1605000 – Steam	
Spec Item	**Title**
1	General Information
1.1	Concept of Operations
2	Management and Administration
2.1	Definitions and Acronyms
2.2	Personnel
2.2.1	Certification, Training and Licensing
2.2.2	Key Personnel
2.2.2.1	Steam System Manager
2.2.2.2	Steam System Supervisor
2.3	Special Requirements
2.3.1	Work Coordination
2.3.2	Federal and Local Authority
2.3.3	Cross-Connection Program
2.4	References and Technical Documents
2.5	Financial Requirements
3	Recurring Work
3.1	Operations
3.1.1	Steam Plant and Distribution System Operation
3.1.1.1	Steam Quality
3.1.1.2	Plant Boiler Combustion Limits and Efficiencies
3.1.1.3	Heating and Power Boiler Minimum Operator Attendance
3.1.1.4	Boiler Water Treatment and Testing Program
3.1.1.5	Condensate Return System
3.1.1.6	Steam Operating Records, Logs and Reports
3.1.2	Demineralized Water System Operation
3.1.2.1	Demineralized Water Quality
3.1.2.2	Demineralized Water System Minimum Operator Attendance
3.1.2.3	Demineralized Water Operating Records, Logs and Reports
3.2	Planned Maintenance (PM) Program
3.3	Inspection, Testing and Certification Program
3.3.1	Power Boiler and Unfired Pressure Vessels (UPV) Certification Assistance
3.4	Other Recurring Services
3.4.1	Steam Consumption Data Collection
3.4.2	Boiler Fuel Consumption Data Collection
3.4.3	Demineralized Water Consumption Data Collection
3.4.4	Demineralized Water Treatment Chemical Consumption Data Collection
3.4.5	Waterfront Support Services

1605000 – Steam		
Spec Item	**Title**	**Description**
1	General Information	The Contractor shall also provide all labor, supervision, management, tools, material, and equipment to continuously operate, maintain and repair the steam and hot water generation plant, steam and hot water distribution systems, demineralized water plant and condensate return systems at Joint Region Marianas on the island of Guam.
1.1	Concept of Operations	The intent of 1605000 Steam is to specify the requirements to provide steam, hot water and demineralized water production and distribution systems to support ships, power plants and the Naval Hospital. Included are services to operate, maintain, repair, monitor and analyze the steam, hot water and demineralized water production and distribution systems and meet customer demands, the requirements of the National Pollutant Discharge Elimination System (NPDES) discharge permits, steam quality standards, applicable laws and regulations, and other standards to maximize system availability, reliability and sustainability. Operation and maintenance of the boilers, water heaters and demineralized water systems will meet the following, in order of precedence: (1) industry standards, codes and applicable laws and regulations of Guam, (2) manufacturer's instructions and, (3) Government standards and procedures to maximize system availability, efficiency, reliability and sustainability. Prepare boilers and unfired pressure vessels for certification inspections. Interface and coordinate work with customers, U.S. Navy and Air Force personnel. Certification costing for other UPVs, boilers and hot water heaters greater than 400,000 BTUH (12 BHP) rating are found in Annex 1502000. Requirements to certify the equipment are contained within this Annex. Utility location of services are listed in Navy Facilities Asset Data (from iNFADS) J-0200000-02. Utility boundaries for services shall be in accordance with NAVFAC P-603 Utilities Infrastructure Management Manual.

1605000 – Steam		
Spec Item	**Title**	**Description**
2	Management and Administration	
2.1	Definitions and Acronyms	Definitions and Acronyms are listed in J-0200000-01.
2.2	Personnel	The Contractor shall provide an adequate amount of personnel with the current qualifications, technical knowledge, experience and skills required to efficiently operate, maintain and repair the Steam and hot water generation plant, Steam and hot water distribution systems, Demineralized water plant and Condensate return system. The Contractor shall continuously maintain an adequate staff with management expertise to assure work is scheduled and completed in accordance with these specifications. The Contractor shall maintain an adequate craft workforce to complete work in accordance with the time and quality standards specified. Primary and alternate points of contact (POCs) shall be available 24/7 (24 hours per day/7 days per week) in accordance with PWCGUAM/OICCMARINST 1601.1B. The Contractor shall ensure that all required personnel are able to/and maintain access and security clearances for the various locations required in this annex. The Contractor shall coordinate the training and approvals of the contract personnel in this annex. The Contractor shall provide qualified equipment operators and watchstanders in sufficient quantities of staffing per shift to ensure the efficient and safe operation of the heating and power boilers and demineralized water plant at all times of operation, throughout the contract period. For safety reasons, the Contractor shall meet the minimum staffing requirements for safe boiler operation. Cutting of asbestos pipe/asbestos cement pipe shall be completed by personnel with an asbestos certification. Welding on pressure piping covered by American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code requires specific procedures and welder qualifications. Welders and welding operators shall be properly qualified and certified. The certification shall state the type of welding, positions, code and procedure under which each is qualified and the firm and individual certifying the qualifications tests. All certifications shall be current. Personnel used to certify the boilers and unfired pressure vessels shall meet the qualifications of UFC 3-430-07. The Contractor shall ensure personnel training and certification are kept current.

1605000 – Steam		
Spec Item	**Title**	**Description**
2.2.1	Certification, Training and Licensing	Steam generation plant operators shall comply with ASME certification guidance exhibiting knowledge and skills of high capacity fossil fuel fired boilers, and principles of steam production. Heating and power boiler operators shall be qualified as having minimum training, certification, and experience specified in ASME QFO Boiler Operator certification program. Alternative demonstrations of qualifications and training are listed in NAVFACINST 11300.37 and equivalent demonstration/certification of qualifications found in NAVFAC P-1154.
2.2.2	Key Personnel	
2.2.2.1	Steam System Manager	The Contractor shall provide a Steam System Manager who is a registered professional engineer licensed by a U.S. State or Territory with a minimum of five years' experience in the management, operations, and maintenance of steam, hot water, demineralized water systems; or has a Bachelor of Science degree in Engineering from a U.S. accredited college, university, or institution or an equivalent ABET-accredited college or university program with 10 years' minimum experience in steam, hot water, demineralized water systems management, operations and maintenance; or has a minimum of 15 years' experience in steam, hot water, demineralized water systems management, operations and maintenance.
2.2.2.2	Steam System Supervisor	Provide a Steam System Supervisor who has a minimum of 5 years' experience operating steam, hot water and demineralized water systems.
2.3	Special Requirements	
2.3.1	Work Coordination	The Contractor shall coordinate all aspects associated with the operations, maintenance and repair work and outages in a manner that minimizes the disruption of steam services by submitting a Monthly Work Schedule. The Contractor is responsible to ensure that personnel required are present and certified/trained/able to perform the required tasks. Coordinate all maintenance and repair work and outages in a manner that minimizes the disruption of services to customers.
2.3.2	Federal and Local Authority	Conform to all environmental regulations and requirements imposed by the Federal and local authorities.
2.3.3	Cross-Connection Program	The cross-connection program is under Annex 1601000. The maintenance requirements and backflow specialist for the backflow preventers are specified in Annex 1502000. Reports should be sent to Annex 1601000 per the cross-connection control program.
2.4	References and Technical Documents	References and Technical Documents are listed in J-0200000-04.

1605000 – Steam		
Spec Item	**Title**	**Description**

2.5	Financial Requirements	The Contractor shall expend, track and record costs in a manner that supports the NAVFACMAR Steam Commodity cost schedule.
		
		Costs shall be broken down by labor and material in the following manner:
		• Operations
		• Maintenance
		  ○ Preventive Maintenance (PM)
		  ○ Repairs*
		  ▪ Sustainment
		  ▪ Restoration & Modernization
		
		*Note:
		The Contractor shall submit the monthly public voucher with costs separated in accordance with the above categories and shall also include Project Abbreviation, Work Order Number and Job Order Number.

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
3	Recurring Work	The Contractor shall efficiently operate and maintain the steam and hot water generation plant, steam and hot water distribution systems, demineralized water plant, and condensate return system to ensure the safe production and distribution of quality, reliable steam, demineralized water, and hot water, such that all shore-to-ship steam, and shore facilities steam, demineralized water, and hot water heating requirements are continually met.	The Steam, Hot Water and Demineralized Water Distribution Systems Descriptions are provided in J-1605000-01. MAXIMO Utilities Assets are provided in J-1601000-02 and the Navy Facilities Assets (from iNFADS) are provided in J-0200000-02. The Contractor shall adhere to written operating procedures. The work will be performed on, but not limited to, the current steam, hot water, demineralized water generation plants, steam and hot water distribution systems, and condensate return system. Estimated quantities of Chemical and Material Usage are provided in J-1605000-02. Estimated quantities of Utility Workload Data are provided in J-1605000-03. The Contractor shall operate, shut-down, restart, lay-up, perform operational and start-up checks/inspections, take and record readings, take and analyze samples, make adjustments to maximize boiler and other equipment efficiencies, and perform periodic maintenance for the steam and hot water generation plant, steam and hot water distribution systems, demineralized water plant, and condensate return system as part of this requirement. The Contractor shall shut down, restart, and perform operational checks on all equipment affected by both scheduled and unscheduled utility outages at no additional cost to the Government.	Steam and hot water are continuously and safely produced and distributed and meet minimum quality standards and demand requirements, as required. Pier side steam will be provided, as required by ship. Shore facility steam and hot water is required 24 hours per day, seven days per week. Maintenance work is scheduled to not impact the delivery of this commodity. Demineralized water is safely and efficiently produced and distributed and meets minimum quality standards and demand requirements, as required. Maintenance work is scheduled to not impact the delivery of this commodity.

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
			The Contractor shall develop, maintain and submit, per Section F, a current Special Tools and Critical Spare Parts List and maintain such inventory required to keep the entire system in continuous service and respond to emergency casualties so as to meet all steam, demineralized water and hot water service requirements. The list will be updated as required by new equipment. Pier side steam and demineralized water demand will vary as required by ship. Demineralized water shall be supplied to the ship or shore facility as it is required. Shore facility steam and hot water is required 24 hours per day, seven days per week. Pier side support includes maintaining, certifying, connection and disconnection of steam and demineralized water. Maintain records, logs, procedures repair/replacements equipment and manuals and provide to Government representative as required. Where multiple equipment exists, the Contractor shall rotate their operation to extend operational life of the equipment.	
3.1	Operations	The Contractor shall operate the steam and hot water generation plant, steam and hot water distribution System, demineralized water plant and condensate return system to efficiently and	Operation consists of "watch-standing" or attendance type work, sampling, testing, equipment operations, equipment adjustments, water transportation, observations and data recording by a sufficient staff of qualified persons during a specified time period to ensure safe, reliable, efficient generation and distribution of steam and hot water.	Plant and Systems equipment and components are efficiently, safely and continuously operated per specified operating criteria to produce quality steam, demineralized water and hot water to meet demand.

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
		safely produce quality steam, demineralized water and hot water to ensure all shore-to-ship steam, demineralized water, and shore facilities steam and hot water heating requirements, are continuously met, using approved procedures.	Operation of the steam and hot water generation plant, steam and hot water distribution systems, and condensate return system includes equipment and system components, such as, plant boilers, heat exchangers, monitoring and controls systems, meters, steam traps, pumps, valves, and system/distribution lines, and includes tasks, such as, monitoring and regulation of equipment controls, maintaining operating records, logs, and reports, and examination, lubrication and minor adjustment of equipment and system components. The task will be performed on all equipment that is the primary, or support for the Steam, Hot Water, Demineralized Water and Condensate Return Systems. Steam sampling shall meet the requirements of MIL-STD-1362A. Steam and Feed / Makeup / Demineralized Water quality and testing shall meet the requirements of NAVFACINST 11300.37A. The Contractor shall maintain complete control of the steam, condensate, demineralized water and hot water equipment and system operation. Access will be coordinated through the UEM Director or his representative. The Contractor shall develop and submit, per Section F, Standard Operating Procedures to which he shall adhere. The operating procedures prepared by the Contractor shall be based on the following, in order of precedence: (1) manufacturer's instructions, (2) industry standards and national codes, and (3) procedures outlined in NAVFAC publication MO 209, MO 225 and UFC 3-430-07.	Unscheduled interruptions are minimized such that steam temperature and pressure (quality) and hot water temperature demands are met. Systems are operated in accordance with industry standards. Current operating procedures on site. Plant and distribution systems' equipment and components are efficiently, safely and continuously operated to meet demand. Operational production, distribution, equipment operating data and equipment maintenance records are delivered on time.

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
			The procedures shall also include operator's qualification requirements, inspection check sheets, data and verification reporting to demonstrate the equipment as well as the system is being operated to maximize efficiency and minimize deterioration. The data and check sheets shall also demonstrate the quality of steam and demineralized water being produced and delivered meet the user's requirements. Record the monthly boiler fuel consumption for each facility. Submit a Boiler Fuel Consumption Report, monthly. Quality Assurance validation shall also be identified in the records. The Contractor shall have the current operating procedures for steam, hot water generation and demineralized water plants, steam and hot water distribution systems, and condensate return systems. Safe operation shall ensure that all Heating and Power Boilers and equipment requiring operator attendance are staffed by qualified personnel at all times of operation, and that, no plant boilers requiring certification shall be operated without a valid Inspection Certificate, NAVFAC Form 11014/32. Support waterfront steam and demineralized water requirements as scheduled by Port Operations. The COR shall be notified immediately when unsafe conditions are discovered, during normal operations or following certification inspection or repair of a pressure component or auxiliaries. The affected equipment shall not be	

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
			placed back in operation until written authorization and certification is received from a certified boiler inspector. Where multiple Boilers exist, the Contractor shall rotate their operation to assure that the boiler plant is fully functional at all times. The Contractor shall maintain a minimum 90-day inventory of water treatment chemicals (shelf life permitting).	
3.1.1	Steam Plant and Distribution System Operation	The Contractor shall operate the steam plant, distribution and condensate collections systems to efficiently and safely produce quality steam, for all shore-to-ship steam and shore facilities' steam heating requirements, are continuously met, using approved procedures.	The Contractor shall develop, implement and submit, per Section F, a written operating procedures called Steam Plant and Distribution Systems Operating Procedures. The operating procedures prepared by the Contractor shall be based on the following, in order of precedence: (1) manufacturer's instructions, (2) industry standards and national codes, and (3) procedures outlined in NAVFAC publication MO 209, MO 225 and UFC 3-430-07. Procedures shall cover items such as: a) Safety plan including precautions, Material Safety, Lock Out/Tag Out procedures and Emergency Response Planning. b) Inspect and perform checks on primary and auxiliary equipment prior to light-off. c) Steps to light-off and secure equipment. d) Operate and adjust all primary and auxiliary systems (such as boilers, fuel feed and storage systems, water level, feedwater pumps, regulators, exhaust gas,	Steam Plant and Distribution Systems Operating Procedures submitted within the required timeframe. Equipment manuals are made available to the Government as required. Personnel shall be familiar with the current operating procedures and have them available on site. Boilers over 12 BHP that are operated have been inspected and certified per UFC 3-430-07. Root Cause Analysis and Corrective Actions report is comprehensive and give sufficient detail to ensure follow-up efforts will minimize or eliminate failure.

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
			steam pressure and blowdown, chemical addition, steam traps, etc.) e) Distribution system warm-up, drain and venting f) Distribution system checks g) Distribution system monitoring sensors h) Logging all operating conditions i) Diagnose and correct operational problems j) Test the operation of the plant equipment and its control and safety devices. k) Perform water and steam quality/hardness tests on treated water and steam. Steam or water that does not meet the specified requirements shall not be delivered. l) Safety plan including precautions, Material Safety and Emergency Response Planning m) Mishap and outage reporting. n) Root Cause Analysis and subsequent Corrective Actions reporting o) Special Tools Safe operation shall ensure that all Heating and Power Boilers and equipment requiring operator attendance are staffed by qualified personnel at all times of operation, and that, no plant boilers requiring certification shall be operated without a valid Inspection Certificate, NAVFAC Form 11014/32. Where multiple boilers exist, the Contractor shall rotate their operation to assure that the	

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
			boiler plant is fully functional at all times.	
3.1.1.1	Steam Quality	The Contractor shall provide and implement a steam testing program to ensure the pressure, and purity requirements UFC 4-150-02 for Shipboard steam and equipment manufacturer's requirements for shoreside facilities equipment are met.	The Contractor shall develop and submit, per Section F, Steam Testing Program to include collection of samples, testing and adjustment of boilers. The testing procedures prepared by the Contractor in this program shall adhered to and be based on the following, in order of precedence: (1) Shipboard requirements and procedures outlined in UFC 4-150-02 (ONLY FOR SHIPBOARD STEAM), (2) manufacturer's instructions, (3) industry standards and codes. Pier side steam delivered to the ships shall meet pressure and quality requirements of UFC 4-150-02. Shipboard steam connections shall be sampled and tested daily, recorded and provided on the Contractor developed Shipboard Steam Connection Testing Data Sheets and submitted daily, per Section F. Each pier steam distribution shall be sampled and tested quarterly, recorded and provided on the Contractor developed Pier Distribution Steam Testing Data Sheets, per Section F. Other Ship steam certification requirements: a) Documentation of the most recent daily and quarterly analysis results shall be provided to each ship prior to shore steam hookup. b) Daily steam analysis results shall be made available to each ship. c) Each ship shall be notified any time shore steam does not meet the specified requirements.	Steam Testing Program is submitted within the scheduled timeframe. Testing and data sheets demonstrate that steam delivered to the pier and Ships meet the quality require-ments prior to connection to ships. Daily and quarterly testing and reporting are provided within the required timeframes. Twice weekly testing is performed and data sheets provided for shore facilities demonstrate that the steam delivered meets the quality requirements of the connected equip-ment 95% of the time during operations.

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
			Steam delivered to other facilities shall meet the purity requirements of the supported equipment. Shoreside Facilities shall have Contractor perform twice weekly testing and provide data sheets for shore facilities demonstrating the steam delivered meet the quality requirements of the connected equipment, recorded and provided on the Contractor developed Shoreside Facilities Steam Testing Data Sheets, per Section F.	
3.1.1.2	Plant Boiler Combustion Limits and Efficiencies	The Contractor shall provide and implement a boiler exhaust testing program to efficiently operate and make adjustments to the plant boilers to ensure specified combustion limits and efficiencies are continuously met.	The Contractor shall develop and submit, per Section F, a Boiler Exhaust Testing Program to include sampling, testing and adjustment of boilers. The sample and testing procedures prepared by the Contractor shall be based on the following, in order of precedence: (1) manufacturer's instructions, (2) industry standards and codes, and (3) procedures outlined in UFC 3-430-07 or use combustion efficiency formula below: a) Fuel Combustion Efficiency b) Oil -0.250(CO2)-0.9009 (Ts-Ta+7.5) +94.3 c) Ambient air temperature (Ta) should be taken before the first heat transfer device. d) Flue gas temperature (Ts), O2, CO2, and CO readings should be taken after the last heat recovery device. e) Since a single CO2 value may have more than one O2 value and air infiltration can be a problem, O2 versus CO2 needs to be plotted on an Oswald chart. f) Temperatures are in degrees Fahrenheit.	Boiler Exhaust Testing Program is submitted and approved in a timely manner. The Contractor shall perform testing and record data to demonstrate that boiler combustion process meets requirements or maximum efficiency 95% of the time during operations. Provide data sheets as requested by Government.

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
			g) CO2 and O2 readings are in % by volume. h) The CO reading should not exceed 200 ppm.	
3.1.1.3	Heating and Power Boiler Minimum Operator Attendance	The Contractor shall provide qualified equipment operators and watchstanders in sufficient quantities of staffing per shift to ensure the efficient and safe operation of the boilers and feedwater plant at all times of operation, throughout the contract period.	The Contractor shall develop and submit, per Section F, a Steam Plant and Distribution System Operator Attendance Schedule to safely and efficiently operate the steam and condensate systems. Schedule shall include personnel training and qualification information and status in a Qualified Personnel List. Pier side support will vary depending on ship berthing and steam requirements. Attendance visits for operating equipment shall be of sufficient duration to observe, perform operator checks and adjustments, and log observations and operating conditions. For safety reasons, the Contractor shall at least meet the minimum staffing requirements for safe boiler operation.	Operator Attendance Schedule is submitted within the required timeframe. Operators and watchstander attendants have current training for applicable equipment and certification to operate, adjust and collect data to support safe boiler, water heater and demineralized water equipment operations as specified in operating procedures. Operating log shows times when operator and watchstander performed checks, inspections and necessary adjustments.
3.1.1.4	Boiler Water Treatment and Testing Program	The Contractor shall provide and implement a Boiler and Feedwater Testing and Treatment Program to ensure steam and boiler feedwater produced and delivered will yield optimum equipment operation and efficiency and Shipboard steam	The Contractor shall develop and submit, per Section F, a Boiler and Feedwater Testing and Treatment Program to include collection of samples, testing and treatment of boiler and feedwater such that the Shipboard steam meets all quality requirements. The testing and treatment procedures prepared by the Contractor shall be based on the following, in order of precedence: (1) Shipboard steam	Boiler Water Testing and Treatment Program Plan submitted in a timely manner. Boiler and Feedwater is sampled and tested in accordance with the Contractor's incorporated Boiler and Feedwater Testing and

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
		meets quality requirements of UFC 4-150-02 and results of analysis are documented and available as required.	requirements and procedures outlined in UFC 4-150-02, (2) manufacturer's instructions, (3) industry standards and codes or MO 225. a) Shipboard steam shall be sampled and tested daily. Record and provide data on Contractor developed Shipboard Steam Boiler Feedwater Testing Data Sheets, per Section F. b) Documentation of the most recent daily analysis results shall be provided to each ship prior to hookup. c) Shore side facilities boiler water shall be sampled and tested quarterly, recorded on the Contractor developed Shoreside Facility Boiler Water Testing Data Sheets, per Section F, compiled and submitted annually. d) Make adjustments to boiler feed demineralized water treatment. e) Maintain record of treatment chemicals used, amount of demineralized water produced and demineralized water distributed on Contractor developed data sheets. f) Feedwater that does not meet the specified requirements shall not be delivered or used. g) Provide data sheets to Government as required.	Treatment Program. The Contractor shall provide daily pier side water test data sheets as required. Water for shore facilities have quarterly data collected and annually provided to COR.
3.1.1.5	Condensate Return System	The Contractor shall operate the condensate return system to ensure minimal condensate loss nor contamination.	The Contractor shall prepare and submit, per Section F, a Condensate Return System Operating Procedures for the condensate system equipment. The operating procedures prepared by the Contractor shall be based on the following, in order of precedence: (1) manufacturer's instructions, or (2) industry standards and	Condensate is returned to the Plant in accordance with the Operating Procedures 95% of the time during operations.

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
			national codes. Procedures shall cover items such as: a) Inspect and perform checks on equipment prior to light-off. b) Steps to operate equipment during boiler lite-off and shut down. c) Operating and adjustments d) Logging all operating conditions e) Listing acceptable operating conditions (temperatures, flows, etc) f) Diagnose and correct operational problems g) Safety plan including precautions, Material Safety and Emergency Response Planning h) Mishap and outage reporting.	
3.1.1.6	Steam Operating Records, Logs and Reports	The Contractor shall prepare, submit and maintain operating records, logs and reports for process tracking of plant operations and output characteristics for operators, watchstanders and technicians.	The Contractor shall submit, per Section F, a monthly Steam Plant Boiler Operating Records, Logs and Reports document. The document shall include shall include copies of daily operating logs, chemical treatment performed, and steam, boiler feedwater and condensate return water laboratory analysis. Maintain a Boiler History File at each location. History file shall contain operating records, logs, steam and water test reports, chemical treatment performed, maintenance and repair actions. The Contractor shall provide the monthly Steam Meter Reading, Boiler Fuel Consumption Report, and Demineralized Water Production and Consumption Report electronically.	All required operating records, logs, and reports are maintained current and complete and applicable copies provided to the KO within the specified times. Other data sheets are available to Government as requested in a timely manner.
3.1.2	Demineralized Water System Operation	The Contractor shall ensure the safe and efficient	The Contractor shall operate and maintain complete control of the demineralized water generation	Demineralized Water Systems Operating

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
		operation of the demineralized water plant equipment and distribution equipment.	and distribution equipment and system operation. Access will be coordinated through the UEM Director or his representative. The Contractor shall prepare and submit, per Section F, a Demineralized Water System Operating Procedures document. The operating procedures prepared by the Contractor shall be based on the following, in order of precedence: (1) manufacturer's instructions, (2) industry standards and national codes, and (3) procedures outlined in NAVFAC publication MO 225, and NAVFACINST 11300.37A. Procedures shall cover items such as: a) Safety plan including precautions, Material Safety, Lock Out/Tag Out procedures and Emergency Response Planning. b) Inspect and perform checks on primary and auxiliary equipment prior to light-off. c) Steps to start up demineralizer train. d) Operate and adjust all primary and auxiliary systems (such as chemical feeds, drains, output quality, etc.) as required. e) Logging all operating conditions f) Diagnose and correct operational problems g) Test the operation of the demineralizer and its control and safety devices. h) Mishap and outage reporting	Procedures submitted within the required timeframe. Equipment manuals are made available to the Government as required. Personnel shall be familiar with the current operating procedures and have them available on site. Plant and Systems equipment and components are efficiently, safely and continuously operated per specified operating criteria to produce quality Demineralized Water to meet demand. Unscheduled interruptions are minimized such that Demineralized Water quantity and quality demands are met. Root Cause Analysis and Corrective Actions report is comprehensive and give sufficient detail to ensure follow-up efforts will minimize or eliminate failure.

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
			i) Root Cause Analysis and subsequent Corrective Actions reporting j) Special Tools The procedures shall also include operator's qualification requirements, inspection check sheets, data and verification reporting to demonstrate the equipment as well as the system is being operated to maximize efficiency and minimize deterioration. The data and check sheets shall also demonstrate the quality of demineralized water being produced and delivered meet the users' requirements. Record the monthly equipment "operation time" and water delivered. Quality Assurance validation shall also be identified in the records. Safe operation shall ensure that all primary and support equipment requiring operator attendance are staffed by qualified personnel at all times of operation.	
3.1.2.1	Demineralized Water Quality	The Contractor shall provide and implement a Demineralized Water Testing Program to ensure the quality and purity requirements of UFC 4-150-02 and NAVFACINST 11300.37A for Demineralized Water are met.	The Contractor shall develop and submit per Section F, a Demineralized Water Quality Testing Program to include collection of samples, testing and adjustment of Demineralized Water equipment. Testing procedures prepared by the Contractor in this program shall be adhered to and be based on the following, in order of precedence: (1) Shipboard requirements as outlined in UFC 4-150-02, (2) manufacturer's instructions, (3) industry standards and codes or NAVFACINST 11300.37A.	Demineralized Water Quality Testing Program is submitted within the required timeframe. The Contractor shall perform testing and provide data sheets to demonstrate that Demineralized Water delivered to the pier and Ships meet the quality requirements prior to connection to ships, and periodically during support, as required

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
			Make adjustments to demineralized water treatment process as required. Maintain record of treatment chemicals used, amount of demineralized water produced and demineralized water distributed on Contractor developed data sheets. Demineralized water that does not meet the specified requirements shall not be delivered. Shipboard Demineralized Water shall be sampled and tested daily at the manifold or connection from the tanker truck, recorded and provided on the Contractor developed Demineralized Water Connection Testing Data Sheets and submitted daily. Other Ship Demineralized Water certification requirements: a) Documentation of the most recent daily and quarterly analysis results shall be provided to each ship prior to shore Demineralized Water hookup. b) Daily analysis results shall be made available to each ship. c) Each ship shall be notified any time Demineralized Water does not meet the specified requirements.	by ship (daily) and upon disconnection. Daily testing and reporting are provided demonstrating the Demineralized Water delivered meet the quality requirements 95% of the time during operations.
3.1.2.2	Demineralized Water System Minimum Operator Attendance	The Contractor shall provide qualified equipment operators and watchstanders in sufficient quantities of staffing per shift to ensure the efficient and safe operation of the heating and power boilers and	The Contractor shall develop and submit, per Section F, a Demineralized Water System Operator Attendance Schedule to safely and efficiently operate the demineralized water systems. Attendance visits for operating equipment shall be of sufficient duration to observe, perform operator checks and adjustments, and log observations and operating conditions.	Operator Attendance Schedule is submitted within the required timeframe. Operators and watchstander attendants have current training for applicable equipment and

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
		demineralized water plant at all times of operation, throughout the contract period.	Informational note: Pier side support will vary depending on ship berthing and demineralized water requirements.	certification to operate, adjust and collect data to support safe demineralized water equipment operations as specified in operating procedures. Operating log shows times when operator and watchstander performed checks, inspections and necessary adjustments.
3.1.2.3	Demineralized Water Operating Records, Logs and Reports	The Contractor shall prepare, submit and maintain operating records, logs and reports to ensure plant and distribution systems' operating and output characteristics are being monitored and corrected as required by operators, watchstanders and technicians.	The Contractor shall develop and submit, per Section F, a monthly Demineralized Water Operating Records, Logs and Reports document which includes copies of daily operating logs, equipment adjustments performed, and Demineralized Water quality analysis. Maintain a Demineralized Water History File at each location. History file shall contain operating records, logs, Demineralized Water quality test reports, equipment adjustments performed, maintenance and repair actions and monthly production/ operation time reports. The Contractor shall provide the Monthly Demineralized Water Production Meter Reading on paper and electronically. Contractor shall monitor and record chemical usage.	All required operating records, logs, and reports are maintained current and complete and applicable copies provided to the KO within the specified times. Other data sheets are available to Government as requested in a timely manner.
3.2	Planned Maintenance (PM) Program	The Contractor shall develop and implement a program to maintain the steam	The Contractor shall develop, implement and submit, per Section F, an Equipment and System Maintenance Program Plan for the steam, hot water and	PM Program Plan is submitted within required time-frame.

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
		and hot water generation plant, steam and hot water distribution systems, demineralized water plant, steam and hot water distribution systems and condensate return system at their current conditions to meet their intended purpose and sustain maximum life with the results provided in MAXIMO.	demineralized water plants and distribution systems. The maintenance program shall include a plan with maintenance and repair procedures prepared by the Contractor based on the following, in order of precedence: (1) manufacturer's instructions and recommendations, (2) industry standards and national codes, and (3) procedures outlined in NAVFAC publication MO 209, UFC 3-410-06N and UFC 3-430-07. This PM plan shall provide group actions for Annual Maintenance, Semi-annual Maintenance, Quarterly Maintenance, Monthly Maintenance, Weekly Maintenance, Daily Maintenance, Per Shift Maintenance, Hourly Maintenance as required by manufacturer recommendations, code or Government Instruction. The plan shall also include maintenance technician's qualification requirements, inspection check sheets, data and verification reporting to demonstrate the equipment as well as the system is being maintained to minimize deterioration. Maintenance shall include cleaning, preparation and operator/technician support for certification assistance for boilers, and unfired pressure vessels in accordance with UFC 3-430-07. Submit the Maintenance Plan broken up by periodicity (Annual, Semi-annual, Quarterly, Monthly, etc.). Provide all necessary test instruments, equipment, and tools required to perform maintenance.	Maintenance tasks are scheduled and performed on the steam and hot water generation plant, steam and hot water distribution systems, demineralized water plant, and condensate return system per the Contractor's maintenance plan and procedures and reported in MAXIMO. As a result, the system equipment with the appropriate secondary/backup equipment are operational. Degradation Index (DI) is recorded as of latest maintenance action. Unscheduled interruptions are minimized such that steam temperature and pressure and hot water temperature demands are met. Pier side steam will be provided, as required by ship. Shore facility steam and hot water is required 24 hours per day, seven days per week. Completed work can be tracked through MAXIMO. Inventory of Maintenance

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
			The PM Plan shall include all equipment associated with the Steam, Hot Water and Demineralized Water Systems, and also include Unfired Pressure Vessels from Annex and Sub Annexes of 1500000. Estimated Equipment Inventory List and Description of Steam, Hot Water and Demineralized Water is in J-1601000-02. Major Maintenance, such as Overhauls, that occur on a frequency greater than every two years shall be planned and tracked but executed as a separate contract action. The ACOR and COR shall be notified immediately when unsafe conditions are discovered. Utilize MAXIMO to record all maintenance and repair work. Inventory of equipment is kept current with new equipment added and replaced components deleted. As maintenance is performed Degradation Index (DI) is updated.	Supplies and Special Tools are kept complete and without expired shelf life. All Maintenance tasks, including Overhauls, are planned and tracked.
3.3	Inspection, Testing and Certification Program	The Contractor shall ensure the tanks in the steam plant, condensate equipment, demineralized water plant and distribution equipment are fit for service to meet intended needs	The Contractor shall develop, implement and submit, per Section F, a Tank Inspection Program for the steam plant, condensate equipment, demineralized water plant and distribution equipment. The inspection program shall include a plan with frequency and procedures prepared by the Contractor based on the following, in order of precedence: (1) manufacturer's instructions and recommenda-tions, (2) industry standards and national codes. The plan with procedures shall cover items such as:	Tank Inspection Program Plan submitted within required time-frame. Water and chemical tanks are fit for service to meet intended needs. No service disruptions due to tank failures (structural or cleanliness).

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
			a) Periodic inspections and checks on equipment. b) Periodic cleaning c) Disassembly and re-assembly instructions for cleaning and inspections. d) Acceptable conditions and parameters. e) Descriptions of abnormal conditions f) Troubleshooting procedures to correct abnormal condition g) Logging all inspection conditions including check sheets (condition monitoring records) and repair actions to be taken. h) Schedule of periodic refurbishment or replacement i) Housekeeping requirements j) Painting and preservation k) Safety plan and precautions (conditions and material hazards) including Lock-out/Tag-out procedures, confined space entry requirements, etc.	
3.3.1	Power Boiler and Unfired Pressure Vessels (UPV) Certification Assistance	The Contractor shall thoroughly clean and prepare the system Heating and Power Boilers and UPVs to allow testing, inspections and certification. The Contractor shall support all certification testing for the Certified Boiler Inspector.	The Contractor shall provide advance notification to the KO when boilers, and UPVs are ready for testing and certification, normally in conjunction with annual boiler overhaul, and shall assist in the certification process. The boiler certification process will consist of four phases: a) external inspection b) internal inspection c) hydrostatic pressure testing d) operational and safety testing.	Operational Boilers and UPVs are cleaned and prepared for testing and Government certification per UFC 03-430-07. Certified Inspector successfully performs certification inspections and testing, and each equipment is certified and ready to operate through

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
			Keep completed certification certificate form Inspection Certificate (NAVFAC Form 9-11014/32), for history files when received from Government representative.	a completed and valid NAVFAC Form 9-11014/32 in history files.
3.4	Other Recurring Services	The Contractor shall perform other recurring services on facilities, systems, and equipment to ensure they are fully functional and operational.		Systems and equipment are in an operable condition and function properly in accordance with specified standards. Services are completed in a timely manner.
3.4.1	Steam Consumption Data Collection	The Contractor Shall collect and provide accurate and timely Steam consumption data based on steam delivered.	The Contractor shall collect and submit, per Section F, a Steam Consumption Data Report each month to charge customers, based on the Steam produced. Consumption shall be divided among the customer's usage (connection durations). Consumption data shall be provided on the 3rd working day of the following month.	Consumption data is provided on the scheduled date. The data is accurate, complete and with no errors. Proration factors are accurate, correct and updated monthly.
3.4.2	Boiler Fuel Consumption Data Collection	The Contractor Shall collect and provide accurate and timely Boiler Fuel consumption data.	The Contractor shall collect and submit, per Section F, a Boiler Fuel Consumption Data Report each month. Consumption data shall be provided on the 3rd working day of the following month.	Consumption data is provided on the scheduled date. The data is accurate, complete and with no errors.
3.4.3	Demineralized Water Consumption Data Collection	The Contractor Shall collect and provide accurate and timely Demineralized Water production and consumption data based on Demineralized Water delivered.	The Contractor shall collect and submit, per Section F, a Demineralized Water Production and Consumption Data Report each month to charge customers based on the Demineralized Water delivered. Customer consumption shall be based on Demineralized Water delivered. Consumption data shall be provided on the 3rd working day of the following month.	Consumption data is provided on the scheduled date. The data is accurate, complete and with no errors.

1605000 – Steam				
Spec Item	**Title**	**Performance Objective**	**Related Information**	**Performance Standard**
3.4.4	Demineralized Water Treatment Chemical Consumption Data Collection	The Contractor shall collect and provide accurate and timely Chemical consumption data for the Demineralized Water Treatment	The Contractor shall collect and submit, per Section F, a Chemical Consumption and Inventory Data Report each month. Consumption data shall be provided on the third working day of the following month.	Consumption data is provided on the scheduled date. The data is accurate, complete and with no errors.
3.4.5	Waterfront Support Services	The Contractor shall provide waterfront support services to connect, disconnect and miscellaneous work to provide pier side Steam, Demineralized Water and Condensate utility service to Navy ships.	The Contractor will perform all utility connection and disconnection work to support Port Operations at pier side. This annex covers work for the Steam, Demineralized Water and Condensate systems at the pier. Work will be coordinated by Port Operations. There will be a 72-hour minimum notification for docking and a 24 hour minimum notification for un-docking.	Port operations are carried out per Port Operations Schedule, with no delays due to shore side utility connection or disconnection problems.