

*Nothing in this job description restricts management's right to assign or reassign duties and responsibilities to this job at any time.*

**DUTIES** Serves as full performance (journey level) Central Plant Mechanic in the HVAC Operators Group of the Utilities Section of the Utilities Division in the Engineering and Maintenance Department at Washington Dulles International Airport, Metropolitan Washington Airports Authority (Airports Authority). Maintains, repairs, and modifies the Airport's central plant and related remote facilities heating and cooling systems including five high temperature hot water generators (255 million BTUH), eight 2010-ton electrical centrifugal chillers, and a 16,044 ton-hour ice harvester and storage system. Applies the theories, principles, requirements, and standards of the trade and uses the full range of tools of the trade. Uses specialized software to operate/adjust equipment/systems and diagnose problems. Performs related functions.

Maintains, and repairs heating and air-handling systems and related HVAC equipment ranging from low-pressure boilers in satellite machine rooms to 50,000 BTU high-temperature hot-water boilers in the Utilities Building, and from small exhaust fans to multi-zoned air-handling units with multi-filtering systems. This also includes air intake fans, mixed-air fans, high-voltage HVAC units used with high-temperature hot-water and chilled water, ventilation units, exhaust fans in manholes, Variable Air Volume (VAV) boxes, heat pumps, various pumps and air compressors, diffusers, ductwork, etc.

Troubleshoots problems with equipment by using tools and/or other means, e.g., observes cracks and metal corrosion, checks gauges for pressure, temperature and level, assesses sounds of motors, detects odors given off from flow of gas leaks, detects temperatures of pipes, etc. Reviews computer data and written logs, and uses schematics, maintenance manuals and drawings to troubleshoot problems with electrical, electronic or pneumatic controls, and mechanical equipment.

Dismantles, inspects, cleans, repairs or replaces equipment, such as, pumps, gearboxes, tube bundles, chillers, condensers/evaporators, burners, expansion joints, etc. Repairs or replaces piping and modifies controls, per schematics and drawings as necessary. Aligns motor and pump shafts; adjusts controls; replaces bearings, bushings and connecting rods; and cleans cooling tower basins, tubes on high temperature generators, etc. Rebuilds chilled water and high temperature hot-water pumps by replacing impeller mechanical seals and adjusting to close tolerances required by manufacturers' specifications.

Replaces blower motors and cleans coils on heat pumps. Repairs and/or replaces timers, electrical switches, solenoids, and electrical controls, such as, for automatic roll-filter equipment on HVAC units. Replaces mechanical seals on pumps and aligns to close tolerances for shaft alignment with motors. Installs duct work and diffusers as required. May recommend modification to design of equipment for improved operations.

Performs preventive maintenance on high temperature hot water generators, centrifugal chillers, pumps, compressors, cooling towers, etc. Lubricates and replenishes oil; changes various kinds of filters; tightens loose connections; and cleans coils. Replaces worn belts, gaskets, pulleys, "O" rings, etc. Checks and charges refrigerant and performs other tasks to

maintain equipment within manufacturer's recommendations. May set controls on electronic filters and sandblast parts.

Answers trouble calls (such as temperature complaints). Uses computer software in initial troubleshooting to determine operating status of equipment. Reads dials and gauges on air-handlers to determine whether pressures and temperatures are appropriate for intended cycles in isolating problems such as defective/malfunctioning automatic valves. Troubleshoots motors for electrical and/or mechanical failures. Is assigned periodically to operate 50,000 BTU high-pressure boilers and 2,000-ton chillers by recording readings of gauges, observing for leaks, changes in motor sounds, or other indications of abnormal operations; makes adjustments as required or takes unit off line after following proper procedures to start another.

May work along with HVAC Mechanics and/or Air-conditioning Mechanics in maintaining or repairing thermal ice storage systems, chillers, window air conditioners, water coolers, roof-top heat pumps, and refrigeration equipment.

Regularly uses water sampling equipment and common hand tools such as wrenches, socket sets, hammers, chisels, and calipers. Uses multimeter, amp probe, vacuum pump, oxygen and acetylene torches, acid pump, leak detector and refrigerant reclaimer for tasks such as measuring water, refrigerant temperature and pressure, and for brazing copper tubing and parts, etc. Occasionally uses distributed control system (DCS) to determine the operational status of equipment monitored and controlled by the DCS.

Keeps records and makes reports of work accomplished (such as completion of work orders) and materials used (such as filters, lubricants, refrigerants, special chemicals, and cleaning solvents). Maintains familiarity with Safety Data Sheets (SDS).

Sets up and cleans up work-site. Performs 'shop keeping' tasks common to the trade, and as assigned. Operates incinerator and paints equipment as required.

Handles refrigerants and hazardous materials (such as fuel and chemicals) in accordance with regulations and other requirements. Works according to building/fire codes. Works safely in accordance with safety procedures.

Continues education in industrial changes that affect IAD heating, ventilation, air conditioning, and refrigeration (HVAC-R) equipment and systems. As opportunities arise in the course of daily work, recommends (based on observations) improvements in preventive maintenance and in practical use of modern technology.

Communicates and interacts effectively with internal and external business contacts including, but not limited to, other members of the unit/team, other Airports Authority employees (such as managers, supervisors, professionals, and support staff), other mechanics, vendors/suppliers, and the general public. Maintains radio/phone contact with supervisor/shop leader/base and customers, keeping them informed.

Uses a computer and (a) modern office suite software (such as MS Office) to communicate

(email), word process (light word processing only), and perform or conduct research (Internet use); (b) enterprise system/software for requisitioning, tracking work orders, documenting work, time and attendance reporting, and other functions; and (c) special systems/software used in the Division.

Drives a vehicle to and from work locations, airside and landside. May escort contractors to work sites.

\*Performs other duties as assigned.\*

*Critical features of this job are described under the headings below. They may be subject to change through reasonable accommodation or otherwise.*

### **MINIMUM QUALIFICATIONS (MQs)**

To be rated qualified for this job, an applicant must meet both of the MQs listed below at the time of vacancy announcement closure.

1. A high school diploma or Certificate of General Educational Development (GED); or an equivalent combination of education, experience, and training.
2. Four years of progressively responsible experience (post high school) in the maintenance and repair of mechanical equipment, which includes one year specializing in installation, test, diagnosis, maintenance, and repair of a range of heating and air-handling systems and related HVAC equipment ranging from low-pressure boilers to high BTU high-temperature hot-water boilers, and from small exhaust fans to multi-zoned air-handling units including air intake fans, mixed-air fans, high-voltage HVAC units, ventilation units, exhaust fans, Variable Air Volume (VAV) boxes, heat pumps, various pumps and air compressors, diffusers, ductwork, etc.

A Journey License as an Air Conditioning Mechanic is evidence of four years of progressively responsible trade experience, but is not, by itself, evidence of the one year of specializing in installation, test, diagnosis, maintenance, and repair of a range of heating and air-handling systems and related HVAC equipment.

### **PREFERRED QUALIFICATIONS**

The qualifications listed below (if any) are preferred and may be considered in the selection process, but they are not required to be rated qualified for this job.

1. A Journey License in HVAC.
2. EPA certification (universal) to service HVAC/Refrigeration Equipment.
3. Experience working safely in a skilled trade, on a busy airfield, or in an equivalent work environment, such as, but not limited to, work in a skilled trade requiring prolonged concentration and attention to detail amid maritime or motor freight cargo loading/unloading,

or other types of near-constant movements/operations that require continuous situational awareness and alertness to continually changing circumstances and events.

## **KNOWLEDGE, SKILLS, ABILITIES, AND OTHER FACTORS (KSAOs)**

The following KSAOs are required for successful performance of this job and are a basis for rating and ranking applicants who are found to meet the MQs. *Local, Federal, airport industry or Airports Authority specific bodies of knowledge listed below may be acquired on the job, typically; ability to rapidly acquire them is required at the time of vacancy announcement closure.*

1. Full performance (journey) level knowledge of, and skill in, heating, ventilation, and air conditioning (HVAC) equipment and system installation, operation/adjustment, maintenance, troubleshooting, and repair/replacement. This includes but is not limited to:

Knowledge of the theories, principles, requirements, and standards of the trade (such as cycles, air flow, heat transfer laws, pressure-temperature characteristics and controls, and the mechanical operation of HVAC equipment to recognize abnormal conditions and make adjustments or repairs.

Knowledge of the operating characteristics of a wide range of commercial-industrial and residential systems/equipment, such as high temperature hot water generators, centrifugal chillers, and ancillary equipment.

Knowledge of basics in advances in HVAC equipment and materials as may apply to the equipment/systems of IAD to recommend practical applications to IAD systems as opportunities arise.

Knowledge of which HVAC units, return air, and mixed-air fans work together and the areas they serve to trace problems and restore regulated temperatures in specific areas.

2. Skill in using tools, technical manuals, schematics, materials, and other equipment and guides in journey level HVAC work. Examples include:

Skill in electrical testing equipment such as voltmeter, megohm tester, and electronic shaft alignment tools.

Skill in using hand and power tools of the trade in routine and non-routine work, such as punches, hacksaws, hydraulic press, grinder, sand blaster, shears, multi-meter, gas welding outfit, vacuum pumps, Vernier calipers, micrometers and pipe threaders/cutters in such work as disassembling/assembling high-pressure boilers, replacing and aligning shafts with bearings, replacing heating coils on HVAC units, repairing or replacing electrical switches and controls, and installing ductwork.

Skill in using manuals, schematics, and equipment to adjust mechanical seals on pumps and grind seats on valves to manufacturers' specifications.

Basic skill in using energy management system (EMS) software to revise set points for automatic operation of equipment at new ranges.

3. Ability to rapidly acquire technical knowledge of new equipment and systems as they come on line and off warranty.
4. Skill in problem solving to select, organize, and logically process relevant information (verbal, numerical, or abstract) to solve a problem. This includes ability to recognize subtle aspects of problems, identify relevant information, and make balanced recommendations and decisions. Examples include: troubleshooting to locate causes of malfunctions in high-temperature hot-water generators, centrifugal chillers, pumps, valves and related systems and interpreting schematics and manufacturer's specifications to perform work assist in troubleshooting.
5. Skill in using a computer and (a) modern office suite software (such as MS Office) to communicate (email), word process (light word processing only), and perform or conduct research (Internet use); (b) enterprise system/software for requisitioning, tracking work orders, documenting work, time and attendance reporting, and other functions; and (c) special systems/software used in the Division.
6. Skill in reading comprehension to understand written information (including instructions, descriptions, and ideas), and to express such information in writing so that others will understand. Examples include reading technical-operational materials (such as technical manuals, maintenance schedules, and work orders) and administrative-programmatic materials (such as IAD and Airports Authority supply procedures), and writing briefly about similar types of matters, such as closing out work orders and completing Safety Data Sheets (SDS).
7. Skill in oral communication to understand verbal information (including instructions, descriptions, and ideas), and to express such information verbally so that others will understand. Examples include exchanging routine and non-routine operational and procedural information with co-workers and contractors.
8. Interpersonal skills to interact with contacts in a businesslike, customer service-oriented manner.
9. Ability to work safely and knowledge of the safety rules and procedures needed to do so.

**RESPONBILITY** Is responsible, at the full performance (journey) level, for installing, maintaining, troubleshooting, and repairing all central plant systems and equipment. Reports to a Group Supervisor, however, a Leader in the trade typically makes assignments and assures that needed materials are available. Incumbent independently performs work on own or in a team and solves journey-level problems in accordance with established priorities, policies, procedures, preventive maintenance guides, manufacturer's specifications, codes and other requirements and standards. The incumbent keeps the Supervisor and/or Leader informed of progress and

problems or conflicts requiring assistance. The work is checked for such factors as quantity, quality (including compliance with work orders, regulations and accepted trade practices), timeliness, customer satisfaction, and performance goals and measures.

**EFFORT** Work requires moderate to heavy physical exertion (such as frequent, prolonged periods of exerting 20 to 40 pounds of force or continual exertion of force in the range of 10 to 20 pounds), and considerable mental attention (as in working in very close proximity to energized electro-mechanical systems). Work situations typically require walking, standing, stooping, kneeling, crouching, reaching or otherwise positioning of self to access and monitor equipment and instrumentation. Ascends stairs and vertical ladders to monitor equipment and resolve problems. Lifts, pushes/pulls or otherwise moves items weighing up to 50 pounds such as shafts and cooling tower fan blades. Typically identifies potential problems and the effectiveness of repairs by visible/audible/other indicators, such as data from displays, color coded wiring, and read-outs of dials, gauges and monitors; shade of boiler feed water testing materials; excess heat caused by overheating motors; and odors given off by leaks. Obtains information about the status of equipment/systems from dials and gauges. Uses schematics and manuals containing small print. Operates vehicle based using judgment in consideration of traffic, weather and other factors. Communicates by two-way radio and telephone.

**WORKING CONDITIONS** Generally works inside with near-constant exposure to noise from generators, chillers, and compressors; may work outside in all kinds of weather when working outside on cooling tower fan, basin, etc. Is subject to dust, grease and dirt; high temperatures of plant; possible electric shock from working near energized electrical equipment and burns from chemicals or hot piping; potential falls from slippery surfaces or ladders; and potential injury from blown gaskets on high pressure lines. Annually, may work inside generators or other confined spaces for periods ranging up to most of the shift. Exercises care and uses personal protective gear such as asbestos gloves, hard hat, safety shoes, respirator mask, tripod, safety-recovery harness, and confined space monitor, as required.

**OTHER SIGNIFICANT JOB ASPECTS** Is subject to hold-over and recall on a 24-hour basis for essential services and other emergencies such as equipment/system outages and snow removal.