

ANNEX 5.4 OPERATIONS

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5.4.1 General Information

5.4.1.1 Annex Description

This Annex identifies the day-to-day operation, standing, recurring, and miscellaneous services required for the Structures, Facilities, Utilities, Systems/Subsystems and Installation-Accountable Government Property (SFUSS & IAGP). Even though specific guidelines/requirements and minimum standards have been established, the services to be performed will rely heavily on knowledgeable, experienced individuals capable of safely and efficiently operating the SFUSS & IAGP. The Contractor is required to operate the SFUSS & IAGP, providing cost effective and energy efficient usage. Services addressed in this Annex include operator maintenance but do not include Corrective Maintenance (CM) or Preventive Maintenance (PM) services (See Annex 5.2 for PM and Annex 5.3 for CM).

5.4.1.2 Minimum Standards

Operation of systems, included in this Annex, shall include necessary skills and procedures, tools & equipment to facilitate SFUSS & IAGP operations, to provide intended functions, outputs, redundancy, and availability as defined in Annex 5.5.

5.4.1.3 Common Terms Used in this Annex

For additional terms and definitions, not listed here, See Annex 5.1.

Monitor and Inspect: These terms are used in conjunction with “operate” to delineate system activities other than actual operations which require periodic staffing. The Government requires that these activities would be accomplished by trained personnel with ability to recognize abnormal conditions and evidence of potential problems.

Recurring Work – Work which is performed under the contract which is not a part of the Scheduled Maintenance and Repair Program and is required an

undetermined number of times during the year, but is required at least once. This work will be accomplished as required. An example is implementation of the Hurricane Plan which will be performed (partially) once per year at the start of hurricane season with the resumption and completion of the plan carried out dependent on the number of storms which threaten the Gulf Coast.

Staff and Operate: This term is used for systems that require continuous staffing during the operational period. Personnel may also operate other systems within the immediate vicinity.

Standard Operating Procedure (SOP): This is a standing procedure that provides step-by-step instructions to operate systems. It is used for activities that commonly occur. The SOP requires Contracting Officer (CO) review and shall be maintained in electronic format easily accessible to the Government. Documents shall become Government property and shall be stored at CEF. (See DR 5-GA09)

Standing Work – Work which is performed under the contract which is not a part of the Scheduled Maintenance and Repair Program and is required a pre-determined number of times during the year. The schedule can be specifically called out as in, once per hour or may be left to the Contractor, as in, once annually. An example is meter reading which always occurs once per month.

Operate: This term is used for systems that require periodic operational activities but not continuous staffing. Personnel may be available for other contract activities. Operations include the first hour of trouble-shooting/investigation of a malfunction or availability loss (See Table 5.5-4 for response time), and also includes operational support for planned outages required for Utility PM’s.

Utility Process Plan (UPP): This is a one time per operation. Contractor generated, document that provides step-by-step instructions that establish responsibility and control system configuration changes. It provides details such as lockout/tagout, switch operation, valve operation, coordination, etc. Documents shall become Government property. (See DR 5-FA05)

5.4.1.4 Operations Guidelines for this Annex

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The Contractor shall provide personnel with qualifications, technical knowledge, and skills required to manage, supervise, operate, and maintain the SSC SFUSS & IAGP. Major configuration changes or changes which place the SFUSS & IAGP in an abnormal configuration shall be accomplished with a UPP. If the change is accomplished with a SOP, then the UPP is not required. Operational inspections/logging require a check sheet to document time/date, items inspected, conditions found, actions taken, and identification of inspector. All operations shall be performed by trained/certified personnel. The SFUSS & IAGP located in test areas and secure resident agency areas require special access requirements. These requirements limit access to individuals who have a need to be in these areas, and are aware of restrictions and notification requirements for activities within these areas (See ****NASA PTD-01-T29 & PTD-01-T18****).

5.4.1.5 Operations Plan

The Contractor shall prepare an Operations Plan for all SFUSS IAGP covered under this Annex. The Plan shall provide details as to how the Contractor intends to perform work necessary to meet all requirements for Operations under this Annex, including operations required to meet Availability as defined in Annex 5.5. This plan shall also address how the contractor intends to meet personnel requirements, including certifications, training, etc. Where operations require specific skills and/or certification, the contractor shall submit planned methods for addressing attrition or other necessary contingency planning. DR 5-GA10 Plan shall be submitted for CO approval within 60 days from contract start, and be updated annually.

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5.4.2	Personnel Requirements	See Annex 1 and information below.	Nothing Additional	Current certifications or evidence of experience is on hand for individuals performing services.
5.4.2.1	Electrical Personnel			
5.4.2.1.1	Provide Lineman/Linemen to perform operations and services on the 13.8 kV High Voltage System	Each lineman shall have completed an initial apprenticeship-training program with annual re-certification as per **29 CFR (OSHA) ANSI C2** and Mississippi Power Company (MPCo) requirements for overhead and underground systems.	Contractor Determined	Be able to show compliance with training and knowledge requirements. Required for individuals working on high voltage power systems.
5.4.2.1.2	Provide High Voltage System Engineer/Manager with the Qualifications, Technical Knowledge, Demonstrated Experience and Skills Required to Efficiently Manage, Supervise, Operate and Maintain the SSC 13.8 kV Electrical System	The electrical engineer/manager shall have successfully completed a four year electrical Engineering Bachelor's degree and have at least three years experience in high voltage system operations in plants similar in size and type as those at SSC. Engineers must have an interim operation certification at the end of the phase in period and full certification within 6 month after award. Specific experience shall include design and cost estimating; knowledge and ability to generate and modify electrical and geographical system utility maps, on-line drawings, and shop drawings; perform trouble shooting and repair; system load and fault current analysis; relay coordination; tests and measurement; system operation and switching including operation of Supervisory Control and Data Acquisition (SCADA) system and centrally located back-up generators.	Contractor Determined to support Performance Requirement	Current degrees, certification, licenses, and experience history shall be on file for Government review.
5.4.2.2	Potable Water			
5.4.2.2.1	Provide Potable Water System Certified Operator	Operator shall be certified by the State of Mississippi (Mississippi State Department of Health) for drinking water system operation. Operator shall be trained and	Contractor Determined minimum of one on	Show compliance with certification and operating knowledge required to

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		experience in operations of potable water system.	staff at all times.	maintain potable water system within requirements of this contract.
5.4.2.2.2	Provide Potable Water System Technician	Technician shall be trained and experience in operations of potable water system.	Contractor Determined minimum of one on staff at all times.	Show operating knowledge required to maintain potable water system within requirements of this contract.
5.4.2.3	Sanitary Sewage			
5.4.2.3.1	Provide Sewage Treatment System Certified Operator	Operator shall be certified by the State of Mississippi (Mississippi Department of Environmental Quality) to operate Sewage Treatment Systems. Operator shall be trained and experienced in operations of the wetland type lagoons and rock-reed systems.	Contractor Determined. Minimum of one on staff at all times.	Show compliance with certification and operating knowledge required to maintain effluent water quality within requirements of this contract.
5.4.2.3.2	Provide Sewage Treatment System Technician	Technician shall be trained and experienced in operations of the wetland type lagoons and rock-reed systems.	Contractor Determined. Minimum of one on staff at all times.	Show operating knowledge required to maintain effluent water quality within requirements of this contract.
5.4.2.4	EMCS			
5.4.2.4.1	Provide EMCS System Operators	Shall demonstrate practical working knowledge of industrial HVAC systems and other related industrial utility systems. Operators shall also demonstrate site-specific knowledge and training required prioritizing EMCS activities, notifications, and callouts, and performing other real-time management decisions. Operators shall possess an understanding of the facility service organization structure and system failure response procedures and implementation practices for both working and non-working hours. Operators shall demonstrate the ability to	Contractor Determined. Minimum of one operator continuously.	Provide staff per plan (DR 5-GA10).

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		utilize information collected through site resident agencies/customers, control system feedback, and field technicians to make sound decisions. Utilities Operations Plan costed under Annex 5.4.1.5 (DR 5-GA10) shall address specific procedures/methods used to achieve EMCS operator qualifications as well as ensure that EMCS related SSC site specific operational requirements are continuously met.		
5.4.2.4.2	Provide EMCS System Chief Operator	Chief Operator shall possess same technical qualifications as Operators; additional requirements shall be as follows. Three years (minimum) as an EMCS operator; Supervisory experience, training or equivalent; Five years (minimum) in engineering technology field or equivalent practical working knowledge of industrial HVAC, automation, or remote utility control systems.	Contractor Determined. Minimum of one.	Demonstrate knowledge of EMCS and SSC site specific operational requirements.
5.4.2.5	Establish, Maintain and Document a Licensing Program for Equipment Operators	The Contractor shall establish, maintain, and document a licensing program for operators of built-in cranes, monorails, hoists, and Special Purpose Mobile Equipment (SPME). The licensing shall be based on successfully completed classroom instruction and testing, and hands on training and demonstrated proficiency. The licensing program shall meet **NASA Safety Standard NSS/60-1740.9** (latest edition), OSHA requirements and receive CO approval.	One operator license program. See Exhibit 1, Inventory of Built-in Cranes, Monorails, and Hoists, and See Exhibit 4.	The program shall meet **NASA Safety Standard NSS/60-1740-9** (latest edition) and OSHA requirements. All documentation concerning licensing, including evidence of operator license, shall be maintained by the Contractor and be available for NASA review.
5.4.2.5.1	Provide License Operators for Built-in Cranes, Monorails, and Hoists	A license from the above licensing program (5.4.2.5) is required for operating both critical and non-critical lifting equipment. The inventory referenced in the work load data column gives the responsible operator for each lifting device. The Contractor shall provide licensed operators for	See Exhibit 1, Inventory of built-in cranes, monorails, and hoists. In the FOS contract	Only licensed operators will operate the lifting equipment for which the Contractor is shown as the responsible operator. No

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		the equipment where he is listed as the responsible operator.	licensing of non-contractor personnel will be provided upon request.	instance of non-licensed operators operating the lifting equipment for which the Contractor is shown as the responsible operator.
5.4.2.5.2	Provided Licensed Operators for Special Purpose Mobile Equipment (SPME)	A license from the above licensing program (5.4.2.5) is required for operating both critical and non-critical SPME.	See Exhibit 4	No instance of SPME being operated by non-licensed operators.
5.4.2.6	HVAC Provide Air-Conditioning & Refrigeration Technicians	All Personnel performing installation, maintenance or repairs that might reasonably have the opportunity to release refrigerant into the atmosphere shall be certified per EPA regulations.	Contractor Determined.	Contractor shall maintain records & evidence of certification; available for Government review upon request.
5.4.2.7	Nondestructive Evaluation Personnel (NDE)			
5.4.2.7.1	Lead Technician/Supervisor	Must have current Level 1 NDE Certification in accordance with Recommended Practice No. SNT-TC-1A (latest edition) as recommended by The American Society for Nondestructive Testing, Inc. At least two years experience in reading film including interpretation of results from high energy cobalt used in NDE of wall thickness in excess of 4 inches.	Minimum of one on staff at all times.	Current Certificate and evidence of experience on file.
5.4.2.7.2	Technicians	Must have one year or greater experience in setting up and taking radiographs of thick walled pressure vessels and piping. Level III Certification required.	Contractor Determined	Current Certificate and evidence of experience on file.
5.4.2.8	Marine Operations			

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5.4.2.8.1	Tugboat Captain	Must have current U.S. Coast Guard approved license for inland Waterways of the United States for Uninspected Towing Vessels (Minimum Requirement) with Radar Endorsement.	Contractor Determined	Current license
5.4.2.8.2	Tug Pilot	Must have current U.S. Coast Guard approved license for inland Waterways of the United States for Uninspected Towing Vessels (Minimum Requirement) with Radar Endorsement.	Contractor Determined	Current license
5.4.2.8.3	Marine Maintenance	At least 2 years experience in the maintenance of marine vessels and equipment.	Contractor Determined	Certification
5.4.2.8.4	All Operating Personnel	Able to pass annual physical examination for confined space entry. CPR certification training. Captain and Pilots require 5 year physical to renew license. Marine personnel are governed by the JONES ACT.	Contractor Determined	Certification
5.4.3	Utility Distribution			
5.4.3.1	Electrical 13.8 kV System			
5.4.3.1.1	Operations	The current system configurations and operations have been established by the Government based on Mississippi Power Company (MPCo) requirements, customer needs and the availability of equipment. System definitions and descriptions are provided in Table 5.1-1. Complete drawings of the systems are available in the SSC Central Engineering Files CEF. The Contractor shall be responsible for ensuring proper operation of the systems. All operations on the 13.8 kV Electrical System requires 2 qualified linemen during normal duty hours, IAW OSHA Standard Work Practices as stated in **29 CFR 1910**	Operator maintenance by linemen is limited to replacement of fuses or resetting of switches and/or circuit breakers.	Linemen shall be attentive to potential problems and initiate any required corrective action in a timely manner.

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		series. Operational performance is required in addition to any operator maintenance in an effort to preserve the integrity of the equipment.		
5.4.3.1.1.1	Operate the MPCo/SSC 13.8 kV Main Substation	Operations within the 13.8 kV main substation are limited to switch operation for maintenance, NASA/SSC construction support, and as requested by MPCo for service access or isolation. All operations require coordination with the MPCo control center as well as the SSC EMCS control center, per the **MPCo/NASA Operating Procedure** all operations shall be executed via radio-phone with MPCo’s control center. Within 30 minutes after any switching activity, mark-up the Electrical Utility one line drawing to indicate present configuration.	The primary workload is determined by the amount of maintenance/construction activity. Unit: Daily workdays	Linemen available at SSC for scheduled switching operations. Linemen available within 1 hour for non-scheduled switching or problem investigation. Operation the system to achieve the availability requirements and operational hours as designated in Annex 5.2.
5.4.3.1.1.2	Monitor and Inspect the MPCo/SSC 13.8 kV Main Substation	Inspect all 13.8 kV buswork to the high side of each transformer including all components listed in Table 5.1-1, “Site Electrical 13.8 kV Main Substation”, for visual damage and abnormal conditions. Inspection shall be ground level and energized. Notify MPCo via radio-phone immediately of any abnormal condition.	1 Substation Unit: Daily workday	Inspect entire system no less than once each work day by personnel qualified to operate the system.
5.4.3.1.1.3	Operate the SSC 13.8 Kv Distribution System	Operations on the 13.8 Kv Distribution System entail switch and circuit breaker operation for maintenance support, construction support, isolation of faults, and redistribution of loads. All switch and breaker shall be executed via 2-way radio communications and recorded in the EMCS Control Center. Operate the Site 13.8 Kv Distribution System in accordance with SOP’s for maintenance support and UPP’s for construction support. Prior to operating switches, check for evidence of tampering or damage. During operations of switches, observe for signs of arcing.	Primary workload is determined by the amount of maintenance or construction activity. Unit: Daily workdays	Linemen available at SSC for scheduled switching. Linemen available within 1 hour for non-scheduled switching or problem investigation. Operate the system to achieve the availability requirements and operational hours as designated in Annex 5.2.
5.4.3.1.1.4	Monitor and Inspect the SSC 13.8 Kv	Beginning at the load side of each 13.8 Kv 2000A vacuum	Inspection shall be	Inspections shall be

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	Distribution System	Breaker in the MPCo/NASA Main Substation to each facility main disconnecting means as listed in Table 5.1-1: "Site 13.8 Kv Electrical Distribution System.": Inspect all switches and overhead line components for visual damage or abnormal conditions.	ground level with system energized. Unit: Daily workdays	conducted by personnel qualified to operate the system. Initiate corrective action for all abnormal conditions in a timely manner.
5.4.3.1.1.5	Operate the Area Lighting Systems	These systems are operated by a combination of photo cells and timers, and have up to 10 different types of luminaries.	621 lights	Monitor the systems, and initiate corrective action for all abnormal conditions in a timely manner to obtain availability.
5.4.3.1.1.6	Operate 13.8 Kv Facility Switches	Operations on the 13.8 Kv facility switches entail switch operation for maintenance/construction support, isolation of faults, and redistribution of loads. All switch operations are executed via 2 way radio communications and recorded in the EMCS Control Center. Within 30 minutes after any switching activity update the one line diagram to indicate present configuration. Operate the 13.8 Kv Facility switches in accordance with SOPs, and UPP's. Prior to operation of facility switches, inspect enclosures for evidence of tampering or damage. During operations observe switch contacts for arcing.	Primary workload is for maintenance and construction support. Minimum redistribution of loads once annually. Refer to Table 5.1-1 for description and components of "13.8 Kv Switching Facilities." Unit: Daily workdays	Linemen available at SSC for scheduled switching. Linemen available within 1 hour for non-scheduled switching or problem investigation. Operate the system to achieve the availability requirements and operational hours as designated in Annex 5.2
5.4.3.1.2	Standing Work			
5.4.3.1.2.1	Read and Record main Substation	Document the kilowatt-hour (kWh), voltage and current readings at the main substation. All readings must be taken and date recorded on the last workday of each month.	Unit: 8 meters Monthly	Accurately read meters and record data on the last workday of each month.
5.4.3.1.2.2	Read and Record Kilowatt-Hour (kWh) Meters at all Locations on the Site 13.8	Document the electrical loads on all metered facility electrical systems at SSC. All readings must be taken and	Unit: 156 meters Monthly	Accurately read kWh meters and record data on

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	Kv Electrical Distribution System DR 5-FA07	data recorded on the last workday of each month. This data shall provide input for DR 5-GA18.		the last workday of each month.
5.4.3.1.2.3	Read and Record Run Time on Installed Generators	Document run time and provide input for DR 7-GA41 under Annex 7.0	5 generators at Buildings: 1100, 1201, 2201, 2204, and 3203. Unit: Monthly	Initiate reporting of corrective action for all abnormal conditions, in a timely manner.
5.4.3.1.2.4	Maintain High Voltage Switching Documentation Map	Maintain **Site HV System Configuration** which is the Reference Document for High Voltage Switching that identifies response to power losses in buildings switches, feeders, and transformers. To be used in the planning of outages or restoration procedures.	Unit: Daily workday	Provide marked-up map to CEF quarterly
5.4.3.1.2.5	Control Access to main Substation, Building 4400 Substation, and Cryogenic Transfer Deluge Substation	Fenced area is controlled access. Operations personnel are responsible for controlling access and securing area when they are not present.	3 Substations Unit: Continuous	Verify personnel are logged into fenced area and that gates are kept locked.
5.4.3.1.3	Recurring Work			
5.4.3.1.3.1	Update/Maintain Electrical Power System & SOPs (DR 5-GA09)	All activities, which can impact the reliability of the electrical power supply, shall have a SOP developed or upgraded. The CO approved SOPs shall be electronically maintained with Government access. System documentation shall be maintained as required by configuration changes. (See DR 5-GA09)	Update annually or as equipment or operational changes are made. Unit: Yearly	Maintain system SOPs and equipment documentation to be available for review by CO.
5.4.3.1.3.2	Provide Marked-Up Utility Drawings for Mission Support	Provide marked-up master utility drawings showing system and switch configuration. A set of drawings shall be delivered to CEF.	Unit: Quarterly 4 Drawings per Year	Provide marked-up drawings quarterly, to CEF.
5.4.3.1.3.3	Locate, Identify, and Mark Electrical Utility Systems Upon Request	This work is required through **SSC 99-015 Site Wide Digging Permit** . The contractor shall mark electrical utilities within 3 workdays of the request. Utilities shall	Unit: 6 per Year	Physically mark the affected utility within 3 days of request.

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		be marked using colored flags and paint as specified by the Government.		
5.4.3.1.3.4	Provide Operational Support During Adverse Weather Conditions	Monitor ambient temperatures and provide operations support as required in the **SSC Freeze Conditions Plan** to implement the plan, and to monitor and inspect equipment as needed to preclude damage. Operational performance is requires in addition to any operator maintenance in an effort to preserve the integrity of the equipment.	Unit: 2 occurrences per year	Linemen shall be attentive to potential problems and initiate corrective action for all abnormal conditions, in a timely manner.
5.4.3.1.3.5	Provide Support to Maintain Right-of-Way (R.O.W.) Clearance for Overhead Powerlines	Provide operational support to cutback tree branches that encroach into R.O.W. of overhead powerlines.	Unit: a) 2150 LF b) 110,050 LF c) 26,800 LF	a) 13.8 Kv: 10 ft. either side of centerline b) 13.8 Kv Single circuit: 15 ft. either side of centerline c) 13.8 Kv Dual Circuit: 30 ft. either side of centerline
5.4.3.1.3.6	Pump Out Electrical Manholes	Provide operational support for maintenance and operation requirements.	Unit: 10 occurrences per year	Maintain water level no higher than top of sump in base of manhole.
5.4.3.2	Potable Water System			
5.4.3.2.1	Operations	The potable water system shall be operated to ensure a continuous supply of water is provided at all times. The system is used to operate drinking, sanitation, and fire protection systems. See Table 5.1-1 for a description of the system. Further detailed information is given in the **SSC Utility RCM Analysis manual for Potable water** . The Contractor shall be responsible for ensuring proper and efficient operation of the system while continually monitoring and evaluating the system configuration and operations, making recommendations	Typical daily water usage during regular workdays is approximately 250,000 gallons. System output requirements are given in Table 5.1-1.	Potable Water System operations do not require continuous coverage but do require operator support to meet availability requirements (See Annex 5.5).

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		for improvements to the CO. System performance shall comply with requirements of the Mississippi Department of Environmental Quality. The system shall be kept under the direct supervision of qualified personnel who are kept knowledgeable and capable of performing all operations and associated work. Operators shall have and maintain the certification required by the State of Mississippi.		
5.4.3.2.1.1	Operate SSC Water Treatment System to Maintain Water Quality	<p>Operate the water treatment system in accordance with **SSC OI 42-54-001** (Operating Instruction for Potable Water System Well House).</p> <p>Operate the system to achieve the availability requirements as designated in Annex 5.5, Table 5.5-2, and the operational hours as designated in the **Building Operating Hours Summary**. Operate the water treatment system to maintain the output as stated in Table 5.1-1. The contractor shall operate, inspect and monitor the chemical treatment equipment. The contractor shall purchase all chemicals associated with water treatment and field test for chlorine content. Chemicals used shall be equivalent in salient characteristics to those for which the facility was designed.</p>	24-hour a day controlled treatment of chlorine. Provide chemicals on a continual basis to treat all flow conditions. Field test chlorine content daily at the active pump houses and weekly at a remote point approximately ¼ to ½ mile from the pump house.	Monitor system as needed for continuous control. Water quality shall meet Mississippi Department of Health standards.
5.4.3.2.1.2	Operate SSC Water Storage System to Maintain Water Quantity	Operate the system to achieve the availability requirements as designated in Annex 5.5, Table 5.5-2, and the Operational Hours as designated in the **Building Operating Hours Summary** . Operate the water treatment system to maintain the output as stated in Table 5.1-1. Maintain levels in elevated tanks to achieve the pressures required in Table 5.1-1.	Continuous Operation. The storage system consists of three elevated tanks. Tanks 1 & 2 each have a capacity of 300,000 gallons. Tank 3 has a capacity of 250,000. There is a 10,000-gallon ground level pressure	Monitor system as needed for continuous control. Elevated storage tanks shall be monitored for high/low alarm. Respond to alarms within 30 minutes during core hours, and within 2 hours during non-core hours.

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5.4.3.2.1.3	Operate SSC Water Wells and Pumping System to Maintain Water Generation and Water Pressure	Operate the system to achieve the availability requirements as designated in Annex 5.5, Table 5.5-2, and the operational hours as designated in the **Building Operating Hours Summary** . Operate the water treatment system to maintain the output as stated in 5.1-1. Maintain the operability of the three water wells and their associated pumps.	tank at Well No. 3 in down mode. Monitor system as needed for continuous control. Wells 1 & 2 are active and each has a 500 gpm, 30 hp electric driven pump. Well 3 is stand-by and has two 750 gpm, 40 hp electric driven pumps. The No. 3 elevated tank pump house has two 15 hp electric driven pumps.	Monitor system as needed for continuous control. Operate each pump monthly.
5.4.3.2.1.4	Operate SSC Water Distribution System	<p>The Potable Water Distribution System begins at the point of pump discharge and ends at a point 5 feet outside the facility, which it serves. See Table 5.1-1 for system definition. It shall be operated to ensure a continuous supply of water is provided at all times to all facilities and use points. The Distribution Piping Systems provides water to facilities and Fire Protection Systems.</p> <p>The Distribution System is designed with a series of loops and valves to minimize outages in the event of line failures or repairs. The contractor is expected to take advantage of this design to maintain availability.</p> <p>Fire hydrants are located on lines throughout the system for flushing and fire protection. Flushing of the lines is necessary to maintain site water quality and to maintain the chlorine residual required by the Mississippi</p>	Approximately 12 miles of piping distribution system. Piping material is either cast iron, plastic, or Transite and ranges in size from 14" to 2".	Water Distribution System Operation does not require continuous coverage but does require operator support to meet availability requirements (See Annex 5.5). Operators shall maintain the certification required by the State of Mississippi. The system shall be kept under the supervision of a certified operator per the regulations. Maintain Mississippi Department of Health required chlorine residual as a minimum.

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		<p>Department of Health. Operate the system to achieve the availability requirements as designated in Annex 5.5, Table 5.5-2, and the operational hours as designated in the **Building Operating Hours Summary**. Operate the water treatment system to maintain the output as stated in Table 5.1-1.</p> <p>The contractor shall monitor, inspect and operate the water distribution system to maintain the quality of the water, to maintain the functionality of the distribution system and to initiate corrective actions to maintain the output as stated in Table 5.1-1. Water distribution outages shall be supported. Flushing shall be required in areas, which experience deterioration of water quality noted through bacteriological sampling or physical discoloration due to outages or to correct customer complaints. All flushing shall be done per an SOP in a controlled manner to minimize impacts of pressure fluctuation in the system.</p>		
5.4.3.2.2	Standing Work			
5.4.3.2.2.1	Read and Record Water Meters	A flow meter is installed in each pump house. Read and record water meters at active pumps daily to monitor total gallons pumped.	2 meters each workday.	Records available continuously.
5.4.3.2.2.2	Maintain a Daily Log of Operator Activities	The Log shall include the kinds and quantities of chemicals used, feed rates, dosages, and water quality field tests conducted. The log shall include the status and length of outages and all other pertinent information.	One log, update daily.	Log available continuously.
5.4.3.2.3	Recurring Work			
5.4.3.2.3.1	Update/Develop/Maintain Potable Water System Operation Manuals and SOP's (See DR 5-GA09)	Potable water system documentation shall be maintained and updated as required. (See DR 5-GA09)	One annual revision.	Develop or revise and obtain CO concurrence on documentation within 90 days of contract start date.

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5.4.3.2.3.2	Change Out Chlorine Tanks	Check chlorine tanks and replace as necessary. When changing cylinders verify product in cylinder prior to connecting to service.	2 active wells, 1 inactive well.	No instance of empty chlorine cylinders.
5.4.3.2.3.3	Support Freeze Plan	Monitor ambient temperatures and provide operations support as required in the **SSC Freeze Plan (Annex L of the SSC Disaster Preparedness Plan)** to implement the plan, and to monitor and inspect equipment as needed to preclude freeze damage.	2 occurrences per year.	No instances of non-support.
5.4.3.3	Sanitary Sewage Systems			
5.4.3.3.1	Operations	The Sewage Collection Systems shall be operated to ensure continuous collection, pumping and removal of wastewater is provided at all times. Treatment Systems shall be operated to ensure that effluent water quality meets all applicable state regulations and permit requirements, without disruption of wastewater flow from any facility during occupied periods. The Sanitary Sewage Systems consists of Primary Collection Systems, Lagoon/Treatment Systems, Rock-Reed Systems, and Septic Tank/Field Drain Systems. See **SSC Utility RCM Manuals** and Table 5.1-1 for sketches and technical descriptions.		
5.4.3.3.1.1	Operate, Monitor, and Inspect the Sanitary Sewage Collection Systems	Operate the Sanitary Sewage Collection Systems to achieve the availability requirements and operational hours as designated in Annex 5.5, and to achieve output as stated in Table 5.1-1. Operate the Collection Systems in accordance with applicable O&M Manuals, SOP's and UPP's. Operations for Slide Mounted Pump Type Lift Stations shall include the following (These requirements are daily (D) for criticality levels I, II, and III, and weekly for criticality IV &V): <ol style="list-style-type: none"> 1. Check and insure that "WATER IN LUBRICANT" light is off. 2. Trip primary effluent limit switch and verify system 	Two collection systems consist of 47 Lift Stations, approximately 76,800 linear feet of forced main, and approximately 29,850 linear feet of gravity main. Separate collection system in B-1105.	Maintain continuous availability for sewage pumping and transport from any facility (during occupied periods) to the treatment system.

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		<p>operation.</p> <ol style="list-style-type: none"> 3. Trip backup effluent limit switch and verify system operation. 4. Check alternator circuitry by tripping primary limit switch twice and verifying alternate pump operation. 5. Trip alarm limit switch and observe alarm light is on. <p>Daily (D) operations for Secure Mounted pump Type Lift Stations shall include the following:</p> <ol style="list-style-type: none"> 1. Check operation of Lift Station ventilator and lights by opening access cover and verifying operation. 2. Verify air is flowing in air bubbler systems, check flow meter, regulator and level gauge. 		
5.4.3.3.1.2	Operate, Monitor, and Inspect the Sanitary Sewage Treatment Lagoon Systems	<p>Operate the Sanitary Sewage Treatment Systems to achieve the availability requirements as designated in Annex 5.5, and to achieve output as stated in Table 5.1-1. Operate system equipment in accordance with applicable O&M Manuals, SOP's and UPP's. Operations shall include activities such as:</p> <ol style="list-style-type: none"> 1. Clean debris and other materials from scupper. 2. Clean UV light bulbs of contaminant buildup, verify proper operation, and replacement of bulbs as required.* 3. Verifying proper lagoon and marsh levels. 4. Verifying proper instrumentation operation. 5. Maintain/Replenish vegetation life within the lagoon and marsh. 6. Addition and mixing of environmentally approved chemicals and compounds as required. 7. Inspect and initiate any necessary corrective actions on berms and levies to prevent erosion or leaks. 8. Initiate any necessary activities to control wildlife or rodents. 	Effluent for Lagoon #1 is approximately 170,000 GPD, Lagoon #2 is approximately 70,000 GPD.	Maintain treatment capability for all sanitary sewage, without interruption to facility sanitary sewage discharge. All effluent shall comply with state regulations and permit requirements.

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5.4.3.3.1.3	Operate, Monitor, and Inspect the Sanitary Sewage Rock-Reed Systems	Operate the Sanitary Sewage Treatment Systems to achieve the availability output as stated in Table 5.1-1. Operate system equipment in accordance with applicable O&M Manuals, SOP's, and UPP's. Operations shall include: <ol style="list-style-type: none"> 1. Clean debris and other materials from rock/reed and discharge area. 2. Clean UV light bulbs of contaminant buildup, verify proper operation, and replacement of bulbs as required. 3. Maintain/Replenish vegetation life. 4. Addition and mixing of environmentally approved chemicals and compounds as required. 5. Inspect and initiate any necessary corrective actions on berms and levies to prevent erosion or leaks. 	1 ea. Systems. Rock-Reed systems treat less than 3,000 GPD.	Maintain treatment capability for all sanitary sewage, without interruption to facility sanitary sewage discharge. All effluent shall comply with state regulations and requirements.
5.4.3.3.1.4	Operate, Monitor, and Inspect the Sanitary Sewage Septic Tank/Field Drain Systems	Operate the Sanitary Sewage Treatment Systems to achieve the availability requirements as designated in Annex 5.5, and to achieve output as stated in Table 5.1-1. Add environmentally approved chemicals and compounds as required.	Three septic tank/field drain systems shall be operated: less than 3,000 GPD treatment.	Maintain treatment capability for all sanitary sewage, without interruption to facility sanitary sewage discharge.
5.4.3.3.1.5	Notify Government of any Excursions from State permits, Regulations and Requirements (DR 7-GA09)	Contractor shall provide notifications to the Government in accordance with Annex 7.0.	Report per occurrence.	Reports shall be maintained on record and available for Government review upon request.
5.4.3.3.2	Standing Work			
5.4.3.3.2.1	Maintain a Daily Log of Operator Activities	The log shall include the following information: <ol style="list-style-type: none"> 1. Listing of any abnormal conditions, concerns, systems malfunctions or failures, or other pertinent data related to systems operations and inspections. 2. Any corrective actions initiated or completed on systems. 	Log updated daily.	Log shall be accurate and current, and shall be available for Government review upon request.

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		3. Status of systems configurations. 4. Scheduled outages.		
5.4.3.3.2.2	Maintain Statistical Data	Trend and maintain accurate records of the following influent and effluent flow rates for lagoon systems: 1. Peak Flow Rate during month, Gallons Per Hour (GPH). 2. Peak Daily Average during month, Gallons Per Day (GPD). 3. Monthly daily average (GPD). 4. Annualized daily average (GPD).	Update monthly.	Records shall be accurate and current, and shall be available for Government review upon request.
5.4.3.3.3	Recurring Work			
5.4.3.3.3.1	Update/Develop/Maintain Sanitary Sewage System Operation Manuals and SOP's (See DR 5-GA09)	Documentation shall be updated and maintained as required for the operation and maintenance of the treatment systems: Lagoon Systems, Rock-Reed Systems, and Septic Tank/Field Drain Systems (See DR 5-GA09)	One annual revision.	Develop or revise and obtain CO review within 90 days of contract start date.
5.4.3.3.3.2	Pump Out Oil/Water Separator	Pump out and dispose of waste.	One oil/water separator located outside Building 2105. (Historically 2 times annually)	Pump out as necessary to ensure tanks do not exceed 80% capacity; however, no less than annually.
5.4.3.3.3.3	Pump Out Grease Traps	Pump out and dispose of waste.	One oil/water separator located outside Building 2105. (Historically 2 times annually) Check B-1100 cafeteria.	Pump out as necessary to ensure traps are clean and functional.
5.4.3.4	Energy Management and Control System			

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5.4.3.4.1	Operations	<p>The EMCS Operations Control Center consists of the EMCS, the Fuel Management Monitoring System and the Main Substation Monitoring System as defined in Table 5.1-1. These systems are consolidated into a single operations room, which shall be staffed and operated continuously. The Control Center is established to monitor and control parameters of various utilities, systems and equipment. By this function, the center acts as an effective method for controlling energy consumption, operations and maintenance. Because of the broad visibility of site systems at the center, operators act as a central focal point for the real-time operation and management of utilities, systems and equipment.</p> <p>The EMCS System Control Center Hosts have historically been maintained under service contracts, which are procured annually by the Government (available at the TRL). The System 600 contract includes hourly rates for service and repair; basic services for system performance benchmarking and review are also provided under this service contract. The Government will <u>not</u> renew these contracts. The EMCS is also defined to include microprocessor field cabinets, wiring and instrumentation required to provide control and central console visibility of equipment and processes. Often these field controls are directly associated with the operation of a specific equipment item or system.</p>		
5.4.3.4.1.1	Staff and Operate the EMCS Central Console Station	<p>Staff and operate the EMCS Central Console Station, consisting of the EMCS, the Fuel Management Monitoring System and the Main Substation Monitoring System. Operation shall be in accordance with applicable SOP's, O&M Manuals, and as listed below:</p> <p>a. Operate all systems to achieve the availability requirements and operational hours as designated in</p>	EMCS Systems with a total of 2 Work Stations (System 600 monitors approximately 14,000 points), 1 Fuel Monitoring System	The system shall be staffed continuously be personnel who are knowledgeable of site specific operations and missions, and are trained to operate EMCS hardware and software (including

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		Annex 5.5.		
b.	Operate all systems to maintain the output as stated in Table 5.1-1.		with Work Station (monitors 6 fuel storage systems and 2 fuel sentry locations), and 1 Main Substation Monitoring System with Work Station.	other systems at the EMCS Central Console Station). Obtain approval from CO prior to any hardware, software or firmware changes. Acknowledge non-critical alarm within 10 minutes and start remedial action within 15 minutes. Acknowledge critical alarms within 1 minute and start remedial action within 3 minutes. Adjust algorithms to correct operational problems and/or optimize efficiency within 3 work days. Apply consistent methods of control and logic site wide.
c.	Monitor ambient temperatures and weather conditions and provide operational support and notifications as required to support site operations.			
d.	Coordinate and track site outages (Planned and Unplanned) for maintenance and construction and provide notification to site users and Facility Managers.			
e.	Receive and log user complaints for utilities and facility systems malfunctions, interruptions or failures. Initiate investigation and work orders for problems, as required, and log significant site activities and problems.			
f.	Answer phone inquiries.			
g.	Implement EMCS control system setpoint and algorithm adjustments as required to maintain site operations and maintain energy conservation.			
h.	Monitor and respond to alarm conditions. Initiate work orders as required to initiate investigation or repairs.			
i.	Report significant breakdowns, malfunctions and reliability concerns to the CO.			
j.	Maintain audible system alarm records.			
k.	Analyze and adjust operating parameters to resolve field problems.			
l.	Provide operational data, analyze and adjust operating parameters in response to Site Energy Management requests.			
m.	Input data to EMCS reports, operating instructions, support programs and databases.			
n.	Input after-hours notifications and callouts in response to site problems or systems failures (e.g., fire alarm, natural gas, high voltage, electrical, bascule bridge, sewer systems, phone system, high pressure			

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		<p>industrial water, high pressure gas, HVAC).</p> <ul style="list-style-type: none"> o. Monitor and initiate fueling operations to maintain fuel storage tanks properly supplied. p. Program fueling keys and maintain records on Fuel Sentry system. q. Monitor Main Substation and initiate callout to Mississippi Power for Monitoring System or Substation problems. r. Provide operator support for condition assessment and plans as required to maintain EMCS (including hardware, firmware and software). s. Perform benchmarking for the EMCS as required to ensure system speed, availability and reliability are maintained (existing benchmark is available in the TRL). t. Initiate and manage data trending for EMCS monitored systems and equipment. Provide system-generated reports and trend data as requested. u. Assist in defining EMCS site equipment/system requirements in support of equipment/system designs and operational inquiries. Provide system generated reports upon request v. Provide host operational support for Functional Checkout and Point-to-Point Checks in support of PM, trouble shooting, corrective maintenance and construction. w. Monitor critical Field Device parameters through back-up communication links during System 600 Central Host outages. x. Initiate corrective actions as required on all EMCS System equipment, Fuel Management Monitoring System equipment and Main Substation System equipment (Host and field devices). y. Provide Security for all central console equipment and software. 		

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5.4.3.4.1.2	Manage EMCS Software	<p>Manage software for the EMCS Central Console Systems and accessories, EMCS programmable field panels and the Fuel Management Monitoring System (Does not include the Main Substation Monitoring System). Management of software includes quality assurance, reliability, verification/validation, document and data control, configuration/change control, license agreements, maintenance, records, training, servicing, audits, back up, handling, storage, packaging, testing, acceptance, nonconformance reporting, coordinating corrective actions, and security.</p> <p>Includes all software developed, supplied, maintained or operated for, or in support of, EMCS Systems and the Fuel Monitoring System.</p> <p>Protect systems and data. Return all items in a usable and documented format at end of contract.</p> <p>Provide Software Management Support for completion of vendor benchmarking, upgrades or troubleshooting. This includes system backup/protection, and transmitting of system data to the vendor.</p> <p>Provide test plan for all software development or changes. Functionally check operation after any system modifications.</p>	<p>See Table 5.1-1. Includes:</p> <ol style="list-style-type: none"> 1) EMCS Central host systems. 2) EMCS Field Cabinet software: System 600 – 150 MFDs (SCU's & MBC's), and 35 UC's. 3) Three laptop PC's used for EMCS troubleshooting, operations and database management. 4) Fuel Monitoring System Host. 	<p>Maintain daily, weekly, monthly and quarterly taped backup of system software for EMCS Central host. Quarterly backup shall be registered and stored in CEF. System Software shall also be backed up prior to any system configuration changes or modifications.</p> <p>Maintain current software taped backup of EMCS for each Field Cabinet software. Maintain current software taped backup of software for Fuel Monitoring Host. Taped backup shall be capable of system restoration in event of system corruption or destruction. System operating, programming and maintenance manuals shall be maintained current.</p>
5.4.3.4.1.3	Provide EMCS Programming Support	<p>Provide EMCS programming support, including the following:</p> <ol style="list-style-type: none"> a. Accomplish graphics modifications or additions to operator-machine interfaces (e.g., floor plans, information screens, system schematics and point description). b. Accomplish algorithm modifications or additions to support operational requirements and maintain energy efficient operation. 	<p>See Table 5.1-1. Includes:</p> <ol style="list-style-type: none"> 1) EMCS Central Host systems. 2) EMCS Field Cabinet software (FID, MBC, SCU and UC). 	<p>All EMCS databases, programs and reports shall be made available electronically for Government access.</p> <p>All software development and modifications shall comply with the system standards, or shall receive</p>

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		<ul style="list-style-type: none"> c. Modify point parameters for alarm management and energy conservation (e.g., setpoints, alarm limits, start/stop times). d. Modify parameter settings in response to natural gas curtailment exercises and activities. 	3) Fuel Monitoring System Host.	prior approval from the CO.
5.4.3.4.1.4	Maintain Energy Conservation Exception Log	Log shall provide information for tracking and calculating energy consumption due to individual requests to activate facility utilities or HVAC for after-hours operations. Log shall include date of request, requester and phone number, building no., room no., equipment required to run, time on and time off, no. of personnel working, authorizing official, and any pertinent comments.	Log updated daily.	Log shall be maintained continuously, current and accurate. Data shall be submitted to Energy Analyst for calculation of Energy Consumption Allocation, monthly. Data shall be available for Government review upon request.
5.4.3.4.1.5	Maintain Daily Log	Maintain daily log of trouble calls, outages and significant site events. Log shall record dates and times of events.	Maintain updated and available for review continuously. Log update daily.	Continuously update and maintain accurate. Records shall be sufficient to allow for time-sequenced review of site events. Data shall be available for Government review upon request.
5.4.3.4.1.6	Reserved			
5.4.3.4.1.7	Encode Fuel Sentry Keys	Support for fueling activities shall include encoding keys as required for site vehicle fueling. This shall include encoding keys as required for site vehicle fueling. This shall include encoding, record keeping and reporting of keys generated, reported losses of keys, etc.	Contractor Determined	Sufficient to meet operational needs.
5.4.3.4.2	Standing Work			

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5.4.3.4.2.1	Provide EMCS Status Report (DR 5-GA02)	Provide Monthly EMCS Report (See DR 5-GA02).	Monthly Report	Conformance with DR
5.4.3.4.2.2	Provide Fuel Receipt Report (DR 5-GA03)	Provide Monthly Fuel Receipt Report (DR 5-GA03).	Monthly Report	Conformance with DR
5.4.3.4.2.3	Provide Fuel Utilization Report (DR 5-GA04)	Provide Monthly Fuel Utilization Report (See DR 5-GA04).	Monthly Report	Conformance with DR
5.4.3.4.2.4	Provide Fuel Forecast Report (DR 5-GA01)	Provide Fuel Forecast Report (See DR 5-GA01).	Semi-annual Report	Conformance with DR
5.4.3.4.3	Recurring Work			
5.4.3.4.3.1	Develop Operating Manuals and SOP's. (DR 5-GA09)	Documentation shall be developed as required for proper instruction and procedures for the EMCS (See DR 5-GA09).	Contractor Determined	Conformance with DR
5.4.3.4.3.2	Update and maintain Operating Manuals and SOPs (DR 5-GA09)	Documentation shall be bound in manual(s) and maintained available for EMCS operator instructions at the EMCS Central Console. Requests for updates shall be initiated by the EMCS as required to maintain current data. Initial documents shall be presented for Government review within 30 days of start of contract, and upon review shall become Government property. Documents shall be available at CEF and at the EMCS. Documents shall provide all pertinent phone, pager, and radio numbers for operational or emergency notification, EMCS procedures and instruction to support all facility specific and mission specific requirements, and any operation plans and instructions required to perform EMCS operations, recurring and standing work. (See DR 5-GA09)	39 Ea Documents	Conformance with DR Documents maintained current and accurate.

****These documents shall include**:**

1. Radio and Pager Number Listing

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		2. Responsible Person Listing (By System-NASA and Contractor Personnel)		
		3. Building 1103 Room 113 ITD/SRSC (Space Remote Sensing Center) Procedures and Notification		
		4. NAVO Facility Equipment Room Procedures		
		5. High Pressure Industrial Water Alarm and Callout Procedure		
		6. Test Area After Hours EMCS Support Procedures		
		7. Building 1003 Air Conditioning Failure Procedure		
		8. Building 1105, EPA After Hours Contact List		
		9. After Hours Contact Listing for Graphics Personnel		
		10. After Hours Contact Listing for CEF (Central Engineering Files)		
		11. Hazardous Spill Requirements/Instruction		
		12. Building 4110 After Hours Helium Alarm Response procedure		
		13. Building 3305 HPG (High Pressure Gas) Alarm Procedures and Contact Listing		
		14. Building 1110 Computer Room Monitoring and Response Procedures		
		15. Telephone IM Equipment Requirements and Locations Listing		
		16. Building 1000 Super Computer Room Control Requirements and Contact List		
		17. Building 1000 Boiler Restoration Plan		
		18. Emergency After-Hours Callout for Communications Systems		
		19. Sewage Treatment Systems' Out of Tolerance Procedures		
		20. Gas Leak Notification Procedures		
		21. Notification and Recall Procedure for After Hours Incidents Involving Construction Subcontractors or Utilities Systems		

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		<p>22. After Hours Warehouse and Salvage Yard Access Procedure</p> <p>23. FOSS Safety Personnel Recall List</p> <p>24. FOSS After Hours Call Listings and Procedures</p> <p>25. Procedures for Generator Support to Mississippi Power Co.</p> <p>26. SSC Essex Back-Up Phone Listing</p> <p>27. Building Operating Hours Summary</p> <p>28. Disaster Preparedness Plan</p> <p>29. Critical Facility Custodian Listing</p> <p>30. FOSS Emergency Recall List</p> <p>31. SSME Test Complex Security Access Concurrence Contact List</p> <p>32. SSC Building Custodian List</p> <p>33. Emergency Operations Center Telephone List</p> <p>34. Operation Control Center, 24 Hour Operations</p> <p>35. NASA PSC Video Teleconference System Support</p> <p>36. Natural Gas Outage Notification List</p> <p>37. Building Operating Hours Summary</p> <p>38. Mississippi Power Emergency Contact Phone Listing and Instructions</p> <p>39. Fuel Cell Operating Instructions and Call Out Listing</p>		
5.4.3.4.3.2	Maintain Manual of Updated Procedures, Instructions & Listings	Refer to the TRL	Contractor Determined	Kept Current
5.4.3.5	Natural Gas System			
5.4.3.5.1	Operations Information	Natural gas for SSC is supplied by the Koch Gateway Pipeline Co. metering facility. An odorizing station is located adjacent to the metering facility. The odorized gas flows into a 10” main pipeline at a pressure of 40-43 psig to the main distribution No. 1 meter. The gas system piping continues to the user facilities where pressure is	Nothing Additional	

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		reduced to the pressure required by the equipment it serves. See Table 5.1-1 for system definition. Additional detailed system information is given in the **SSC Utility RCM Analysis Manual for Natural Gas** .		
5.4.3.5.1.1	Operate, Inspect, and Monitor the Natural Gas Distribution System	Operate the Natural Gas System in accordance with applicable SOP. Operate the system to achieve the availability requirements and operational hours as designated in Annex 5.5, Table 5.5-2 and the Operating Hours Summary (**EMCS Operating Procedure**). Operate the natural gas distribution system to maintain the output as stated in Table 5.1-1.	SSC has approximately 78,000 linear feet of pipe and associated valves, regulators, meters and cathodic protection.	The natural Gas System Operation does not require continuous coverage, but does require operator support to be available 24 hours a day to accomplish routine activities and respond to emergencies.
5.4.3.5.2	Standing Work			
5.4.3.5.2.1	Maintain Log of Operator Activities	The Natural Gas Distribution System log shall include status of valve configuration if other than normal, outages, (scheduled & non-scheduled) and other pertinent information.	Update log daily.	Log available continuously.
5.4.3.5.2.2	Read main and Distribution Meters to Monitor and Report Consumption	Record and report meter reading for input into energy allocation program (DR 5-FA07). Meter locations and number are given in **SSC Utility RCM Analysis Manual for Natural Gas** .	Read 32 meters.	Read meters on the first work day of the month. Record date, time, location, and reading.
5.4.3.5.2.3	Inspect and Operate In-Ground Valves	Inspect and operate in-ground valves to ensure valves operate properly. Develop and implement a schedule that provides for the location and manual operation of each underground natural gas valve to ensure it operates properly. Lubricate valves as needed to ensure proper operation. Log any discrepancies found during the inspections in the natural gas distribution system log. Identify any valves requiring new identification markers.	See **SSC Utility RCM Analysis Manual for Natural Gas for location of valves** . (Approximately 66 valves)	Accomplish valve inspection annually. Note discrepancies in log daily.

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5.4.3.5.2.4	Inspect Distribution System for Leaks	Develop and Implement a schedule that provides for the Inspection of the Natural Gas Distribution System for leaks. Log any leaks found during the inspections in the daily operations log and initiate work orders for repairs. Immediately safeguard and mitigate conditions posing imminent danger to life, health, or property.	78,000 linear feet of pipe. See **SSC Utility RCM Manual for Natural Gas System** .	Accomplish valve inspection annually. Note discrepancies in log daily.
5.4.3.5.3	Recurring Work			
5.4.3.5.3.1	Provide Operational Support for Gas Curtailment	Provide operations support necessary to implement the **SSC Natural Gas Curtailment Plan** when notified by the government of a natural gas curtailment.	Historically, 2 curtailments since 1990.	Follow Plan and take actions necessary to ensure the safety of personnel and protection of government owned facilities and equipment, while keeping gas consumption below the Maximum Daily Quantity specified in the Plan.
5.4.3.5.3.2	Identify Above Ground Markers	The Natural Gas underground piping required above ground markers per **SSC standard 80-005** . During routine operations, identify missing and/or badly damaged/deteriorated markers.	Approximately 350 markers & 78,000 linear feet of pipe. See **SSC Utility RCM Manual for Natural Gas** .	Initiate work order for repair within 7 days of discovery.
5.4.3.5.3.3	Update/Develop/Maintain Natural Gas System SOP's (DR 5-GA09)	SOP's shall be maintained and updated as required (See DR 5-GA09)	Annual revision or whenever configuration changes. Quantity is contractor determined	Develop or revise and obtain CO review within 90 days of contract start.
5.4.3.6	Operate Fuel Systems	Operate the fuel storage tanks, fuel tanks, pumps, and ancillary components to provide for adequate fuel supplies and safe loading and unloading, of fuel. Receive vendor	Described below	Described below

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		<p>delivery vehicles within 30 minutes of arrival and remain with delivery vehicle at all times while unloading. Measure tank levels before and after loading. Monitor for leaks and spills, and report any to the CO.</p> <p>Fuel shall be procured in accordance with Annex 9.3.</p>		
5.4.3.6.1	Manage and Operate Diesel Fuel System	<p>The diesel fuel storage tanks (two 25,000 gal. Tanks) are located at Building 2105. Diesel fuel is received here and dispersed to the equipment and fuel tanks described by the Workload Data. Additionally, the Contractor shall provide diesel fuel to resident agencies on an SWR.</p> <p>Sample the diesel fuel in the two 25,000 gallon storage tanks semi-annually, and treat as required with MIL-S-5302/A approved conditioners to meet the fuel quality standards of Federal Specification VV-F-8000.</p>		<p>Storage Tanks Building 2105: Maintain 90% or above level during hurricane season June 2 thru December 1, maintain 75% or above level the rest of the year.</p> <p>Fuel Tanks: Provide fuel to generator tanks to achieve availability at all times. No instance of generator unavailability because of fuel supply.</p> <p>Tugboat Tank: Provide fuel as required by mission. No instance of unavailability because of lack of fuel.</p> <p>Equipment: Provide fuel for all IAGP (including portable generators) equipment used by the Contractor.</p> <p>Operate all diesel fuel</p>

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				systems to provide the availability requirements of Annex 5.5.
5.4.3.6.2	Operate Propane Fuel System	The propane fuel system provides fuel for heating in areas not serviced with natural gas. Propane shall be procured in accordance with Annex 9.3. The Contractor shall operate the system to provide adequate supplies to the tanks given in the Workload Data. Normally these tanks are filled by vendor delivery vehicles at the tank location. There is one supply propane tank located at Building 2105. It is used to fill the propane tank on the food service truck. The Contractor shall provide propane to resident agencies on an SWR.	<p>Supply Propane Tank: 1-1,000 gal. Tank at Building 2105</p> <p>Food Service Truck:1-500 gal. Tank</p> <p>Propane Tanks: 1-500 gal. Tank and 1-1,000 gal. Tank at Building 2423 1-500 gal. Tank and 1-1,000 gal. Tank at Building 2421 2-150 gal. Tank at Building 2110 1-1,000 gal. Tank at Building 2402</p>	<p>Supply Propane Tank Building 2105: Maintain 50% or above level.</p> <p>Food Service Truck: Fill as required to maintain availability.</p> <p>Propane Tanks: Fill as required to maintain availability.</p>
5.4.3.6.3	Operate Gasoline Fuel System	The gasoline fuel storage tanks, 24,000 gal. Capacity, are located at Building 2201. Gasoline is received here and dispersed to resident agencies and for Contractor use. Gasoline for resident agencies is provided on an SWR	24,000 gal capacity underground storage tanks at Building 2201	Fill as required to maintain availability. Maintain at or above 20% capacity.
5.4.3.6.4	Document and Report Fuel System Operations	See Line Items 5.4.3.4.2 Thru 5.4.3.4.2.	Nothing Additional	See 5.4.3.4.2
5.4.4	Building Structures			

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5.4.4.1	Operate Electrical Systems			Operate to maintain availability
5.4.4.1.1	Switch Boards & Panel Boards	Ensure the Switchboards and Panelboards are securely fastened during operation.	1257 Switchboards and Panelboards	See 5.4.4.1
5.4.4.1.2	Motor Control Center	Motor Control Center consists of starter module circuit breakers, control transformers, wiring, relays and other devices.	94 Motor Control Centers	See 5.4.4.1
5.4.4.1.3	Lighting Systems	Lighting Systems consists of receptacles, switchplates, bulbs, lamps, lenses, reflectors and luminaries.	112 Systems	See 5.4.4.1
5.4.4.1.4	UPS	Uninterruptible Power Supply (UPS) are 45 Kva and above.	70 UPS Systems	See 5.4.4.1
5.4.4.1.5	Generators	Generators shall operate as originally intended if components are replaced with like components.	11 Generators	See 5.4.4.1
5.4.4.1.6	Cathodic Protection Systems	Cathodic Protection System consists of active & passive systems with rectifiers.	1 Cathodic Protection System and 11 recifiers	See 5.4.4.1
5.4.4.1.7	Lightning Protection Systems	Lightning Protection System consists of ground conductors, air terminals, and ground rods.	237 Systems	See 5.4.4.1
5.4.4.1.8	Dry Type Transformers	Dry Type Transformers are 45 Kva and above	162 Dry Type Transformers	See 5.4.4.1
5.4.4.2	HVAC and Refrigeration Equipment and Systems			
5.4.4.2.1	Operations Information, Equipment/Systems	HVAC and Refrigeration Equipment and Systems consist of equipment identified in the Equipment Database (available in the TRL). These equipment items and		

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Information, NASA Refrigerant Stock		<p>systems include all peripheral and support equipment, parts, and components such as pumps, motors, actuators, valves, piping, expansion tanks, controls, instrumentation and other components necessary to provide a complete and operational system. See Table 5.1-1 for a description of the system, components and output.</p> <p>NASA currently owns a stock of refrigerants (Inventory Listing is available at TRL). The Government will not replenish this stock of refrigerant. The Contractor may use NASA owned refrigerant to replace refrigerant loss due to leakage, subject to the following restrictions. This refrigerant shall:</p> <ol style="list-style-type: none"> 1.) Only be used to charge equipment which has been numbered and entered into the MAXIMO Database. The refrigerant capacity for the equipment item must also be in the MAXIMO Database. 2.) Only be used to replace refrigerant up to 15% of an equipment's total refrigerant capacity (lbs of refrigerant) within a 12 month period of time. 3.) Not be used to charge newly installed, retrofitted or refurbished equipment. 4.) Only be used to replace refrigerant in equipment which has been repaired and leak checked. 		
Information, Quality Control of Refrigerant.		<p>The Contractor may reuse refrigerants recovered at SSC, by the Contractor. The Contractor shall be responsible for insuring that reused refrigerants are free of contaminants prior to reuse. As a minimum, where recovered refrigerant is to be used in equipment from which it was not recovered, the Contractor shall filter the refrigerant and test for proper temperature/pressure relationships, moisture content and acid.</p>		

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5.4.4.2.1.1	Operate HVAC and Refrigeration Equipment and Systems.	<p>The Contractor shall operate HVAC and Refrigeration Equipment and Systems. The Contractor shall operate, inspect and monitor equipment/systems as required to optimize equipment life cycle costs, to meet output requirements (see Tables 5.1-1), or to achieve the Availability requirements (See Annex 5.5) during operational hours (See the Building Operating Hours Summary).</p> <p>Equipment shall be operated as intended/designed, and in the most energy efficient manner, while meeting availability requirements (e.g., EMCS controlled equipment shall normally be cycled off during unoccupied and non-operational periods, heating boilers shall be shut-down during the cooling season, economizer cycles shall be used, optimum start/stop programs shall be used, etc.). During periods in which the EMCS controls fail, equipment shall be manually started and stopped at times normally started/stopped by the EMCS.</p>	2037 Units	Monitor/Operate equipment as needed to meet availability requirements and to optimize equipment life cycle costs.
5.4.4.2.1.2	Operate Automated Chemical Injection/Treatment Systems for open loop cooling tower systems.	<p>The Contractor shall operate Chemical Injection/Treatment Systems to prevent excessive water usage, corrosion, algae buildup, biological growth, mineral deposits/scale, fouling or deterioration of equipment.</p> <p>Contractor shall provide all treatment chemicals. All chemicals used shall be compatible with the sewage treatment systems in use at Stennis Space Center, shall not violate existing National Pollution Discharge Elimination System (NPDES) discharge permits. (See Annex 7 for site chemical usage and submittal requirements.)</p> <p>Contractor shall provide all materials, chemicals and supplies to perform all testing and sampling as required to properly treat and verify proper treatment. Contractor</p>	12 Units	Conductivity shall be maintained between 1,500 and 2,400 mhos. Quarterly average corrosion rates shall be maintained at or below 4.0 mils/yr. for mild steel and 0.2 mils/yr. for copper (Coupon tests examined quarterly, minimum). Biological Count of heterotrophic bacteria shall be maintained below 10,000 organisms per ml (Test 1 time each 30 days,

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		<p>shall meet the following minimum sampling and testing requirements:</p> <ol style="list-style-type: none"> 1.) Quarterly - Coupon tests for mild steel and copper corrosion rates. 2.) Monthly - Biological Count of heterotrophic bacteria. 3.) Weekly – Visual inspection for algae growth. 4.) Weekly – Tackle inspection for bacteria. 5.) Weekly – Record Conductivity. 		<p>minimum). No visible signs of Algae growth shall exist (Treatment within 24 hours of appearance of visible signs).</p>
5.4.4.2.1.3	Provide chemical treatment of closed loop chilled water and hot water heating systems.	<p>The Contractor shall chemically treat closed loop systems to prevent excessive corrosion, build-up of deposits, or deterioration of piping/equipment. Contractor shall provide all treatment chemicals. All chemicals shall be compatible with the sewage treatment systems in use at Stennis Space Center, shall not violate existing NPDES discharge permits. (See Annex 7 for site chemical usage and submittal requirements).</p> <p>Contractor shall provide all materials, chemicals and supplies to perform all testing and sampling as required to properly treat and verify proper treatment. Contractor shall perform sampling of nitrite (as NO₂) concentrations quarterly (minimum).</p>	Contractor Determined	<p>Treatment level shall be maintained between 360 (minimum) and 1500 (maximum) ppm of nitrite as NO₂, continuously. Quarterly average corrosion rates shall be maintained below 3.0 mils/yr. for mild steel, and 0.2 mils/yr. for copper.</p>
5.4.4.2.1.4	Manage and record NASA owned refrigerant stock/inventory.	<p>Manage the refrigerant stock to prevent pilferage, loss, or contamination of refrigerant. Maintain an inventory of the stock. The Contractor shall be responsible for replacement of contaminated or lost refrigerant, or refrigerant which can not be accounted for through refrigerant use records (Refrigerant use records are covered under Annex 5.4.4.2.1.5 and 5.4.4.2.1.6).</p>	1 ea record	<p>Maintain refrigerant in proper containers and in a secure area(s). Maintain current and accurate records of refrigerant inventory, including locations and bottle numbers. Records shall be maintained for 3 years and shall be available for Government review upon request.</p>

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5.4.4.2.1.5	Maintain use Records for Refrigerant from NASA Stock.	The Contractor shall maintain records for all refrigerant used from the NASA stock. These records shall provide an audit trail down to the date, type and weight of refrigerant added, and the MAXIMO Database equipment item number. Records shall clearly differentiate between NASA stock refrigerant and other refrigerant sources (Also see Annex 5.4.4.2.1.6 for additional records requirements).	1 ea record	Maintain records current and accurate and available for Government review upon request.
5.4.4.2.1.6	Maintain Refrigerant Records for Refrigerant Use and Equipment Leakage Rates.	The Contractor shall maintain records of SSC refrigerant use and equipment leakage rates in accordance with EPA regulations and requirements. Note, some record requirements for NASA owned refrigerants (see Annex 5.4.4.2.1.5) may not match EPA regulations; where this is the case, the more stringent requirement shall apply	1 ea record file or database	Maintain records current and accurate and available for Government review upon request.
5.4.4.2.1.7	Manage Refrigerant Leakage Rates and Develop Repair Plans	Develop Repair Plans and maintain records in accordance with EPA regulations. The contractor shall act on behalf of and in accordance with both "Service Organization" and "Owner" requirements established in the EPA regulations, for ensuring that leaks are repaired within EPA time constraints. (Repair costs and requirements are covered under Annex 5.3)	1 Plan	Maintain records current and accurate, and available for Government review upon request. Notify the Government of potential conflicts/problems (e.g., non-funded repairs). Notification shall be provided within 10 work days of discovery.
5.4.4.2.1.8	Disposal of Contaminated Refrigerant.	The Contractor shall be responsible for disposal of contaminated refrigerants generated by PM, CM or Operations (Annexes 5.2, 5.3 and 5.4). This includes handling, storage and disposal.	Contractor Determined	Compliance with EPA regulations.

Note: This annex is **not** intended to cover the costs for the recovery of refrigerant. The recovery of refrigerant will be evaluated by the Government as part of a PM, CM, or

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		other activity (e.g., Removal of refrigerant from a demolished air conditioner, prior to a repair/replacement, shall be part of the CM).		
5.4.4.2.1.9	Provide HVAC/Refrigeration Technician for support of Programmatic or Scheduled Operations during normal working hours.	<p>Technician shall be located within the area of assignment (e.g., Test Complex) beginning 30 minutes prior to the scheduled test firing (or other scheduled activity). The Government will provide approximately 2 hr notification prior to start of test, but no less than 1 hr notification. Technicians shall check in with Program Operators (e.g. Test Area Operators), upon arrival at the site, for briefing and specific instruction. Minimum requirements include logging of chiller and boiler parameters prior to tests (See 5.4.4.2.2.1 and 5.4.4.2.2.3), check-in with EMCS for alarming or equipment problems, investigate areas of concern as instructed by Program Operators, and report potential problems/concerns to the EMCS and to Program Operators, mitigate and repair (as approved by Program Operator) to prevent interruption of programmatic activities.</p> <p>Technician shall be equipped with transportation, tools and supplies which shall include a vehicle, ladders, hand tools, multimeter, temperature and humidity measuring devices, refrigerant gauges, air flow and differential pressure measuring devices and other tools as necessary to troubleshoot HVAC and Refrigeration systems.</p> <p>Historically, duration for each support activity is approximately 3 hrs.</p>	180 hours annually.	No instances of failure to respond.
5.4.4.2.1.10	Provide HVAC/Refrigeration Technician for support of Programmatic or Scheduled Operations during non-working hours.	<p>Technician shall be located within the area of assignment (e.g., Test Complex) beginning 30 minutes prior to the scheduled test firing (or other scheduled activity). The Government will provide approximately 3 hr notification prior to start of test, but no less than 2 hr notification. Technicians shall check in with Program Operators (e.g.</p>	30 hours of support annually.	No instances of failure to respond.

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		<p>Test Area Operators), upon arrival at the site, for briefing and specific instruction. Minimum requirements include logging of chiller and boiler parameters prior to tests (See 5.4.4.2.2.1 and 5.4.4.2.2.3), check-in with EMCS for alarming or equipment problems, investigate areas of concern as instructed by Program Operators, and report potential problems/concerns to the EMCS and to Program Operators, mitigate and repair (as approved by Program Operator) to prevent interruption of programmatic activities.</p> <p>Technician shall be equipped with transportation, tools and supplies which shall include a vehicle, ladders, hand tools, multimeter, temperature and humidity measuring devices, refrigerant gauges, air flow and differential pressure measuring devices and other tools as necessary to troubleshoot HVAC and Refrigeration systems.</p> <p>Historically, duration for each support activity is approximately 3 hrs.</p>		
5.4.4.2.2	Standing Work			
5.4.4.2.2.1	Maintain a Log of Centrifugal/Screw Compressor Chiller parameters, during operating periods	<p>The Contractor shall log operating parameters for Centrifugal/Screw Compressor Chillers. Logged data shall include entering/exiting water temperatures, amp readings, loading, oil pressures, oil level, refrigerant pressures, purge unit run time (where applicable), general conditions and observations, date and time, logging technician, and any other pertinent data.</p> <p>Logged data shall be reviewed for evidence of equipment deterioration. Conditions threatening the reliability and safety of the equipment shall be reported for corrective action.</p> <p>Equipment shall have data logged within 8 hours of being returned to service after service/repair, change of season start-up, etc.</p>	21 Units	<p>Log Chillers Weekly.</p> <p>Log shall be accurate and current, and shall be available for Government review upon request.</p> <p>Log shall be maintained on record for 24 months.</p>

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		<p>Equipment log shall record date (within 5 work days) when equipment is removed from service for repairs, seasonal shut-down, etc.</p> <p>Each equipment reset shall be recorded in the log, including the date, time and alarm conditions. Parameters shall be logged after the equipment has been reset and has reached stable operating conditions.</p> <p>Log Chillers daily during any periods in which the EMCS Host Visibility and Alarming is not available</p>		
5.4.4.2.2.2	Maintain a Log on Chiller parameters at buildings 1110, 1200 and 1201, during operating periods.	<p>The Contractor shall log operating parameters for Chillers. Logged data shall include entering/exiting water temperatures, amp readings, loading, oil pressures, oil level, refrigerant pressures, general conditions and observations, date and time, logging technician, and any other pertinent data.</p> <p>Logged data shall be reviewed for evidence of equipment deterioration. Conditions threatening the reliability and safety of the equipment shall be reported for corrective action.</p> <p>Equipment shall have data logged within 8 hours of being returned to service after service/repair, change of season start-up, etc.</p> <p>Equipment log shall record date (within 5 workdays) when equipment is removed from service for repairs, seasonal shutdown, etc.</p> <p>Each Equipment reset shall be recorded in the log, including the date, time and alarm conditions. Parameters shall be logged after the equipment has been reset and has reached stable operating conditions.</p> <p>Log Chillers daily during any periods in which the EMCS Host Visibility and Alarming is not available.</p>	4 Units	<p>Log Chillers weekly.</p> <p>Log shall be accurate and current, and shall be available for Government review upon request.</p> <p>Log shall be maintained on record for 24 months.</p>
5.4.4.2.2.3	Maintain a Log on Reciprocating Compressor Chiller parameters, during operating periods.	<p>The Contractor shall log operating parameters for Chillers. Logged data shall include entering/exiting water temperatures, amp readings, loading, oil pressures, oil</p>	21 Units	<p>Log chillers monthly.</p> <p>Log shall be accurate and</p>

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		<p>level, refrigerant pressures, general conditions and observations, date and time, logging technician, and any other pertinent data.</p> <p>Logged data shall be reviewed for evidence of equipment deterioration. Conditions threatening the reliability and safety of the equipment shall be reported for corrective action.</p> <p>Equipment shall have data logged within 8 hours of being returned to service after service/repair, change of season start-up, etc.</p> <p>Equipment log shall record date (within 5 workdays) when equipment is removed from service for repairs, seasonal shutdown, etc.</p> <p>Each Equipment reset shall be recorded in the log, including the date, time and alarm conditions. Parameters shall be logged after the equipment has been reset and has reached stable operating conditions</p>		<p>current, and shall be available for Government review upon request.</p> <p>Log shall be maintained on record for 24 months.</p>
5.4.4.2.2.4	Maintain a Log on gas-fired boilers, during operating periods.	<p>The Contractor shall log operating parameters for gas-fired boilers. Logged data shall include entering/exiting water temperatures, stack temperatures, flame color, general conditions and observations, date and time, logging technician, and any other pertinent data.</p> <p>Logged data shall be reviewed for evidence of equipment deterioration. Conditions threatening the reliability and safety of the equipment shall be reported for corrective action.</p> <p>Equipment shall have data logged within 8 hours of being returned to service after change of season start-up, service, repairs, etc.</p> <p>Equipment log shall record date (within 5 workdays) when equipment is removed from service for repairs, seasonal shutdown, etc.</p> <p>Each Equipment reset shall be recorded in the log, including the date, time and alarm conditions. Parameters shall be logged after the equipment has been reset and has</p>	52 Units	<p>Log Boilers Weekly.</p> <p>Log shall be accurate and current, and shall be available for Government review upon request.</p> <p>Log shall be maintained on record for 24 months.</p>

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		reached stable operating conditions. Log Boilers daily during any periods in which the EMCS Host Visibility and Alarming is not available.		
5.4.4.2.2.5	Provide Quarterly Water Treatment Reports (DR 5-GA06)	The Report shall provide a quarterly report for each treated HVAC water system (e.g., cooling towers, chilled water and hot water loops). The report shall provide results of all sampling and tests, including chemical concentrations of corrosion inhibitors, biocides, algaecides, or other treatment chemicals, monthly average corrosion rates (for all open systems), along with any recommendations or conclusions. (See DR 5-GA06)	59 ea closed systems, 12 ea open systems	Conformance with DR. Report shall be maintained on record for 12 months (minimum), and available for Government review upon request.
5.4.4.2.2.6	Provide Annual NASA Refrigerant Inventory Report (DR 5-GA07)	The Report shall provide a listing by refrigerant type of the NASA owned Refrigerant Stock, for the Fiscal Year. The information shall include: 1.) Quantities at start of Fiscal Year. 2.) Quantities at the end of Fiscal Year. 3.) Refrigerant quantities, types and storage bottle numbers. (See DR 5-GA07)	1 Report	Conformance with DR. Report shall be maintained on record for 36 months (minimum), and available for Government review upon request.
5.4.4.2.3	Recurring Work			
5.4.4.2.3.1	Develop/Maintain HVAC and Refrigeration System Operation Manuals and SOPs (See DR 5-GA09)	Documentation shall be updated and maintained as required for the operation and maintenance of the HVAC and Refrigeration Systems. (See DR 5-GA09)	One annual revision.	
5.4.4.2.3.2	Support Freeze Plan	Monitor ambient temperatures and provide operations support as required in the SSC Freeze Plan (portion of DR1-GA03, Emergency Preparedness Plan of the **SSC Disaster Preparedness Plan**) to implement the plan, and to monitor and inspect equipment as needed to preclude freeze damage.	2 occurrences per year.	No instances of non-compliance with freeze plan.
5.4.4.3	Operate all Plumbing	The Contractor shall operate all plumbing systems	Specified structures	Achieve the availability

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		(potable water, sanitary sewage, natural,....) so that they meet the availability requirements and operational hours as designated in Annex 5.5 and the Operating Hours Summary, (**EMCS Operating Procedures**, available at the TRL).	and facilities are identified in Section Exhibit 8.	requirements given in Annex 5.5, Table 5.5-2, and operational hours as designated in the Operating Hours Summary (**EMCS Operating Procedure**, available at the TRL).
5.4.4.4	Operate Elevators	The routine and periodic inspections/tests for elevators are accomplished by Annex 5.2 Item Number 5.2.2.2.8.1.2. The Contractor shall accomplish any additional operations required to achieve the availability requirements and operational hours as designated in Annex 5.5 and the Operating Hours Summary (**EMCS Operating Procedures**, available at the TRL).	Contractor Determined See the Inventory of Vertical Transportation List in Exhibit 5.	Achieve the availability requirements given in Annex 5.5, Table 5.5-2, and operational hours as designated in the Operating Hours Summary (**EMCS Operating Procedure**, available at the TRL).
5.4.4.5	Operate Built-In Cranes, Monorails, and Hoists	Provide operation of the Built-In Cranes, Monorails, and Hoists where the Contractor is listed as the responsible operator in the Inventory of Built-In Cranes, Monorails and Hoists (Exhibit 1). Operations shall be in accordance with **NSS/G0-1740.9 latest edition** .	See Exhibit 1, Inventory of Built-In Cranes Monorails, and Hoists. The Contractor only responsible for providing operations where the Inventory List shows the Contractor as the responsible operators.	Provide operations in accordance with **NSS/G0-1740.9**
5.4.4.6	Operate Fire Protection & Alarm Detection Systems			Operate to achieve availability (Table 5.5-1)
5.4.4.6.1	Fire Protection & Alarm Systems	Consists of alarm panels.	91 Alarm Panels	See 5.4.4.6

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5.4.4.6.2	Facility RF Transceivers	Part of the Fire Alarm System	89 RF Transceivers	See 5.4.4.6
5.4.4.6.3	Sprinkler & Supression Systems	Systems consist of Sprinklers, foam, dry chemical and gas (CO ₂ and Halon), including piping, valves, tanks, pumps, gauges and associated equipment.	100 Sprinkler and 4 Suppression Systems	See 5.4.4.6
5.4.4.6.4	Fire Hydrants	Fire Hydrants include Post Indicator Valves.	139 Fire Hydrants and 16 Post Indicator Valves	See 5.4.4.6
5.4.5	Marine Operations	<p>Marine Operations includes operation and operator maintenance of the Tugboat Clermont II, 3 work barges, navigation lock, bascule bridge, docks, navigational aids, mooring devices, monitoring and level control of the canal system, signage and the procurement and storage of marine materials and supplies required for day to day marine operations at SSC and when off –site. The canal waterway system consists of approximately 6 miles of canals. The level of the water in the canals is regulated by pumping water from the Pearl River system into the canal system through the use of 4 vertical pumps located at the West End of the lock. Operation of the pumps is required during extended periods of dry weather and when there is a lockage. The high water level of the canal system is controlled automatically by flow over a spillway.</p> <p>The tugboat Clermont II is used primarily to transport propellant barges from the loading docks on Propellant Boulevard to the test stands which is a trip of from 1 hour to the B-Test Stand to 45 minutes to the A-1 and A-2 Test stands. The tug is also utilized to transport NASA owned barges to and from the Michoud facility in New Orleans, LA before and after hurricane season. Resident agencies are provided tugboat service on a time available basis. The current method of propellant delivery is to load liquid oxygen and liquid hydrogen into their respective barges at</p>		See 5.4.4.6

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the loading facilities on Propellant Boulevard and deliver them to the respective test stands. (Although the capability exists to transit to Air Products and Chemical Corp. in New Orleans, LA to pick up barge loads of liquid hydrogen, this method of delivery is not presently utilized.)

The lock is filled from the canal system through the use of “tainer valves” which are opened to fill the lock to the level of the canal system by gravity feed. The tainer valves can also be utilized to minimize spillway flow during periods of high rainfall. Tainer valves are also utilized to drain water from the lock into the Pearl River system so that the level of the lock matches that of the river system. The upper and lower gates of the lock are operated by hydraulic rams. The hydraulic pressure is furnished by electric/hydraulic pumps located in the lock equipment building. There is a separate lock control building for the upper and for the lower gates. During hurricane warning periods, commercial and privately owned boats are allowed into the lock for protection against the storm on a first come/first serve basis.

The Bascule Bridge is a twin span, 4-lane bridge, which is operated automatically by programmable logic controller. Manual operation is possible from the control building by trained and certified operators. The bridge has two variable speed electric motor/gear drives on each span. The bridge can be operated with one motor. The second motors are installed in each bridge span for redundant capability.

The waterway system is an extensive series of natural and dredged canals, which connect the three major test stands, the propellant area on Propellant Blvd, and the Engine Assembly Complex including B-3202 and the Data Buoy

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		<p>facility. The waterway system extends all the way to the Pearl River and includes docks, navigational aids and structures below the lock. There are pilings and other structures in the waterway system to aid in the safe maneuvering of the tug and barges. The waterway system includes all docks, pilings, timbers, bollards, navigational aids, dolphins, spillway and surface water of the canal system. The canal system average depth is 9 feet and is dredged periodically.</p> <p>All portions of the above are “mission critical” and require a high degree of availability and reliability (See Annex 5.5)</p>		
5.4.5.1	Provide Marine Operations Plan (DR 5-GA11)	Prepare a Marine Operations Plan for all facilities and equipment covered under this Annex. The Plan shall provide details as to how the Contractor intends to perform work necessary to meet all requirements for Marine Operations under this annex, including operations required to meet Availability as defined in Annex 5.5. This plan shall also address how the Contractor intends to meet personnel requirements, including certifications, training and special requirements to meet Coast Guard Regulations. Where operations require specific skills and/or certifications, the Contractor shall submit planned methods for addressing attrition and other contingency planning.	One Plan	Plan shall be submitted for CO concurrence within 60 days of contract award.
5.4.5.2	Support the Tornado & Severe Weather Plan	Monitor weather conditions and provide operations support as required in the **Tornado and Severe Weather Plan (Annex A of the Disaster Preparedness Plan MA-05)** to implement the Plan. This is an annual plan required by DR 1-GA03	Anticipate 4 occurrences per year	No instance of non-support
5.4.5.3	Recurring Work			
5.4.5.3.1	Operate Lock Control Equipment and	Operate and provide operator maintenance of the lock	30 times/yr	The lock shall be able to

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	Controls	hydraulic system including: pumps, motors, oil system, gate rams and entire piping and tubing systems as part of this hydraulic power system. Operation includes calibration and operation of controls, electrical and electronic devices and all devices associated with safe operation of the lock and lock control equipment.	(The lock control equipment shall be exercised no less frequently than once each month. Normal operation can be counted as part of this monthly minimum.)	perform its intended function within 2 hours of a request to operate it. The request may come from the Government, other contractors, or resident agencies.
5.4.5.3.2	Operate Navigation Lock	Operation of this facility shall include all events of opening and closing the lock, adjusting and maintaining the water level, operation of controls, operation of tainter valves and assisting in mooring boats and barges into and out of the lock. There is a special requirement to lubricate the pintal bearings of the lock gates every 30 days. This operation must be performed with the gates in motion to aid grease flow to the bearings. (Failure to perform this function will result in seizing of the bearings.) Operators shall be trained and certified in accordance with Annex 5.4.2.7 to operate this critical equipment. There will be a minimum of 30 lockages per year with approximately 5 of these occurring after hours. It is normal to have 24 hours notice prior to a lockage; however, the Contractor shall be able to support 3 lockages per year within 1-hour notice. Operator maintenance of the lock shall include maintenance of marine safety devices, lock mooring devices, and replenishment of operating fluids.	30 times/yr including maintenance and resident agency use.	The navigation lock shall be able to be operated (lock filled, water level adjusted to river level or canal level, and the gates operated within 2 hours of notification to operate.)
5.4.5.3.3	Operate Bascule Bridge	Operate the bascule bridge on request. Operators shall be trained and certified to operate this critical system. The bridge is of the bascule type and has North and South spans that are operated by electric motors which are assisted by counterweighing. The bridge controls are automatic through a programmable logic controller (PLC); however, the operators must be trained and certified to be	48 openings/yr	The bridge shall be able to be opened (at least one span) within 2 hours of notification.

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		<p>able to operate the bridge in “manual” as well as “automatic” mode. The bridge is operated on demand for various test programs and resident agencies. It is normal practice to operate the bridge on demand except for the hours 6:30 am to 8:30 am and from 3:30 p.m. to 5:00 p.m. During these peak automobile traffic hours, auto traffic is given preference unless there is a critical programmatic requirement. The NASA Program Office for the test program affected or the Director of Center Operations and Support Directorate or the Director of the Propulsion Test Directorate will determine programmatic need. The bridge may be required to be opened up to 48 times per year of which 4 of these openings may be after hours. This includes requirements for maintenance.</p>		
5.4.5.3.4	Operate Tugboat Clermont II	<p>The Contractor shall assume complete operational control and authority for the NASA tugboat. The Contractor shall have a licensed Captain and boat driver(s) to perform work requirements on an as needed basis. The Captain shall assume full and unrestricted control of operational decisions, scheduling in support of test programs and other requirements and be responsible to assure that the tug is maintained in accordance with Coast Guard regulations and standards for a marine vessel of this type and size. The tugboat shall be available to support the requirements of test programs and/or resident Agencies on an as-needed basis. Historically, 90% of the annual requirements for barge relocations have been accomplished during the hours 5:00 am to 4:00 p.m. during normal weekdays. Approximately 10 of the anticipated 600 barge moves will be accomplished after normal working hours. Work that is started during normal working hours shall be completed even if it requires work past normal working hours. Workdays in excess of 12 hours continuous are anticipated to occur 10 times per</p>	620 movements/yr	<p>The tugboat shall be able to conduct barge movements during normal working hours with zero excursions. The Contractor shall be able to support barge movement after normal working hours with two hours advanced notice with zero excursions allowed. In the event that the NASA tug cannot support barge movements due to mechanical malfunction or other unexpected event, the Contractor shall be able to supply alternate means to move barges within 48 hours of the time that the</p>

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5.4.5.3.4.1	Operate Tugboat and other marine facilities to assist resident agencies and other contractors	<p>year. Sufficient trained and certified personnel must be available to support 24 hr/day operations for periods up to 4 consecutive days. This extended work period may occur up to 4 times per year. If the hydrogen transfer facility on Propellant Blvd. is unable to transfer hydrogen to the barges for any reason, it is anticipated that barges will be pushed to Air Products and Chemical Corp. in New Orleans, LA, filled there and returned to SSC fully loaded. This round trip takes 15 to 20 hours and usually requires the marine crew to stay on the tugboat over night at Air Products. Night transits through the waterway system are discouraged due to safety considerations. It is likely that during good weather, two hydrogen barges can be pushed to Air Products at one time. This requires prior approval of the NASA Project Office or the CO. In addition to movement of the 3 liquid hydrogen and 6 liquid oxygen barges, the tug will be used to relocate the 3 work barges to be used for maintenance of the canal system. The tug will also be required to relocate barges from Michoud to SSC on demand and to assist other resident agencies at SSC.</p> <p>It is normal practice to assist resident agencies in the movement of material within the SSC waterway system and to and from Michoud. This is infrequent and is accomplished on a “time available” basis. On rare occasions the Contractor may be required to assist other contractors with movement of material on the waterway system when such movement would be considered in the best interest of the Government. This work will be on a time available basis. On an infrequent basis, the marine personnel are requested to act as pilots for boats transiting the Pearl River and SSC water systems. They are not to serve as licensed pilots, only as advisors.</p>	Contractor Determined	tug is determined to be unavailable for service.

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5.4.5.4	Standing Work			
5.4.5.4.1	Operate Lock Pumping Station	The Contractor shall operate the 4 vertical, electrically driven pumps to maintain the canal level above the lock between 16 feet 4 inches to 16 feet 6 inches, as measured at the gauge on the canal lock wall upstream of the upper gates. The canal level shall not be allowed to fall below 16 feet 0 inches because the cryogenic barges have a very limited ability to rise and fall with canal level changes. During periods of high rainfall, it shall be normal practice to open the tainer valve system in order to limit flooding below the spillway. The high level of water in the canal system is controlled by the spillway system. The pumps, once started, can operate unattended as long as the level of the canal is carefully observed and kept within the limits above. This building shall not be used for storage of supplies or materials of any kind with the exception of material needed on a daily basis to operate the pumps.	Operate and provide operator maintenance on the pumping system 35 times/yr for approximately 8 hours each time. Operation of the tainer valves to control excessive rainfall (more than 6 inches of rainfall in any 24-hour period or a rainfall accumulation of 10 inches within any 3-day period) will occur 7 times per year.	There shall be zero excursions of the canal system below the operating limit.
5.4.5.4.2	Operate Lock Cathodic Protection System	The cathodic protection system, which protects the lock and bridge, shall be operated in accordance with standards set in Annex 5.2.2.2.8.4.7. This system operates unattended.	Nothing additional	No outages exceeding 24 hours. Maintain operational settings per annex 5.2.2.2.8.4.7.
5.4.5.4.3	Maintain Logs	The Contractor shall maintain a log at each location of the Bascule Bridge, and Lock. These logs shall provide historical information of openings, closings, maintenance activities performed with dates and times for all information.	2 logs	Logs shall be legible, contain all operational and maintenance data and have entries up to date.
5.4.5.4.4	Maintain Log	The Contractor shall maintain a log on the bridge of the Tugboat Clermont II which provides dates and times of all	1 log	Log shall be legible and complete in every detail of

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		maintenance activities, operational data, names of personnel doing work or operations and initialed by the Captain as being performed in accordance with regulations and other pertinent data. This log shall also show consumables usage, fueling records and any equipment, which is malfunctioning.		operation
5.4.5.4.5	Submit Fuel Usage Report	The Contractor shall submit on a monthly basis a consumable usage report, which provides the amount of fuel used during the month. (See Dr 5-GA18)	Monthly	Report shall be submitted to the NASA CO before the 5 th working day after the end of each fiscal month. See DR 5-GA18
5.4.6	Solid Waste Management			
5.4.6.1	Refuse Collection – Standing Work			
5.4.6.1.1	Schedule Update Report, DR 5-GA12	Develop, submit, and maintain monthly schedule updates to verify compliance with Refuse Pickup Schedule.	Monthly	Nothing additional.
5.4.6.1.2	Collect Refuse from Non-bulk Containers	The Contractor shall pick up solid waste containers at locations and frequencies listed in the Refuse Pickup Schedule (See Exhibit 9) and deliver to a permitted landfill. The Contractor shall visually inspect all containers before pick up to ensure there are no materials or components in the containers that are not on the refuse WIS. If unauthorized dumping is detected, report immediately to the SSC Environmental Officer. Collect refuse spilled from under and within 10 feet of containers and refuse spilled from collection vehicles.	5,500 containers emptied annually	Empty containers during core hours. Return empty trashcans and lids to original position and location.
5.4.6.1.3	Pick Up Refuse from Containers Handled Mechanically for Disposal	Containers holding 2 to 10 cubic yards are normally handled mechanically. A detailed listing of locations will be provided upon contract award. Provide an appropriate size container at the specific locations and establish a	11,800 containers emptied annually, with approximately 30 tons of waste	Empty containers as necessary to ensure that they do not exceed 90% capacity, develop

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		frequency of collection. Collect refuse spilled from, under, and within 10 feet of containers and refuse spilled from collection vehicles and deliver to a permitted landfill. Return containers to their original locations and ensure services are accomplished within the frequency of service parameters specified. NOTE: Quantities in individual containers will vary seasonally, and on occasion, special events/ circumstances (e.g., cardboard from deliveries, office moves, etc.) may inadvertently fill container before the anticipated collection date.	weekly transported to the landfill	obnoxious odors but not less than monthly.
5.4.6.1.4	Pick Up Cardboard from Container Areas	The Contractor shall pick up cardboard from containers at Buildings 1100 (two locations), 2101, 1000, 2204, 1105, 2104/2105, 2201, 2205, 3202, 1005, and 8100. In addition, the Contractor shall collect cardboard from all other refuse collection points where quantities of cardboard are occasionally generated but do not warrant the installation of a container. Administration of cardboard recycling program is in Annex 7.0.	12 locations with cardboard containers 36 to 48 tons of cardboard each year	Empty containers as necessary to ensure they do not exceed 90% capacity, but not less than monthly.
5.4.6.2	Landfill Operations – Standing Work			
5.4.6.2.1	Class A Landfill and Class II Rubbish Landfill Operations	Operate in accordance with Landfill Operations Manual, Permit No. SW02401B0376, and the MDEQ **Non-hazardous Waste Management Regulations** .	Daily	Meet all requirements of Landfill Operations Manual, Permit No. SW02401B0376 and MDEQ Nonhazardous Waste Regulations.
5.4.6.2.2	Cardboard and Drum Compression	Compress all cardboard collected in 5.4.6.1.4, store and arrange for sale and/or recycling. Compress all previously rinsed drums in the drum crusher and place in the metal recycling program administered by requirements of Annex 7 and 9.	3 to 4 tons of cardboard per month; 100 drums on average per month	Less than 20% cardboard in debris/ garbage disposed of in landfills. No drums in landfill except for unsalvageable crushed drums upon approval of SSC Environmental

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				Officer.
5.4.6.2.3	Solid Waste Disposal Report, DR 5-GA13	Provide report per DR 5-GA13.	Monthly	Compliance with DR
5.4.7	Maintenance Engineering			
5.4.7.1	Personnel Qualifications, Roof Maintenance	Due to the criticality of the roofing systems, it is imperative that personnel assigned as craftsman and inspectors for roof maintenance be thoroughly familiar with repair procedures of the various systems. All inspectors and technicians, assigned to these positions must meet the Roofing Industry's Educational Institute Requirements for Roofer ID (3 years of specialized experience in repair and maintenance of the roofing system being repaired and inspected.)	Contractor determined	Submit qualifications within first 60 days of contract start for inspectors and technicians.
5.4.7.2	Provide Maintenance Engineering Support	At a minimum, Maintenance Engineers shall provide the following: <ul style="list-style-type: none"> a. Maintenance planning, both long and short term, based on experience and expert knowledge of SSC facilities and systems. b. Required inspections. c. The gathering of information for correct evaluation of problems. d. The determination of cause and the proper repair of correction of operation. e. The mathematical design, with sketches or drawings, as required. f. The specifying of requirements, or method of operation, and selection of proper materials. g. The investigation of and reporting of unplanned utility system, and equipment outages or failures. h. Respond to requests from the Government for information regarding SFUSS condition and proposed 	Contractor determined	

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		solutions for failed equipment and systems		
5.4.7.3	Reserved			
5.4.7.4	Reserved			
5.4.7.5	Implement, manage and operate the existing Computerized Maintenance Management System (CMMS).	The CMMS software, workstation licenses, and maintenance history are Government owned and will be made available to the Contractor for the duration of the contract. The ADP hardware and software to support this system will be maintained by the ODIN contractor.	Contractor determined	The CMMS system shall be maintained in a manner that minimizes downtime.
5.4.7.6	Establish a work management system for receiving, scheduling, tracking, and reporting all maintenance and repair work.	The system shall provide maximum visibility (Network online access) to all generated, scheduled, in-progress, and completed maintenance and repair.	Contractor determined	Information shall be available for Government review 24 hours a day, 7 days a week. At a minimum, the information shall be updated daily, no later than 7 am each day. Receive work 24 hours a day, 7 days a week.
5.4.7.6.1	Establish a central work control center for receiving maintenance and repair work.	Publish or otherwise notify customers of the location and phone number. Establish and publish a procedure for receiving calls outside normal business hours.	Contractor determined	Numbers shall be accounted for at all times.
5.4.7.6.2	Assign a work control number to maintenance and repair work received for tracking and reporting purposes.	Each occurrence of maintenance and repair work shall be assigned a unique number distinguishable for other service performed under the terms of this contract.	Contractor determined	Input is correctly completed with 24 hours of receipt of change.
5.4.7.6.3	Input and update data required for tracking of received or identified	Include all information necessary to provide accurate network online visibility to all work. Update data	Nothing Additional	A complete audit trail shall exist for work performed

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	maintenance and repair work.	whenever a change occurs, additional data becomes available or condition changes.		on numbered equipment.
5.4.7.6.4	Track work accomplished on all numbered equipment in the CMMS database.	Includes all work covered under the terms of this contract; operation, standing work, etc. Provide accurate network online visibility.	Nothing Additional	Retag equipment that has missing or illegible tags.
5.4.7.6.5	Maintain CMMS Program identification on equipment.	Ensure equipment has a Maintenance ID tag attached. Ensure equipment has a corresponding ID in the CMMS database.	1 system Contractor determined	Place an equipment identification number on all new equipment. All documentation shall be up to date and available for review by the Government.
5.4.7.6.6	Document all software procedures that are generated by the Contractor that customizes CMMS system.	The Contractor shall include in the documentation a description of the procedure and its purpose and interfaces.	Nothing additional	Nothing additional See Exhibit 3
5.4.7.7	Maintain and operate existing, Government owned, P.T.&I. Program. (See Exhibit 3)	The Contractor shall maintain the existing software current or replace with new software if the vibration and/or thermography equipment is replaced with a different system. The systems in use at the end of the contract term shall be provided to the Government. (See Exhibit 3)	3 manyears per year	
5.4.7.8	Utilize and update the existing Government owned ROOFER software and database.	The ROOFER program, utilizing maintenance history, prioritizes roof maintenance requirements.	1 database	Complete and accurate database
5.4.7.9	Utilize and update the following system databases: Common use areas database, including condition of carpet, interior paint, ceiling tile and restroom partition and fixture condition.	These databases provide information on the condition of specific facilities and systems and maintenance planning. Information contained in these databases shall be updated to reflect current conditions a determined by the Facility Inspection Program.	3 databases	Complete and accurate database

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	Facility relamp database.			
	Exterior paint database.			
5.4.7.10	Schedules			
5.4.7.10.1	Prepare a 3 month schedule at the beginning of each month, available online	The Contractor shall prepare the 3 month schedule for all operation, recurring work, contractor generated work orders, preventive maintenance, and other SWR's. The schedule shall include the work order number, location (specific location description to permit the Government to inspect the work), start date, and end date.	12 schedules	The schedule shall be updated the first of each month.
5.4.7.10.2	Prepare a weekly schedule, available online.	The Contractor shall prepare a weekly work schedule that covers the same types and categories of work as the three month schedule specified above and shall contain the same information.	52 schedules	The schedule shall be available online by 7:00 am, Friday for the following week. The schedule shall be updated as changes occur.
5.4.7.11	Collect and report historical information on trouble calls and all maintenance work orders. DR 5-GA23	Historical cost information, that summarizes the content of the maintenance work at SSC, shall be provided no later than October 15 for the previous fiscal year. This information shall be provided for review in online reports and retained in Central Engineering Files. Tables 5.4-2 and 5.4-3 provide the format and suggests the content required for each report. The Contractor shall provide this information by October 15, each year for the previous fiscal year.	Historical: 6948 trouble calls for FY97	No instance of undocumented trouble call work
5.4.8	Operate the Installation-Accountable Government Property (IAGP)	All IAGP are to be used only to complete work under this contract. The use of Government furnished property and services for other purpose is prohibited. The contractor shall maintain all current calibrations and certifications, which might be required for this equipment.	Attachment J-10 List 1 and 2	No instance of improper operation of equipment.

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		NASA's Test Area requirements shall have the highest priority in the use of all IAGP.		
5.4.8.1	Operate the Special Purpose Mobile Equipment (SPME)	The Contractor is responsible to operate all Special Purpose Mobile Equipment in accordance with the Operator Maintenance Instruction for Special Purpose Mobile Equipment (SPME) No. OMI-FSD-001.	Exhibit 4	
		The Contractor shall also be responsible for refueling any or all of these items which are engine-driven, as necessary, to maintain this readily available condition.		
5.4.9	Provide Non-destructive Evaluation Service Capability (NDE)	NDE includes extensive capabilities in the area of inspection and evaluation services. These capabilities must be readily available and be of state-of-the-art capability. The services required include such items as the following: leak inspections by mass spectrometer, radiograph filming and interpretation, ultrasonic examination, borescope inspection, magnetic particle inspection, dye penetrate inspection, hardness determination, radiation safety and other inspection and evaluation work.		
		The work includes capability to inspect welds up to 6 inches in thickness, pressure vessel certification, failure prediction, failure evaluation, corrosion detection and evaluation, leakage rate evaluation during component testing in the shops and in the field, and a multitude of other inspection efforts required to support cryogenic and high pressure gas systems and equipment operations. This capability extends to inspection of "flight" hardware as determined by the customer.		
		This performance requirement also includes the cost to maintain radiation sources including high-energy cobalt source, and the licenses to maintain this capability.		

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5.4.10	Energy Management	<p>The maintenance of all NDE equipment, license fees, and all other costs associated with maintaining this capability in a high state of availability are included in this Annex.</p> <p>The work schedule is not predictable and overtime is frequently required to support customer requirements. Table 5.4-1 provides a historical list of the type of equipment used and the amount of effort required for the various work efforts and also includes the data from anticipated overtime requirements.</p> <p>The contractor must be licensed by the Mississippi State Board of Health, Division of Radiological Health and operate in accordance with the Mississippi State Board of Health Regulations for the Control of Radiation. The Contractor must obtain and maintain “Radioactive Material” license and “Registration of Sources of Ionizing Radiation” (X-ray).</p> <p>Leak inspection is split between the repair work being performed in the Fluid Component Processing Facility and at the gas and cryogenic systems located in the test complexes and site-wide systems.</p> <p>Radiograph work is mostly fieldwork and is the inspection of welding made during construction and or maintenance and in the recertification of pressure vessels for failure prediction.</p> <p>Pressure vessel inspection is performed on all pressure vessels in accordance with the **NASA Pressure Vessel Recertification Program**.</p>	<p>2 licenses See Table 5.4-1</p>	<p>Licenses must be current and comply with State regulations.</p> <p>Contractor shall respond to request within 1 hour of notification of requirement. Results of inspection shall be submitted within 24 hours.</p>

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5.4.10.1	Establish and Implement an Energy Management Program to ensure compliance with Federal Laws and Executive, Agency and Center Mandates for SSC (DR 5-GA22)	<p>The Contractor shall propose an Energy Management Plan that accomplishes the end results of:</p> <p>The plan shall implement the energy resource management goals established by the National Energy Conservation Policy Act (NECPA), as amended, and Executive Orders 12759 and 12902. These goals include a 20% reduction in energy consumption per square feet of building by FY 2000 and a 30% per cent reduction by FY 2005 as measured from the base year of FY 1985. Additionally, the plan shall implement the **SSC Utilities Energy Consumption and Cost Allocation Procedures** in accordance with NHB 8831.2A Facilities Maintenance and Energy Management Handbook. The plan shall describe how the Contractor will achieve energy management for all Performance requirements. The plan shall be inclusive of new designs, renovations, equipment replacements, procurements of energy goods or equipment and operations and maintenance of Utility Systems. Life-Cycle Costs (LCC) as defined in 10 CFR 435 and 436 shall be integral part of plan.</p> <p>A certification process must be included in the program which ensures compliance of design, construction, installation and operation with Federally Mandated Standards including **10 CFR 435 and 436**.</p>	1 Plan	Initial plan to be approved and in place within 180 days after contract start. There-after, update any changes within 30 days.
5.4.10.2	Provide the Energy Consumption and Cost Reports in accordance with DR 5-GA18	Submit to SSC's Energy Manager	See DR 5-GA18	Timely, accurate and complete reporting.

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TABLE 5.4-1

**NONDESTRUCTIVE TESTING
HISTORICAL WORK EFFORT**

NDT METHOD	TYPE	FY97	FY98	FY99 (ESTIMATED)
Leak Inspections	Unit	3751	2760	510
Visual Inspections	Unit	3920	4825	975
Radiographs Interpreted	Unit	1711	4047	859
Radiographs Produced	Unit	4380	3729	774
Radiography Preparation	Hours	380	463	82
Equipment Maintenance	Hours	289	423	36
Pressure Vessel Periodic Inspections	Unit	70	271	29
Pressure Vessel Recertifications	Unit	4	13	2
Ultrasonic Inspections	Unit	427	628	176
Ultrasonic Preparation	Hours	21	30	7
Boroscope Inspections	Unit	59	267	43
Magnetic Particle Inspections	Feet	147	451	83
Dye Penetrant Inspections	Feet	790	507	540
Eddy Current Inspections	Unit	18	7	2
Hardness Inspections	Unit	120	1	1
Helium Mass Spec Inspections	Unit	413	237	9
Radiation Safety	Hours	320	398	99
NDT Overtime Worked	Hours	848	1838	328
		17,668	20,895	4,555

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Total number of trouble calls by building:

Total number of work orders, other than trouble calls, by building:

Provide the following historical information for ALL work orders other than trouble calls, including IDIQ delivery orders:

WORK ORDERS other than trouble calls	NASA BASE SIDE	NASA TEST COMPLEX	NASA E- COMPLEX	NAVO	NRL	NDBC	USGS	TOTAL	Average Material Cost
\$0-\$500									
\$501-\$1000									
\$1001-\$2000									
\$2001-\$4000									
\$4001-\$6000									
\$6001-\$8000									
\$8001-\$10000									
\$10001-\$15000									
\$15001-\$20000									
Over \$20000									