Job Description – Electro Mechanical Technician, T19
Location: Washington Dulles International Airport

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

DUTIES At the full performance level, performs preventive maintenance, determines causes of operating problems, traces and locates defects, installs and makes repairs to electrical systems (up to 670V) on equipment maintained at Dulles International Airport (Airport) (e.g., mobile lounges, Plane Mates, passenger boarding bridges (PBBs)), heating, ventilation and air-conditioning systems (HVAC), auxiliary generators, crash/fire equipment, buses, police vehicles, and other general and special purpose equipment maintained by the section).

--Maintains, adjusts, dismantles, repairs, overhauls and reassembles cooling/heating units for different types of equipment (e.g., 15-ton units in mobile lounges and 45, 60, and 90 ton units in PBBs) such as compressors, condensers, pumps, receivers, evaporators, service valves, thermostats, coils, and drive assemblies. Detects, locates, and analyzes faulty operation in various types of electric and air-conditioning control devices such as solenoid valves, expansion devices, and thermostatic controls. Makes repairs as necessary, to include changing filters, checking pressure ranges, thermostats, and refrigerant levels to assure that the equipment is operating up to performance standards. Use soldering and brazing techniques to install copper tubing and air-conditioning components while making various repairs. Performs repairs on HVAC systems in accordance with EPA regulations.

--Regularly makes repairs on Plane Mate and PBB lift systems, to include electrical systems (up to 670V) and various electronic controls. Repairs component and subcomponent repairs of PBB high-voltage Ground Power Units which supply shore-based power to aircraft, to include avionic electronics. Make subcomponent repair to include capacitors, transistors, rectifiers, etc. In consultation with immediate supervisor, initiates any corrective action that will bring the equipment and components up to previously established maintenance standards using maintenance manuals, operations manuals, wiring diagrams, and mechanical schematics. May consult with equipment users to gather more information about the nature of operating difficulties. Enters complete details of all work performed in the computerized maintenance management system. Performs preventive maintenance inspections to identify and correct deficiencies in the operation of the lift systems. Using appropriate checklist, examines elements of equipment, and diagnoses immediate and potential problems to determine proper course of action or repair, such as repair or replacement of diodes, relays, transistors, thyristors, SCR's, capacitors, and numerous electrical and electronic components, running load test bank to test efficiency of generator sets, etc.

--Maintains, repairs, and troubleshoots Programmable Logic Controllers (PLC) for mobile lounge hydrostatic drive systems and Plane Mate lift and safety interlock systems. Performs component and subcomponent repairs to obsolete PLC's (i.e., HED Lift Controller, Plane Mate) to include soldering/desoldering of integrated circuit components such as resistors and diodes into the existing integrated circuit board.

--Troubleshoots PLC components with PC-based (laptop) proprietary troubleshooting of mobile

lounge and Passenger Loading Bridges (PLBs) PCAir air conditioning systems, no logic-based troubleshooting can be performed on the newer bridges without this capability.
--Services, repairs, and maintains control systems governing the output of Ground Power Units (GPU's) used on passenger loading bridges in accordance with Military Standard 704E at 400 Hz, 115/200 VAC, 3 phase, 4 wire from a 480VAC, 3 phase power source. This system requires performance to extremely close tolerances for aircraft power supply and avionics.

--Maintains and repairs deficiencies in auxiliary diesel generators, electrical power supplies, and electronic transfer systems which provide power for mobile lounge at terminal gates (breaker point to power outlet, under 600 volts). Also maintains and repairs electrically operated transition ramps (gangways), automatic doors, lighting, transformers, rectifiers, digital public address systems, fans, defrost systems, and electrical circuits for television monitors, and solid state cameras for mobile lounges, passenger boarding bridges, and other appropriate equipment. Maintains and repairs mobile electro-mechanical hoist systems and mobile electronic signs.

--Removes refrigerants from air-conditioning units and recycles, recharges refrigerant systems, detects, and corrects leaks in refrigerant systems, and makes mathematical calculations to determine percentage of efficiency on performance of units.

--Makes emergency service calls to stalled or malfunctioning vehicles and equipment in the Airport Operations Area and elsewhere on the airport, (e.g., the lift system of a Plane Mate carrying passengers that is "stuck" in the up position and PBBs that will not position at the aircraft). On-site repairs often require immediate action so that equipment can be mated/removed from aircraft, unloaded or brought into the shop for further repair or to move it from the Airport Operations Area. While on airfield, operates two-way radio.

--Performs comprehensive inspections of vehicles and equipment and prepares labor, parts and materials requirements for the development of itemized estimates. In conjunction with the tool and parts attendant, identifies replacement parts and materials needed to make repairs from various parts catalogues and manufacturer's specifications. Due to age of equipment maintained, parts are often no longer available and mechanics will have to research possible substitutions supplied by other manufacturers' or fabricate (if possible) replacements.

--Corrects, as necessary, mechanical and more complicated electrical (primarily less than 24V, DC current) systems, and hydraulic deficiencies in equipment.

--In addition to common hand-tools, uses manifold gauges, multimeters, amp probe, power supplies, signal generators, capacitance checkers, diode testers, logic probes, vacuum pump, oxygen and acetylene torches, leak detector, load bank testers, oscilloscope, megger and refrigerant reclaim units to test and repair equipment.

-- Performs recurring duties such as cleaning shop/work/living area as required or when instructed by the supervisor/leader; inputting information and completing work orders via computer for all

equipment maintained, overhauled or repaired; and driving equipment to fueling station, dispensing fuel and recording amounts in fuel logs.

--Uses a computer for various applications (email, word processing, etc.), ERP (enterprise procurement-logistics system) applications, reviewing equipment manuals, and the current Computerized Maintenance Management System (CMMS).

--As required, communicates by two-way radio or computer (email) with other Airport personnel including equipment and vehicle operators and supervisors.

--Drives shop vehicle to various locations, airside and landside, to perform assigned functions. Also operates PBBs, mobile lounges, Plane Mates, and other airport equipment as required.

Performs other duties as required and 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 all four of the MQs listed below at the time of vacancy announcement closure.

1. A high school diploma, a Certificate of General Educational Development (GED), or an equivalent combination of education, experience and training.

2. Four years of repair and maintenance of electrical systems (up to 670V) on heavy duty equipment such as mobile lounges, Plane Mates, passenger boarding bridges (PBBs)) as well as heating, ventilation and air-conditioning systems (HVAC), auxiliary generators, crash/fire equipment, buses, police vehicles, and other general and special purpose equipment; **or**

   Four years of approved apprenticeship training in electrical systems for heavy equipment and one year of repair and maintenance of electrical systems (up to 670V) on heavy duty equipment such as mobile lounges, Plane Mates, passenger boarding bridges (PBBs)) as well as heating, ventilation and air-conditioning systems (HVAC), auxiliary generators, crash/fire equipment, buses, police vehicles, and other general and special purpose equipment; **or**

   Four years of electrical repair and maintenance experience on vehicles and 240 hours of electrical systems vocational training for heavy equipment.

3. Ability to obtain a Class B Commercial Driver's License (CDL) within 90 days of hire, or placement into the position.

PREFERRED QUALIFICATIONS (PQs)

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

1. Possession of a Class B Commercial Driver's License (CDL).
2. Experience working on heavy duty equipment electrical systems and electronic/electric controls such as transformers, rectifiers and suppression circuits, and equipment in buses and mobile lounges and related electronic components of mobile, stationary and portable equipment, including electronically-controlled generators in and on crash/fire equipment, construction equipment, snow removal equipment, buses, trucks, police and passenger cars for a public or government entity.

3. Certification in Refrigerant Type I and Type II, and Automotive EPA certification.

4. Virginia Master Electrician License.

5. Virginia Master HVAC License.

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. *Any local, Federal, airport industry or Airports Authority specific bodies of knowledge listed below may be acquired on the job; ability to rapidly acquire them is required at application/placement.*

1. Knowledge of electrical theory such as transformers, rectifiers and suppression circuits, the National Electric Code and the electronic principles used with various electronic/electric controls to work safely on a variety of electrical systems and equipment in buses and mobile lounges and related electronic components of mobile, stationary and portable equipment, including electronically-controlled generators.

2. Knowledge of journey-level electrical theory governing discrete components, linear integrated circuits, transformers, rectifiers, and amplifier circuits, the National Electric Code and OSHA electrical safety regulations, and the electronic principles used with various electronic/electric controls to work safely on a variety of electrical systems and equipment.

3. Journey level skill in analyzing, troubleshooting, and repairing complex interrelated electronic and electro-mechanical systems which require journey-level proficiency in HVAC, electronics, electrical, industrial controls, automatic door systems, and mechanical. Determines system efficiency thru operational test, identifying deviant performance and repairs defective components, and adjust to specified precise close tolerances, e.g., adjusts controls for PLC's and PBBs to within milliamps/millivolts/milliohms and specific frequencies.

4. Possess skills in applying knowledge of the electrical theory, heating and air-conditioning, and electronic and electro-mechanical systems as they relate to heavy mechanical equipment to recognize operating deficiencies and making appropriate repairs. Check leaks by visual, audible, and test instruments. Troubleshoots equipment components, disassembles, and assembles air conditioning and heating units, rebuilds compressors, and replaces components such as evaporators and condensers as needed.

5. Knowledge of the principles and operating characteristics of heating and air-conditioning systems, and related controls, and mechanical systems of vehicles, including cars, trucks, SUV's, buses, mobile lounges, Plane Mates, and PBBs. Must have knowledge of EPA regulations related to HVAC systems and posses certification in Refrigerant Type I, Type II, and Automotive EPA certification.

6. General knowledge of the operation of related equipment such as mechanical and hydraulic systems for mobile equipment to determine problems and refer (if necessary) to Heavy Mobile Equipment Mechanics for related repairs.

7. Knowledge, skill and ability in using a computer to work with Windows-based operating systems, spreadsheets, word processing and on–line technical information systems such as Mitchell On-Demand, ALLDATA, and industry maintenance management software and the Airports Authority's Computerized Maintenance Management System (CMMS).

8. 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 interpreting technical manuals, illustrations, specifications, diagrams, schematics, parts catalogues, and similar guides (showing the complete assembly of HVAC systems such as regulators, valves, electrical circuitry, etc.), including on-line computerized information systems, to troubleshoot breakdowns, service, and make repairs/modifications.

9. Skill in using tools-of-the-trade such as manifold gauges, multimeters, oscilloscope, power supplies, signal generators, capacitance checkers, logic probes, amp probe, vacuum pump, oxygen and acetylene torches, leak detector, load banks and refrigerant reclaim systems to perform tasks such as troubleshooting electrical circuitry; brazing copper tubing and AC parts, and testing various components of equipment, etc.

10. Skill in written communication 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 DCA and Airports Authority supply procedures), and writing briefly about similar types of matters, such as closing out work orders and completing Material Safety Data Sheets (MSDS).

11. 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, contractors and customers.

12. Interpersonal skills to interact with business contacts in a businesslike, customer service-oriented manner.

13. Ability to work safely and knowledge of those safety rules and procedures needed to do so.

RESPONSIBILITY Responsible for troubleshooting, repairing, overhauling, and performing preventive maintenance on HVAC systems and electrical/electronic components of various types of mobile equipment and auxiliary generators at the journey level maintained by the shop. Mandated with maintaining all critical airport transportation systems such as mobile lounges, Plane Mates, and PPBs as well as construction equipment, snow removal equipment, buses, and other equipment used or operated by the Airport. These systems require immediate and decisive servicing on a 24-hour basis to eliminate impacts on passenger conveyance. Assures that emergency repairs made to PBBs, mobile lounges, Plane Mates in the Air Operations Area are safely made as soon as possible often independently assuming responsibility for using a thorough knowledge of systems to locate and analyze problems often involving complex interrelated systems, determine their significance, troubleshooting, and deciding course of action to take to minimize any "down time" and maintain passenger flow through the airport transport system. Frequently required to interface directly with the tenants and customers to solve problems related to the PBBs.

Responsible for maintaining obsolete systems and components or upgrading them with state-of-the-art replacements e.g. HVAC controls, circuit boards, PA systems, lift system, automatic door components, and integrated circuit boards assuring compliance with accepted trade practices, manufacturer specifications, the National Electric Code, OSHA, and NFPA regulations as applicable.

Often works independently and keeps supervisor informed of work progress or problems. Supervisor assigns work according to standard or special procedures. Supervisor's oversight focuses on work prioritization and compatibility with other jobs scheduled and emergencies, assuring that it is performed in a timely manner. Responsible for completing work assigned by Supervisor in a timely manner according to accepted trade practices and manufacturer specifications, and within prescribed processes and parameters.

EFFORT Stands or stays in one position for long periods while performing some repairs. Frequently bends, stoops, kneels, and crawls under equipment, or otherwise positions self to access hard to reach places. Ascends large vehicles (such as mobile lounges or crash/fire trucks) and PBBs stairs and roofs; maintains balance on PBB roof that may be slippery using personal protective gear. Bends forward on knees (to check, tighten or replace 75 lb rollers on PBBs). Works in a kneeing and crouching position (to troubleshoot electrical components). Requires acute mental alertness on most electrical work (as in troubleshooting live circuits less than 600VAC to avoid electrocution) Works

in cramped positions reaching overhead, and carries or otherwise transports objects weighing up to 100 pounds (such as acetylene and refrigerant tanks). Detects warmth of overheating motors. Detects fuel or chemical leaks. Distinguishes color-coded objects (e.g., electrical wiring) and condition of material by their shade (e.g., metal parts discolored by overheating). May identify condition of working components visually or by their pitch, frequently working safely near or around equipment in operation (e.g. running motors, gears, and engines). In driving, operates vehicle using judgment in consideration of weather, traffic and other factors. Communicates by telephone and two-way radio. Reviews technical manuals, diagrams, schematics and similar materials that contain small print. Has the ability to concentrate while aligning parts and making adjustments to precise tolerances.

WORKING CONDITIONS Works in shop and frequently outside (in order to repair PBBs, vehicles and equipment) in all kinds of weather when making service calls. When working on stalled or inoperative vehicles that are disrupting the AOA (such as a mobile lounge filled with traveling passengers) is subject to pressure of making appropriate repairs as soon as possible. Is exposed to: possible burns from caustic chemicals, high pressure steam or heated engine components; possible electrical shock: possible falls from ladders or large mobile equipment, PBB roofs and slips on oily flooring; moving vehicles in both fast moving and heavy traffic, e.g. Dulles Access Highway and the mobile lounge gates; flying metal parts from grinding; hazardous fumes and substances; and loud noises from revving heavy equipment engines and aircraft. Frequently works from man lifts and scissor lifts using fall protection gear. May work for prolonged periods of time in noise levels in excess of 105db (as when servicing Preconditioned air units on the PBBs). Works on and around energized electrical lines (up to 600 VAC) troubleshooting defective operation of equipment requiring special personnel protective gear (e.g. Electrical safety shoes, fire retardant (FR) uniforms, voltage (V) rated insulated gloves and leather protectors, switching hood and hearing protection, FR hard hats and liner, FR eye protection, V-rated insulated tools. Takes care, follows general and/or special safety precautions and wears protective gear such as safety shoes, goggles, gloves, ear plugs, leather aprons, and other personal protective gear as may be appropriate to the task at hand.

OTHER SIGNIFICANT JOB ASPECTS Subject to holdover and recall on a 24-hour basis for essential services, shift coverage, equipment repairs, and emergencies such as snow removal.