VA Maryland Health Care System (VAMHCS)
Perry Point Medical Center
Facilities and Engineering Service

Boiler Plant Operator (BPO)
WG-5402-11

GENERAL: The incumbent is employed in the Plant Operations Section, Facilities and Engineering Service, Perry Point Medical Center. This section is responsible for the Boiler Plant, Chiller Plant, Filter Plant, sewage disposal plant, swimming pools, steam and water distribution systems.

SKILL AND KNOWLEDGE: The incumbent is responsible for the start operation, adjustment, shut-down, maintenance and repair of four (4) 1967 Cleaver Brooks boilers with the capacity of 37,000 lbs. steam per hour at a maximum pressure of 270 psig with a normal operating pressure of 120 psig. He/she must be able to determine when to bring another boiler on line or to remove a boiler from operation, in the least amount of time, to meet changing load demands while maintaining safe levels and efficient combustion. He/she must have the knowledge through the use of manual, automatic, microprocessor controls or control systems to monitor, adjust, and control all phases of the boiler plant operations. The Boiler Plant operates full steam 24 hours/day. Thus, he/she must posses the skill and knowledge to keep steam in the patient areas if a power, water, or steam failure occurs.

The incumbent shall have the knowledge to operate and maintain feedwater and condensate regulators and pumps, combustion control equipment, de-aerating equipment, de-alkalizers, and special safety equipment such as relief valves and flame failure devices. He/she must be able to operate all boiler auxiliary equipment such as automatic boiler controls, feedwater heaters, pumps, forced and induced draft fans, and water softeners.

The incumbent must have knowledge of operating a multiple fuel boiler. He/she must be able to operate the boiler with Natural Gas as the primary fuel with No. 2 Fuel Oil providing backup from a 150,000-gallon aboveground fuel storage tank. He/she must know how to adjust firing controls for the correct air fuel mixture, adjust fuel feeds, and air drafts to obtain the most efficient air fuel mixture for maximum combustion efficiency and energy conservation.

The incumbent must have the knowledge to oversee the unloading of tanker fuel oil trucks and transferring the fuel to a 150,000-gallon aboveground fuel storage tank. By doing this, he/she must have knowledge in hazardous materials handling in case of emergencies. He/she will provide assessment and initial response, then contact the Fire Department to notify of the situation.

The incumbent must have a practical knowledge as how to maintain efficient combustion levels to ensure compliance with air pollution laws. Pollution levels are

monitored regularly by the Maryland Department of the Environment (MDE) and other regulatory agencies. The incumbent must have knowledge of the equipment which affect pollution control, such as the following:

Economizers—recirculate exhaust gases to preheat water entering the boiler. The stack temperature reading indicates when the economizer is to be blown down by the BPO. When the temperature becomes too high, this indicates a loss in heat transfer to the boiler feedwater and heat loss into the air (thermal pollution). Blowing down the economizer using steam will clean soot from the piping inside the economizer.

Fuel/Air Cam Assembly—These devices work together to insure proper fuel-air mixture. This device is adjusted by the BPO to maintain the proper percentages of carbon dioxide, carbon monoxide, and oxygen. The BPO also maintains the equipment by replacing worn parts and lubricating movable parts to insure that it works smoothly and freely. The fuel/air cam assembly has 24 set screws for gas adjustments and 24 set screws for oil adjustments and the adjustments are made at different percentages in the steam load, from 0% to 100%.

O2 analyzers—monitor oxygen levels in the exhaust stack to assist in determining the proper efficiency and firing of the boiler. The BPO will make adjustments to the cam assembly as outlined.

Orsat and Fyrite analyzers—used to measure the percentages and amounts of oxygen, carbon monoxide and oxygen levels in the boiler flue gasses. The BPO will use this device to measure these gases. After testing, the BPO will make adjustments to the Fuel/Air Cam Assembly, then reset and readjust until acceptable readings are obtained.

Ringelmann Chart Devices—monitor imbalances in fuel mixtures which cause smoke to be emitted requiring adjustments to fuel/air mixtures in the boilers to eliminate smoke from the stack. The entire process from getting readings from the Orsat Assembly to making adjustments on the cam assembly is monitored on these chart devices.

Ring-Type Burner Assembly—The gas orifices in the ring-type burner assembly are relatively small and tend to become plugged. This results in improper swirl and improper flame stability which causes an incomplete combustion of fuel gases and heat loss in the fire box. If enough heat is lost before air from the burner mixes with the fuel rich combustion gases, nitrogen oxides (the primary pollutant of natural gas) is produced. The BPO removes the flame assembly form the boiler and unplugs the clogged orifices. Then inspects and reworks the masonry circle, that the flame assembly fits into to insure the proper swirl and stability of the flame.

Oil Atomizers—break fuel into small particles to allow for complete combustion and control the emission of Nitrogen Oxides from the boilers. The BPO removes this device from the flame assembly, changes the oil and filter, removes the nozzle and hose, to insure that the nozzle spins freely so that the oil breaks down into small enough particles for complete combustion.

The incumbent must be able to recognize, interpret, and react to a variety of problems that may be indicated on chart recorders, gauges, and/or meters which indicate steam

flow, steam pressure, feedwater flow, and temperatures and make the necessary adjustments to prevent the loss of a boiler(s).

The incumbent must be able to take boiler and condensate return water samples and run tests to determine specifics such as acidity, causticity, and alkalinity using reagents, color slides and other standards. He/she is required to determine the type and amount of chemicals to be added to the boilers and the condensate return system for control of corrosion and scale formation. He/she will also test the boiler feedwater for hardness and, if necessary, will switch water softeners and insure the softener removed from service would proceed to be regenerated.

The incumbent shall have knowledge of maintenance requirements (i.e. cleaning fuel guns, lubricating equipment, and power cleaning water tubes) and procedures necessary to perform operational repairs of limited to moderate complexity (i.e. repair or replace valves, gauges, water pipes, and refractory linings). In some work situations, he/she will require basic knowledge of electricity to test and replace wires, switches, and other basic electrical components.

The incumbent shall have the skill and knowledge to perform journeyman level steamfitter work independently such as, to replace and install valves and piping for steam transmitters, chemical pumps, boiler sampling equipment, boiler steam drum vent lines, brine suction systems, feedwater systems, condensate systems, liquid caustic suction line system, supply and drain line system for portable A/C units, and gas and oil line valves. He/she shall also replace and install boiler water sight glasses, boiler line plugs, feedwater float assembly, steam drum baffles, and manway covers for boiler inspections.

The incumbent shall have the skill and knowledge to perform journeyman level electrician work independently such as, to wire pumps, fabricate extension cords, replace fan belts, install electric motors, install high/low pressure switches on fuel line systems, disconnect electric lines from auto blowdown valves, and grease all electric motors, valves and pumps.
The incumbent shall be have the knowledge to oversee internal and external boiler inspections. These inspections are required for each boiler two times (one internal, one external) per year.

The incumbent shall have an in-depth knowledge of the facility utility systems such that in the event of an emergency, he/she will independently be able to cut off and re-route steam and potable water supplies to the medical center buildings.

The incumbent shall have a working knowledge of computer-based Energy Management Systems and their capabilities with regard to monitoring and controlling conditions related to the boiler plant. He/she must be able to make decisions based on data trends to determine the need for adjustment and/or repair.

The incumbent must satisfactorily be able to read, write, and understand the English language. He/she must be skilled in following instructions and operating procedures, and conveying ideas both orally and in writing.

Concentration and close attention is required for extended periods of time, and good judgement is necessary for the diagnosis of any equipment or system malfunctions.

RESPONSIBILITY: The incumbent works independently, but receives organizational instruction and supervision from the Foreman, Plant Operations, or his designee, or as relayed to him/her from the previous shift operator. He/she is responsible for the operation of all Boiler Plant equipment including all minor maintenance and repair. He/she will make independent decisions and judgements regarding boiler plant operations (i.e. combustion and pollution control adjustments, troubleshooting techniques, and equipment maintenance and repair procedures).

The incumbent shall work in a 7-day, 3-shift operating schedule. During working hours other than 7:00am to 4:30pm, Monday through Friday, and on holidays and weekends, the operator will serve as the designee to the Associate Chief for Maintenance and Operations, Perry Point Medical Center, Facilities and Engineering Service. As such, he/she will be considered the operator in charge and have the responsibility for evaluating and making decisions with the steam distribution system, hazardous spills, safety problems, as well as problems concerning other trades such as electrical, plumbing, locksmith and environmental controls (HVAC). He/she will be responsible for initiating immediate action to correct any of those situations that he/she determines emergencies. If necessary, he/she has the authority to call in personnel from other shops to make repairs and isolate problems. Also, he/she has to responsibility to notify state or federal agencies if the situation warrants.

The incumbent must have a thorough knowledge of all Facilities and Engineering Service operations. He/she will serve as the work order clerk during the off-shifts and during 7:00am to 4:30pm when no one else is assigned the task. The operator has the responsibility to determine which calls are emergencies and whom to call to respond to the situation.

The incumbent works alone on the two off-shifts, weekends and holidays, and has no supervisor or higher-grade operator present or at a nearby facility. He/she is responsible for relaying written or oral information to the next shift operator which may be accompanied by diagrams, charts, operating manuals or procedures followed during emergencies, equipment failure, or system malfunction.

PHYSICAL EFFORT: The incumbent must be in satisfactory physical and mental condition and fit for duty at all times, excluding body maintenance items. He/she will be required to frequently work in confined areas in and around boilers and support equipment (i.e. auxiliary and pollution control equipment). The work requires moderate to strenuous effort and long periods of walking, standing, climbing, bending, and crouching. Workers frequently lift and carry boiler parts and chemical supplies weighing

up to 40 pounds unassisted and occasionally items weighing over 40 pounds with the assistance of other workers or weight handling equipment.

WORKING CONDITIONS: The incumbent will work indoors and occasionally work outside for short periods where they are subject to prevailing weather conditions. He/she is subject to high temperatures, constant noise, rotating machinery, soot, dirt, grease, chemicals, oil, and fumes in the work area. He/she may be subject to cuts and abrasions form the use of tools and equipment and burns from acids, caustics, hot water, steam, and contact with piping and boilers. In addition, work on catwalks and ladders will be necessary. Use of personal protective equipment (i.e. hearing protection, coveralls, masks, gloves, etc.) will be required when subject to these working conditions.