

Statement of Work Boiler Inspection, Tuning and Safety Device Testing

I. Introduction:

- A. The North Florida South Georgia Healthcare System requires an annual service to inspect and test boiler safety devices on the six (6) boilers that provide steam to the Malcom Randall VA Medical Center and the Lake City VA Medical Center.
- B. Both VAMCs have a central boiler plant to provide steam for heating and air conditioning, domestic hot water, kitchens and sterilization. The Lake City VA has a laundry that utilizes steam from the Boiler Plant.
- C. Boiler plant safety, reliability, efficiency, and equipment longevity are paramount concerns of VAMC management. Malfunctioning burners or controls can cause catastrophic events resulting in injuries and death and massive property damage. Inaccurate or inadequate data management and monitoring systems can fail to warn of unsafe or inefficient performance. Regular inspections, testing, and calibration by expert technicians are an essential part of a program to address these concerns.
- D. This statement of work describes the requirements for the inspection, testing and calibration of the boiler plant burners, controls, and instruments by qualified technicians.

II. Objective:

This service contract is an annual preventative maintenance service contract on the Boilers at the Malcom Randall VA Medical Center and the Lake City VA Medical Center to meet the requirements of VHA Directive 2008-062 "Boiler Plant Operations".

III. Scope of Work:

The contractor shall furnish all labor, materials, parts, supervisions, services and incidentals to perform annual internal and external boiler inspections of all six (6) Boilers. The contractor shall perform semi-annual Boiler Safety Device Testing on all safety devices on all six (6) Boilers. The contractor shall perform semi-annual Boiler Tuning on oil and natural gas of all six (6) Boilers.

The following equipment is included in the annual service contract.

- a) **Malcom Randall VA Medical Center**
1601 sw Archer Rd Gainesville, Fl 32608

3 Boilers
Water Tube Boilers.
1965 Keeler
250 S.W.P
665 W.W.H.S
20000 lbs/hr
Serial # 14237-1, 14-237-2, 14-237-3
B.H.S. 2030
STD. No NB4040
Preferred Combustion Controls PCC2 and PCC3 controls
Fireeye Burner Controls
Webster Burner

- b) **Lake City VA Medical Center**
619 S. Marion Avenue Lake City, FL 32025-5808

3 Boilers
Fire Tube Boilers (Built 2014)
Manufacturer - Superior
Model 7-X-1750
Serial # Boiler 1 = 17764
Serial # Boiler 2 = 17777
Serial # Boiler 3 = 17775
12075 lbs/hr

Powerflame Burners Model UCM 350-GO-30
Serial # Boiler 1 = 091455125
Serial # Boiler 2 = 091455124
Serial # Boiler 3 = 091455126
Ultra Low NOX
Dual Fuel Source. Natural Gas or #2 Diesel

Preferred Controls Scada/Flex Distributed Controls

IV. **Data/Deliverables:**

A. **Annual Boiler Inspections**

The contractor shall perform an annual internal and external Boiler inspection on all three (3) boilers at the Malcom Randall VA Medical Center, and on all three (3) Boilers at the Lake City VA Medical Center. The inspection shall be performed by certified Boiler Inspectors. A certificate of inspection shall be provided to the Contracting Officers Representative (COR) upon completion of each Boiler Inspection. Only one boiler can be down for inspection at a time. All Boiler Inspections shall be coordinated with the COR. The schedule for inspections will be as follows:

- a) Malcom Randall VA Medical Center
#1 Boiler – October
#2 Boiler – April
#3 Boiler – October
- b) Lake City VA Medical Center
#1 Boiler – June
#2 Boiler – July
#3 Boiler – August

B. **Semi-annual Boiler Safety Device Testing Inspections**

The contractor shall perform the required semiannual maintenance specified by “VHA Directive 1810 Boiler and Boiler Plant Operations”. The VHA Boiler Plant Safety Device Testing Manual (5th Edition) shall be used as the only procedure to test all Boiler Safety Devices. All Boiler Safety Device Inspections shall be scheduled with the COR. Boiler Safety Devices will be tested in October and April. A detailed report of inspection for each safety device tested shall be supplied to the COR in a timely manner. All failures shall be immediately reported to the COR and the Boiler Watch.

V. Inspection, Testing, and Calibration Requirements:

- A. Technicians shall provide all tools and labor necessary to perform inspection, tuning, testing, calibrating, and adjustments of burners and boiler and boiler plant controls as specified below. This shall be completed every 6 months in accordance with a schedule provided by VAMC. VAMC may extend the schedule for burners in limited service.
- B. Instrumentation, monitoring, and data management systems as listed below shall be calibrated every 6 months.
- C. Provide at least 2-weeks-notice to the Contracting Officer's Representative (COR) prior to performing the work. Work cannot be scheduled during heavy steam load periods. Only one boiler at a time can be out of service for the inspection, testing, and calibration procedures. Work must be conducted when the COR or his/her designate is available on site to monitor the work.
- D. The VA Medical Center (VAMC) will have the boilers that are to be serviced prepared for the technicians upon their scheduled arrival. This includes having the boilers clean of soot and loose scale; fully warmed and at normal steam pressure; steam exhaust silencer system operable; all boiler, burner, and fuel train pressure gauges and thermometers calibrated; fuel meters in accurate operation (pressure/temperature correction factors provided if applicable); boiler steam flow, stack temperature, and flue gas oxygen instruments operating.
- E. The VAMC will comply with any other requirements of the test personnel that are considered reasonable by VAMC and have been presented in writing at least 2 weeks prior to the scheduled testing.
- F. The inspections, testing and calibrations shall comply with:
 - 1) The recommendations and requirements of VHA Boiler Plant Safety Devices Testing Manual, 5th Edition.
 - 2) The written recommendations of the equipment manufacturers.
 - 3) The requirements and recommendations of NFPA® 85: Boiler and Combustion Systems Hazards Code including applicable appendices.
 - 4) Burner performance requirements from the burner manufacturer.
- G. A summary of the work is as follows:
 - 1) Review boiler plant log sheets and alarm and trouble reports.
 - 2) Review records that show combustion performance (flue gas oxygen and carbon monoxide).
 - 3) Perform overall visual inspection of systems. Verify that systems comply with referenced codes and VAMC requirements stated in this contract.
 - 4) Test and record the operation and set points of all burner/boiler safety interlock devices. Verify that the set points and operating points are within approximately 20 percent of normal operating parameters. Make adjustments as necessary and record the new settings. The operation of a device must result in burner shutdown and/or proper alarm operation.
 - 5) Operate burner(s) on each fuel from low fire to high fire and back to low fire in at least six increments and record combustion performance (flue gas oxygen, carbon monoxide, nitrous oxide, where applicable), fuel train pressures, atomizing train pressures, burner pressures, stack temperatures, boiler steam output.
 - 6) Compare the combustion performance data with VAMC requirements and previous readings. If necessary, make adjustments to the fuel flow and combustion air controllers, control valves and dampers to obtain the required performance. Record the new performance data.

- 7) Verify accuracy of instrumentation. Verify that all devices are properly selected for the application in terms of type, size, set point range, performance, and code approval. Calibrate all instruments that are not within manufacturer specifications for accuracy.
 - 8) Immediately inform the COR of any recommended repairs or modifications.
- H. All interlocks and safety devices to be inspected and tested on each boiler/burner/equipment are contained in the VHA Boiler Plant Safety Devices Testing Manual, 5th Edition, along with testing procedures.
- I. Required burner performance (natural gas and fuel oil):
- 1) Turndown (ratio of maximum and minimum firing rates): 10/1 8/1 5/1 4/1 (Refer to original burner specification).
 - 2) Achieve, but do not exceed, boiler maximum steam flow output rating. Measure fuel input at minimum and maximum firing rates.
 - 3) Maximum carbon monoxide: 200 parts per million (ppm).
 - 4) Maximum nitrous oxide: refer to original burner specification.
 - 5) Flue gas oxygen: 2.5-4.2 percent (Up to 5.2 percent at loads below 40 percent of maximum steam output, no upper limit at minimum firing rate, oxygen can be one percentage point higher on oil firing on single-point positioning systems).
 - 6) Flue gas oxygen (low excess air burners): 1.0-2.0 percent (Up to 2.5 percent at loads below 40 percent of maximum steam output, no upper limit at minimum firing rate: oxygen can be one percentage point higher on oil firing on single point positioning systems).
 - 7) No visible smoke.
 - 8) Flames shall be stable with no pulsations, shall be retained near burner, no blowoff or flashbacks, no constant flame impingement on refractory or waterwalls.
- J. List of instrumentation and controls to be inspected and calibrated:
- 1) Steam flow transmitters (all).
 - 2) Steam flow recorders/computer readout.
 - 3) Flue gas oxygen sampling, analyzing, and recorder/computer readout.
 - 4) Boiler and economizer stack temperature transmitters and recorder/computer readout.
 - 5) Master steam pressure and combustion controllers.
 - 6) Boiler outlet draft controllers.
 - 7) Boiler water level controllers.
 - 8) Feedwater deaerator and condensate storage tank water level controllers including overflow.
 - 9) All pressure and temperature sensors and transmitters.
 - 10) All signal processing and readout devices.

The following safety devices will be tested:

High Water Alarm on Condensate Tank (HWACT)
 Low Water Alarm on Condensate Tank (LWACT)
 High Water Alarm on Deaerator Tank (HWADT)
 Low Water Alarm on Deaerator Tank (LWADT)
 Deaerator Overflow Drain System (DAODS)
 Deaerator Safety Valve (DASV)
 Safety Valve Following DA PRV (SVFPRV) - Steam
 Liquid Relief Valve on Oil Pump Set (LRVOPS)
 Propane Pilot Backup System
 Carbon Monoxide and Combustible Gas Alarms in the Boiler Plant
 Outside Air Damper Interlock (OADI)

Low Water Alarm and Cutoffs on Boiler (LWA/LWCO/ALWCO)
 Recycle and Non-Recycle Boiler Steam Pressure Limit Switches
 Steam Safety Valves on Boiler (SVB)
 Low Fuel Gas Pressure Cutoff Switch (LFGPCS)
 High Fuel Gas Pressure Cutoff Switch (HFGPCS)
 Automatic Fuel Gas Shutoff Valves and Solenoid Vent Valve Seat Leakage –
 Main Gas Line
 Automatic Pilot Fuel Gas Shutoff Valves and Automatic Pilot Fuel Gas
 Solenoid Vent Valve Seat Leakage – Pilot Line
 Proof of Closure on Automatic Fuel Shutoff Valves – Natural Gas
 Flame Scanner-for main flame out (FSMFO)
 Flame Scanner Not Sensing Igniter Spark (FSNSIS)
 Igniter Timing (IT)
 Main Flame Ignition Timing (MFIT)
 Pre-Purge and Post-Purge Timing (PPT)
 Low-Fire Proving Switch (LFPS)
 Forced Draft Damper Wide-Open Pre-Purge Proving Switch (FDDWOPS)
 Combustion Air Pressure Switch (CAPS)
 Purge Airflow Proving Switch (PAPS)
 Forced Draft Motor Interlock Switches (FDMIS)
 Outlet Stack Damper Interlock Switch (OSDI)
 Furnace Pressure Interlock (FPI)
 Low Pilot Fuel Gas Pressure Cutoff Switch (LPFGPCS)
 Low Flue Gas Oxygen Level Interlock (LFGOLI)
 Low Fuel Oil Pressure Cutoff Switch (LFOPCS)
 High Fuel Oil Pressure Cutoff Switch (HFOPCS)
 Low Atomizing Media Pressure Switch (LAMPS)
 Automatic Fuel Oil Shutoff Valves (AFOSV) - for Seat Leakage
 Proof of Closure on Automatic Fuel Oil Shutoff Valves – Oil

VI. Report Requirements:

- A. Provide complete written report of the inspection fully describing all tests performed, all findings, and recommendations. At a minimum the following information will be delivered to the COR in a table (Excel or Word):
 - 1) The first column, labeled "Function," did the device pass or fail.
 - 2) The second column, labeled "Device," list the device number and description in accordance with the VHA Boiler Plant Safety Devices Testing Manual, 5th Edition.
 - 3) The third column, labeled "Deficiencies-Recommendations."
 - 4) The fourth column, labeled "Corrective Actions," list any corrective actions taken during the inspection.
 - 5) The fifth column with the date tested.
 - 6) The sixth column with person performing the test.
 - 7) The seventh column will be for comments.

Furnish report within 1 week of each facility inspection in Microsoft Word format by email to the COR and to the designated VA Headquarters Office. Provide hard copies of data sheets and flue gas analyzer strip printouts to the COR within 1 week of visit.
 All safety-related deficiencies shall be immediately reported to the COR, Boiler Plant Supervisor, and/or Chief Engineer during the inspection visit.

VII. Semiannual Boiler Tune Ups

All six Boilers shall be tuned at least once every six months. A qualified and certified personnel shall be used to tune the boilers and a report of the results of the tuning shall be submitted to the COR. The tuning performed shall be on Natural Gas and on Fuel Oil. The Boilers shall be tuned at a minimum of six points through the entire range of 0-100% Boiler Firing Rate.

VIII. Qualifications/Certifications

- a) The contractor shall have electrical safety training to meet the requirements of NFPA 70e.
- b) The contractor and all of the individuals working on the project site shall have taken the OSHA Certified 10-hour construction safety course.
- c) Technicians shall have completed at least a 1 year of trade school and have 5 years of successful experience in this field. The experience shall be largely with institutional and industrial boiler plants similar in design to the VAMC plant. The VAMC facility manager/engineer may define and accept equivalent qualifications.
- d) Technicians shall demonstrate familiarity with and ready access to the current versions of the following references:
 - National Fire Protection Association (NFPA) 85
 - Boiler and Combustion Systems Hazards Code
 - VHA Boiler Plant Safety Device Testing Manual, 5th Edition
- e) Technicians shall be equipped with portable electronic flue gas analyzers and other test instruments necessary for the required tests and calibrations, all calibrated within 1 month of the site visits. At facilities with programmable digital controls, the technicians must be capable of programming the controls and have the appropriate hardware and software for this.

IX. Safety Regulations

- All applicable safety regulations shall be observed during all work of this contract.
- VA Police will issue identification badges to contractors, employees and subcontractors which must be worn at all times when on VA property
- Contractor shall keep the area cleaned daily and haul away all debris to a designated container
- The VA Safety Officer shall have full authority to see that the contractor obeys all safety rules and regulations relative to the fulfillment of this contract.
- Provide the necessary barricades/signage where required.

X. Scheduling and Hours of Work

- All work in areas involved shall be scheduled with the VA Operations Supervisor.
- Work shall be scheduled for proper execution to completion of this contract.
- Hours of work. The work will be conducted during normal working hours 0800-1630 Monday – Friday excluding Federal Holidays.
- The 10 holidays observed by the Federal Government, are New Years Day, Labor Day, Columbus Day, Veterans Day, Thanksgiving Day, and Christmas or any other day specifically declared by the President of the United States to be a national holiday.