October 2010

SAUSALITO-MARIN CITY SANITARY DISTRICT

ELECTRICAL/INSTRUMENTATION & MECHANICAL MAINTENANCE TECHNOLOGIST III

DEFINITION

Under minimum, general supervision of the Plant Superintendent, performs lead or advanced level maintenance work involving the maintenance, diagnosis, repair and installation of electrical, instrumentation, and mechanical equipment at the wastewater treatment plant and pump stations.

SUPERVISION EXERCISED

Exercises technical and functional supervision over assigned Operations and Maintenance personnel engaged in maintenance and repair activities.

IMPORTANT AND ESSENTIAL DUTIES (Illustrative only)

Electrical/Instrumentation

1. Performs common and complex preventive and corrective maintenance including checking voltage and amperage, tightening and cleaning equipment, locating potential problems, and making repairs.
2. Performs electrical and instrumentation circuit installation for additions or modifications by bending and installing conduit, pulling wire, wiring in circuits as shown on blueprints and testing system for proper installation.
3. Maintains, repairs and upgrades electrical and instrumentation equipment facilities, such as motors, generators, switchgear, substations and control equipment.
4. Prepares purchase requests for parts and materials and contacts vendors for pricing of specialized parts and services.
5. Generates power during outages by connecting emergency generator to pump stations and at the treatment plant.
6. Performs inspections and monitors the work of contractors relating to electrical and instrumentation repairs and upgrades
7. Recognizes abnormally operating equipment and used advanced troubleshooting methods and skills to diagnose, analyze recommend and implement required repairs.
8. Performs and instructs staff in the safe, effective and efficient methods of electrical/instrumentation system testing, operations and maintenance, including meter calibration.
9. Designs, installs, tests, adjusts, modifies and maintains digital and logic circuitry, microprocessor controlled devices and elements, such as programmable logic controllers, process control equipment, telemetering devices, recorders, sensors, alarms, and controllers on wastewater treatment process instruments and devices.
10. Plans projects, maintains records of work performed and makes estimates of labor and material necessary for the performance of the work.
11. Supervises assigned O&M technicians and conducts training in electrical and instrumentation maintenance, repair and safe work practices.

Mechanical

1. Installs, inspects, maintains, troubleshoots, adjusts and repairs, a variety of mechanical equipment at wastewater treatment, collection and disposal facilities, such as sluice gates, compressors, flights, drives, hydraulic controls, mechanical structural and plumbing, apparatus, belts, chains, and conveyors, diesel and/or gas engines and related co-generation equipment.
2. From work orders, drawings, specifications, schematics, sketches, and/or verbal and written instructions, performs complex mechanical maintenance, repair, fabrication, and rebuilding of shop, field and plant equipment used in wastewater plants and pump stations.
3. Installs, inspects maintains, and repairs a variety of pumps, such as centrifugal, positive displacement, and diaphragm; services, lubricates, and adjusts chemical feed and processing equipment; determines excess wear and pump efficiencies; follows preventive and predictive maintenance practices.
4. Performs horizontal and vertical welding, fabricating, silver soldering, hard facing, and brazing using acetylene, arc, mig, and tig welders on ferrous and nonferrous metals; makes specialized cuts and complex angles using a band saw; performs blacksmithing and parts fabrication.
5. Installs, inspects, maintains, and repairs piping systems of PVC, black and cast iron, stainless steel, and copper tubing; installs, removes, and repairs larger pipes and valves; draws minor new designs; modifies existing piping systems and welded steel pipe, such as nozzles and saddles; taps, cuts, and threads pipes.
6. Performs maintenance and repair tasks on a wide variety of internal combustion engines; adjusts valves and carburetors; repairs and maintains exhaust systems.
7. Performs regularly scheduled inspection, maintenance, and repair tasks on comminuting and grinding devices; overhauls equipment, such as cutters, bearings, chains, mechanical seals, gear reducers; performs close tolerance checking and testing.
8. Performs inspection, maintenance, and repair or overhaul tasks on drive components, such as right angle drive gears, reduction drives, and variable speed and belt and chain drives.
9. Installs, maintains, inspects, overhauls, and adjusts, repairs a variety of hydraulic and pneumatic systems and compressors.
10. Properly uses and cares for hand and power tools such as grinders, saws, jacks, hydraulic presses and pullers and pipe threaders; inspects, tests, and measures equipment and material using precision instruments such as scales, height and depth gauges, calipers, verniers, and micrometers of various types.
11. Plans tasks, maintains records of work performed and makes estimates of labor and material necessary for the performance of the work.
12. Follows proper safety practices, precautions, and procedures, such as confined space entry; the storing, handling, and transportation of gases; using correct lockout, tagout and rigging procedures, wearing flash protection when welding and other safety requirement as appropriate; and operating and maintaining hand and power tools and test equipment in a safe manner.
13. Operates, cleans, services, lubricates, maintains, and paints equipment, machinery, vehicles, structures, buildings, pipelines, storage tanks and additional items found in wastewater collection, treatment and disposal facilities.
14. Inspects, diagnoses, and performs routine servicing and repair of vehicles and a variety of diesel powered equipment.

OTHER DUTIES

- Operates flatbed trucks, generators, and other types of machinery, equipment, and vehicles.
- Assists in maintaining the currency of Operations and Maintenance manuals and record drawings, prepares and updates standard maintenance procedures, and develops and

maintains proper maintenance management schedule and activities and equipment inventory in connection with the District's maintenance management computer system.
- Responds to emergencies.
- Performs other related duties as assigned.
- Establish and maintain effective working relationships.

QUALIFICATIONS

Knowledge of:

1. Electrical and instrumentation principles, methods, tools, equipment and safety procedures.
2. Safe and proper use of various hand and power tools, test meters and equipment to troubleshoot, repair adjust and perform preventive maintenance on electronic process controls and measurement systems, instrumentation systems, electronic meters, programmable controllers and related equipment.
3. Communicate effectively both orally and in writing, in the English language.
4. Establish and maintain cooperative working relationships.
5. Use electrical and instrumentation test equipment and record data regarding electrical/electronic equipment.
6. Read and interpret computer logic diagrams, programming guides, electrical drawings, control loop diagrams, schematics, blue prints, maintenance manuals, technical bulletins, ladder diagrams, troubleshooting guides and preventive maintenance instructions.
7. Diagnose, repair and calibrate defective electrical, electronic components.
8. Design basic electrical and instrumentation controls.
9. Troubleshoot electrical, electronic, mechanical, pneumatic, hydraulic, digital and analog control equipment and systems.
10. Generate accurate and effective maintenance records, status reports, data and maintenance logs and effectively respond to oral directions and requests.
11. Methods, materials and equipment used in the maintenance of wastewater pumping and treatment facilities.
12. Pertinent federal and state safety regulations and electrical codes
13. Hazards and proper safety precautions and procedures, including chemical hygiene and personal protective equipment.
14. Techniques, methods, practices, procedures, and tools of plant maintenance.
15. Principles and practices of preventative maintenance.
16. Electrical circuits, including sizing, installation, troubleshooting and repair.
17. Shop mathematics.
18. Computer applications related to the work.
19. Basic principles and practices of supervision, training and work review.

Ability to:

- Direct, train and review the work of assigned staff.
- Plan and organize a project from start to finish including purchasing of materials and supplies and scheduling of equipment rentals and specialty contractors.
- Wear personal protective equipment, such as safety glasses or goggles, hard hat, respirator protection (e.g. dust mask, self-contained breathing apparatus, etc.), safety steel toe boots, gloves and protective clothing.
- Read and interpret gages and other recording instruments.
- Prepare reports and keep accurate records.
- Communicate clearly and concisely, both orally and in writing in the English language.
- Establish, maintain, and foster positive and harmonious working relationships with those contacted in the course of work.

- Follow oral and written instructions.
- Read, understand and follow proper procedures related to work performed.
- Perform tasks in a timely manner.
- Read and interpret mechanical, electrical and instrumentation drawings, plans, and specifications.

Experience and Education:

Any combination of experience and training that would likely provide the required knowledge and abilities is qualifying. A typical way to obtain the knowledge and abilities would be:

Experience:
Six years of experience in electrical/instrumentation technology, or other field closely related to water or wastewater plant electrical/instrumentation maintenance. Successful completion of college or technical school coursework related to the field may be substituted for the experience on a year for year basis to a maximum of two years.

Education:
Equivalent to graduation from high school supplemented by specialized training in the electrical, instrumentation and mechanical technologies. An associate or bachelor degree in a technical discipline is highly desirable.

LICENSES AND CERTIFICATES

Must possess a Grade II Electrical/Instrumentation Technologist and Grade II Mechanical Maintenance Technologist certificates issued by the California Water Environment Association, or obtain such certificates Technologist certificate in a time frame specified by the District.

Must possess a valid California class C driver's license and a satisfactory driving record.

PHYSICAL DEMANDS

Must possess stamina to walk, stoop, climb and work in confined spaces and a laboratory setting; strength to lift and carry equipment, tools and supplies weighing up to 50 pounds and heavier weights with proper equipment; vision to read a printed page and a computer screen; and hearing and speech to communicate in person and over the telephone.

WORKING CONDITIONS

Must be willing to work under potentially hazardous conditions and with exposure to potentially hazardous chemicals. Must be available for standby, emergency on-call and periodic off-shift work.