THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

OPERATIONS AND MAINTENANCE TECHNICIAN I
(MECHANICAL OR ELECTRICAL)
(ENTRY)

Group-Section: Water System Operations - Various	**FLSA Status:** Non-Exempt **Bargaining Unit:** AFSCME	**Classification:** Operations and Maintenance Technician **Salary Grade:** 28 **Job #:** S03

JOB SUMMARY

Learns mechanical/electrical skills, experience and knowledge in the practices, procedures, and methods of installing, maintaining, and repairing both general and complex water utility and facility mechanical/electrical systems. Assists in monitoring, inspecting, installing, and repairing mechanical/electrical equipment and related systems for reliable operating condition and performance, including predictive and diagnostic testing, preventive and corrective maintenance, improving equipment and asset capacity and upgrading systems to meet conveyance and distribution, treatment, and pump plant operating and service demands.

Assists with maintaining and improving a variety of mechanical/electrical equipment related to Metropolitan's significant revenue-generating assets, systems, processes, supporting facilities and infrastructure including those within treatment and pump plants, chemical unloading and transfer facilities, conveyance and distribution structures, reservoirs, hydroelectric plants and right-of-ways. Assists with ensuring ongoing reliability and capacity, primarily through maintenance activities. Assists in the operational service necessary to convey, store, treat and distribute water and hydroelectric power effectively to member agencies and other customers.

Conveyance and Distribution

Activities in conveyance and distribution include learning skills and assisting with inspecting, maintaining, and improving mechanical/electrical systems associated with large equipment, infrastructure, and assets such as pumps, turbines, generators, motors, compressors, valves, turnouts, and hydraulic systems, pipelines, feeders and canals, control and pressure-relief structures, reservoirs, and other appurtenances and processes related to the effective delivery of water and electric power. Also, activities include operating utility trucks, cranes/rigging and heavy equipment. Operational activities include water flow changes and adjusting flow pressure settings in control and pressure relief structures, including shutdown and outage operations for maintenance such as dewatering, disinfecting and refilling.

Treatment Plants

Activities in treatment include learning skills and assisting with inspecting, maintaining, and improving the reliability of mechanical/electrical equipment such as chemical feed systems, ozone generators and related systems, flash mixers, flocculators, filter beds, geared drive equipment, sedimentation basins, tanks, valves, pumps, compressors, piping systems and slide gates, as well as processes such as chemical unloading and transfer, reclamation systems and sludge removal systems. Also, activities include operating utility trucks, cranes/rigging and heavy equipment. Operational activities include those responsibilities associated with effective water flow and treatment such as operating valves and performing minor adjustments and calibrating chemical feed and similar systems.

Pumping Plants
Activities in pumping plants include learning skills and assist in operating and maintaining large equipment such as generators and motors, overhead hoists and cranes, compressors and pneumatic systems, hydraulic power units, domestic water systems in plant and residential facilities and other associated pump plant mechanical equipment and systems. Preventive and corrective mechanical maintenance duties include, but are not limited to: lubricating bearing, rebuilding various pumps and valves, repairing and installing piping, troubleshooting and repairing water system equipment failures, lubricating and exercising small and large diameter valves and actuators, rebuilding, replacing and installing pumps, refurbishing and/or rebuilding valves and associated piping, operational duties and high-voltage switching operations.

Work in treatment and pump plants, and conveyance and distribution involve collecting a wide variety of operational process and maintenance data including equipment readings, treatment and conveyance flow information and water quality samples to ensure reliable operations, equipment and asset maintenance, and protection/security of public health and District assets on a routine and emergency response basis.

SUPERVISION:

Received:
Work is performed with clear and detailed instruction on how to complete a maintenance task, activity or project. Close supervision is given to ensure proper adherence to standards, procedures, rules and practices; deviations are referred to a supervisor or lead person. Checking for quality workmanship is accomplished on a routine basis. As the employee progresses in skill, knowledge and experience, routine supervision may be appropriate. Direction is provided on the tasks to be undertaken with some latitude to rearrange work. Guidance on the approach to standard circumstances, tasks and activities is provided in procedures, manuals, rules or common craft practice. A lead person or supervisor provides guidance on the approach to tasks or activities encountered in non-standard or uncommon circumstances.

Receives oversight from the Team, Unit, Section, Assistant Group, or Group Manager.

Given:
None

JOB DUTIES

Assists in performance of general mechanical/electrical maintenance tasks and activities at treatment and pump plants, chemical unloading and transfer facilities, conveyance and distribution structures, reservoirs, hydroelectric plants, along right-of-ways and at other facilities utilizing equipment processes and systems to ensure ongoing reliability of water and power delivery.

Conveyance and Distribution

1. Assist with a wide variety of mechanical/electrical preventive and corrective maintenance (PM/CM) on conveyance and distribution related systems, processes and facilities to ensure conveyance and distribution reliability that may include work on valves of various sizes, configuration, and operation control (manual and motor) including pneumatic and hydraulic systems, pipelines, feeders, aqueducts, canals, siphons, reservoirs, pumps, motors, generators, lubrication and cooling equipment, control and pressure relief structures and associated equipment/assets, cranes and rigging systems.

2. Assist with completion of PM and CM activities on large-scale water conveyance and distribution infrastructure and assets including aqueducts, tunnels, pipelines, siphons, feeders, canals, and reservoirs to maintain distribution system integrity, capacity and operational reliability.

3. Learns state-of-the-art technology, assist with predictive and preventive maintenance activities to determine infrastructure and equipment wear, assist with the performance of predictive analysis through laser alignment, vibration and oil analysis to anticipate maintenance needs and determine appropriate actions to maintain and enhance equipment life and uptime.

4. Assists with maintenance tasks and activities at hydroelectric plants and other facilities with mechanical/electrical equipment to ensure ongoing water and power reliability.

5. Assists with the preventive and corrective maintenance on mechanical/electrical systems necessary for standby power generators and associated systems to maintain operational readiness during outages or other emergencies.

6. Assist with preventive and corrective maintenance on valves of differing size, configuration, age and operating control systems. May include lubrication, exercise, and repair and replacement of parts to ensure effective water movement and valve longevity.

7. Assist with accomplishing preventive and corrective maintenance on pressure relief and pressure control structures to ensure reliable operations of water distribution components and functions, and assist with PM and CM to ensure structure integrity, safety, security and appearance standards.

8. Assist with the operation and monitoring of valves to make flow changes and adjust pressure settings for routine operations, shutdowns, or other operating conditions requiring safe and effective transfer or adjustment in the movement of water.

9. Assist with rebuilds and repairs conveyance and distribution infrastructure, equipment, systems and processes as necessary, requiring planning, fabrication of parts, welding and/or assembly and installation to bring equipment/processes to as-designed operating condition.

10. Assists with improving mechanical/electrical systems associated with construction and improvement projects such as building and infrastructure enhancements directly associated with conveyance and distribution systems including modifications, rebuilding, and relocating structures, assets and equipment.

11. Learns and assist with completing complex or routine predictive, preventive, and corrective maintenance on mechanical/electrical systems associated with large motors, pumps, generators, turbines, valves, varied equipment and other mechanical/electrical related systems associated with the effective movement of water and power.

12. Learns and assist with instrumentation to test and monitor the capabilities, limits, and effectiveness of equipment and subsystems of equipment, as well as other mechanical/electrical processes and systems directly related to power and water systems, to measure the ongoing effectiveness of those systems and to assure the quality of maintenance and/or improvements.

13. Assist with water analysis such as PH, hardness, chlorine and ammonia at various facilities including reservoirs, to test for contaminates and other essential water quality elements.

14. Assist in regularly inspecting, testing, calibrating and record readings for a variety of mechanical/electrical systems and equipment to meet reliable equipment life and service

expectations, including motors, compressors, valves, pumps, flow meters, cranes and lifts, chemical storage and feed systems, basins and related equipment to ensure effective water operations and movement.

Treatment Plants

1. Assist with a wide variety of mechanical/electrical preventive and corrective maintenance on water treatment related systems, processes and facilities. PM and CM activities includes work on oxygen generation and ozone equipment, valves, pneumatic and hydraulic control systems, pumps, generators, lubrication and cooling equipment, chemical feed systems, and associated equipment.

2. Assist with PM and CM activities on large-scale water treatment assets, systems and processes including flocculators, filter beds, flash mixers, conveyor systems, sedimentation basins, storage tanks, slide gates, pipes, valves and varied drive and control systems to maintain plant integrity, capacity and operational reliability.

3. Learns and assists with state-of-the-art technology, assists with predictive and preventive maintenance activities to determine equipment wear, including predictive analysis through laser alignment, vibration and oil analysis to anticipate maintenance needs and determine appropriate actions to maintain and enhance equipment uptime.

4. Assist with the preventive and corrective maintenance on mechanical/electrical systems necessary for standby power generators and associated systems to maintain operational readiness during outages or other emergencies.

5. Assist with preventive and corrective maintenance on Chemical Unloading Facility equipment, processes and systems to include piping, valves, structures, standpipes, metering and monitoring equipment, alarms and test equipment. Operate and monitor valves, gauges and other chemical transfer and mixing systems to ensure safe and effective transfer, distribution and transportation of chemicals and movement of rolling stock or other lading equipment.

6. Assist with the repair and rebuild of treatment equipment, systems and processes as necessary requiring appropriate planning, fabrication of parts, welding and/or assembly and installation to bring equipment/processes to designed operating condition.

7. Assist with improving mechanical/electrical systems associated with construction and improvement projects such as building and plant enhancements directly associated to water treatment systems including modifications, rebuilding, and relocating plant assets and equipment.

8. Assist with complex or routine predictive, preventive, and corrective maintenance on mechanical/electrical systems associated with large motors, pumps, generators, turbines, valves, varied treatment process equipment and other mechanical/electrical related systems associated with treatment plants.

9. Learns and assist with instrumentation to test and monitor the capabilities, limits, and effectiveness of equipment and subsystems of equipment, as well as other mechanical/electrical processes and systems directly related to power and water systems, to measure the ongoing effectiveness of those systems and to assure the quality of maintenance and/or improvements.

10. Assist with regular inspections, tests, calibrations, and record of readings for a variety of mechanical/electrical systems and equipment to meet reliable equipment life and service expectations, including motors, compressors, valves, pumps, flow meters, cranes and lifts, chemical

storage and feed systems, basins tanks, valves and related equipment to ensure effective water output of treatment plants.

11. In accordance with district required training work with hazardous chemicals such as chlorine, ozone, acids, caustics and ammonia.

Pumping Plant

1. Assists with a wide variety of general mechanical preventive and corrective maintenance on aqueduct pumping plant related systems, processes and facilities to ensure aqueduct plant reliability that may include work on: large rotating equipment, overhead hoists and cranes, rigging systems, compressors, hydraulic power units, valves of various sizes, configuration and operation control (manual, hydraulic and motor) including pneumatic and hydraulic process controls.

2. Assists with a wide variety of corrective maintenance on pipelines, feeders, aqueducts, canals, siphons, reservoirs, pumps, motors, generators, lubrication and cooling equipment, control and head gate structures and associated equipment/assets.

3. Assists with the rebuild and repair of aqueduct pumping plant infrastructure, equipment, systems and processes as necessary, requiring planning, fabrication of parts using general machine shop equipment, welding and/or assembly and installation to bring equipment/processes to as-designed operating tolerances and conditions.

4. Assists with preventive and corrective activities on large-scale water conveyance and distribution infrastructure and assets including aqueducts, delivery lines, head gates and associated structures, pipelines, aqueduct sand traps, canals, radial gates and reservoirs, to maintain distribution system integrity, capacity, and operational reliability.

5. Learns and assist with state-of-the-art technology such as SCADA, and assist with predictive and preventive maintenance activities to determine infrastructure and large rotating and moving equipment wear. Assist with the performance of predictive analysis through laser alignment, vibration and oil analysis to anticipate maintenance needs and determine appropriate actions to maintain and enhance equipment life and uptime.

6. Assists with preventive and corrective maintenance of mechanical/electrical systems.

7. Assists with preventive and corrective maintenance on valves of differing size, configuration, age, and operating control systems. May include lubrication, exercising and repair, and replacement of parts to ensure effective water movement and valve longevity.

8. Assists with preventive and corrective maintenance to ensure structure integrity, safety, security and appearance standards of all pumping plant and residential facilities.

9. Assist with improving mechanical systems associated with construction and improvement projects such as building and infrastructure enhancements directly associated with pumping plant and residential systems including modifications, rebuilding, and relocating structures, assets, and equipment.

10. Assists with corrective maintenance on mechanical/electrical systems associated with large motors, pumps, generators, valves, varied equipment and other mechanical related systems associated with the effective movement of water and power.

11. Learns and assists with the utilization of instrumentation to test and monitor the capabilities, limits, and effectiveness of equipment and subsystems of equipment, as well as other mechanical processes and systems directly related to power and water systems, to measure the ongoing effectiveness of those systems and to assure the quality of maintenance and/or improvements.

12. Assists with water analysis such as PH, hardness, chlorine and turbidity measurement at various facilities including reservoirs, to test for contaminates and other essential water quality elements. Responsible for collection of bacteriological samples.

13. Assists with preventive and corrective maintenance on circulating, fire and domestic water distribution systems and swimming pool maintenance. When necessary maintain septic and associated systems.

14. Assists with regular inspections, testing, calibration, and record readings for a variety of mechanical/electrical systems and equipment to meet reliable equipment life and service expectations, including motors, compressors, valves, pumps, flow meters, cranes and lifts, chemical storage and feed systems, sand traps and related equipment to ensure effective water operations and movement.

15. Assists with operational duties which include: setting up, starting, stopping, and securing main pump units, monitoring, inspecting, recording, calculating, and reporting pump plant operations data and operating conditions of main motors, pumps, power transformers, and related pump plant equipment, water flow changes, including dewatering and refilling pipelines in association with system maintenance and repairs, earthquake and emergency response, switching operations and safety related inspections of facilities and systems. Handle and log hazardous materials and maintains storage area.

EMPLOYMENT STANDARDS

MINIMUM QUALIFICATIONS

Education and Experience:
High school diploma or GED in addition to minimal experience as demonstrated by practical application of basic techniques and practices specific to the operation, maintenance and repair of mechanical/electrical systems in a treatment or pump plant, power generation systems and related apparatus.

Required Knowledge: Employees in this title are entry-level and learn skills through classroom and on-the-job training or they are gaining experience by working with higher-level Technicians to enhance their skills to competently:

Understand theories and practices of mechanical/electrical systems and their application to large-scale mechanical/electrical systems and equipment related to hydroelectric power plants, water treatment and

distribution systems, as well as general and utility facility mechanical/electrical systems, applying methods, practices, machine shop equipment for metal fabrication, and tools to ensure reliable operations for the movement and treatment of water, generation of power, and optimization of assets and equipment to meet operational demands within established limits and standards, contemporary maintenance reliability analysis and troubleshooting methods including determination of failure causes, diagnostic analysis through failure mode, and root cause analysis, using traditional analog and precision digital instruments to ensure critical measurements and alignments as part of diagnostic and predictive maintenance, including laser alignment equipment, analog and digital meters, calipers and other tools related to close tolerance analysis and work, and safety practices and regulations for operating or working near mechanical/electrical equipment, high voltage systems, hazardous materials, and associated tools and equipment.

Required Skills and Abilities to: Learn to understand and interpret mechanical/electrical engineering data necessary to effectively implement predictive, preventive, corrective, and improvement activities. Assist in the layout and development of procedures, manuals, orders and similar documentation to ensure safe operating techniques and/or for training, ability to learn to interpret complex schematics, blueprints, mechanical/electrical diagrams, instructions, manuals, operating and maintenance procedures, and specifications related to water treatment, conveyance and distribution and pump plant, as well as building, facility and hydroelectric power systems/equipment, and experience to utilize tools and diagnostic equipment to test and monitor equipment and asset condition, as well as repair, install and replace equipment necessary to meet water and electrical generation demand and/or capacity, use and maintain mechanical/electrical tools and equipment traditionally used in hydroelectric plants, pump plants, treatment plants, and within water and power control and distribution infrastructure and facilities, and guide and apply safety practices and regulations for operating or working near mechanical/electrical equipment, high voltage systems, hazardous materials, and associated tools and equipment.

CERTIFICATES, LICENSES and REGISTRATIONS REQUIREMENTS
Employees in this position may be required to obtain and maintain the following certifications, licensing and registrations:

Conveyance and Distribution:
- Valid Drivers license from state of residency equivalent to a California Class A, B, and/or C with appropriate commercial license endorsements
- Forklift certification
- Manlift certification

Treatment:
- Valid Drivers license from state of residency equivalent to a California Class A, B, and/or C with appropriate commercial license endorsements
- Forklift Certification
- Man lift Certification
- SCBA and Respirator Certification
- Chemical Responder Certification

Aqueduct Pumping Plants:

- Valid Drivers license from state of residency equivalent to a California Class C with appropriate endorsements
- Crane Certifications
- Water Treatment Certification Grade II
- Chemical Responder Certification
- Forklift Certification
- Manlift Certification
- MWD High Voltage Certification

PHYSICAL DEMANDS/WORK ENVIRONMENT

Expectations of Hours of Service:
Employees in this position may be required to work off-shift hours to address operational needs and emergencies as required. May be required to work extended periods away from the normal reporting location.

Physical Demands:
Heavy tasks may require lifting and carrying items weighing up to 50 pounds, with intermittent need to lift and carry materials and/or equipment weighing up to 100 pounds with assistance. Frequently requires pushing, pulling, turning and positioning parts, assemblies, equipment and tools weighing as much as 100 pounds with assistance. May be required to lift and move heavy items with the assistance of others and with lifting devices such as jacks, hoists and cranes of varied types and capacities. Physical effort includes frequent walking, stooping, bending, reaching, standing, kneeling and sitting for long periods of time. May be required to use Self Contained Breathing Apparatus (SCBA) or other respiratory filtration and personal protection devices.

Work Environment:
Work is performed indoors and outdoors at large pumping, treatment, hydroelectric or control facilities, or associated assets, under all types of conditions including extreme temperatures, open and confined spaces ranging from crawl spaces to sub-structures as well as varied types of terrains. Job tasks frequently require working from heights and functioning from lifts, hoists, scaffolds, and cranes over surfaces ranging from earthen materials to concrete, steel and water. Work frequently is conducted in close proximity to high volume/pressurized water, as well as exposed, electrically energized equipment including high voltage systems. The work environment often involves exposure to equipment and tools producing high levels of noise, as well as potentially dangerous materials, chemicals, and machinery that require careful adherence to extensive safety precautions, rules and regulations.