

CENTRAL PLANT
HEATING/CHILLED WATER OPERATOR

Ref. Code: C-WO-6

| PERFORMING MAINTENANCE DURING ANNUAL PLANT SHUTDOWN | | |
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| Activity | Hazard Identification | Required Precautions |
| 1. Annual boiler shutdown. | 1. Head injuries. | 1. Wear hard hat. |
| 2. Walking on steps, catwalks, and platforms. | 2. Slipping; falling. | 2. Keep walkways clear of hazards. Walk carefully to maintain footing. |
| 3. Using stepladder or mechanics ladder. | 3. Ladder collapsing; slipping/falling from ladder. | 3. Inspect ladder before use. Use ladder of proper height. Make sure ladder is properly assembled and locked and standing on level ground. Do not exceed weight limit for ladder. Do not stand on top of ladder or on top rung. Have coworker hold ladder. |
| 4. Using extension ladder. | 4. Ladder falling; slipping/falling from ladder. | 4. Inspect ladder before use. Verify that ladder is properly assembled and that it is securely positioned on level ground. Use 1'-4' rule. Use OSHA decal to verify that the ladder is in the proper position. Verify safe means of climbing on/off ladder. |
| 5. Using interior scaffolding. | 5. Scaffolding collapsing; falling from scaffolding. | 5. Verify that scaffolding is properly assembled and wheels locked. Use safety rails properly. Verify a safe means of climbing on/off scaffolding. |
| 6. Replacing heavy valves and motors. | 6a. Lines moving or dropping when valve is removed. | 6a. Inspect area before beginning work. Brace or support lines next to valve as needed before removing valve. |
| | 6b. Lifting heavy weight can cause back strain or overexertion. | 6b. Know your weight-lifting capacity and get help if needed. Lift using leg muscles. Keep back straight. Use mechanical lifting equipment. Always use come-along, chain hoists, or pulleys to lift heavy valves or motors. |
| | 6c. Dropping object when lifting it with chains or pulleys. | 6c. Hood come-along to a secure anchoring device before lifting. |

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| | 6d. Cuts from frayed wire ropes. | 6d. Inspect equipment before use and replace any frayed wires. |
| | 6e. Pinching fingers. | 6e. Handle materials carefully. |
| | 6f. Slipping on grease drippings. | 6f. Clean up any spilled oil using Virginia 10 or equivalent product. |
| 7. Using power tools such as saws, drills, grinder, pipe cutter, and pipe threading machine. | 7a. Electric shock/electrocution. | 7a. Inspect cord before use. Keep power cord away from work area. Plug tools into GFCI-protected outlets. Do not use electric tools if work area is wet. |
| | 7b. Tripping over or cutting power cord. | 7b. Keep power cord out of work area. |
| | 7c. Injury from flying bits of material. | 7c. Wear safety glasses, and optionally goggles, dust mask, gloves, long-sleeve shirt and/or coveralls. |
| | 7d. Saw or drill bit catching; severe lacerations or abrasions; dismemberment. | 7d. Keep tools in good condition. Inspect tools before use. Verify that guards work properly. Keep hands away from blades. When using tools, make sure you have a good center of gravity and are properly balanced. Hold tools securely with two hands to maintain control. |
| | 7e. Getting caught in pipe threading machine. | 7e. Do not wear loose clothing, jewelry, or keys. |
| | 7f. Getting cut by metal chips. | 7f. Properly dispose of rags used to clean pipe in order to prevent injury to yourself or others from oil and metal chips. |
| 8. Using fitters tools, pipe wrenches, combination wrenches and other hand tools. | 8a. Cuts, pinches, smashes, punctures, severing of fingers. | 8a. Keep tool sin good condition. Inspect tools before use. Wear safety glasses. Work away from yourself. Use normal caution required for all hand tools. |
| | 8b. Wrench slipping; worker hitting self or others with wrench or dropping wrench on self or others. | 8b. Wear hard hat. Handle tools carefully with dry gloves or hands. Make sure you have a firm footing so you do not fall. |
| 9. Soldering on water pipes. | 9a. Burning self. | 9a. Wear safety goggles, gloves, overalls, and leather chaps. Always burn away from yourself. |

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| | 9b. Starting a fire. | 9b. Remove flammable materials from work area. Always keep a fire extinguisher nearby and have a person stand by as a firewatch. |
| | 9c. Burns from hot solder, dripping metal. | 9c. Do not reach to solder; always work level with torch. |
| | 9d. Inhalation of fumes. | 9d. Work in well-ventilated area. |
| | 9e. Using wrong solder can cause popping and splattering. | 9e. Use correct solder for job. |
| | 9f. Explosions. | 9f. Turn off valves to relieve pressure in work area before beginning work. |
| | 9g. Buildup of acetylene from leaks. | 9g. Check hose and connections for leaks and damage before using. |
| 10. Storing or transporting compressed gas cylinders and oxygen/acetylene torch. | 10a. Explosion of compressed gas. | 10a. Do not allow cylinder valves or regulator assemblies to come into contact with grease, oil, or lubricants. |
| | 10b. Rupture of cylinder if valve breaks off. | 10b. Install protective valve cover. Secure cylinder to a stand or a wall. |
| 11. Using oxygen/acetylene torch to cut bolts, etc. | 11a. Regulator diaphragm rupturing when torch is turned on. | 11a. Turn regulator adjusting screw counterclockwise to disengage plunger before turning on cylinder. |
| | 11b. Acetylene explosion. | 11b. Stand acetylene tank vertically before using. |
| | 11c. Torch explosion. | 11c. Install spark arrestors on torch and regulators. |
| | 11d. Burning self. | 11d. Wear gloves, overalls, and leather chaps. Always burn away from yourself. |
| | 11e. Starting a fire. | 11e. Always keep fire extinguisher nearby and have a person stand by as a firewatch. |
| | 11f. Burns form metal dripping on self. | 11f. Do not reach to burn; always work level with torch. |
| | 11g. Inhalation of fumes. | 11g. Work in well-ventilated area. Use exhaust fans and tubes for ventilation. |

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| | <p>11h. Flash burn to eyes.</p> <p>11i. Burning tar coating and/or galvanized coating creates a poisonous gas.</p> | <p>11h. Wear burning goggles to protect eyes.</p> <p>11i. Tar coating is sometimes wrapped in cardboard. Silver coating on pipes or plates indicated galvanized coating. If possible, use reciprocating saw to cut instead of burning with torch. If it is not possible to saw the pipe or plate, the area must be very well ventilated with incoming and outgoing air. Wear air pack to avoid breathing fumes.</p> |
| | 11j. Buildup of acetylene from leaks. | 11j. Check hose and connections for leaks and damage before using. |
| 12. Working in boiler room | 12a. Getting burned by steam, hot water, or hot oil. | 12a. Wear proper protective clothing. Be aware of your surroundings and of possible leaks. |
| | 12b. Inhalation, skin exposure, or irritation to eyes from contact with waste oil and oil additives. | 12b. Wear proper protective clothing. Be aware of unusual odors (e.g., natural gas) that could signify leaks. |
| | 12c. Electric shock; electrocution. | 12c. Always use GFCI protectors. |
| | 12d. Damage to eyes from bright flame intensities. | 12d. Wear eye protection. |
| | 12e. Slipping on water or oil on floor. | 12e. Clean up any standing water or oil. Identify leak and repair it if possible. |
| | 12f. Excessively hot temperatures; heat exhaustion. | 12f. Take frequent breaks in cooler areas. Drink plenty of liquids. |
| | 12g. Loss of hearing due to loud noise. | 12g. Wear earplugs or earmuffs. |
| | 12h. Tripping. | 12h. Survey work area for hazards. Walk carefully. |
| | 12i. Inhalation of dust. | 12i. Wear dust mask. |
| 13. Removing gaskets. | 13. Exposure to asbestos when removing old gaskets. | 13. Wet down gasket before scraping it off. |

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| 14. Using cleaning solvents (Virginia 10 and surface cleaners). | 14a. Inhalation of solvents. | 14a. Use solvents in well-ventilated area. Use sparingly and reseal bottle. Dispose of rags properly. |
| | 14b. Skin irritation. | 14b. Wear rubber gloves. Do not allow solvents to come into contact with skin. If solvent does get on skin, wash affected area thoroughly. |
| | 14c. Getting solvent in eyes. 14d. Being sprayed with hot oil. | 14c. Wear safety glasses. 14d. Before beginning work, verify that boiler is completely off and that burner motor has stopped. |
| 15. Driving to and from work site. | 15. Motor vehicle accident; striking pedestrians, bicyclists, or persons wearing rollerblades. | 15. Wear prescription lenses, if required, and seatbelt. Verify that all equipment on vehicle is secured properly. Stay alert for pedestrians, bicyclists, and persons wearing rollerblades. |
| 16. Handling heavy, awkward 20' lengths of pipe. | 16a. Back strain; overexertion. | 16a. Know your weight-lifting capacity and get help if needed. Lift using leg muscles. Keep back straight. Use mechanical lifting equipment. |
| | 16b. Hitting someone or something with the pipe. | 16b. Watch where you are going. Handle piping carefully. |
| | 16c. Tripping; slipping. | 16c. Survey area for hazards. Walk carefully to maintain footing. |
| 17. Shutting off boiler and opening doors. | 17a. Getting burned on hot metal surface. | 17a. Do not touch metal surfaces. |
| | 17b. Ash being blown in face; inhalation of ash; ash on skin. | 17b. Wear proper protective clothing: coveralls, dust mask or respirator, gloves, eye protection, boots, head covering, and ear protection. |
| | 17c. Getting burned by radiant heat. | 17c. Wear proper protective clothing (see above). Keep a safe distance from the boiler when it is still hot. |

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| 18. Vacuuming/scraping soot from fireside (firetubes) of boiler. | 18a. Soot in eyes; soot on skin. | 18a. Wear proper protective clothing. |
| | 18b. Inhalation of soot. | 18b. Wear respirator or dust mask. |
| | 18c. Hearing loss from loud noise. | 18c. Wear ear protection. |
| | 18d. Losing balance and falling while reaching to clean firetubes. | 18d. Do not reach to clean. Stand on a safe platform to reach firetubes above. |
| 19. Draining boiler; taking off hand-hole and manhole covers; washing waterside of boiler. | 19a. Burns from steam. | 19a. Wear proper protective equipment. |
| | 19b. Electric shock; electrocution. | 19b. Lock out electrical supply to boiler before washing. Use ground fault circuit interrupter (GFCI). |
| | 19c. Falling from top of boiler. | 19c. Use ladder of proper height to get to the top of the boiler. Clean off top of boiler thoroughly to remove dirt before getting on top of boiler. |
| 20. Cleaning main firetube. | 20a. Getting burned on hot metal. | 20a. Wear proper protective clothing. Wait until temperature is safe before entering firetube. |
| | 20b. Electrocution. | 20b. Use low-voltage trouble light plugged into GFCI-protected outlet. |
| | 20c. Soot in eyes; inhalation of soot. | 20c. Wear safety glasses and dust mask or respirator. |
| | 20d. Lack of oxygen; exposure to fuel gas, oil fumes, or solvent fumes. | 20d. Before working in confined area, verify that it is safe by getting confined space permit. Use safety rope in case worker becomes ill and must be pulled out. Always have one person outside confined area to monitor safety of person inside. |
| | 20e. Dark work area. | 20e. Use trouble light or flashlight. |
| | 20f. Working for long periods of time in cramped position can lead to backache or neck ache. | 20f. Leave confined area frequently to stretch out. |

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| 21. Using power drills on extender rod with brushes. | 21a. Electric shock/electrocution. | 21a. Inspect cord before use. Keep power cord away from work area. Plug tools into GFCI-protected outlets. Do not use electric tools if work area is wet. |
| | 21b. Tripping over or cutting power cord. | 21b. Keep power cord out of work area. |
| | 21c. Injury from flying bits of material. | 21c. Wear safety glasses, and optionally goggles, dust mask, gloves, long-sleeve shirt and/or coveralls. |
| | 21d. Wrenching hand or severing fingers while aiming for hole with long rod. | 21d. Do not turn drill on while hand is on rod. |
| 22. Putting on new door gaskets. | 22. Inhalation of ceramic fibers; getting fibers on skin or in eyes. | 22. Wear proper protective clothing. |