Reporting	Deduct for each occurrence	Incident Reports, CPAR's, Safety/ Health/Environmental Inspection Findings, OSHA investigation findings, Mishap Investigation Reports, other Government Inspection Reports, or Contractor Activity Reports	Violations would be failure to report a mishap or close call (as defined in the GRC Safety Manual) to NASA Emergency Dispatch and the COR as specified in the SOW.

(End of Clause)

H.12 GSR 37-2, MANDATED AND REQUIRED TRAINING FOR ONSITE CONTRACTOR AND SUBCONTRACTOR PERSONNEL (MAR 2015)

The contractor shall ensure that its employees performing onsite at the Glenn Research Center and/or Plum Brook Station complete all federally mandated and Agency/Center required training applicable to the work being performed by those employees. The current mandatory and required training may be found at http://www.grc.nasa.gov/WWW/HCDB/req-training.html
Contractor personnel will be notified when the various training sessions are available for registration or completion via repeated postings on Today@Glenn as the training sessions are added to the System for Administration, Training, and Educational Resources for NASA (SATERN), and shall complete the training in the manner and within the timeframe specified in the notification.
The contractor shall maintain training records for its onsite employees, and, on a quarterly basis, provide a compliance report to the Contracting Officer's Representative (COR), as evidence of completion of all applicable mandatory and required training. The COR will report any failure to comply with the above requirements to the Contracting Officer for implementation of corrective and/or performance-based actions.
The contractor shall include the substance of this requirement in all subcontracts involving onsite performance at the Glenn Research Center and/or Plum Brook Station.

(End of Clause)

H.13 CONTRACT VALUE ADJUSTMENTS

A. If during the performance of this Contract additional in-scope work is required to meet increased overall need, the Contracting Officer may unilaterally increase the total contract value (Cost and Fee) by up to 25% without modification to the contract fee percentage. This decision is entirely within the discretion of the Government.

B. If during the performance of this Contract less in-scope work is required to meet decreased overall need and the total contract costs are 5% or greater below the estimate

costs of the contract as reflected in B.2, both parties hereby agree to enter into negotiations to accordingly adjust contract and fee values commensurate with reductions in the contract costs without modification to the contract fee percentage.

(End of clause)

[END OF SECTION]

PART II - CONTRACT CLAUSES

SECTION I - CONTRACT CLAUSES

I.1 LISTING OF CLAUSES INCORPORATED BY REFERENCE

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

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

CLAUSE NUMBER	DATE	TITLE
52.202-1	NOV 2013	DEFINITIONS
52.203-3	APR 1984	GRATUITIES
52.203-5	MAY 2014	COVENANT AGAINST CONTINGENT FEES
52.203-6	SEP 2006	RESTRICTIONS ON SUBCONTRACTOR SALES TO THE GOVERNMENT
52.203-7	MAY 2014	ANTI-KICKBACK PROCEDURES
52.203-8	MAY 2014	CANCELLATION, RESCISSION AND RECOVERY OF FUNDS FOR ILLEGAL OR IMPROPER ACTIVITY
52.203-10	MAY 2014	PRICE OR FEE ADJUSTMENT FOR ILLEGAL OR IMPROPER ACTIVITY
52.203-12	OCT 2010	LIMITATION ON PAYMENTS TO INFLUENCE CERTAIN FEDERAL TRANSACTIONS
52.203-13	APR 2010	CONTRACTOR CODE OF BUSINESS ETHICS AND CONDUCT
52.203-14	DEC 2007	DISPLAY OF HOTLINE POSTER(S)
52.203-17	APR 2014	CONTRACTOR EMPLOYEE WHISTLEBLOWER RIGHTS AND REQUIREMENT TO INFORM EMPLOYEES OF WHISTLEBLOWER RIGHTS
52.204-2	AUG 1996	SECURITY REQUIREMENTS
52.204-4	MAY 2011	PRINTED OR COPIED DOUBLE-SIDED ON POSTCONSUMER FIBER CONTENT PAPER
52.204-7	JUNE 2013	SYSTEM FOR AWARD MANAGEMENT
52.204-9	JAN 2011	PERSONAL IDENTITY VERIFICATION OF CONTRACTOR PERSONNEL
52.204-10	JUL 2013	REPORTING EXECUTIVE COMPENSATION AND FIRST-TIER SUBCONTRACT AWARDS
52.204-12	DEC 2012	DATA UNIVERSAL NUMBERING SYSTEM NUMBER MAINTENANCE
52.204-13	JUL 2013	SYSTEM FOR AWARD MANAGEMENT MAINTENANCE
52.204-14	JAN 2014	SERVICE CONTRACT REPORTING REQUIREMENTS

52.209-6	AUG 2013	PROTECTING THE GOVERNMENT'S INTEREST WHEN SUBCONTRACTING WITH CONTRACTORS DEBARRED, SUSPENDED, OR PROPOSED FOR DEBARMENT
52.209-19	DEC 2014	INCORPORATION BY REFERENCE OF REPRESENTATIONS AND CERTIFICATIONS
52.210-1	APR 2011	MARKET RESEARCH
52.211-15	APR 2008	DEFENSE PRIORITY AND ALLOCATION REQUIREMENTS
52.215-2	OCT 2010	AUDIT AND RECORDS - NEGOTIATION
52.215-8	OCT 1997	ORDER OF PRECEDENCE - UNIFORM CONTRACT FORMAT
52.215-11	AUG 2011	PRICE REDUCTION FOR DEFECTIVE CERTIFIED COST OR PRICING DATA - MODIFICATIONS
52.215-13	OCT 2010	SUBCONTRACTOR CERTIFIED COST OR PRICING DATA – MODIFICATIONS
52.215-17	OCT 1997	WAIVER OF FACILITIES CAPITAL COST OF MONEY
52.215-18	JUL 2005	REVERSION OR ADJUSTMENT OF PLANS FOR POSTRETIREMENT BENEFITS (PRB) OTHER THAN PENSIONS
52.215-19	OCT 1997	NOTIFICATION OF OWNERSHIP CHANGES
52.215-21	OCT 2010	REQUIREMENTS FOR COST OR PRICING DATA OR INFORMATION OTHER THAN COST OR PRICING DATA—MODIFICATIONS (ALT III)(ALT IV)
52.215-22	OCT 2010	LIMITATION ON PASS-THROUGH CHARGES – IDENTIFICATION OF SUBCONTRACT EFFORT
52.215-23	OCT 2009	LIMITATIONS ON PASS-THROUGH CHARGES
52.215-23	OCT 2009	LIMITATIONS ON PASS-THROUGH CHARGES (ALT 1)
52.216-7	JUN 2013	ALLOWABLE COST AND PAYMENT Insert: "30th" in Paragraph (a)(3).
52.216-8	JUN 2011	FIXED FEE
52.216-24	APR 1984	LIMITATION OF GOVERNMENT LIABILITY
52.217-8	NOV 1999	OPTION TO EXTEND SERVICES
52.219-6	NOV 2011	NOTICE OF TOTAL SMALL BUSINESS SET-ASIDE
52.219-8	MAY 2014	UTILIZATION OF SMALL BUSINESS CONCERNS
52.219-14	NOV 2011	LIMITATION ON SUBCONTRACTING
52.219-28	JUL 2013	POST-AWARD SMALL BUSINESS PROGRAM REREPRESENTATION
52.222-1	FEB 1997	NOTICE TO THE GOVERNMENT OF LABOR DISPUTES
52.222-2	JUL 1990	PAYMENT FOR OVERTIME PREMIUMS Insert *"$25,000 per year*" in paragraph (a).
52.222-3	JUN 2003	CONVICT LABOR
52.222-4	MAY 2014	CONTRACT WORK HOURS AND SAFETY STANDARDS - OVERTIME COMPENSATION
52.222-17	MAY 2014	NONDISPLACEMENT OF QUALIFIED WORKERS
52.222-21	FEB 1999	PROHIBITION OF SEGREGATED FACILITIES
52.222-26	MAR 2007	EQUAL OPPORTUNITY
52.222-35	SEP 2010	EQUAL OPPORTUNITY FOR VETERANS

52.222-36	OCT 2010	AFFIRMATIVE ACTION FOR WORKERS WITH DISABILITIES
52.222-37	SEP 2010	EMPLOYMENT REPORTS ON VETERANS
52.222-40	DEC 2010	NOTIFICATION OF EMPLOYEE RIGHTS UNDER THE NATIONAL LABOR RELATIONS ACT
52.222-41	MAY 2014	SERVICE CONTRACT LABOR STANDARDS
52.222-50	FEB 2009	COMBATING TRAFFICKING IN PERSONS
52.222-54	AUG 2013	EMPLOYMENT ELIGIBILITY VERIFICATION
52.222-55	JUN 2014	MINIMUM WAGES UNDER EXECUTIVE ORDER 13658
52.223-2	SEP 2013	AFFIRMATIVE PROCUREMENT OF BIOBASED PRODUCTS UNDER SERVICE AND CONSTRUCTION CONTRACTS
52.223-3	JAN 1997	HAZARDOUS MATERIAL IDENTIFICATION AND MATERIAL SAFETY DATA (ALTERNATE I) (JUL 1995) Insert "*None*" in paragraph (b).
52.223-5	MAY 2011	POLLUTION PREVENTION AND RIGHT-TO-KNOW INFORMATION (ALTERNATE I & ALTERNATE II) (MAY 2011)
52.223-6	MAY 2001	DRUG-FREE WORKPLACE
52.223-9	MAY 2008	ESTIMATE OF PERCENTAGE OF RECOVERED MATERIAL CONTENT FOR EPA-DESIGNATED PRODUCTS
52.223-10	MAY 2011	WASTE REDUCTION PROGRAM
52.223-17	MAY 2008	AFFIRMATIVE PROCUREMENT OF EPA-DESIGNATED ITEMS IN SERVICE AND CONSTRUCTION CONTRACTS
52.223-18	AUG 2011	ENCOURAGING CONTRACTOR POLICIES TO BAN TEXT MESSAGING WHILE DRIVING
52.223-19	MAY 2011	COMPLIANCE WITH ENVIRONMENTAL MANAGEMENT SYSTEMS
52.224-1	APR 1984	PRIVACY ACT NOTIFICATION
52.224-2	APR 1984	PRIVACY ACT
52.225-1	MAY 2014	BUY AMERICAN - SUPPLIES
52.225-13	AUG 2003	RESTRICTIONS ON CERTAIN FOREIGN PURCHASES
52.227-1	DEC 2007	AUTHORIZATION AND CONSENT
52.227-2	DEC 2007	NOTICE AND ASSISTANCE REGARDING PATENT AND COPYRIGHT INFRINGEMENT
52.227-14	MAY 2014	RIGHTS IN DATA—GENERAL As modified by NFS 1852.227-14 RIGHTS IN DATA—GENERAL (MAY 2014)
52.227-17	DEC 2007	RIGHTS IN DATA—SPECIAL WORKS As modified by NFS 1852.227-17 RIGHTS IN DATA—SPECIAL WORKS (JULY 2013)
52.228-7	MAR 1996	INSURANCE—LIABILITY TO THIRD PERSONS
52.230-2	MAY 2014	COST ACCOUNTING STANDARDS
52.230-3	MAY 2014	DISCLOSURE AND CONSISTENCY OF COST ACCOUNTING PRACTICES
52.230-6	JUN 2010	ADMINISTRATION OF COST ACCOUNTING STANDARDS
52.232-9	APR 1984	LIMITATION ON WITHHOLDING OF PAYMENTS
52.232-17	MAY 2014	INTEREST

52.232-18	APR 1984	AVAILABILITY OF FUNDS
52.232-22	APR 1984	LIMITATION OF FUNDS
52.232-23	MAY 2014	ASSIGNMENT OF CLAIMS (ALTERNATE I) (APR 1984)
52.232-25	JUL 2013	PROMPT PAYMENT (ALTERNATE I) (FEB 2002)
52.232-33	JUL 2013	PAYMENT BY ELECTRONIC FUNDS TRANSFER - SYSTEM FOR AWARD MANAGEMENT
52.232.39	JUN 2013	UNENFORCEABILITY OF UNAUTHORIZED OBLIGATIONS
52.232-40	DEC 2013	PROVIDING ACCELERATED PAYMENTS TO SMALL BUSINESS SUBCONTRACTORS
52.233-1	MAY 2014	DISPUTES (ALTERNATE I) (DEC 1991)
52.233-3	AUG 1996	PROTEST AFTER AWARD (ALTERNATE I) (JUN 1985)
52.233-4	OCT 2004	APPLICABLE LAW FOR BREACH OF CONTRACT CLAIM
52.237-2	APR 1984	PROTECTION OF GOVERNMENT BUILDINGS, EQUIPMENT, AND VEGETATION
52.237-3	JAN 1991	CONTINUITY OF SERVICES
52.239-1	AUG 1996	PRIVACY OR SECURITY SAFEGUARDS
52.242-1	APR 1984	NOTICE OF INTENT TO DISALLOW COSTS
52.242-3	MAY 2014	PENALTIES FOR UNALLOWABLE COSTS
52.242-4	JAN 1997	CERTIFICATION OF FINAL INDIRECT COSTS
52.242-13	JUL 1995	BANKRUPTCY
52.243-2	AUG 1987	CHANGES - COST-REIMBURSEMENT (ALTERNATE II) (APR 1984)
52.244-2	OCT 2010	SUBCONTRACTS (ALTERNATE I) (OCT 2010)
52.244-5	DEC 1996	COMPETITION IN SUBCONTRACTING
52.244-6	MAY 2014	SUBCONTRACTS FOR COMMERCIAL ITEMS
52.245-1	APR 2012	GOVERNMENT PROPERTY
52.245-9	APR 2012	USE AND CHARGES
52.246-25	FEB 1997	LIMITATION OF LIABILITY—SERVICES
52.247-64	FEB 2006	PREFERENCE FOR PRIVATELY OWNED U.S.-FLAG COMMERCIAL VESSELS
52.249-6	MAY 2004	TERMINATION (COST-REIMBURSEMENT)
52.249-14	APR 1984	EXCUSABLE DELAYS
52.251-1	APR 2012	GOVERNMENT SUPPLY SOURCES
52.251-2	JAN 1991	INTERAGENCY FLEET MANAGEMENT SYSTEM VEHICLES AND RELATED SERVICES
52.253-1	JAN 1991	COMPUTER GENERATED FORMS

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

CLAUSE NUMBER	DATE	TITLE
1852.203-70	JUN 2001	DISPLAY OF INSPECTOR GENERAL HOTLINE POSTERS
1852.203-71	AUG 2014	REQUIREMENT TO INFORM EMPLOYEES OF WHISTLEBLOWER RIGHTS

1852.204-76	JAN 2011	SECURITY REQUIREMENTS FOR UNCLASSIFIED INFORMATION TECHNOLOGY RESOURCES
1852.216-89	JUL 1997	ASSIGNMENT AND RELEASE FORMS
1852.219-74	SEP 1990	USE OF RURAL AREA SMALL BUSINESSES
1852.219-76	JUL 1997	NASA 8 PERCENT GOAL
1852.223-74	MAR 1996	DRUG-AND ALCOHOL-FREE WORKFORCE
1852.237-70	DEC 1988	EMERGENCY EVACUATION PROCEDURES
1852.237-72	JUN 2005	ACCESS TO SENSITIVE INFORMATION
1852.237-73	JUN 2005	RELEASE OF SENSITIVE INFORMATION
1852.243-71	MAR 1997	SHARED SAVINGS

I.2 Order Limitations (FAR 52.216-19)(Oct 1995)

(a) *Minimum order*. When the Government requires supplies or services covered by this contract in an amount of less than $0, the Government is not obligated to purchase, nor is the Contractor obligated to furnish, those supplies or services under the contract.

(b) *Maximum order*. The Contractor is not obligated to honor --

(1) Any order for a single item in excess of $15,000,000;

(2) Any order for a combination of items in excess of $15,000,000; or

(3) A series of orders from the same ordering office within ten days that together call for quantities exceeding the limitation in subparagraph (b)(1) or (2) of this section.

(c) If this is a requirements contract (*i.e*., includes the Requirements clause at subsection 52.216-21 of the Federal Acquisition Regulation (FAR)), the Government is not required to order a part of any one requirement from the Contractor if that requirement exceeds the maximum-order limitations in paragraph (b) of this section.

(d) Notwithstanding paragraphs (b) and (c) of this section, the Contractor shall honor any order exceeding the maximum order limitations in paragraph (b), unless that order (or orders) is returned to the ordering office within 10 days after issuance, with written notice stating the Contractor's intent not to ship the item (or items) called for and the reasons. Upon receiving this notice, the Government may acquire the supplies or services from another source.

(End of Clause)

I.3 OPTION TO EXTEND SERVICES (FAR 52.217-8) (NOV 1999)

The Government may require continued performance of any services within the limits and at the rates specified in the contract. These rates may be adjusted only as a result of revisions to prevailing labor rates provided by the Secretary of Labor. The option provision may be exercised more than once, but the total extension of performance hereunder shall not exceed 6 months. The Contracting Officer may exercise the option by written notice to the Contractor within 60 days.

(End of Clause)

I.4 OPTION TO EXTEND THE TERM OF THE CONTRACT (FAR 52.217-9) (MAR 2000)

(a) The Government may extend the term of this contract by written notice via unilateral contract modification to the Contractor at any time prior to the end of the current contract period; provided that the Government gives the Contractor a preliminary written notice of its intent to extend at least thirty (30) calendar days before the contract expires. The preliminary notice does not commit the Government to an extension.

(b) If the Government exercises this option, the extended contract shall be considered to include this option clause.

(c) The total duration of this contract, including the exercise of any options under this clause, shall not exceed five (5) years.

(End of clause)

I.5 STATEMENT OF EQUIVALENT RATES FOR FEDERAL HIRES (FAR 52.222-42) (MAY 2014)

In compliance with the Service Contract Labor Standards statute and the regulations of the Secretary of Labor (29 CFR part 4), this clause identifies the classes of service employees expected to be employed under the contract and states the wages and fringe benefits payable to each if they were employed by the contracting agency subject to the provisions of 5 U.S.C. 5341 or 5332.

This Statement is for Information Only: It is not a Wage Determination

Employee Class	Monetary Wage - Fringe Benefits
Electrician Maintenance	WG-11/4
Electrical Coordinator (Exempt)	WG-15/5
Machinery Maintenance Mechanic	WG-10/3
Mechanical Coordinator (Exempt)	WG-15/5
Electronic Technician, Maintenance III	WG-7/4

Engineering Technician V	WG-11/4
Engineering Technician IV	WG-11/6
Pipefitter Maintenance	WG-8/4
Millwright	WG-10/4
Chief Principle Mechanical Engineer	GS-15/4
Principle Mechanical Engineer	GS-13/5
Senior Mechanical Engineer	GS-13/3
Mechanical Engineer	GS-10/7
Drafter	GS-10/6
Mechanical Work Lead Technician	GS-12/7
Mechanical Technician	GS-11/4
SR Non-Destructive Mechanical Engineer Level II	GS-14/3
Non-Destructive Mechanical Engineer Level III	GS-13/5
Non-Destructive Mechanical Engineer Level II	GS-10/5
Work Control Support	GS-9/2
Buyer	GS-9/4

(End of clause)

I.6 DEVIATION ESTABLISHING A MINIMUM WAGE FOR CONTRACTORS (FAR 52.222-99) (JUNE 2014) (DEVIATION)

This clause implements Executive Order 13658, establishing a Minimum Wage for Contractors, dated February 12, 2014, and OMB Policy Memorandum M-14-09, dated June 12, 2014.

(a) Each service employee, laborer, or mechanic employed in the United States (the 50 States and the District of Columbia) in the performance of this contract by the prime Contractor or any subcontractor, regardless of any contractual relationship which may be alleged to exist between the Contractor and service employee, laborer, or mechanic, shall be paid not less than the applicable minimum wage under Executive Order 13658. The minimum wage required to be paid to each service employee, laborer, or mechanic performing work on this contract between January 1, 2015, and December 31, 2015, shall be $10.10 per hour.

(b) The Contractor shall adjust the minimum wage paid under this contract each time the Secretary of Labor's annual determination of the applicable minimum wage under section 2(a) (ii) of Executive Order 13658 results in a higher minimum wage. Adjustments to the Executive Order minimum wage under section 2(a) (ii) of Executive Order 13658 will be effective for all service employees, laborers, or mechanics subject to the Executive Order beginning January 1 of the following year. The Secretary of Labor will publish annual determinations in the Federal Register no later than 90 days before such new wage is to take effect. The Secretary will also publish the applicable minimum wage on

www.wdol.gov (or any successor website). The applicable published minimum wage is incorporated by reference into this contract.

(c) The Contracting Officer will adjust the contract price or contract unit prices under this clause only for the increase in labor costs resulting from the annual inflation increases in the Executive Order 13658 minimum wage beginning on January 1, 2016. The Contracting Officer shall consider documentation as to the specific costs and workers impacted in determining the amount of the adjustment.

(d) The Contractor Officer will not adjust the contract price under this clause for any costs other than those identified in paragraph (c) of this clause, and will not provide price adjustments under this clause that result in duplicate price adjustments with the respective clause of this contract implementing the Service Contract Labor Standards statute (formerly known as the Service Contract Act) or the Wage Rate Requirements (Construction) statute (formerly known as the Davis Bacon Act).

(e) The Contractor shall include the substance of this clause, including this paragraph (e) in all subcontracts.

(End of clause)

I.7 RIGHTS TO PROPOSAL DATA (TECHNICAL) (FAR 52.227-23) (JUN 1987)

Except for data contained on pages [TBD], it is agreed that as a condition of award of this contract, and notwithstanding the conditions of any notice appearing thereon, the Government shall have unlimited rights (as defined in the "Rights in Data - General" clause contained in this contract) in and to the technical data contained in the proposal dated [TBD], upon which this contract is based.

(End of clause)

I.8 PROVIDING ACCELERATED PAYMENT TO SMALL BUSINESS SUBCONTRACTORS (FAR 52.232-99)(AUG 2012) (DEVIATION)

This clause implements the temporary policy provided by OMB Policy Memorandum M-12-16, Providing Prompt Payment to Small Business Subcontractors, dated July 11, 2012.

(a) Upon receipt of accelerated payments from the Government, the contractor is required to make accelerated payments to small business subcontractors to the maximum extent practicable after receipt of a proper invoice and all proper documentation from the small business subcontractor.

(b) Include the substance of this clause, including this paragraph (b), in all

subcontracts with small business concerns.

(c) The acceleration of payments under this clause does not provide any new rights under the Prompt Payment Act.

(End of Clause)

I.9 CLAUSES INCORPORATED BY REFERENCE (FAR 52.252-2) (FEB 1998)

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

http://www.acquisition.gov/far/

http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm

(End of clause)

I.10 AUTHORIZED DEVIATIONS IN CLAUSES (FAR 52.252-6) (APR 1984)

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

(b) The use in this solicitation or contract of any __N/A__ Regulation (48 CFR _N/A____) clause with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

(End of clause)

I.11 SECURITY CLASSIFICATION REQUIREMENTS (NFS 1852.204-75) (SEP 1989)

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

(End of clause)

I.12 OMBUDSMAN (NFS 1852.215-84) (NOV 2011)

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

(b) If resolution cannot be made by the contracting officer, interested parties may contact the installation ombudsman, whose name, address, telephone number, facsimile number, and e-mail address may be found at: http://prod.nais.nasa.gov/pub/pub_library/Omb.html. Concerns, issues, disagreements, and recommendations which cannot be resolved at the installation may be referred to the Agency ombudsman identified at the above URL. Please do not contact the ombudsman to request copies of the solicitation, verify offer due date, or clarify technical requirements. Such inquiries shall be directed to the Contracting Officer or as specified elsewhere in this document.

(End of clause)

I.13 RESTRICTION ON FUNDING ACTIVITY WITH CHINA (NFS 1852.225-71)(FEB 2012)

(a) Definition - "China" or "Chinese-owned company" means the People's Republic of China, any company owned by the People's Republic of China or any company incorporated under the laws of the People's Republic of China.

(b) Public Laws 112-10, Section 1340(a) and 112-55, Section 539, restrict NASA from contracting to participate, collaborate, coordinate bilaterally in any way with China or a Chinese-owned company using funds appropriated on or after April 25, 2011. Contracts for commercial and non-developmental items are exempted from the prohibition because they constitute purchase of goods or services that would not involve participation, collaboration, or coordination between the parties.

(c) This contract may use restricted funding that was appropriated on or after April 25, 2011. The contractor shall not contract with China or Chinese-owned companies for any effort related to this contract except for acquisition of commercial and non-developmental items. If the contractor anticipates making an award to China or Chinese-owned companies, the contractor must contact the contracting officer to determine if funding on this contract can be used for that purpose.

(d) Subcontracts - The contractor shall include the substance of this clause in all subcontracts made hereunder.

(End of clause)

I.14 MINIMUM INSURANCE COVERAGE (NFS 1852.228-75)(OCT 1988)

The Contractor shall obtain and maintain insurance coverage as follows for the performance of this contract:

(a) Worker's compensation and employer's liability insurance as required by applicable Federal and state workers' compensation and occupational disease statutes. If occupational diseases are not compensable under those statutes, they shall be covered under the employer's liability section of the insurance policy, except when contract operations are so commingled with the Contractor's commercial operations that it would not be practical. The employer's liability coverage shall be at least $100,000, except in States with exclusive or monopolistic funds that do not permit workers' compensation to be written by private carriers.

(b) Comprehensive general (bodily injury) liability insurance of at least $500,000 per occurrence.

(c) Motor vehicle liability insurance written on the comprehensive form of policy which provides for bodily injury and property damage liability covering the operation of all motor vehicles used in connection with performing the contract. Policies covering motor vehicles operated in the United States shall provide coverage of at least $200,000 per person and $500,000 per occurrence for bodily injury liability and $20,000 per occurrence for property damage. The amount of liability coverage on other policies shall be commensurate with any legal requirements of the locality and sufficient to meet normal and customary claims.

(d) Comprehensive general and motor vehicle liability policies shall contain a provision worded as follows:

> "The insurance company waives any right of subrogation against the United States of America which may arise by reason of any payment under the policy."

(e) When aircraft are used in connection with performing the contract, aircraft public and passenger liability insurance of at least $200,000 per person and $500,000 per occurrence for bodily injury, other than passenger liability, and $200,000 per occurrence for property damage. Coverage for passenger liability bodily injury shall be at least $200,000 multiplied by the number of seats or passengers, whichever is greater.

(End of clause)

I.15 CONTRACTOR TRAINING, QUALIFICATIONS, AND CERTIFICATION RECORDS (GRC 52.237-92)(APR 2011)

Performance of this contract may require specialized training, certifications, or qualifications of contractor personnel. Upon the request of the Government, the Contractor shall provide personnel training, certifications and/or qualifications records which detail individual's qualifications to perform the duties to which they are assigned.

Records shall include all training, certifications and qualifications completed by an individual while under the Contractor's employment. If this contract contains clause 52.237-3, Continuity of Services, these records are considered to be part of "necessary personnel records" and shall also be provided to any follow-on contractor upon request.

(End of clause)

I.16 GRC 12/14 MODIFICATION TO FAR 52.236-13 ACCIDENT PREVENTION (NOVEMBER 1991) ALTERNATE I (NOVEMBER 1991)

(a) The Contractor shall provide and maintain work environments and procedures which will—

(1) Safeguard the public and Government personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities;

(2) Avoid interruptions of Government operations and delays in project completion dates; and

(3) Control costs in the performance of this contract.

(b) For these purposes on contracts for construction or dismantling, demolition, or removal of improvements, the Contractor shall—

(1) Provide appropriate safety barricades, signs, and signal lights;

(2) Comply with the standards issued by the Secretary of Labor at 29 CFR Part 1926 and 29 CFR Part 1910; and

(3) Ensure that any additional measures the Contracting Officer determines to be reasonably necessary for the purposes are taken.

(c) If this contract is for construction or dismantling, demolition or removal of improvements with any Department of Defense agency or component, the Contractor shall comply with all pertinent provisions of the latest version of U.S. Army Corps of Engineers Safety and Health Requirements Manual, EM 385-1-1, in effect on the date of the solicitation.

(d) Whenever the Contracting Officer becomes aware of any noncompliance with these requirements or any condition which poses a serious or imminent danger to the health or safety of the public or Government personnel, the Contracting Officer shall notify the Contractor orally, with written confirmation, and request immediate initiation of corrective

action. This notice, when delivered to the Contractor or the Contractor's representative at the work site, shall be deemed sufficient notice of the noncompliance and that corrective action is required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to promptly take corrective action, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not be entitled to any equitable adjustment of the contract price or extension of the performance schedule on any stop work order issued under this clause.

(e) The Contractor shall insert this clause, including this paragraph (e), with appropriate changes in the designation of the parties, in subcontracts.

(f) Within 30 calendar days after contract award, the Contractor shall submit to the Contracting Officer (CO) a detailed safety and occupational health plan for concurrence by the GRC Safety, Health and Environmental Division (SHED), and approval by the CO. Until the Safety and Health Plan is approved, the contractor may only perform necessary phase-in and other administrative activities.

(1) If the contract is for services and/or operations, the Safety and Health Plan shall be prepared in accordance with NASA Procedural Requirements (NPR) 8715.3 NASA General Safety Program Requirements, Appendix E.

(2) If the contract is for construction, the Safety and Health Plan shall be prepared in accordance with: a) Chapter 17 of GLM-QS-1700.1, Glenn Research Center Safety Manual, and b) the General Safety Specification 01 35 26.98.

(3) If the contract statement of work or specification includes site-specific and/or unique safety and health requirements, they shall be addressed in the Safety and Health Plan as well. Upon approval, the Safety and Health Plan will be incorporated as an Attachment to the contract via modification.

(End of clause)

[END OF SECTION]

PART III - LIST OF DOCUMENTS, EXHIBITS AND OTHER ATTACHMENTS

SECTION J - LIST OF ATTACHMENTS

J.1 LIST OF CONTRACT ATTACHMENTS

Attachment A Additional Data for Section C

Section J Number	Attachment Title	Incorporated Into Contract (Yes/No)
J-C-Safety Manual	Safety Manual	Yes
J-C-FORMS	Sample Forms	Yes
J-C-1a	Historic workload data for Central Process and High Voltage Controls	Yes
J-C-1b	Historic workload data for Recertification and Cryogenics	Yes
J-C-1c	GRC Lewis Field Real Property List	Yes
J-C-2.6	Listing of Institutional systems at GRC LF & PBS that requires certification.	Yes
J-C-4.2.6	Safety Permit process	Yes
J-C-4.6	Example of CPS Shift Schedule	Yes
J-C-5.4a	A current listing of Government furnished tools and equipment for Central Process and High Voltage Controls	Yes
J-C-5.4b	A current listing of Government furnished tools and equipment for Recertification and Cryogenics	Yes
J-C-8.1.4.1	Operating procedures, such as, Operations check sheets, hardwired shutdown procedures, calibration procedures, LO/TO procedures, and all other related procedures located in the Operator's Console	Yes
J-C-8.1.4.4	Run Report	Yes
J-C-8.1.10	CPSS schedule	Yes
J-C-9.4.1	The list of Preventative Maintenance Tasks for PSO	Yes
J-C-9.4.3	Samples of PM Work Instructions	Yes
J-C-11.2.1	The proof of certification and qualifications report. General personnel requirements details	Yes
J-C-11.3.1	The current certification process, including flowcharts.	Yes
J-C-12.3	HASP-Electronic Template document	Yes
J-C-12.11.1	Environmental Manual	Yes
J-C-OHPM	Occupational Health Program Manual	Yes
J-C-12.11.1.5.2	Soil Relocation and Authorization Form	Yes
J-C-12.11.1.5.3	Spill Occurrence Report	Yes
J-C-12.11.1.5.4	NASA Mishap Information system (NMIS) Report	Yes

J-C-12.17	Sample Safety Permits	Yes
J-C-12.17.1	Example of Annual documentation necessary for submittal to the NASA GRC Electrical Applications and/or Process Systems Safety Committees as part of the permit renewal request process.	Yes
J-C-13.2a	Basic definitions and terminology for the GRC Maximo System	Yes
J-C-13.2b	Maximo process flowcharts	Yes
J-C-13.2c	Maximo System Module Information & Status	Yes
J-C-13.3.1	GRC Maximo Security Groups	Yes
J-C-13.3.2	Person Groups available for both Government and Contract personnel	Yes
J-C-15.1	Financial reports on NASA Form 533 in accordance with the instructions on the reverse side of the form, and as published in the NASA Policy Guideline NPG 9501.2, see Section J-C-14.1, "NASA Contractor Financial Management Reporting	Yes
J-C-Waste Disposal	Waste Disposal Requests By Agency	Yes
/	2012 System Manager letter CAEB Compressors	Yes

Attachment B Wage Determination

Attachment C 1.Past Performance Questionnaire
2.Past Performance Cover Letter
3.Summary of Past Performance, Worksheets 1 & 2

Attachment D Cost and Pricing Templates Excel

The following attachments will be incorporated upon contract award:

Attachment E Site Specific Safety and Health Plan (30 days post award)

Attachment F Organizational Conflicts of Interest Avoidance Plan (30 days post award)

[END OF SECTION]

PART IV – REPRESENTATIONS AND INSTRUCTIONS

SECTION K - REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF OFFERORS

K.1 ANNUAL REPRESENTATIONS AND CERTIFICATIONS (FAR 52.204-8) (MAY 2014)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is 561210.

(2) The small business size standard is $38.5 million.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b)(1) If the provision at 52.204-7, System for Award Management, is included in this solicitation, paragraph (d) of this provision applies.

(2) If the provision at 52.204-7 is not included in this solicitation, and the Offeror is currently registered in the System for Award Management (SAM), and has completed the Representations and Certifications section of SAM electronically, the Offeror may choose to use paragraph (d) of this provision instead of completing the corresponding individual representations and certifications in the solicitation. The Offeror shall indicate which option applies by checking one of the following boxes:

[ ] (i) Paragraph (d) applies.
[ ] (ii) Paragraph (d) does not apply and the Offeror has completed the individual representations and certifications in the solicitation.

(c)(1) The following representations or certifications in SAM are applicable to this solicitation as indicated:

(i) 52.203-2, Certificate of Independent Price Determination. This provision applies to solicitations when a firm-fixed-price contract or fixed-price contract with economic price adjustment is contemplated, unless-

(A) The acquisition is to be made under the simplified acquisition procedures in Part 13;

(B) The solicitation is a request for technical proposals under two-step sealed bidding procedures; or

(C) The solicitation is for utility services for which rates are set by law or

regulation.

(ii) 52.203-11, Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions. This provision applies to solicitations expected to exceed $150,000.

(iii) 52.204-3, Taxpayer Identification. This provision applies to solicitations that do not include provision at 52.204-7, System for Award Management.

(iv) 52.204-5, Women-Owned Business (Other Than Small Business). This provision applies to solicitations that-

(A) Are not set aside for small business concerns;

(B) Exceed the simplified acquisition threshold; and

(C) Are for contracts that will be performed in the United States or its outlying areas.

(v) 52.209-2, Prohibition on Contracting with Inverted Domestic Corporations-Representation. This provision applies to solicitations using funds appropriated in fiscal years 2008, 2009, 2010, or 2012.

(vi) 52.209-5, Certification Regarding Responsibility Matters. This provision applies to solicitations where the contract value is expected to exceed the simplified acquisition threshold.

(vii) 52.214-14, Place of Performance-Sealed Bidding. This provision applies to invitations for bids except those in which the place of performance is specified by the Government.

(viii) 52.215-6, Place of Performance. This provision applies to solicitations unless the place of performance is specified by the Government.

(ix) 52.219-1, Small Business Program Representations (Basic & Alternate I). This provision applies to solicitations when the contract will be performed in the United States or its outlying areas.

(A) The basic provision applies when the solicitations are issued by other than DoD, NASA, and the Coast Guard.

(B) The provision with its Alternate I applies to solicitations issued by DoD, NASA, or the Coast Guard.

(x) 52.219-2, Equal Low Bids. This provision applies to solicitations when contracting by sealed bidding and the contract will be performed in the United

States or its outlying areas.

(xi) 52.222-22, Previous Contracts and Compliance Reports. This provision applies to solicitations that include the clause at 52.222-26, Equal Opportunity.

(xii) 52.222-25, Affirmative Action Compliance. This provision applies to solicitations, other than those for construction, when the solicitation includes the clause at 52.222-26, Equal Opportunity.

(xiii) 52.222-38, Compliance with Veterans' Employment Reporting Requirements. This provision applies to solicitations when it is anticipated the contract award will exceed the simplified acquisition threshold and the contract is not for acquisition of commercial items.

(xiv) 52.223-1, Bio-based Product Certification. This provision applies to solicitations that require the delivery or specify the use of USDA-designated items; or include the clause at 52.223-2, Affirmative Procurement of Bio-based Products Under Service and Construction Contracts.

(xv) 52.223-4, Recovered Material Certification. This provision applies to solicitations that are for, or specify the use of, EPA-designated items.

(xvi) 52.225-2, Buy American Certificate. This provision applies to solicitations containing the clause at 52.225-1.

(xvii) 52.225-4, Buy American-Free Trade Agreements-Israeli Trade Act Certificate. (Basic, Alternates I, II, and III.) This provision applies to solicitations containing the clause at 52.225-3.

(A) If the acquisition value is less than $25,000, the basic provision applies.

(B) If the acquisition value is $25,000 or more but is less than $50,000, the provision with its Alternate I applies.

(C) If the acquisition value is $50,000 or more but is less than $79,507, the provision with its Alternate II applies.

(D) If the acquisition value is $79,507 or more but is less than $100,000, the provision with its Alternate III applies.

(xviii) 52.225-6, Trade Agreements Certificate. This provision applies to solicitations containing the clause at 52.225-5.

(xix) 52.225-20, Prohibition on Conducting Restricted Business Operations in Sudan-Certification. This provision applies to all solicitations.

(xx) 52.225-25, Prohibition on Contracting with Entities Engaging in Certain Activities or Transactions Relating to Iran-Representation and Certifications. This provision applies to all solicitations.

(xxi) 52.226-2, Historically Black College or University and Minority Institution Representation. This provision applies to-

(A) Solicitations for research, studies, supplies, or services of the type normally acquired from higher educational institutions; and

(B) For DoD, NASA, and Coast Guard acquisitions, solicitations that contain the clause at 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns.

(2) The following certifications are applicable as indicated by the Contracting Officer:

[] (i) 52.219-22, Small Disadvantaged Business Status.
[] (A) Basic.
[] (B) Alternate I.
[] (ii) 52.222-18, Certification Regarding Knowledge of Child Labor for Listed End Products.
[] (iii) 52.222-48, Exemption from Application of the Service Contract Labor Standards to Contracts for Maintenance, Calibration, or Repair of Certain Equipment-Certification.
[] (iv) 52.222-52, Exemption from Application of the Service Contract Labor Standards to Contracts for Certain Services-Certification.
[] (v) 52.223-9, with its Alternate I, Estimate of Percentage of Recovered Material Content for EPA-Designated Products (Alternate I only).
[] (vi) 52.227-6, Royalty Information.
[] (A) Basic.
[] (B) Alternate I.
[X] (vii) 52.227-15, Representation of Limited Rights Data and Restricted Computer Software.

(d) The Offeror has completed the annual representations and certifications electronically via the SAM Web site accessed through *https://www.acquisition.gov*. After reviewing the SAM database information, the Offeror verifies by submission of the offer that the representations and certifications currently posted electronically that apply to this solicitation as indicated in paragraph (c) of this provision have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201); except for the changes identified below (Offeror to insert changes, identifying change by clause number, title, date). These amended representation(s) and/or certification(s) are also incorporated in this offer and are current,

accurate, and complete as of the date of this offer.

FAR Clause No.[ ]
Title[ ]
Date[ ]
Change[ ]

Any changes provided by the Offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on SAM.

(End of provision)

K.2 INFORMATION REGARDING RESPONSIBILITY MATTERS (FAR 52.209-7) (JUL 2013)

(a) Definitions. As used in this provision-

"Administrative proceeding" means a non-judicial process that is adjudicatory in nature in order to make a determination of fault or liability (e.g., Securities and Exchange Commission Administrative Proceedings, Civilian Board of Contract Appeals Proceedings, and Armed Services Board of Contract Appeals Proceedings). This includes administrative proceedings at the Federal and State level but only in connection with performance of a Federal contract or grant. It does not include agency actions such as contract audits, site visits, corrective plans, or inspection of deliverables.

"Federal contracts and grants with total value greater than $10,000,000" means-

(1) The total value of all current, active contracts and grants, including all priced options; and

(2) The total value of all current, active orders including all priced options under indefinite-delivery, indefinite-quantity, 8(a), or requirements contracts (including task and delivery and multiple-award Schedules).

"Principal" means an officer, director, owner, partner, or a person having primary management or supervisory responsibilities within a business entity (e.g., general manager; plant manager; head of a division or business segment; and similar positions).

(b) The Offeror [ ] has [ ] does not have current active Federal contracts and grants with total value greater than $10,000,000.

(c) If the Offeror checked "has" in paragraph (b) of this provision, the Offeror represents, by submission of this offer, that the information it has entered in the Federal Awardee Performance and Integrity Information System (FAPIIS) is current, accurate, and complete as of the date of submission of this offer with regard to the following information:

(1) Whether the Offeror, and/or any of its principals, has or has not, within the last five years, in connection with the award to or performance by the Offeror of a Federal contract or grant, been the subject of a proceeding, at the Federal or State level that resulted in any of the following dispositions:

(i) In a criminal proceeding, a conviction.

(ii) In a civil proceeding, a finding of fault and liability that results in the payment of a monetary fine, penalty, reimbursement, restitution, or damages of $5,000 or more.

(iii) In an administrative proceeding, a finding of fault and liability that results in-

(A) The payment of a monetary fine or penalty of $5,000 or more; or

(B) The payment of a reimbursement, restitution, or damages in excess of $100,000.

(iv) In a criminal, civil, or administrative proceeding, a disposition of the matter by consent or compromise with an acknowledgment of fault by the Contractor if the proceeding could have led to any of the outcomes specified in paragraphs (c)(1)(i), (c)(1)(ii), or (c)(1)(iii) of this provision.

(2) If the Offeror has been involved in the last five years in any of the occurrences listed in (c)(1) of this provision, whether the Offeror has provided the requested information with regard to each occurrence.

(d) The Offeror shall post the information in paragraphs (c)(1)(i) through (c)(1)(iv) of this provision in FAPIIS as required through maintaining an active registration in the System for Award Management database via *https://www.acquisition.gov* (see 52.204-7).

(End of provision)

K.3 PROPOSAL DISCLOSURE--COST ACCOUNTING PRACTICE CHANGES (FAR 52.230-7)(APR 2005)

The Offeror shall check "yes" below if the contract award will result in a required or unilateral change in cost accounting practice, including unilateral changes requested to be desirable changes.

___ Yes ___ No

If the Offeror checked "Yes" above, the Offeror shall--

(1) Prepare the price proposal in response to the solicitation using the changed practice for the period of performance for which the practice will

be used; and

(2) Submit a description of the changed cost accounting practice to the Contracting Officer and the Cognizant Federal Agency Official as pricing support for the proposal.

(End of provision)

K.4 RESTRICTION ON FUNDING ACTIVITY WITH CHINA—REPRESENTATION (NFS1852.225-72) (FEB 2012)

(a) Definition - "China" or "Chinese-owned" means the People's Republic of China, any company owned by the People's Republic of China or any company incorporated under the laws of the People's Republic of China.

(b) Public Laws 112-10, Section 1340(a) and 112-55, Section 536, restrict NASA from contracting to participate, collaborate, or coordinate bilaterally in any way with China or a Chinese-owned company with funds appropriated on or after April 25, 2011. Contracts for commercial and non-developmental items are excepted from the prohibition as they constitute purchase of goods or services that would not involve participation, collaboration, or coordination between the parties.

(c) Representation. By submission of its offer, the Offeror represents that the Offeror is not China or a Chinese-owned company.

(End of provision)

K.5 REPRESENTATION BY CORPORATIONS REGARDING AN UNPAID DELINQUENT TAX LIABILITY OR A FELONY CONVICTION UNDER ANY FEDERAL LAW (NFS 1852.209-75) (DEVIATION FEB 2012)

(a) In accordance with sections 544 and 543 of The Consolidated and Further Continuing Appropriation Act of 2012 (Pub. L.112-55), none of the funds made available by that Act may be used to enter into a contract with any corporation that-

(1) Has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability, where the awarding agency is aware of the unpaid tax liability, unless the agency has considered suspension or debarment of the corporation and made a determination that this action is not necessary to protect the interests of the Government; or

(2) Was convicted (or had an officer or agent of such corporation acting on behalf of the corporation convicted) of a felony criminal violation under any Federal law within the preceding 24 months, where the awarding agency is aware of the conviction, unless

the agency has considered suspension or debarment of the corporation and made a determination that this action is not necessary to protect the interests of the Government.

(b) The Offeror represents that

(1) It is [ ] is not [ ] a corporation that has had any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability; and

(2) It is [ ] is not [ ] a corporation that was convicted, or had an officer or agent acting on behalf of the corporation convicted, of a felony criminal violation under a Federal law within the preceding 24 months.

(End of provision)

K.6 CERTIFICATION BY OFFERORS REGARDING FEDERAL INCOME TAX FILING and FEDERAL INCOME TAX VIOLATIONS (NFS 1852-209.74) (DEVIATION FEB 2012)

(a) In accordance with section 527 of The Consolidated and Further Continuing Appropriation Act of 2012 (Pub. L.112-55) none of the funds made available by the Act may be used to enter into a contract in an amount greater than $5 Million unless the prospective contractor certifies in writing to NASA that, to the best of its knowledge and belief, the contractor has filed all Federal tax returns required during the three years preceding the certification, has not been convicted of a criminal offense under the Internal revenue Code of 1986, and has not, more than 90 days prior to certification, been notified of any unpaid Federal tax assessment for which the liability remains unsatisfied, unless the assessment is the subject of an installment agreement or offer in compromise that has been approved by the Internal Revenue Service and is not in default, or the assessment is the subject of a non-frivolous administrative or judicial proceeding.

(b) The Offeror's proposal shall include a signed written certification as follows--

To the best of my knowledge and belief, ---(name of Offeror)--- has filed the Federal tax returns required during the three years preceding this certification, has not been convicted of a criminal offense under the Internal revenue Code of 1986, and has not, more than 90 days prior to certification, been notified of any unpaid Federal tax assessment for which the liability remains unsatisfied, unless the assessment is the subject of an installment agreement or offer in compromise that has been approved by the Internal Revenue Service and is not in default, or the assessment is the subject of a non-frivolous administrative or judicial proceeding.

Firm _____

Signature _____

Name _____

Title _____

Date of execution _____

(End of Provision)

K.7 REPRESENTATION BY OFFERORS THAT THEY ARE NOT THE ASSOCIATION of COMMUNITY ORGANIZATIONS for REFORM NOW (ACORN) or a SUBSIDIARY of ACORN (NFS 1852.209-73)(DEVIATION FEB 2012)

(a) In accordance with section 534 of The Consolidated and Further Continuing Appropriation Act of 2012 (Pub. L.112-55) none of the funds made available by the Act may be distributed to the Association of Community Organizations for Reform Now (ACORN) or its subsidiaries.

(b) The Offeror represents, by submission of its offer, that it is not the Association of Community Organizations for Reform Now (ACORN) or a subsidiary thereof.

(End of provision)

[END OF SECTION]

SECTION L - INSTRUCTIONS, CONDITIONS, AND NOTICES TO OFFERORS

L.1 LISTING OF PROVISIONS INCORPORATED BY REFERENCE

NOTICE: The following solicitation provisions pertinent to this section are hereby incorporated by reference:

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

CLAUSE NUMBER	DATE	TITLE
52.204-6	APR 1998	DATA UNIVERSAL NUMBERING SYSTEM (DUNS) NUMBER
52.211-14	SEP 1990	NOTICE OF PRIORITY RATING FOR NATIONAL DEFENSE USE "DO-C9 rated order"
OCT 1997	INSTRUCTIONS TO OFFERORS – COMPETITIVE ACQUISITIONS (ALTERNATE I) (OCT 1997)	
52.237-1	APR 1984	SITE VISIT

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

CLAUSE NUMBER	DATE	TITLE
1852.231-71	MAR 1994	DETERMINATION OF COMPENSATION REASONABLENESS
1852.223-73	DEC 1988	SAFETY AND HEALTH PLAN (ALTERNATE I)
1852.233-70	OCT 2002	PROTESTS TO NASA

(End of Provision)

L.2 TYPE OF CONTRACT (FAR 52.216-1) (APR 1984)

The Government contemplates award of a **Cost Plus Fixed-Fee** contract.

(End of Provision)

L.3 PREAWARD ON-SITE EQUAL OPPORTUNITY COMPLIANCE REVIEW (FAR 52.222-24) (APR 1984) (DEVIATION) ("$1 million" is revised to read "$10 million".)

An award in the amount of $10 million or more will not be made under this solicitation unless the Offeror and each of its known first-tier subcontractors (to whom it intends to award a subcontract of $10 million or more) are found, on the basis of a compliance review, to be able to comply with the provisions of the Equal Opportunity clause of this solicitation.

(End of Provision)

L.4 SERVICE OF PROTEST (52.233-2) (AUG 1996)

(a) Protests, as defined in section 33.101 of the Federal Acquisition Regulation, that are filed directly with an agency, and copies of any protests that are filed with the General Accounting Office (GAO), shall be served on the Contracting Officer (addressed as follows) by obtaining written and dated acknowledgment of receipt from:

NASA Glenn Research Center
Eunice J. Adams-Sipp, Contracting Officer
Services and Construction Branch
Mail Stop 60-1
21000 Brookpark Road
Cleveland, OH 44135

(b) The copy of any protest shall be received in the office designated above within one day of filing a protest with the GAO.

(End of Provision)

L.5 SOLICITATION PROVISIONS INCORPORATED BY REFERENCE (FAR 52.252-1) (FEB 1998)

This solicitation incorporates one or more solicitation provisions by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. The Offeror is cautioned that the listed provisions may include blocks that must be completed by the Offeror and submitted with its quotation or offer. In lieu of submitting the full text of those provisions, the Offeror may identify the provision by paragraph identifier and provide the appropriate information with its quotation or offer. Also, the full text of a solicitation provision may be accessed electronically at this/these address(es):

http://www.arnet.gov/far/

http://www.hq.nasa.gov/office/procurement/regs/nfstoc.htm

L.6 AUTHORIZED DEVIATIONS IN PROVISIONS (FAR 52.252-5) (APR 1984)

(a) The use in this solicitation of any Federal Acquisition Regulation (48 CFR Chapter 1) provision with an authorized deviation is indicated by the addition of "(DEVIATION)" after the date of the provision.

(b) The use in this solicitation of any Federal Acquisition Regulation (48 CFR Chapter 15) provision with an authorized deviation is indicated by the addition of "(DEVIATION)" after the name of the regulation.

L.7 RESERVED. INTENTIONALLY LEFT BLANK.

L.8 PROPOSAL PREPARATION INSTRUCTIONS-GENERAL

Offerors shall submit the following written documents in response to this solicitation, prepared in accordance with their related specific instructions:

a. Volume I - Mission Suitability, including:
   (1) the written response to sub-factors 1, 2, 3 and 4,(Section M.3)

b. Volume II - Cost and Fees; accompanied by a separately-bound, completed and signed contract document, consisting of Standard Form 33 and Sections A through I of this solicitation, specifically noting any exceptions to the Government's terms and conditions;

c. Volume III - Relevant Experience and Past Performance; including Past Performance questionnaires shall be completed and submitted directly from the Offeror's client references.

d. Volume IV - Business Volume - Completed and signed set of Representations, Certifications, and Other Statements of Offerors (such as signed letters of commitment for the proposed key personnel).

e. Volume V - Complete electronic copy of Volumes I, II, III, and IV. All Electronic media (e.g. CDs, flash drives) associated with the RFP should be placed in this folder. See Section L-14 for details.

Due dates, and the contents of each volume, are as follows:

Proposal Volume	*Quantity/Copies*	*Due Dates*	*Time*
I Mission Suitability	Original+9	May 28, 2015	4:30 p.m. EST
II Cost	Original+9	May 28, 2015	4:30 p.m. EST
III Past Performance	Original+9	May 28, 2015	4:30 p.m. EST
IV Business	Original+9	May 28, 2015	4:30 p.m. EST
V Electronic Media	Original+1	May 28, 2015	4:30 p.m. EST

L.9 PROPOSAL STRUCTURE

Offerors are instructed to structure their proposals as specified in the following paragraphs to facilitate the evaluation process. Specifically, each segment of the proposal should address completely the related evaluation factor and be outlined so that it completely addresses, in the same sequence, each sub-factor, element or paragraph of the related instructions below.

The proposal should be organized according to the following general outline:

Subfactor 1 – Management Approach and Organizational Structure

Element 1 Program Manager, Key Personnel and Staffing
Element 2 Business Management and Work Control
Element 3 Quality Control Requirements
Element 4 Safety, Health and Environmental

Subfactor 2 – Technical Understanding of Central Process Systems (CPS)

Element 1 Base Requirements
Element 2 IDIQ Requirements
Element 3 IDIQ Sample Task Requirements

Subfactor 3 – Technical Understanding of PVS Certifications & Cryogenic System

Element 1 PVS Certifications Base Requirements
Element 2 Cryogenic System Base Requirements
Element 3 PVS Certifications & Cryogenic System IDIQ Requirements
Element 4 Recertification IDIQ Sample Tasks Requirement

Subfactor 4 – Contract Phase-in

Element 1 Plan to accomplish

L.10 PREPARATION OF VOLUME I - MISSION SUITABILITY

The Mission Suitability proposal shall contain all of the information which will be evaluated under the Mission Suitability Factor. The proposal shall demonstrate a thorough understanding of the requirements of the Statement of Work and a logical plan for accomplishing the total effort. The proposal shall be divided into sections consistent with the following sub-factors and elements:

A. Sub-factor 1 – Management Approach and Organizational Structure

Element 1. Program Manager, Key Personnel and Staffing. Describe the duties and responsibilities of the full-time, on-site Program Manager including levels of autonomy from corporate management relative to hiring, firing, promoting, purchase authority, and other relevant authority. In the temporary absence of the Program Manager, describe how the Offeror shall manage the contract.

Describe qualification requirements for the key positions and plan for recruiting key personnel and the ability to attract, retain, and replace qualified individuals for this effort. The Offeror shall identify any specific individuals identified to fill the key positions and detail their education or other relevant training and experience. The Offeror shall provide resumes and signed commitment letters or agreements from key personnel as identified in the proposal.

Provide a diagram of the proposed organizational structure, identifying the approximate numbers of supervisory, support, or contract management personnel for each identified organizational function. Identify specific positions/functions considered key for successful contract performance. Include a narrative explaining the roles and responsibilities for each organizational function. Identify any functions that would be performed by subcontractors of any size.

Provide an explanation of how the Offeror shall staff for work fluctuation including corporate reach-back and temporary hires.

Provide a response detailing the approach to maintaining qualified personnel for anticipated retirements and attrition for all requirements of the SOW. Describe your approach to the Apprentice Program as described in the SOW.

Element 2. Business Management and Work Control. Describe your approach to performing the requirements of the contract with minimal disruption to scheduled research testing. For any major (more than 10% of the direct technical effort) or management-related (e.g., quality control, work control) subcontracts, explain how the

prime contractor would manage those functions, including the type of metrics that would be utilized. Explain how you would incorporate the use temporary personnel, if needed, to for this effort. Describe your approach to documenting and notifying the Government of completed requirements. Describe efficiencies that will be implemented that would improve productivity and/or reduce cost over the life of this Contract.

Describe your approach to utilizing the Government's CMMS to perform the requirements of the Contract. Describe your understanding of the use of CMMS for CPS and Recertification effort. Describe your approach to documenting and notifying the Government of completed requirements.

Describe your Business Model of how the Offeror will manage Accounting, Inventory, Purchasing, Employee Benefits, Time Keeping, etc.

Element 3. Quality Control Requirements. Provide a response detailing your quality control plan and how it will be implemented to assure the individual facilities are maintained in the proper condition and "Facility up-time" is maximized. "Facility Up-time" shall be defined as the reliability of system operation that provides users with services at scheduled times and for required durations. The response shall include the proposed inspection techniques, frequencies, continuous process improvements, documentation, corrective action, any proposed use of automated QC systems, and the Reliability Centered Maintenance (RCM) strategy.

Element 4. Safety, Health and Environmental Requirements. Provide your response detailing the technical understanding of Federal, State, Local and Glenn-specific Occupational Health and Safety Requirements outlined in SOW, your understanding of typical site-specific hazards encountered in performing the requirements of the SOW.

Provide specific examples of complying with Federal, State and Local environmental laws in the performance of this contract as outlined in the SOW, and an identification of the most likely environmental compliance issues and possible mitigation strategies including coordination with Environmental Management Office.

B. Sub-factor 2 – Technical Understanding of Central Process Systems (CPS)

Provide a detailed response that demonstrates an understanding of the specified work effort. The response should be organized to be consistent with the elements below:

Element 1. Base Requirements. Provide a detailed response that demonstrates a technical understanding of the operational, maintenance and repair requirements of the Central Process Systems as outlined in the SOW. The response shall also demonstrate Offeror's the technical and personnel utilization approach towards operating, maintaining and repairing these systems. The response shall demonstrate the Offeror's knowledge of Government requirements and approach to start-up, shut-down, control, monitor, emergency repair, and trouble-shooting procedures.

Additionally, the response shall include the knowledge of Government requirements and approach to innovative or PT&I techniques, methods to identify excessive periodic maintenance and corrective actions, coordinated scheduling process, and methods to insure maintenance is completed in a timely manner.

Element 2. IDIQ Requirements. Provide a detailed response that demonstrates a technical understanding and approach to accomplish the IDIQ requirements outlined in the SOW. The approach shall demonstrate the Offeror's ability to accomplish IDIQ work without compromising the Base requirements.

Element 3. IDIQ Sample Task. Provide a detailed response to demonstrate the Offeror's technical and managerial expertise as well as the Offeror's understanding of the IDIQ task requirements of the SOW.

The Government is issuing a task to perform a major rehabilitation of a Combustion Air Dehydrator. The Offeror shall provide an implementation plan to accomplish the required task. A design package with drawings and specifications will be supplied by others once the design is complete.

Rehabilitation includes upgrading the mechanical, control and electrical components of an existing Dehydrator in the Central Process System. All work associated with this task is located within existing building with high ceilings. The following are the specifications for the Dehydrator:

Bus Voltage = 2300 KV
Inlet Temperature = 90 Degrees Fahrenheit
Inlet Pressure = 40 PSIG; Compressed Atmospheric Air
Outlet Temperature = 40 Degrees Fahrenheit
Outlet Pressure = 40 PSIG Operating Pressure
Flow = 0 to 120 Pounds per second

The plan shall address the implementation of rehabilitation to the switchgear, piping, valves, auxiliary equipment, start/stop sequence control, pressure regulation, data acquisition equipment, and an upgraded programmable controller. Describe the approach to perform this task from initial design support through implementation and check out. Finally, address the CMMS requirements for the IDIQ task.

C. Sub-factor 3 – Technical Understanding of PVS Certification & Cryogenics System

Element 1. PVS Certification Base Requirements. Provide a detailed response that demonstrates an understanding of the technical requirements outlined in the SOW for PVS certification. The response shall demonstrate the Offeror's knowledge and understanding in the following subject areas:

- NASA policy requirements.
- Basic certification process.
- Configuration Management.

- Applicability of National consensus Codes and standards.
- Fit-For-Service methods and criteria.

Element 2. Cryogenics System Base Requirements. Provide a detailed response that demonstrates an understanding of the technical requirements outlined in the SOW for Cryogenic Systems. The response shall also demonstrate the Offeror's the technical approach and personnel utilization to be used in operating, maintaining and repairing these systems. The response shall demonstrate the Offeror's knowledge of Government requirements and approach to start-up, shut-down, control, monitor, emergency repair, and trouble-shooting procedures.

Element 3. PVS Certifications & Cryogenic System IDIQ Requirements. Provide a detailed response that demonstrates the Offeror's technical understanding and approach to accomplish the IDIQ requirements outlined in the SOW for both PVS Certifications & Cryogenic System. The approach shall demonstrate the Offeror's ability to accomplish IDIQ work without compromising the Base requirements.

Element 4. Recertification IDIQ Sample Task Requirements

GRC has many existing non-code (Legacy) PV/S. Non-Code PV/S must be documented and evaluated to the extent possible as meeting the requirements of the most applicable NCS as per Para 4.7 of NASA-STD 8719.17.

A 40 Psig refrigerated air non-code (Legacy) piping system that has been operating trouble free for twenty years is due for certification. The piping system carries +5 DEGF. air from a cooler outlet to a test facility. Assume that a limited amount of information is available on fabrication method and inspection but available information is not validated (no inspection records, or certification data available). Assume material is low carbon steel (no other material specification available). Assume that the piping system varies 10-inch to 20-inch in diameter, is of considerable length, and has many turns, expansions joints, supports, flanges, etc. Also assume that there are non-standard components (mitered elbow, expansion joint, plenums, welds joints, etc) within the piping system that cannot be assessed using simple calculations.

Part I - Describe detailed steps you will take in completing the entire certification process.

Part II - Describe what NCS you will use and what category of fluid service classification you would recommend to owner. Give selection rationale for NCS and fluid category choices. Assume that you are working on behalf of the owner.

Part III - Provide detail summary of the processes, tools, and criteria that would be used to accomplish the Integrity Assessments, Remaining Life Assessments, and inspections that are required for the system under Para 4.8 of NASA-STD-8719.17". Describe what engineering programs and/or codes you will use in performing each step of integrity assessment. Describe your subcontract methodology for implementing any repairs. Qualitatively

discuss how selection of NCS, fluid service category and other factors will impact certification costs.

D. Sub-factor 5 – Phase-In

The Government intends to allow thirty (30) calendar days, in advance of the planned start date of the period of performance, for contract transition.

Element 1. Plan to accomplish. List and describe the activities necessary to assume complete responsibility for performance of all contract requirements on the start date of the period of performance. Provide a schedule, with timeframes, for those activities. Explain how each activity would be assured of timely completion with minimum disruption of current operations. Identify the personnel and their positions that would be responsible for performing the transition activities and their prior experience in similar activities.

L.11 PREPARATION OF VOLUME III - COST PROPOSAL

There is no page limit for the cost volume. It is contemplated that a single contract will be awarded as a result of this RFP. For pricing purposes, the Offeror shall use the period of performance from October 1, 2015 to September 30, 2020.

§ B.2	Contract Year	Fee	Mths	Period
Phase-In	Phase-In	FFP	2	30 days Prior to Full Performance Date
Base	Year 1 (CY 1)	CPFF	12	October 1, 2015 – September 30, 2016
Base	Year 2 (CY 2)	CPFF	12	October 1, 2016 – September 30, 2017
Option 1	Year 3 (CY 3)	CPFF	12	October 1, 2017 – September 30, 2018
Option 2	Year 4 (CY 4)	CPFF	12	October 1, 2018 – September 30, 2019
Option 3	Year 5 (CY 5)	CPFF	12	October 1, 2019 – September 30, 2020

Table – Contract Period of Performance

1. Introduction

a. The intention of this solicitation is to obtain the work described herein by means of a Cost-Plus-Fixed Fee (CPFF) and an Indefinite Delivery, Indefinite Quantity (IDIQ) element. The Phase In period will be awarded as a Firm Fixed Price (FFP) contract line item.

b. The contract will be for a 24 month basic effort and three 12 month options. The effort shall be priced by Contract Year (CY). (*See Table – Contract Period of Performance*)

c. The Government will pay actual costs incurred as specified in the contract. The contemplated resultant proposed price shall be written in a manner that is consistent with the Offeror's normal, disclosed, and/or approved estimating and accounting

practices.

d. Prospective subcontractors shall submit proprietary cost data in a sealed envelope through the Prime Offeror. The Prime Offeror is responsible for submitting a comprehensive proposal including all required subcontractor proposals.

e. The Government assumes that adequate price competition may exist, thereby negating the need for submission of certified cost and pricing data with this proposal submission. (See FAR 15.403-1). It is anticipated that the amount and types of data required at this time will be adequate to determine price reasonableness.

f. Only minimal information other than cost or pricing data necessary to establish a price shall be requested at this time (See FAR 15.403-3 and 52.215-20). Additional cost information will not be requested unless proposed prices appear unreasonable or unrealistically low given the Offeror's proposed approach and there are concerns that the contractor may default; and/or if only one proposal is received in response to the solicitation (See FAR 15.403-1(c)). Offerors will be advised if additional data is needed (See FAR 15.403-3).

g. The cost proposal will encompass all costs associated with the requirements of the contemplated contract and will comply with applicable FAR, NFS, and governing statutory requirements.

h. As a Cost-Reimbursement type contract, the contract is subject to the allowable, reasonable, and allocable cost standards established in FAR Part 31. Because equitable and appropriated cost allocation is required, it is anticipated that the Offeror and subcontractors will estimate and price their proposals using their respective estimating, pricing, and accounting practices, and in accordance with their Cost Accounting Standards Disclosure Statement, if applicable. Rationale shall be provided for CAS Disclosure noncompliance variances in Part 1, Section 3.

i. An important prerequisite for the award of the contract is the Offeror's accounting system being capable of identifying and segregating costs. While these proposals are not required to be cost certifiable, they are to be in sufficient detail to allow direct and indirect rate verification and audit of selected costs by their cognizant Defense Contract Audit Agency offices. Comprehensive audits of the Offeror and any of the subcontractor's proposals may occur should there be adequate reasons for undertaking the effort to ensure a fair and reasonable price to the Government. The decision to perform comprehensive audits will be made on a case-by-case basis after receipt of the proposals.

j. For cost proposal instruction purposes only, "subcontractors" shall include the definition of an Offeror's interdivisional and/or intercompany effort and if they are considered to be a "subcontractor" related effort. Major subcontractors are defined as those subcontractors having a total subcontract value equal to or greater than $7 million (at any tier) for the inclusive effort (Major Subcontractor). Minor

subcontractors are defined as those subcontractors having a value less than the required Major Subcontractor value and more than $2 million (at any tier) for the inclusive effort. Miscellaneous subcontractors are defined as those subcontractors having a value of less than $2 million (at any tier) for the inclusive effort. The definitions contained herein for Major, Minor and Miscellaneous subcontractors are for the Cost Proposal Volume only and may not have similar or equal monetary amounts as those found in the Relevant Experience and Past Performance Volume definitions.

k. In addition to hard copies, a copy of the proposal shall be prepared and submitted in "Word for Windows," Microsoft Word 2010 and / or "Excel for Windows", Microsoft Excel 2010 formats and shall be provided on quality, virus-scanned, virus-free CD-ROM disks (Offerors based on their sole discretion may use USB "Flash" Drives in lieu of CD-ROM Disk for Volume II). All electronic files must be searchable and will not contain scanned documents. PDF format is acceptable for graphics and photos only. Two disks (or USB Flash Drives) shall be provided, one shall be marked "Original Disk" and one shall be marked "Backup Disk". Each electronic media provided and associated storage case shall have an external label affixed indicating: the name of the Offeror; the RFP number; date of the proposal and a list of the files contained on the electronic media and shall be marked in accordance with FAR 3.104.

l. In the event of a discrepancy between the electronic and the hard copy version of an Offeror's cost proposal data, the hard copy will be considered the intended text. Further, should there be discrepancies between the Offeror's Pricing Model (OPM) and the Offeror's Excel Pricing Model (EPM) data, the EPM takes precedence, should there be discrepancies between the EPM and §B.2 prices, §B.2 takes precedence. Any discrepancies between the OPM and EPM prices or EPM prices and §B.2 prices shall be clearly explained in Part 1, Section 3 of the Cost Volume. §B.2 hardcopy prices shall be interpreted as the intended price for all contract efforts.

m. Pursuant to FAR 16.304-3(a)(3), an Offeror may be awarded a cost-reimbursement type contract only if the Offeror's "accounting system is adequate for determining costs applicable to the contract." This also applies to any subcontractor that is proposed to receive a cost-reimbursement type contract. Therefore, Offeror's and their proposed subcontractors must submit documents from the cognizant Government agency showing their accounting system is approved for tracking and separating costs for cost-reimbursement contracts. If the Offeror cannot demonstrate they have an adequate government approved accounting system before award, the contract may not be awarded to the Offeror until their accounting system has been approved by the Government.

n. Offerors who do not have an approved accounting system pursuant to FAR 16.301-3(a)3 may, based on their sole discretion, employ at no cost to the government a Certified Public Accountant (CPA) who is in good standing, who shall prepare and execute an audit program designed for the evaluation of the Offeror's accounting

system pursuant to FAR 52.232-20, 52.232-21, and 52.216-16, Generally Accepted Accounting Principles and the requirements identified on Standard Form 1408. A copy of the audit program, engagement letter, final review and executed SF 1408 signed in block 3 by the auditor shall be provided with the Cost Volume in Part 1, Section 3. The Offeror shall not have DCAA currently conducting any contract audit services to be eligible for this option. (see NFS 1815.404-2) The information will be reviewed by the Contracting Officer for a determination of acceptability of the Offeror's accounting system applicable to this contract only if the Offeror is selected for contract award.

2. General Instructions

a. For pricing purposes, the Offeror shall use the start date of October 1, 2015. The provided cost templates are designed to accommodate a performance period of up to eleven (11) CYs. The Excel® templates may have hidden columns for the CY not used.

b. All contract years' effort for the base and options shall be priced using the provided Excel Pricing Model (EPM).

c. The Offeror and all Major Subcontractors shall provide Cost Volumes containing Basis of Estimates (BOEs) following the specified format as required herein.

d. The Government has provided Cost templates for completion by the Offeror and Major Subcontractors in Microsoft Excel format (EPM). Offerors shall submit the templates in Microsoft Excel format and shall not submit scanned versions in the electronic submittal unless specifically allowed herein.

e. The Cost volume for the Offeror and Major Subcontractors shall consist of four separate Parts, with each Part consisting of various Sections. Each Part and Section shall be clearly tabbed and labeled. Table L-1 outlines the structure of the four Parts and their respective Sections.

Cost Volume – Part 1. General Cost Information
Section 1 – Cover Page and Table of Contents
Section 2 – Price Summary
Section 3 – Pricing Narrative Basis of Estimate and Supporting Data (PN-BOE)
Section 4 – Financial Accounting Standards (FAS) 13 Analysis / Financial Capability
Section 5 – Copies of Subcontractor Analysis
Section 6 – Systems Reviews and Status Information
Section 7 – Proposed Prime Offeror / Subcontractor Information Summary
Cost Volume – Part 2: Excel Pricing Model (EPM)
Section 8 – Workbooks 1. Phase – In (***offeror provided Excel spreadsheet***) 2. Price Template (*for the basic and three options efforts by contract year)* 3. CATO
Cost Volume – Part 3: Offeror Pricing Model (Separate Binder)
Section 9 – Offeror Pricing Model (OPM)
Cost Volume – Part 4: Contractor Basis of Estimate (Separate Binder)
Section 10 – Contractor Basis of Estimate (BOE)

Table L-1

f. The cost volume shall include a table of contents for ready reference to key parts, figures, and illustrations. For convenience, the cost volume may be divided into separate binders, provided they are properly identified as such, e.g., "Volume II, Part I", and must adhere to all other proposal format and page limitations instructions given herein. Cost Volume, Part 3 and Part 4 shall be in separate binders for ease of use during proposal evaluation. For Part 2, each of the EPM workbooks shall be clearly tabbed.

g. All dollar amounts provided shall be rounded to the nearest dollar. All labor rates shall be rounded to the nearest penny, $xx.xx. All rates (indirect percentages) shall be to the second decimal place, xx.xx%.

h. A Work Year Equivalent (WYE) is defined as follows: the proposed productive hours needed to comprise one average full time employee. A WYE may be comprised of one employee or several part time employees. Productive labor hours are defined as follows: the total available hours for productive work in a year, excluding overtime and paid time off (vacation, sick, holiday, etc.).

i. For proposal and estimating purposes only, the Government will provide all required facility, telecommunications, office equipment and ACES seats for contractor personnel that the Offeror chooses to be located at NASA Glenn Research Center, Lewis Field, Cleveland, OH and Plum Brook Station, Sandusky,

OH up to the limits set herein.

j. Due to extreme uncertainties in forecasting future out year work load, undefined future budgets and the comprehensive nature and the scope of the base contract effort, Offerors shall assume the government will issue fifty percent (50.0%) of the IDIQ maximum dollar amount when forecasting their business base for the development of labor requirements, non-labor resource requirements and indirect cost burden rates for this effort.

3. Specific Instructions

Cost Volume, Part 1 – General Cost Information

Section 1. Cover Page – The Offeror and subcontractors; in addition to a Table of Contents, shall provide the following information on the cover page of the cost proposal:

a. Solicitation number

b. Name, address, and telephone number of Offeror

c. <u>CAGE Code</u>

d. Name, title and telephone number of Offeror's point of contact

e. Type of contract, place(s) and period(s) of performance

f. The total proposed amount, stated in Cost, Fee and Total

g. Name, address, telephone and fax number of the Government cognizant contract audit office

h. Name, address, telephone and fax number of the Government cognizant contract administration office

i. Name and title of authorized representative of the company, and date of submission.

Section 2. Summary Cost Data – The Offeror shall provide a detailed price summary by CY year for the Phase-In, base effort, and all Options. The Price template, part of the Excel Pricing Model shall be provided by the Offeror and each Major Subcontractor.

Section 3. Pricing Narrative Basis of Estimate and Supporting Data – The Offeror and all Major Subcontractors shall provide a Pricing Narrative-Basis of Estimate (PN-BOE) for all proposed cost elements that explains in detail all pricing and estimating techniques, discloses the basis of all projections including a detailed explanation of learning curve

application, rates, ratios, percentages, and cost estimating relationship factors, and explains all judgmental elements of cost projections. As a minimum, this includes, but is not limited to, the following:

a. The Offerors are required to propose realistic direct labor and labor escalation rates. Offerors shall provide adequate documentation in support of all proposed direct labor rates. Wage/salary increases shall be in compliance with any applicable union agreements, collective bargaining agreement, wage determination, etc. Offerors shall provide the latest three years of historical labor escalation for similar projects, if available. Include the rationale and methodology used for the annual escalation rate development – including escalation assumptions, sources of projections, how these rates are reflective of your prior company experience, and how they relate to your total compensation package.

b. Offerors are required to propose realistic WYE staffing. Offerors shall provide adequate documentation in support of all proposed direct labor WYE, productive labor hours and learning curve application for recurring labor.

c. Offerors are required to include in the cost narrative a discussion of the planned usage of incumbent versus new personnel for the base effort and justification for the proposed labor rates.

d. Offerors are required to include their rational for the skill levels of the proposed staff for the base effort.

e. If Offerors propose the use of uncompensated overtime, identify hours of uncompensated overtime proposed by the Offeror's labor category by WBS and provide a summary of the total hours of uncompensated overtime by labor category and provide adequate narrative support in the PN-BOE. (See FAR 37.115-3 and 52.237-10 -- Identification of Uncompensated Overtime)

f. Offerors will utilize established Forward Pricing Rate Agreement (FPRA) or Forward Pricing Rate Proposal (FPRP) in development of this cost proposal. For all FPRA and FPRP utilized in an Offeror's cost proposal, the Offeror is to provide a statement identifying the agreement by report number, date issued, and the issuing agency's office and phone number. A copy of the FPRA and/or FPRP is to be included (this document may be a scanned PDF file). Should an Offeror deviate from the published FPRA or FPRP, a written explanation and justification shall be included in the supporting information, stating the rationale and methodology used for the varying rate development and indicating a clear description of the projected rate. Offerors utilizing a FPRA for indirect rates shall not complete and submit an "Overhead Template (OHT)" for each FPRA proposed indirect rate, and a "General and Administrative Template (GAT)" for all of their FPRA G&A rate(s).

g. Offerors that do not have established FPRA/FPRP are required to provide a

narrative rationale explaining all proposed indirect rates, any assumptions, and basis of applications, as part of this section. Additionally, Offerors shall complete and submit an "Overhead Template (OHT)" for each proposed indirect rate, and a "General and Administrative Template (GAT)" for all of their G&A rate(s). The OHT and GAT templates can found in the EPM, and shall be submitted with the EPM.

h. The Offeror and subcontractors shall propose reasonable labor rate increases and shall utilize, for labor rates not defined by a Collective Bargaining Agreement, FPRA or FPRP, the following uniform rates of change for Contract Years 7 through 11 escalation rates as provided below. Labor escalations for CY2 is the responsibility of the Offeror. These rates are for pricing purposes only.

Contract Year	Labor Escalation Rates
CY3 Through CY5	2.0%
Projected Wage Escalation for Contract Years 3 through 5	

Should an Offeror determine the need for a different CY2 through CY5 escalation rate a written explanation and justification shall be included in the supporting information, the rationale and methodology used for the annual escalation rate development, including escalation assumptions, sources of projections and a clear description of the projected rates.

i. The Offeror is required to propose realistic material and other direct costs. The Offeror shall provide adequate documentation in support of all Offeror proposed direct non-labor resource (NLR) items associated with their own unique understanding of the SOW, methodologies that are not associated with the Government's projected historical NLR identified in Attachment A.

j. The CROM contractor may procure materials, travel, and training and other non-labor resources (NLR) that will be consumed or expended in the performance of the contract. The nature and quantity of these items would not be expected to vary with the Offeror's planned approach to performing the work. The Government anticipates that some costs may be difficult to estimate due to a lack of historical data or known future requirements. For proposal preparation and evaluation purposes only, Offerors shall include the Government estimate for NLR from Attachment A on their ODC EPM Template. These costs are to be included in the appropriate contract year. The costs are not burdened with indirect costs nor do they include fee or profit. The NLR costs are pass-through costs for commodities to be consumed by the contractor for the Government's direct requirements and shall not be subject to any markups, such as G&A or Fee. The cost of procuring these non-burdened NLR may be subject to a Material Handling charge or require an Offeror to have additional direct labor for the procurement, stocking and handling of the items in accordance with their estimating and accounting systems.

k. The Government's NLR estimate, Attachment A is provided for costing the requirement without incorporation of any one Offeror's specific management or technical approach, it does not include an Offeror's direct (NLR) items associated with their own unique understanding of the SOW and unique methodologies. It is intended to assist the Offeror in determining the magnitude of requirements for which an estimating effort may not be available to adequately provide an accurate cost estimate. The Attachment A ODC amount forecasts, Travel, Training, Equipment, Materials/Tools, Vehicles and ODC costs. Due to historical record keeping the ODC cost estimate does not allow for a segregation of the discreet elements.

l. Offeror unique NLR costs shall be shown as a separate line item(s) on the ODC EPM Template.

m. Incumbent Labor Demographics information, WYE's, Labor Classifications and Wage Rates for the two current contract's incumbent WYEs is provided for informational purposes only. This information is not intended to address or influence an Offeror's intended methodology for contract performance. Labor classifications and Wage information is provided by the incumbent contractors. Therefore, the accuracy of the information is not subject to Government review and the Government cannot attest to the accuracy of the information. The historical demographics data is for informational purposes only and is not intended to direct or influence an Offeror's proposal. The Incumbent Labor Demographics is at Attachment D. Note, the SOW Apprentice program WYEs are not reflected in the Incumbent Labor Demographics as there are no incumbent Apprentices.

n. Government Provided Property:

NASA policy regarding providing Government-furnished property is reflected in Federal Acquisition Regulation Part 45. With certain exceptions, it is Government policy that contractors will furnish all property required for the performance of Government contracts. However, there are circumstances where it may be essential to contractor performance or otherwise advantageous to NASA to provide Government property to a contractor. If Government-furnished property is proposed for the performance of the effort, the Offeror shall identify and justify such property, including the needed time period of its use.

o. If the Offeror proposes to use Government production or research property on a no-charge, noninterference basis in performance of this contract, the Offeror will furnish with their proposal an authorization from the contracting officer having cognizance of such property. The Government will evaluate the inclusion of any proposed Government property and make cost proposal adjustments, where necessary, to eliminate the competitive advantage that might accrue to a contractor from the use of Government property.

p. Offerors not utilizing a Forward Pricing Rate Agreement shall provide and explanation and basis for their indirect rates, Fringe Allocation Base, Overhead Allocation Base, General and Administrative Allocation Base, others as appropriate.

q. The Offeror shall provide a description of proposed fee structure. If a fee sharing pool arrangement is proposed, include a discussion of the arrangement and the distribution of fee earned. All Offerors and Subcontractors fees shall be proposed at the maximum potential fixed fee amount.

r. The goal of the Fixed Fee structure is to assure sufficient fee is available to operate as an effective incentive to ensure excellent performance at a reasonable cost. Offerors are to select and use a Fixed Fee within the range of 4.00% to 7.00%. This fee percentage range has been set to ensure there is sufficient fee dollars to incentivize excellent performance. Proposals having a fee percentage outside of this range must include a detailed justification for the variation in the cost volume Part 1, Section 3. Offerors shall discuss and justify their Major Subcontractor's fee/profit amounts in the cost volume Part 1, Section 3. All subcontractor fees or profit must be proposed at the maximum potential award amount. Offerors are encouraged to but are not required to use the NASA Structured Approach for determining the proposed fee (NASA Form 634 and accompanying guidelines) providing the document in their cost volume Part 1, Section 3.

s. IDIQ value shall be priced at the Maximum contract value, $15,000,000.00. The IDIQ contract value is the inclusive value accounting for all direct, indirect costs and profit. The CY IDIQ value by WBS is identified in Attachment B.

Section 4. Financial Accounting Standard (FAS) 13 Analysis – Financial Capability

1. Prime Offerors and all Major Subcontractors shall perform and submit a FAS 13 analysis, as required by FAR 31.205-11 and FAR 31.205-36, in determining the classification of a lease as operating or capital. This applies only to proposed facilities and capital equipment. The Offeror shall also, whether it considers the lease to be operating or capital, submit the rationale therefore, with sufficient substantiation to enable the Government to conclude that the Offeror's categorization and proposed cost of the lease is correct. The Offeror should explain where these costs are included in the cost proposal elements. A negative statement shall be placed in Section 4 should an offeror not propose facilities or capital equipment.

2. Pursuant to FAR 9.104-1(a) Offerors and all Major Subcontractors shall submit information which demonstrates their financial capability to perform the contract. Acceptable information includes letters from certified United States banks indicating the total line of credit including the expended and available amounts at the time of proposal submission for the business, or the company's certified annual

report. If a teaming arrangement, joint venture, or other business combination is contemplated, disclose each participant's responsibility for financial management of the venture, funding requirements, limitation of liabilities, and any other information which describes the financial arrangement.

Section 5. Copies of Subcontractor Analysis – The Offeror and all Major Subcontractors shall perform and submit a copy of a cost and / or price analysis of their subcontractors as required by FAR 15.404-3(b). The proposal shall provide details and a discussion on all adjustments made to the subcontractor's cost proposal, including any adjustments based on technical findings, rate adjustments, and fee adjustments. The proposal shall provide a discussion on the use, or non-use of any adjustments based on Offeror history with the subcontractor.

Section 6. Systems Reviews and Status Information

a. Offerors and their Major Subcontractors are to provide for their companies: (1) the current status of, (2) date of last review, and (3) name, address, and phone number of the governmental agency who performed the review for the systems listed below, and (4) the audit report number. If the review has not been performed or is not required, Offerors are required to provide a negative response. In addition to any narrative provided, the following Table shall be used to provide the required information. The following table may be resized or modified by the Offeror but the information provided shall adhere to the basic format contained in the following table:

System	Status	Date of Last Review	Review Office	Report #
Contractor Estimating System Review (CESR)				
Contractor Purchasing System Review (CPR)				
Contractor Billing System Review				
Contractor Accounting System Review				
Contractor Disclosure Statement Accuracy				
Contractor Executive Compensation Review				
Determination of Cost Accounting Standards (CAS) Applicability *				
Level of CAS applicability *				

* *This part does not apply to any contract with a small business concern (see 48 CFR 9903.201-1(b))*

Table: Section 6 Systems Status

Section 7. Proposed Prime Offeror/Subcontractor Information Summary – The Offerors and all Major Subcontractors shall complete and submit Table L-2, shown below:

Offerors are to fill-in the italic areas in column two with the required information	
Prime Offeror/Major Subcontractor	*Identify name of the Prime Offeror or Major Subcontractor*
Title:	*CROM*
Description:	*Common pool of engineering, technician and material resources to support multiple test facilities and operations at multiple locations. 2015 - 2025*
Program:	*CROM*
Project:	*CROM*
Period of Performance:	*The length from start date, mm/dd/yyyy to completion date of the contacted effort.*
Type of Action:	*Identify New Contract, Contract Modification, Exercise of Option, Exercise new task or delivery order, or other. If other state the nature of the type of action.*
Contract Type:	*CPFF*
Company:	*The name of the Prime Offeror or Subcontractor filing this form.*
Address:	*Full USPS street address to include suite or apartment numbers*
Performance Location:	*City and State of the principal work performance location(s)*
USPS 9 digit Zip Code	*Enter the 9 digit USPS Zip Code XXXXX-XXXX. The 9 digit Zip code is a Mandatory Requirement.*
Estimated Price with Options	*Dollar amount rounded to the nearest $1,000*
Subcontractors: ($>1M)	*List all Subcontractors to the offeror filing this form and their business size status for each subcontract worth $1 million or more for the total contract performance.*
Socioeconomic Business Subcontracting Goals:	*All socioeconomic business goals subcontracting goals both in dollars and percentage of the total value of the contract (including all options)*

Table L-2

Cost Volume - Part 2 - Excel Pricing Model (EPM)

a. To ensure a consistent evaluation among Offerors, NASA is providing two (2) Microsoft Excel® files/workbooks designed to capture proposed cost information in an automated and standardized format. The two Microsoft Excel® workbooks are shown in Table L-3 below:

Excel Pricing Model (EPM)			
#	Workbook	Excel File Name	Attachment
1	Price Summary Template	Price.xls	C
2	CAOT	CAOT.xls	E

Table L-3

b. Workbook names included in an Offeror's EPM shall begin with the company name's first three letters followed by a hyphen and the workbooks file name. Below is an example of how company "ABC" would name their Cost Volume workbooks:

Example: "ABC- Price Summary Template.xls"

NOTE: The above file naming protocol is provided as an example only and may not utilize titles associated with this procurement.

c. The Offeror shall use the cost template acronyms, shown below in Table L-4.

Template Acronyms
Cost Workbook(s)
CST - Cost Summary Template (for each WBS)
ICT – Indirect Cost Template
PST - Price Summary Template (total contract value)
SUMT – Summary Template
Support Data Workbook(s)
ILRT – Indirect Labor Rate Template
LPT - Labor Pricing Template
ILCT – Indirect Labor Cost Template
ICT – Indirect Cost Template
IRT- Indirect Rate Template
STRT - Summary Technical Resources Template, Subcontractor WYE
SCT - Subcontractor Cost Template
TCT - Travel Cost Template
MCT – Material Cost Template
ODCT – Other Direct Cost Template
OHT - Overhead Template
GAT - General and Administrative Template
PHCT-T - Productive Hours Conversion Template – Team

CAOT - Cognizant Audit Office Template

Table L-4

d. The EPM shall be integrated to facilitate changes to source data such as direct labor hours and / or rates, overhead and G&A rates, etc., and be sophisticated enough to compute the total impact of various changes to both cost and price. For example; the model must be able to compute the cost and price impact of increasing/decreasing the number of WYEs, or increasing/decreasing the overhead rate(s).

e. All formulas used in the EPM shall be clearly visible in the individual cells and verifiable. Whereas linking among the spreadsheets or workbooks may be necessary, the use of external links (source data not provided to NASA) of any kind is prohibited. The EPM shall not contain any macros and/or hidden cells. Additionally, the EPM shall not be locked / protected and / or secured by passwords.

f. Selected templates may have formulas pre-populated by the Government as a courtesy. Offerors are responsible for ensuring the accuracy of these formulas and editing/correcting them as necessary.

g. Offerors can modify the EPM by adding columns and rows to fit their proposal information as necessary. The EPM contains several self-calculating cells and it shall summarize totals. Offerors should pay attention to the notes on each worksheet/tab regarding the instructions relating to formulas already provided by the Government. In general, yellow areas require Offeror input while grey areas either contain a Government provided formula or require a formula to be added by the Offeror. In selective templates, example entries are provided and identified in red. These example entries shall be removed prior to the use of a template. Subcontractor fees are to be stated as negotiated with the prime contractor.

h. Workbooks specific instructions are as follows:

1. Price Summary Template (PST): is designed to summarize the total price (profit included) for the contract effort.

2. Cost Summary Templates 1 through 5 (CST 1 through 5): are designed to summarize the total price (profit included) for each WBS. Their costs are summarized in the PST.

3. Labor Pricing Template(s) (LPT/LPT CBA/LPTWD): are designed to calculate labor costs by multiplying the Offeror's labor rate by the hours for the proposed labor categories. Labor hours and direct labor costs shall equal the PST and CST's labor hours and direct labor costs. Productive Labor hours are as identified in the PHCT-T tab. One WYE shall equal one productive hour category per contract year.

4. Indirect Labor Cost Template (ILCT): is designed to calculate the indirect

labor costs associated with the Offeror's direct labor costs by CY. CY Indirect rates are taken from the ILRT template. The ILCT costs shall equal the PST/CST Indirect Labor Fringe and Overhead costs.

5. Indirect Labor Rate Template (ILRT): is designed to calculate the weighted indirect labor rates for the CY based on a distribution of the Offeror's fiscal year. The ILRT rates are used on the ILCT to calculate the indirect labor costs.

6. Indirect Cost Template (ICT): is designed to calculate the indirect costs associate with the non-labor recourses direct costs. The ICT indirect costs are summarized on the CST template. The ICT costs shall equal the PST Indirect Labor G&A, COM and other indirect costs.

7. Indirect Rate Template (IRT): is designed to calculate the weighted indirect non labor rates for the GFY based on a distribution of the Offeror's fiscal year. The IRT rates are used on the ICT, template to calculate the indirect non labor costs.

8. Summary Technical Resources Template (STRT): summarizes a prime Offeror's and subcontractor(s) WYE by CY. The staffing WYE shall be identified by WYEs not by productive labor hours or costs.

9. Subcontractor Cost Template (SCT): identifies the major and minor subcontractor proposed costs by CY. The total Subcontractor Costs shall be the same as the amount shown on the PST template. Miscellaneous Subcontractor, inclusive contract costs less than $2 million per subcontractor, may be summarized as a single line. Subcontractor cost shall be the same amount as shown on the PST/CST template(s).

10. Travel Cost Template (TCT): identifies the Offeror's travel costs by CY. The total amount shall be the same as the amount shown on the PST/CST template(s).

11. Material Cost Template (MCT): material costs shall be identified by vendor, by CY. The total amount shown on this template shall equal the amount proposed in the cost summary workbook. The total amount shown on this template shall equal the amount proposed in the PST/CST template(s).

12. Other Direct Cost Template (ODCT): other direct costs are identified by vendor and CY. The total amount shown on this template shall equal the amount proposed in the cost summary workbook. ODC costs shall be the same amount as shown on the PST/CST template(s).

13. Overhead Template (OHT): discloses the Offeror's overhead rate

development and discreet elements by the Offeror's fiscal year and prior three years actuals. The fiscal year rates are converted to CY rates. The CY OH rates shall be the same as the ILRT template indirect rates used to calculate the Overhead costs.

14. General and Administrative (GAT): discloses the Offeror's G&A rate development and discreet elements by the Offeror's fiscal year and prior three years actuals. The fiscal year rates are converted to CY rates. The CY GAT rates shall be the same as the IRT template indirect rates used to calculate the G&A costs

15. Productive Hours Conversion Template (PHCT-T): discloses the Offeror's and subcontractor's productive labor hours by Contract year for each labor category.

16. Cognizant Audit Office Template (CAOT): This template is designed to capture relevant information concerning (1) the specific location (address or addresses for prime and proposed Major Subcontractors and minor subcontractors as appropriate) where auditable cost information physically resides that supports amounts proposed; (2) the person or persons (name, address, phone number, and e-mail address) who can be contacted by DCAA to provide audit information for the prime Offeror, (3) the person or persons (name, address, phone number, and e-mail address) who can be contacted by DCAA to provide audit information for companies, partners (in a teaming, joint venture or partnership situation) or proposed Major Subcontractor(s); and (4) the name and address of the cognizant DCAA field audit office to which electronic and hardcopy proposals were sent. The name, location and contact information for the DCMA PACO or ACO.

i. Phase In prices shall include all costs associated with the planning for the transition and transfer of existing work, property and Offeror unique contract initiation costs incurred prior to contract execution. There is no RFP Phase In template provided. Offerors shall provide their own format for the Phase In FFP price, ensuring adequate information is provided to demonstrate an understanding of the proposed staffing and non-labor resources price.

Cost Volume - Part 3 – Offeror's Pricing Model (OPM)

a. The Offeror's Pricing Model (OPM) shall be time-phased by Contract year, and separated by WBS. Additionally, it should follow the format specified in Table 15-2 of FAR 15.408.

b. The OPM shall be true self-calculating spreadsheet files that allow for easy cost adjustments arising from changes in types, quantities, rates, factors, etc. The submission of scanned documents inserted into document applications such as Adobe PDF or MS

Word DOC files is prohibited. All documents in an OPM shall be searchable and capable of being manipulated. These instructions, including the requirements for detailed cost and substantiation information are equally applicable to the Prime Offeror and all Major Subcontractors.

Cost Volume – Part 4 Contractor Basis of Estimate (BOE)

The Offeror and proposed Major Subcontractors shall submit a separate BOE part in the cost volume. The purpose of this part is to give the Government insight into the thought processes and methodologies used by the Offeror in estimating the labor skill mix by labor hours, other direct costs, etc., required for successful performance on this contract for the cost estimates. Emphasis should be placed on a description of the processes and methodologies themselves, and how these relate to the technical approach described in the proposal. The BOE part shall be at the same WBS/DO level as the cost proposal. The Offeror shall include a matrix allowing traceability to the Mission Suitability Volume and other pertinent parts of this Cost Volume. The information provided under this part will be used to assess the reasonableness and realism of the Offeror's estimate and will be utilized in developing the Government's most probable cost rationale.

A BOE shall address elements as follows:

a) Narrative explaining how you arrived at your estimate of labor hours, including: if your estimate was based on similar program(s), in which case, identify and provide a reason why the programs are similar; a standard, in which case, identify the standard and explain if it is from the industry, your company, or a product; or engineering judgment, in which case, explain the philosophies used.

b) Complexity factors utilized - all factors must be defined; explain the rationale for their use and basis of the factor.

c) Use of any other cost-estimating relationships to include learning curve analysis; explain the rationale for their use and basis of the factor.

d) How subcontracts were estimated. Please note if you have experience with the proposed subcontractor(s).

e) Data to support cost volume labor rates, labor hours by skill, travel requirements, and other direct costs. The BOE should explain the genesis of the labor categories including the rationale for the entire skill mix and evolved skill mix.

f) Data to support materials costs and the methodology utilized to estimate the types and quantities for these items as they relate to the Cost Volume. Explain the use of decrements to vendor quotes based on historical experiences or other rationale.

g) Data to support subcontractor costs and the methodology utilized to estimate the types and quantities for these items as they relate to the Cost Volume. Explain the use of decrements to vendor quotes based on historical experiences or other rationale.

h) Provide a list of subcontractors and an award schedule showing when the subcontract will be awarded and the start or arrival date of the subcontract effort.

i) For software explain the rationale for and estimates used for new, modified, re-used and programmer productivity.

L.12 PREPARATION OF VOLUME III – RELEVANT EXPERIENCE AND PAST PERFORMANCE

The Offeror's Relevant Experience and Past Performance Volume shall consist of three (3) distinct sections, one (1) of which the Offeror shall provide, one (1) which will be provided by the Offeror's references, and one (1) which the Government will obtain from an available database. The three sections the Past Performance Narrative (PPN), the Past Performance Questionnaire (PPQ), and the Past Performance Database (PPD). The details of these sections are as follows:

a. Past Performance Narrative (PPN):

1. The Offeror shall submit a PPN that details past performance and relevant experience for the Prime Offeror and any Major Subcontractor(s)/Teaming Partner(s). A Major Subcontractor/Teaming Partner is defined as an entity that performs services totaling 10% or more of the contract direct labor dollars. The PPN shall not exceed twenty (20) pages in length (including the information for both the Offeror and the Major Subcontractor(s)/Teaming Partner(s)).

2. The Offeror shall include in the PPN experience and performance information for past or current contracts that are relevant to this SOW. Relevancy can be determined considering criteria such as contract type, method of acquisition, total workforce size, total contract value, scope of services provided, technical complexity, contract type and the type of customer.

3. The Offeror's PPN shall only include contracts held within the past five (5) years of the solicitation issue date. In addition, the Offeror shall include only those contracts under which work was performed by an organizational entity or entities (e.g., specific Division or Subsidiary of a parent company).

The Offeror shall also submit past experience and performance information for any Major Subcontractor(s)/Teaming Partner(s) in accordance with the above.

4. The Offers shall address any problems encountered on the identified contracts and any corrective actions that the Offeror implemented.

5. Offerors and Major Subcontractor(s)/Teaming Partner(s) shall utilize Attachment J-C3 Summary of Past Performance Worksheets #1 and #2 (see two tabs on EXCEL spreadsheet) as part of their PPN. These two worksheets will NOT count against the overall page count for Volume III. The worksheets contain the following information:

(i) Worksheet #1

- Contract Number
- Contract Title and Client Name (indicate Government Contract or other)
- Role of Offeror (Prime or Subcontractor)
- Percent of Work Performed by Offeror (in terms of direct labor dollars)
- Place of Performance (city, state, country, etc.)
- Contract Start and End Dates
- Contract Value (value per year and total value over all years)
- Technical Contact name, Phone Number and E-Mail Address (COR or other)
- Business Contact Name Phone Number and E-Mail Address (CO or other)
- Contract Type (fixed-price, cost-plus, etc.)
- Method of Acquisition (invitation for bid, best value, etc.)
- Contract Workforce Size (Offeror's direct workforce + Major
- Subcontractor/Teaming Partner Workforce)
- IDIQ Task Order Element to Contract? (Yes or No)
- If IDIQ Task Order Element, What was the average number of tasks per year?
- Total Dollar Value of IDIQ Task Order Element per Contract Year

(ii) Worksheet #2

- Contract Number (repeat contract numbers identified in Worksheet #1)
- Contract Title and Client Name (repeat information from Worksheet #1)
- Contract Start and End Dates (repeat information from Worksheet #1)
- Technical Content of Contract (check all of the technical disciplines and services that apply to the contracts referenced)
- Additional Comments (Offeror may provide brief comments to clarify the scope of services they furnished as part of the contracts referenced)

6. The Offeror shall address, as a minimum, the following information in narrative form within the PPN:

(i) Large Rotating Equipment Operations, Repair and Maintenance Experience

The Offeror shall furnish relevant past experience in the operations, repair and

maintenance of large rotating equipment such as compressors, pumps, vacuum pumps, etc. This shall include experience with large electric drive motors and controls.

(ii) Process Systems and Controls Operations, Repair and Maintenance Experience

The Offeror shall furnish relevant past experience in the operations, repair and maintenance of process systems (high and low pressure compressed gases, incompressible fluids, vacuum systems, etc.) including distribution piping and components and control systems (pneumatic and hydraulic systems, control valves, programmable logic controllers – PLCs, etc.).

(iii) Cryogenic and High Pressure Gas Systems Operations, Repair and Maintenance Experience

The Offeror shall furnish relevant past experience in the operations, repair and maintenance of cryogenic fluid systems (liquid nitrogen, liquid oxygen, liquid hydrogen, etc.) including storage vessels, piping distributions systems and components, vaporizers, etc.

(iv) High Voltage Substation Controls Operations, Repair and Maintenance Experience

The Offeror shall furnish relevant past experience in the operations, repair and maintenance of high voltage (600 volts and greater) substation controls.

(v) Pressurized Vessels and Systems (PVS) Certification

The Offeror shall furnish relevant past experience in the certification of pressurized vessels and systems in accordance with ASME Codes and standards.

(vi) Computerized Maintenance Management System (CMMS) Experience

The Offeror shall furnish relevant past experience in the successful use of a CMMS to manage work orders, preventative maintenance programs, and asset history. Emphasis will be given to past experience in the use of Maximo Asset Management (IBM, Inc.) software.

(vii) Subcontract Management Experience

If the Offeror is proposing to subcontract 20% or more of the contract effort per year in terms of direct labor dollars, the Offeror shall summarize their past experience in managing Major Subcontractors. The Offeror shall identify each subcontractor and the type, duration and cost of each subcontract managed.

(viii) Health and Safety Past Performance

The Offeror shall furnish Total Recordable Incident Rate (TRIR) information for the past five (5) years (including OSHA Form 300A) for the Offeror's company and any Major Subcontractor(s)/Teaming Partner(s). The OSHA Form 300A will NOT be included in the page limit for Volume III.

7. The PPN shall be organized by Contract Title with the relevant information for part 6 above addressed under each Contract heading.

b. Past Performance Questionnaire (PPQ)

For the contracts listed in the PPN, the Offeror and the Offeror's Major Subcontractor(s)/Teaming Partner(s) shall forward a PPQ to the identified points of contact (PCSs) for both the technical and business aspects of the contract. The Offeror and Major Subcontractor(s)/Teaming Partner(s) shall make the appropriate modifications to Attachment C-2 Past Performance Cover Letter and send this along with Attachment C-1 Past Performance Questionnaire to the POCs.

POCs shall be instructed to complete and forward the PPQ DIRECTLY to the Government at Mark.A.Woodling@nasa.gov May 21, 2015. The Offeror is responsible for ensuring that a minimum of two (2) completed PPQs (combined technical and business evaluations) are submitted for the Prime Offeror and each Major Subcontractor/Teaming Partner for which past performance exists.

Returned PPQs will not be counted against the Offeror's Relevant Experience and Past Performance Volume III page limitations.

The Government reserves the right to contact the POCs directly to obtain further clarification of information provided within the submitted PPQ.

Offerors will be notified by the CO if PPQs contain any negative evaluation(s). In this notice, the CO will provide the Offeror with a deadline by which the Offeror may submit a brief response to the CO addressing the negative comments.

c. Past Performance Databases (PPD)

The Government will collect and review additional relevant experience and past performance information from Government databases as well as other sources of information available to the Government. These databases will be used for the Offeror and Major Subcontractors/Teaming Partners.

L.13 PROPOSAL PAGE LIMITATIONS (NFS 1852.215-81) (FEB 1998)

(a) The following page limitations are established for each portion of the proposal submitted in response to this solicitation.

Proposal Section	Limit
Volume I - Mission Suitability	75 pages
Volume II – Cost/Price	(no limit)
Volume III - Past Performance	20 pages
Volume IV - Business	(no limit)

(b) A page is defined as one side of a sheet, 8 1/2" x 11", with at least one inch margins on all sides, using not smaller than Times New Roman 12 point type. Foldouts count as an equivalent number of 8 1/2" x 11" pages. The metric standard format most closely approximating the described standard 8 1/2" x 11" size may also be used.

(c) Title pages and tables of contents are excluded from the page counts specified in paragraph (a) of this provision. In addition, the Cost section of your proposal is not page limited, however, this section is to be strictly limited to cost and price information. Information that can be construed as belonging in one of the other sections of the proposal will be so construed and counted against that section's page limitation.

(d) If final revisions are requested, separate page limitations will be specified in the Government's request for that submission.

(e) Pages submitted in excess of the limitations specified in this provision will not be evaluated by the Government and will be returned to the Offeror.

(f) Smaller than Times New Roman 12-point font type may be used in figures or charts within the written proposals, so long as the figure or chart does not consist primarily of text.

L.14 ELECTRONIC DISK SUBMISSION (GRC 52.215-100) (APR 2002)

Offerors and their Major Subcontractors are required to submit their proposals in two (2) formats, 10 bound hard copies (1 original and 9 copies) and quality, standardized Compact Disk (CD) format (*Offerors at their sole discretion may provide USB flash drives in lieu of CDs).* Offerors shall provide two (2) copies (1 original and 1 back-up copy) of all electronic versions of all volumes. In the event of a discrepancy between the electronic format and the hard copy, the hard copy will be considered the intended text. The disk submission must be compatible with the software and hardware specifications described below and must be labeled externally with the RFP number, company name, date prepared, a list of all files contained on the electronic media and annotated "Source Selection Information – See FAR 3.104". Submitted electronic media shall be virus-scanned and virus free.

All electronic copies must be compatible with Microsoft Office 2012 for Windows for its evaluation of cost/price proposals. Spreadsheets should be true self-calculating files. Regarding pictures or photographs, the Government prefers encapsulated Postscript (.eps) (IBM compatible) or embedded MS Word 7.0 pictures. The following formats for pictures, photographs, drawings, figures, etc., may also be used: .cgm, .dxf, .bmp, or .jpeg (.mpeg files are not acceptable).

Offerors should refer to Section L.11 for additional instructions concerning the electronic submission of cost/price information.

L.15 PROPOSAL PREPARATION INSTRUCTIONS

(a) General Information

Information in this provision supplements FAR clause 52.215-1, "Instructions to Offerors–Competitive Acquisitions," included elsewhere in this Section L. In the event of a conflict, FAR 52.215-1 is controlling. The Offeror's proposal shall provide the basis for evaluation against the requirements of the solicitation. Proposal information must be precise, factual, detailed, and complete. Vague statements shall be interpreted as evidence of a lack of understanding on the part of the Offeror or the inability to demonstrate adequate qualifications. Information previously submitted, if any, will not be considered unless it is resubmitted as part of the proposal. It must not be incorporated by reference.

An initial review of all proposals will be conducted in accordance with NFS 1815.305-70. All unacceptable proposals will be eliminated from further evaluation. The Government has the option, depending on the specific circumstances of the offers received, to utilize one of the following methods:

(1) make selection and award without discussions (Offerors may be contacted only for clarification purposes); or

(2) after discussions with all finalists, afford each Offeror an opportunity to revise its offer, and then make selection.

(b) Format

The original copy shall be clearly marked as the original. Electronic copies shall be submitted in a separate folder and appropriately marked for each volume. Electronic copies shall be in accordance with L.16 ELECTRONIC DATA SUBMISSION.

A cover sheet should be bound in each book, clearly marked as to volume number, title, copy number, RFP number, and the Offeror's name.

All Offeror's (including companies that have badged access to GRC) who choose to hand deliver their proposal shall schedule a "delivery time" with the Government. Proposals shall be delivered to the NASA Glenn Research Center, Building 60 (loading dock on west

side of building). **Offers shall contact *Eunice.J.Adams-Sipp@nasa.gov* at least 24 hours in advance to schedule a delivery time.** For companies that do not have badged access to GRC, a visitor badge will be issued at the GRC Main Gate. The following information shall be provided when a delivery time is scheduled. Name of individual(s), citizenship, and company representing. A picture identification (driver's license, state identification card, or passport) is also required to receive a visitor's badge. Only US citizens will be permitted access to GRC. Please allow 30 minutes for visitor badge processing.

The pages of each proposal volume shall be numbered and identified with the Offeror's name, RFP number, and date. Subsequent revisions shall be similarly identified to show revision number and date. Each volume shall contain a detailed table of contents to delineate the sections and subsections within that volume. The table of contents must list figures and tables separately. Where necessary, a cross-reference sheet to other volumes shall be included. Tab indexing shall be used to identify sections. Each volume shall contain a glossary of all abbreviations and acronyms used, with an explanation for each. Glossaries do not count against the page limitations for their respective volumes.

Proposals shall be submitted in a format that addresses all the evaluation factors, in order, listed in Section M. Information pertinent to the factors shall be included in their proposal volumes. (The Government does not recommend the use of "see paragraph X" or similar verbiage as a suitable answer to any given section).

(End of provision)

L.16 SUBMITTAL OF QUESTIONS (GRC 52.215-93) (JUN 2002)

Questions regarding this solicitation must be presented in writing and should be submitted to the person identified on the first page of this solicitation within five (5) days of the issue date in order that answers may be obtained and disseminated in a timely manner. Oral questions are not desirable due to the possibility of misunderstanding or misinterpretation. Questions shall not be directed to the technical activity personnel.

[END OF SECTION]

SECTION M - EVALUATION FACTORS FOR AWARD

M.1 LISTING OF PROVISIONS INCORPORATED BY REFERENCE

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

I. FEDERAL ACQUISITION REGULATION (48 CFR CHAPTER 1)

CLAUSE NUMBER	DATE	TITLE
52.217-5	JUL 1990	EVALUATION OF OPTIONS

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

CLAUSE NUMBER	DATE	TITLE
None Included By Reference		

M.2 SOURCE EVALUATION PROCEDURES

This competitive negotiated acquisition shall be conducted in accordance with FAR 15.3, “Source Selection,” and NASA FAR Supplement (NFS) 1815.3, “Source Selection.”

The attention of Offerors is particularly directed to NFS 1815.305 “Proposal evaluation,” and NFS 1815.305-70 “Identification of unacceptable proposals.”

Evaluation(s) will be on the basis of material presented and substantiated in your proposal and not on the basis of what may be implied. A lack of clarity or specificity in an Offeror’s proposal may be interpreted as a lack of understanding on the part of the offeror and/or inability to demonstrate adequate qualifications. All Offeror(s) should pay particular attention to Section L, Instructions, Conditions, and Notices to Offerors.

The Government intends to award a contract without discussions. That is, award is planned to be made on the basis of the initial proposal, without a competitive range determination or final proposal revisions. Accordingly, each Offeror should submit its initial proposal to the Government using the most favorable terms from a price and technical standpoint. However, the Government reserves the right to conduct discussions if it determines, in accordance with applicable NASA regulations, that doing so is in the best interest of the Government. If written or oral discussions are conducted, the Government will seek Final Proposal Revisions from Offerors within the competitive range.

Proposals will be evaluated in three factors: Mission Suitability, Cost/Price, and Relevant Experience and Past Performance. Mission Suitability will be numerically scored. Price and Past Performance will not be numerically scored, but will be evaluated by the Source Evaluation Board (SEB) as detailed below and presented to the Source Selection Authority (SSA) for consideration.

Award will be made to the responsible Offeror whose proposal meets the requirements of the solicitation and provides the best value to the Government.

M.3 MISSION SUITABILITY EVALUATION FACTOR

The Mission Suitability factor indicates, for each Offeror, the quality of the work to be performed, the ability of the Offeror to accomplish what is offered, and the services to be provided. The Mission Suitability sub-factors will be numerically scored in accordance with the following adjectival ratings, definitions and percentile ranges:

ADJECTIVAL RATING	DEFINITIONS	PERCENTILE RANGE
Excellent	A comprehensive and thorough proposal of exceptional merit with one or more significant strengths. No deficiency or significant weakness exists.	91 to 100
Very Good	A proposal having no deficiency and which demonstrates over-all competence. One or more significant strengths have been found, and strengths outbalance any weaknesses that exist.	71 to 90
Good	A proposal having no deficiency and which shows a reasonably sound response. There may be strengths or weaknesses, or both. As a whole, weaknesses not off-set by strengths do not significantly detract from the Offeror's response.	51 to 70
Fair	A proposal having no deficiency and which has one or more weaknesses. Weaknesses outbalance any strengths.	31 to 50
Poor	A proposal that has one or more deficiencies or significant weaknesses that demonstrate a lack of overall competence or would require a major proposal revision to correct.	0 to 30

The following definitions will be used by the evaluation committee to classify the findings of the evaluation of the Offerors:

	DEFINITION (FAR 15.001 & NASA Source Selection Guide)
Deficiency	A material failure of a proposal to meet a Government requirement or a combination of significant weaknesses in a proposal that increases the risk of unsuccessful contract performance to an unacceptable level.
Significant Weakness	A flaw that appreciably increases the risk of unsuccessful contract performance
Weakness	A flaw in the proposal that increases the risk of unsuccessful contract performance.
Strength	An aspect of the proposal that will have some positive impact on the successful performance of the contract
Significant Strength	An aspect of the proposal that greatly enhances the potential for successful contract performance

The following sub-factors will be used to evaluate the Mission Suitability factor for each Offeror. In addition to the evaluation criteria listed below, the sub-factors will also be evaluated for adequacy, realism, effectiveness, and completeness.

A. Sub-factor 1 - Management Approach and Organizational Structure

Element 1. Program Manager, Key Personnel and Staffing. The offer will be evaluated based on the demonstration of overall understanding of the duties and responsibility of the on-site Program Manager including levels of autonomy from corporate management relative to hiring, firing, promoting, purchase authority, and other relevant authority. Additionally, the Offeror will be evaluated based the ability of Offeror to manage the contract in the temporary absence of the full-time, on-site Program Manager. Proposals will be evaluated to determine if the proposed organization will facilitate the Offeror's ability to implement the proposed approaches described throughout its proposal and to respond to scheduled and unscheduled fluctuations in the workload. An assessment of whether the Offeror has identified the appropriate key positions within the proposed organization will be made. If subcontractors are proposed, the role(s) of proposed subcontractor(s) will be evaluated to determine whether the prime contractor would maintain the necessary overall management control.

The Offeror's qualification requirements for the key positions will be evaluated for appropriateness. The Offeror's plan for recruiting key personnel will be evaluated on the basis of its ability to attract, retain, and replace qualified individuals for this effort. Any specific individuals identified to fill the key positions will be evaluated on the basis of their education or other relevant training and their experience to perform their duties. Evidence of the availability of key personnel will be important and will be evaluated on the basis of signed commitments or agreements from the identified individuals.

The offer will be evaluated based on the demonstration of overall approach to maintaining qualified personnel for anticipated retirements and attrition for all requirements of the SOW along with your approach to the Apprenticeship Program.

Element 2. Business Management and Work Control.

The Offeror's approach will be evaluated for the following:

- Performing the requirements of the contract with minimal disruption to scheduled research testing.
- Managing Sub-Contractors and Temporary Personnel.
- Documenting and notifying the Government of completed requirements.
- Efficiencies that will be implemented that would improve productivity and/or reduce cost over the life of this Contract.
- Utilizing the Government's CMMS to perform the requirements of the Contract.
- The use of CMMS for CPS and Recertification effort.
- Business Model used to manage Accounting, Inventory, Purchasing, Employee Benefits, Time Keeping, etc.

Element 3. Quality Control. The Quality Plan for system operations will be evaluated to determine whether the related requirements would be met and whether "Facility up-time" is maximized. The proposed methods of assuring technical quality will be evaluated based on their likely effectiveness in achieving the required level of "Facility up-time". The response will be evaluated for the inclusion of proposed inspection techniques, frequencies, continuous process improvements, documentation, corrective action, and any proposed use of automated QC systems, and the Reliability Centered Maintenance (RCM) strategy

Element 4. Safety, Health and Environmental Requirements. The offer will be evaluated based on the demonstration of overall technical understanding of Federal, State, Local and Glenn-specific occupational health and safety requirements outlined in SOW along with your demonstration of understanding of typical site-specific hazards encountered in performing the requirements of the SOW.

The offer will be evaluated based on the demonstration of overall technical understanding and approach to complying with Federal, State and Local environmental laws in the performance of this contract as outlined in the SOW.

B. Sub-factor 2 - Technical Understanding of Central Process Systems (CPS)

Element 1. Base Requirements. The offer will be evaluated based on the demonstration of overall understanding of the operational and maintenance requirements and repair of the Central Process System as described in the SOW. Consideration will be given to the understanding of the overall effort, demonstrated knowledge of operational procedures, and plans to accomplish the actual operations, repairs and prescribed PMs.

Element 2. IDIQ Requirements. The offer will be evaluated based on the demonstration of overall understanding to perform the IDIQ requirements as described in the SOW. Consideration will be given to any proposed innovations, scheduling procedures, and personnel utilization that yields performance benefit and cost savings.

Element 3. IDIQ Sample Task Requirements. The offer will be evaluated based on the demonstration of overall understanding and approach to rehabilitation of the piece of equipment (e.g. Dehydrator) for the existing Central Process System.

C. Sub-factor 3 – Technical Understanding of PVS Certification & Cryogenic Systems

Element 1. PVS Certification Base Requirements. The offer will be evaluated based on the demonstration of overall understanding of the recertification requirements as described in the SOW. Consideration will be given to the understanding of in-service inspections of pressure systems, vessels, components and large equipment at GRC Lewis Field and at Plum Brook.

Element 2. Cryogenic Systems Base Requirements. The offer will be evaluated based on the demonstration of overall understanding of the cryogenics requirements as described in the SOW. Consideration will be given to the techniques used to operating, maintaining and repairing these systems.

Element 3. PVS Certification & Cryogenic System IDIQ Requirements. The offer will be evaluated based on the demonstration of overall understanding to perform the IDIQ requirements as described in the SOW. Consideration will be given to any proposed innovations, scheduling procedures, and personnel utilization that yields performance benefit and cost savings.

Element 4. Recertification IDIQ Sample Task Requirements. The offer will be evaluated based on the demonstration of overall understanding and approach to certifying Non-Code PV/S using the requirements to meet the requirements of the most applicable NCS as per Para 4.7 of NASA-STD 8719.17.

F. Sub-factor 4 – Phase-In

Element 1. Plan to Accomplish.
The plan will be evaluated to determine for whether the Offeror will able to assume complete responsibility for performance of all contract requirements on the start date of the contract. The plan will be evaluated on the Offeror's ability to describe how each activity would be assured of timely completion and the schedule detail on how the activities will be accomplished with minimum disruption of current operations. The skill and experience of the personnel that would be responsible for performing the transition activities and their prior experience in similar activities will also be evaluated.

M.4 COST/PRICE EVALUATION FACTOR

Although the cost volume is not numerically scored nor receives an adjectival rating, it is important in determining that the Offeror understands the solicitation and the resources required. The cost factor is used to determine what an Offeror's proposal will probably cost the Government should it be selected for award.

A cost realism analysis will be conducted to ensure that a fair and reasonable price is paid by the Government and to assess the reasonableness and realism of the proposed costs. Specifically, the evaluations will include, but are not limited to: (i) comparing the Offerors' rates proposed in response to this solicitation and (ii) comparing the proposed rates to historical rates for the same or similar items purchased by the Government. Offerors should refer to FAR 2.101(b) for a definition of 'cost realism' and to FAR 15.404-1(d) for a discussion of 'probable cost'. As noted in FAR 15.404(d)(1), the cost realism analysis consists of 'independently reviewing and evaluating specific elements of each Offeror's proposed cost estimate to determine whether the estimated proposed cost elements are realistic for the work to be performed; reflect a clear understanding of the requirements; and are consistent with the unique methods of performance and materials described in the Offeror's technical proposal'. A lack of resource realism may adversely affect the Offeror's Mission Suitability scores, and result in cost realism adjustments under the cost factor.

For purposes of source selection, and in accordance with FAR 52.217-5 Evaluation of Options, the total proposed cost will be utilized. The total proposed cost consists of the Phase-In, Base Period, Options and the Maximum IDIQ amount.

The cost evaluation will be conducted in accordance with FAR 15.305(a)(1), FAR 15.404, NFS 1815.305(a)(1)(B) and (a)(3)(B), and NFS 1815.404.

The status of Offeror's systems and audits of such systems will be considered part of the cost evaluation. Evidence of an approved accounting system at proposal submission shall be required for the award of a flexibly price contract, (see FAR 16.304-3(a)(3)).

An evaluation of the proposed fee shall also be conducted. An extremely low proposed fee may be determined insufficient to provide proper motivation for optimum contract performance. Fee dollars will not be adjusted in a probable cost adjustment.

The results of the Government's cost evaluation will be presented to the Source Selection Authority (SSA) for consideration in making the source selection decision. The results of the analyses do not provide a basis for an upward price adjustment after award.

M.5 RELEVANT EXPERIENCE AND PAST PERFORMANCE EVALUATION FACTOR

The Government will evaluate the three (3) sections of relevant experience and past performance for the Offeror and any Major Subcontractor(s)/Teaming Partner(s). These include the Past Performance Narrative (PPN), the Past Performance Questionnaires (PPQ) and any Past Performance Databases (PPD). As it pertains to past performance, only contracts the Government considers to be relevant as compared with this SOW will be considered.

1. The results of the PPN, PPQ and PPD evaluations will receive equal weighting in determining the Level of Confidence rating.

2. Relevancy: The Government will evaluate the Offeror's, Major Subcontractor's and/or Teaming Partner's experience over the past five (5) years to determine its relevancy to the SOW and the overall requirements of this procurement. Consideration will be given to prior/current contracts with the similar scope and complexity, size, dollar value, contract type, customers, dates of performance, and prior relationships of subcontractors and prime contractors.

3. Performance: The Government will evaluate the Offeror's, Major Subcontractor's and/or Teaming Partner's overall performance over the past five (5) years by considering items such as performance evaluation and rating history, and past performance in the areas of technical functions, business functions (including the CMMS function), management functions, schedule functions, Safety/Health performance, timelines and cooperation with clients.

4. The Government will evaluate the Offeror's past performance by considering items such as cost management history, problems and resolutions, contract terminations, relationships with subcontractors or teaming partners, management of subcontracts, task order administration, and cooperation with prior clients and timeliness in the completion of contract deliverables.

5. The Government reserves the right to conduct discussions with prior clients, whether or not the persons are listed within the proposal, for both the PPQ and PPD sections. The Government reserves the right to use other sources of information on contractor performance as available.

6. The Government reserves the right to evaluate past performance information from other subcontractors not listed as a Major Subcontractor and from other entities that will either substantially contribute to the proposed contract or have the potential to significantly impact the performance of the proposed contract.

7. Offeror's without a record of relevant experience and past performance, or for whom information on past performance is not available, shall receive a NEUTRAL

rating in accordance with FAR 15.305(a)(2)(iv).

8. Relevant Experience and Past Performance information will not be numerically scored, but will be consolidated into a single Level of Confidence Rating in accordance with the following table:

Rating	Description (FAR 1815.305(a)(2)(A))
Very High Level of Confidence	The Offeror's relevant experience and past performance is of exceptional merit and is very highly pertinent to this acquisition indicating exemplary performance in a timely, efficient, and economical manner; very minor (if any) problems with no adverse effect on overall performance. Based on the Offeror's performance record, there is a very high level of confidence that the Offeror will successfully perform the required effort. ** (One or more significant strengths exist. No significant weaknesses exist.)
High Level of Confidence	The Offeror's relevant experience and past performance is highly pertinent to this acquisition; demonstrating very effective performance that would be fully responsive to contract requirements with contract requirements accomplished in a timely, efficient, and economical manner for the most part with only minor problems with little identifiable effect on overall performance. Based on the Offeror's performance record, there is a high level of confidence that the Offeror will successfully perform the required effort. ** (One or more significant strengths exist. Strengths outbalance any weakness.)
Moderate Level of Confidence	The Offeror's relevant experience and past performance is pertinent to this acquisition, and it demonstrates effective performance; fully responsive to contract requirements; reportable problems, but with little identifiable effect on overall performance. Based on the Offeror's performance record, there is a moderate level of confidence that the Offeror will successfully perform the required effort. ** (There may be strengths or weaknesses or both.)
Low Level of Confidence	The Offeror's relevant experience and past performance is at least somewhat pertinent to this acquisition, and it meets or slightly exceeds minimum acceptable standards; adequate results; reportable problems with identifiable, but not substantial, effects on overall performance. Based on the Offeror's performance record, there is a low level of confidence that the Offeror will successfully perform the required effort. Changes to the Offeror's existing processes may be necessary in order to achieve contract requirements. ** (One or more weaknesses exist. Weaknesses outbalance strengths.)
Very Low Level of Confidence	The Offeror's relevant experience and past performance does not meet minimum acceptable standards in one or more areas; remedial action required in one or more areas; problems in one or more areas which adversely affect overall performance. Based on the Offeror's performance record, there is a very low level of confidence that the Offeror will successfully perform the required effort. ** (One or more deficiencies or significant weaknesses exist.)
Neutral	In the case of an Offeror without a record of relevant experience and past performance or for whom information on past performance is not available, the Offeror may not be evaluated favorably or unfavorably on past performance (see FAR 15.305(a)(2)(iv)).

M.6 RELATIVE WEIGHTS OF EVALUATION FACTORS

A. There are three evaluation factors, which will apply to the evaluation of proposals submitted in response to this solicitation, namely:

Factor 1 - Mission Suitability
Factor 2 - Cost/Price

Factor 3 - Relevant Experience and Past Performance

B. Mission Suitability Sub-factors

Within the Mission Suitability Factor, the four sub-factors will each be scored based on the following numerical weights, which indicate the relative importance of those evaluation areas:

1. Management Approach	**300 points**
2. Central Process Systems (CPS)	**300 points**
3. PVS Certification & Cryogenic System	**300 points**
4. Contract Phase-In	**100 points**
Total	**1,000 points**

C. Overall Evaluation

Mission Suitability, Relevant Experience and Past Performance, and Cost/Price are all equal in importance. Mission Suitability and Relevant Experience and Past Performance, when combined, are significantly more important than Cost.

[END OF SECTION]