

MAINTENANCE TECHNICAL SUPPORT CENTER
HEADQUARTERS MAINTENANCE OPERATIONS
UNITED STATES POSTAL SERVICE



Maintenance Management Order

SUBJECT: Guidelines for Creating Detailed Local
Building and Building Equipment
Maintenance Preventive Maintenance
Checklists

DATE: February 22, 2022

TO: All Maintenance Sites

PUB NO: MMO-057-21
FILE CODE: M
FILE ID: mm21056
REV LEVEL: ah

| Online Change Record | | |
|----------------------|-----------|--|
| Change # | Date | Description of Change |
| 1 | 3/18/2022 | Att. 1, Table 1-1, line item 166, guide corrected to HVAC-3. |

This Maintenance Management Order (MMO) **supersedes MMO-007-20** and provides local maintenance managers with guidelines to develop detailed Building and Building Equipment Maintenance Preventive Maintenance (PM) checklists. Attachment 1 provides a table listing equipment and corresponding PM guidelines. Attachment 2 provides the PM guides. Attachment 3 provides sample USPS building equipment annual staffing workhour requirement forms. This bulletin applies to Acronym ADMIN, Class Code AA.

The PM requirements and tasks in Attachment 2 provide the minimum required PM and frequencies that should be modified as necessary based on manufacturer's requirements, local conditions, usage, or local ordinances. Manufacturer recommendations may be considered with justification as they relate to Occupational Safety and Health Administration (OSHA), federal, state, and local regulations. Ensure all required OSHA safety requirements including but not limited to Personal Protective Equipment (PPE), Electrical Work Program (EWP), local Energy Control Procedures (ECP), and Safety Data Sheet (SDS) are added to the locally developed PM checklists.

The development of a facility Building and Building Equipment Maintenance (BEM) Plan depends on a complete and accurate inventory. All building equipment that is to be maintained must be identified and listed in the site staffing software application. Failure to accurately inventory the facility equipment may result in inadequate support resources. The site staffing projection for building equipment maintenance is derived and calculated within the staffing software application and is based on the building equipment inventory, maintenance standards, and frequencies. Each inventory item in the staffing software application earns an annual work hour allowance, which should not be exceeded without proper documentation and justification.

Station/Branch and Associate Office building equipment entered into the staffing software application does not count toward building equipment maintenance staffing hours because those facilities are maintained by Field Maintenance and associated staffing hours are calculated in a separate section of the staffing software application.

Other equipment or building systems supported by contract or other means, must be listed, but designated as "maintained by contract".

Route scheduling within eMARS should be coordinated to allow inspection of numerous smaller simplistic components at the same time to minimize travel within the facility. For example: Perform the inspections of steam traps, chilled water valves, other miscellaneous Heating, Ventilation, and Air Conditioning (HVAC) valves and air handler units at the same time when feasible.

For questions or comments concerning this bulletin, contact HQ Maintenance Operations at _HQMaintenanceOperations@usps.gov.



Thomas Rabicki
Executive Manager
Maintenance Policy, Programs, and Support
HQ Maintenance Operations

- Attachments:
1. Equipment Inventory Reference Table
 2. Building and Building Equipment Preventive Maintenance Guides
 3. USPS Building Equipment Annual Staffing Workhour Requirement Forms

Table of Contents

| | | |
|--------|--|----|
| 1.0 | EQUIPMENT INVENTORY TABLE | 1 |
| 1.0 | GUIDE SET HVAC..... | 1 |
| 1.1 | GUIDE NUMBER HVAC-1: AIR-CONDITIONING MACHINE PACKAGE UNITS..... | 1 |
| 1.2 | GUIDE NUMBER HVAC-2: AIR-CONDITIONING, WINDOW UNITS..... | 2 |
| 1.3 | GUIDE NUMBER HVAC-3: AIR-COOLED CONDENSERS..... | 3 |
| 1.4 | GUIDE NUMBER HVAC-4: AIR HANDLERS..... | 4 |
| 1.4.1 | Fans..... | 4 |
| 1.4.2 | Bearings..... | 4 |
| 1.4.3 | Drives (Belt and Direct)..... | 4 |
| 1.4.4 | Coils | 4 |
| 1.4.5 | Freeze Protection | 4 |
| 1.4.6 | Controls | 5 |
| 1.5 | GUIDE NUMBER HVAC-5: BOILERS, OIL FIRED | 6 |
| 1.6 | GUIDE NUMBER HVAC-6: BOILERS, CAST-IRON AND STEEL..... | 7 |
| 1.6.1 | General..... | 7 |
| 1.6.2 | Watersides | 7 |
| 1.6.3 | Exterior and Firesides..... | 7 |
| 1.7 | GUIDE NUMBER HVAC-7: BURNER, GAS..... | 9 |
| 1.8 | GUIDE NUMBER HVAC-8: BURNER, OIL | 10 |
| 1.9 | GUIDE NUMBER HVAC-9: COILS, PREHEAT, REHEAT, ETC. (REMOTE FROM AIR HANDLER) | 12 |
| 1.10 | GUIDE NUMBER HVAC-10: CONDENSATE OR VACUUM PUMPS (ON STEAM RETURN SYSTEM) | 13 |
| 1.11 | GUIDE NUMBER HVAC-11.1: COOLING TOWERS STARTUP (SPRING)..... | 14 |
| 1.12 | GUIDE NUMBER HVAC-11.2: COOLING TOWERS SHUTDOWN (FALL)..... | 15 |
| 1.13 | GUIDE NUMBER HVAC-12: FANS, CENTRIFUGAL | 16 |
| 1.14 | GUIDE NUMBER HVAC-13: FILTERS, ROLL-TYPE DISPOSABLE MEDIA..... | 17 |
| 1.15 | GUIDE NUMBER HVAC-14: CONTROLS AND MECHANISMS ROLL TYPE FILTERS..... | 18 |
| 1.16 | GUIDE NUMBER HVAC-15: FILTERS, THROW-AWAY | 19 |
| 1.17 | GUIDE NUMBER HVAC-16: FANS, PROPELLER | 20 |
| 1.18 | GUIDE NUMBER HVAC-17: HEAT/COOLING UNIT, ROOF TOP | 21 |
| 1.18.1 | Spring..... | 22 |
| 1.18.2 | Fall | 22 |
| 1.19 | GUIDE NUMBER HVAC-18: REFRIGERATION MACHINES, ABSORPTION TYPE | 23 |
| 1.19.1 | Evaporator Circuit..... | 23 |
| 1.19.2 | Solution Circuit | 23 |
| 1.19.3 | Condenser Circuit | 24 |
| 1.19.4 | Purge System | 24 |

| | | |
|--------|---|----|
| 1.19.5 | Controls | 24 |
| 1.20 | GUIDE NUMBER HVAC-19: REFRIGERATION MACHINES (CENTRIFUGAL AND RECIPROCATING) | 25 |
| 1.20.1 | Compressor | 25 |
| 1.20.2 | Chiller | 26 |
| 1.20.3 | Water-Cooled Condensers | 26 |
| 1.21 | GUIDE NUMBER HVAC-20: HEATER, ELECTRIC, IN-DUCT | 27 |
| 1.22 | GUIDE NUMBER HVAC-21: HEATER, ELECTRIC, BASEBOARD | 28 |
| 1.23 | GUIDE NUMBER HVAC-22: UNIT HEATERS (STEAM AND HOT WATER)..... | 29 |
| 1.24 | GUIDE NUMBER HVAC-23: UNIT HEATERS (GAS FIRED) | 30 |
| 1.25 | GUIDE NUMBER HVAC-24: FIRE DAMPERS (IN-DUCT)..... | 31 |
| 1.26 | GUIDE NUMBER HVAC-25: SPLIT SYSTEM EVAPORATOR UNITS | 32 |
| 1.27 | GUIDE NUMBER HVAC-26: SPLIT SYSTEM EVAPORATOR UNITS | 33 |
| 2.0 | GUIDE SET ELEC | 34 |
| 2.1 | GUIDE NUMBER ELEC-1: MOTORS..... | 34 |
| 2.2 | GUIDE NUMBER ELEC-2: BACK-UP GENERATOR- GAS OR NATURAL GAS ENGINES | 35 |
| 2.3 | GUIDE NUMBER ELEC-3: EMERGENCY GENERATORS - DIESEL POWER..... | 36 |
| 2.4 | GUIDE NUMBER ELEC-4: EMERGENCY GENERATORS – ALL TYPES OF ENGINES | 37 |
| 2.5 | GUIDE NUMBER ELEC-5: ELECTRICAL PANEL INFRARED SCANS..... | 38 |
| 3.0 | GUIDE SET MISC | 39 |
| 3.1 | GUIDE NUMBER MISC-1: AIR COMPRESSORS | 39 |
| 3.2 | GUIDE NUMBER MISC-2: LAWNMOWERS AND EDGERS | 40 |
| 3.3 | GUIDE NUMBER MISC-3: SWEEPERS (GASOLINE)..... | 41 |
| 3.4 | GUIDE NUMBER MISC-4: PAPER BALERS | 42 |
| 3.5 | GUIDE NUMBER MISC-5.1: DOCK DOORS, POWER OPERATED | 43 |
| 3.6 | GUIDE NUMBER MISC-5.2: DOCK DOORS, MANUALLY OPERATED | 44 |
| 3.7 | GUIDE NUMBER MISC-6: DOOR, PEDESTRIAN DOORS, POWER OPERATED MAIN AND DOCK ENTRANCES..... | 45 |
| 3.7.1 | Revolving Doors..... | 45 |
| 3.8 | GUIDE NUMBER MISC-7: DOOR, PEDESTRIAN DOORS, NON- POWERED MAIN AND DOCK ENTRANCE | 46 |
| 3.8.1 | Hinged Doors..... | 46 |
| 3.8.2 | Revolving Doors..... | 46 |
| 3.9 | GUIDE NUMBER MISC-8: DOCK LEVELERS, POWERED | 47 |
| 3.9.1 | Hydraulic Units..... | 47 |
| 3.9.2 | Electro-Mechanical and Air Bag Units..... | 48 |
| 3.10 | GUIDE NUMBER MISC-9: FIRE DOORS - STAIRWELLS AND EXITWAYS (SWINGING)..... | 49 |
| 3.11 | GUIDE NUMBER MISC-10: FIRE DOORS - SLIDING TYPE..... | 50 |
| 3.12 | GUIDE NUMBER MISC-11: STATIONARY PACKERS | 51 |
| 3.13 | GUIDE NUMBER MISC-12: STATIONARY PACKERS | 52 |

| | | |
|--------|---|----|
| 3.14 | GUIDE NUMBER MISC-13: STATIONARY PACKERS | 53 |
| 3.15 | GUIDE NUMBER MISC-14: POWER LIFTS | 54 |
| 3.16 | GUIDE NUMBER MISC-15: SNOW BLOWER, WALKING TYPE | 56 |
| 3.17 | GUIDE NUMBER MISC-16: DOCK LEVELERS, MANUAL | 57 |
| 3.18 | GUIDE NUMBER MISC-17: SWEEPERS, ELECTRIC (BATTERY)..... | 58 |
| 3.19 | GUIDE NUMBER MISC-18: FLOOR SCRUBBER, AUTOMATIC..... | 59 |
| 3.20 | GUIDE NUMBER MISC-19: LEAD ACID PIV BATTERY | 60 |
| 3.21 | GUIDE NUMBER MISC-20: TRAILER RESTRAINTS..... | 61 |
| 3.22 | GUIDE NUMBER MISC-21: TRAILER RESTRAINTS..... | 62 |
| 4.0 | GUIDE SET PLUM..... | 63 |
| 4.1 | GUIDE NUMBER PLUM-1: FIRE EXTINGUISHER, PORTABLE, STORED-PRESSURE | 63 |
| 4.2 | GUIDE NUMBER PLUM-2: SUMP PUMPS..... | 65 |
| 4.3 | GUIDE NUMBER PLUM-3: VALVES, REGULATING | 66 |
| 4.4 | GUIDE NUMBER PLUM-4: VALVES, MANUALLY OPERATED (MAIN LINE)..... | 67 |
| 4.5 | GUIDE NUMBER PLUM-5: VALVES, MOTOR OPERATED | 68 |
| 4.6 | GUIDE NUMBER PLUM-6: STEAM TRAPS, ALL TYPES | 69 |
| 4.6.1 | Thermostatic Traps (Bellows or Diaphragm Type)..... | 69 |
| 4.6.2 | Float and/or Thermostatic Traps..... | 69 |
| 4.6.3 | Inverted Bucket Trap..... | 69 |
| 4.6.4 | Impulse Trap..... | 69 |
| 4.7 | GUIDE NUMBER PLUM-7: PUMPS, CENTRIFUGAL | 70 |
| 4.8 | GUIDE NUMBER PLUM-8: ROOF, INSPECTION..... | 71 |
| 4.8.1 | Roofing System..... | 71 |
| 4.9 | GUIDE NUMBER PLUM-9: HOT WATER HEATERS (CONVERTERS)..... | 72 |
| 4.10 | GUIDE NUMBER PLUM-10: HOT WATER HEATERS - DOMESTIC TYPE..... | 73 |
| 4.11 | GUIDE NUMBER PLUM-11: FIRE PUMPS, ELECTRIC MOTOR DRIVE | 74 |
| 4.12 | GUIDE NUMBER PLUM-12: FIRE PUMPS, INTERNAL COMBUSTION ENGINE DRIVE | 75 |
| 4.12.1 | Gasoline or Natural Gas Engines..... | 75 |
| 4.12.2 | Diesel Engines..... | 75 |
| 4.12.3 | Diesel and Gas Engines..... | 76 |
| 4.13 | GUIDE NUMBER PLUM-13: DRINKING WATER COOLERS | 77 |
| 4.14 | GUIDE NUMBER PLUM-14: EYEWASH..... | 78 |
| 4.14.1 | Plumbed Eyewash Stations..... | 78 |
| 4.15 | GUIDE NUMBER PLUM-15: EMERGENCY SHOWERS | 79 |
| 4.15.1 | Plumbed Emergency Showers..... | 79 |
| 1.0 | STAFFING WORKHOUR REQUIREMENT FORMS | 1 |

THIS PAGE BLANK

ATTACHMENT 1**EQUIPMENT INVENTORY REFERENCE TABLE****1.0 EQUIPMENT INVENTORY TABLE****Table 1-1. Equipment Inventory Reference Table**

| Line | Item | eMARS Equip. Description | eMARS Acronym | Class Code | PM Guide No(s) |
|-------------|--|--|----------------------|-------------------|-----------------------|
| 1 | AGV | AGV Seegrid Pallet Jack | AGV | SP | MMO* |
| 2 | AGV | AGV Seegrid Tow Motor | AGV | ST | MMO* |
| 3 | AGV | AGV Seegrid Server System | AGV | SZ | MMO* |
| 4 | AGV | AGV Daifuku Pallet Jack | AGV | UP | MMO* |
| 5 | AGV | AGV Daifuku Tow Motor | AGV | UT | MMO* |
| 6 | AGV | AGV Daifuku Server System | AGV | UZ | NONE** |
| 7 | AGV | Automated Guided Vehicles Mission Assignment Sys | AGVM | AA | NONE** |
| 8 | Air Curtain | Air Curtain | FAN | AC | NONE** |
| 9 | Air Compressors | Compressed Air HVAC | AIR (1) | BA | MISC-1 |
| 10 | Air Compressors | Compressed Air Mechanization/Automation | AIR | AA | MISC-1 |
| 11 | Air Compressors | Compressed Air Other | AIR | ZZ | MISC-1 |
| 12 | Air-Conditioning Machine Package Unit <10 Tons | Rooftop Or Package Cooling Only | HVACPKG | AA | HVAC-1, HVAC-15 |
| 13 | Air-Conditioning Machine Package Unit >10 Tons And <=30 Tons | Rooftop Or Package Cooling Only | HVACPKG | AA | HVAC-1, HVAC-15 |
| 14 | Air-Conditioning, Window Units | AC Window Units | HVACPKG | BB | HVAC-2, HVAC-15 |
| 15 | Air Dryer | Compressed Air Dryer | AIR | CA | NONE** |

| Line | Item | eMARS Equip. Description | eMARS Acronym | Class Code | PM Guide No(s) |
|------|--|--|---------------|------------|--------------------------|
| 16 | Air Handling Unit-Other <=10hp | Air Handling Unit-Other <=10hp | AHU | EA | HVAC-4, HVAC-13, HVAC-15 |
| 17 | Air Handling Unit-Other >10hp | Air Handling Unit-Other >10hp | AHU | EB | HVAC-4, HVAC-13, HVAC-16 |
| 18 | Boilers, Cast Iron And Steel | Boiler Low Press, Hot Water, Gas Fired | BOILER | AA | HVAC-6, |
| 19 | Boilers, Cast Iron And Steel | Boiler Low Press, Hot Water, Oil Fired | BOILER | BA | HVAC-5, HVAC-6, |
| 20 | Boilers, Cast Iron And Steel | Boiler Low Press, Hot Water, Elect Fire | BOILER | CA | HVAC-6, |
| 21 | Boilers, Cast Iron And Steel | Boiler High Press, Hot Water, Gas Fired | BOILER | DA | HVAC-6, |
| 22 | Boilers, Cast Iron And Steel | Boiler High Press, Hot Water, Oil Fired | BOILER | EA | HVAC-5, HVAC-6, |
| 23 | Boilers, Cast Iron And Steel | Boiler High Press, Hot Water, Elect | BOILER | FA | HVAC-6, |
| 24 | Boilers, Cast Iron And Steel | Boiler Low Press, Steam, Gas Fired | BOILER | GA | HVAC-6, |
| 25 | Boilers, Cast Iron And Steel | Boiler Low Press, Steam, Oil Fired | BOILER | HA | HVAC-5, HVAC-6, |
| 26 | Boilers, Cast Iron And Steel | Boiler Low Press, Steam, Elect Fired | BOILER | IA | HVAC-6, |
| 27 | Boilers, Cast Iron And Steel | Boiler High Press, Steam, Gas Fired | BOILER | JA | HVAC-6, |
| 28 | Boilers, Cast Iron And Steel | Boiler High Press, Steam, Oil Fired | BOILER | KA | HVAC-5, HVAC-6, |
| 29 | Boilers, Cast Iron And Steel | Boiler High Press, Steam, Elect Fired | BOILER | LA | HVAC-6, |
| 30 | Burner, Gas | Burner Boiler (Gas) | BURNER | AG | HVAC-7 |
| 31 | Burner, Oil | Burner Boiler (Oil) | BURNER | AO | HVAC-8 |
| 32 | Coils, Preheat, Reheat, Etc. (At Remote Locations) | Coils Preheat Reheat Etc. (Remote Locations) | HVACO | CA | HVAC-9 |
| 33 | Compactor PTR | Compactor PTR | COMPACT | BA | MMO* |
| 34 | Condensers, Air Cooled | Air Cooled Condensers <10 Tons | COOL | HA | HVAC-3, ELEC-1 |
| 35 | Condensers, Air Cooled | Air Cooled Condensers >10 Tons And <=30 Tons | COOL | HB | HVAC-3, ELEC-1 |

| Line | Item | eMARS Equip. Description | eMARS Acronym | Class Code | PM Guide No(s) |
|------|--|---|---------------|------------|---------------------------------------|
| 36 | Condensers, Air Cooled | Air Cooled Condensers >30 Tons | COOL | HC | HVAC-3, ELEC-1 |
| 37 | Condensers, Evaporative | Condenser, Evaporative | COOL | GA | PLUM-7, ELEC-1 |
| 38 | Cooling Towers | Cooling Equipment Cooling Towers | COOL | FA | HVAC-11.1, HVAC-11.2, HVAC-12, ELEC-1 |
| 39 | Docks- All Related Equipment | Docks- All Related Equipment | DOCKS | AA | NONE** |
| 40 | Dock Levelers, Manual | Dock Loading Ramp Adjustable (Manual) | DOCKS | AB | MISC-16 |
| 41 | Dock Levelers, Powered | Dock Levelers - Loading Ramps (Powered) | DOCKS | AC | MISC-8 |
| 42 | Dock (Powered Lift) | Dock (Powered Lift) | DOCKS | AD | NONE** |
| 43 | Dock Boards Fixed | Dock Boards Fixed | DOCKS | AE | NONE** |
| 44 | Dock Lights (Trailer) | Dock Lights (Trailer) | DOCKS | AF | NONE** |
| 45 | Dock Scissor Lift | Dock Scissor Lift | DOCKS | AI | NONE** |
| 46 | Doors, Pedestrian, Main Entrance And Dock Entrance, (Power Operated) | Doors Main Entrance Power Operated | DOOR | AP | MISC-6 |
| 47 | Doors, Pedestrian, Main Entrance And Dock Entrance, (Power Operated) | Turnstile Power Operated | DOOR | AT | MISC-6 |
| 48 | Doors, Pedestrian, Main Entrance And Dock Entrance (Non-Powered) | Doors Main Entrance (Non-Powered) | DOOR | AM | MISC-7 |
| 49 | Doors, Dock, Powered Operated | Dock Door (Trailer Loading And Unloading) | DOCKS | AP | MISC-5-1 |
| 50 | Doors, Dock Manually Operated | Dock Door (Trailer Loading And Unloading) | DOCKS | AM | MISC 5.2 |
| 51 | Door High Speed | Door High Speed | DOOR | HS | NONE** |
| 52 | Drinking Water Coolers | Drinking Water Coolers | PLUMB | DW | PLUM-13 |

| Line | Item | eMARS Equip. Description | eMARS Acronym | Class Code | PM Guide No(s) |
|------|---|--|---------------|------------|-------------------------|
| 53 | Dust Collection System | Dust Collection System | DUST | AA | NONE** |
| 54 | Elevator Electric, Automatic | Elevator Electric, Automatic | EL | AA | NONE** |
| 55 | Elevator Electric, Manual | Elevator Electric, Manual | EL | BA | NONE** |
| 56 | Elevator Hydraulic, Automatic | Elevator Hydraulic, Automatic | EL | CA | NONE** |
| 57 | Elevator Hydraulic, Manual | Elevator Hydraulic, Manual | EL | DA | NONE** |
| 58 | Elevator Escalator | Elevator Escalator | EL | EA | NONE** |
| 59 | Electrical Power Supply 15KV And Above | Electrical Power Supply 15KV And Above | ELEC | PA | NONE** |
| 60 | Electrical Power Supply Below 7 KV | Electrical Power Supply Below 7 KV | ELEC | PB | NONE** |
| 61 | Electrical Panel Control | Electrical Panel Control | ELEC | PC | NONE** |
| 62 | Electrical Panel Distribution | Electrical Panel Distribution | ELEC | PD | ELEC-5 |
| 63 | Electrical Power Supply 7 - 14 KV | Electrical Power Supply 7 - 14 KV | ELEC | PS | NONE** |
| 64 | Emergency Systems Emergency Lighting | Emergency Systems Emergency Lighting | EMSYS | EL | NONE** |
| 65 | Emergency Shower | Emergency Showers | EMSYS | ES | EMSYS MMO, PLUM-15 |
| 66 | Eyewash, Plumbed | Emergency Systems Eyewash | EMSYS | PW | EMSYS MMO, PLUM-14 |
| 67 | Eyewash, Self-Contained | Emergency Systems Eyewash | EMSYS | SW | EMSYS MMO, PS FORM 4894 |
| 68 | Emergency Exit Signs | Emergency Exit Signs | EMSYS | EX | EMSYS MMO, PS FORM 4894 |
| 69 | Emergency Systems Fire Alarm | Emergency Systems Fire Alarm | EMSYS | FA | EMSYS MMO |
| 70 | Fans, Centrifugal (Exhaust Or Return Air) | Fan Centrifugal | FAN | FC | HVAC-12 |
| 71 | Fans, Propeller, Pedestal Or Wall-Mounted | Fan Propeller | FAN | FP | HVAC-16 |

| Line | Item | eMARS Equip. Description | eMARS Acronym | Class Code | PM Guide No(s) |
|------|--|---|---------------|------------|-----------------------|
| 72 | Fans Propeller >=24 Inches | Fans Propeller >=24 Inches | FAN | FQ | NONE**, 4894 |
| 73 | Filters, Roll Type, Disposable Media | Filters Roll Type Disposable Media | FILTER | FR | HVAC-13 |
| 74 | Controls And Mechanisms For Roll-Type Filters | Controls And Mechanisms For Roll-Type Filters | HVACINS | CA | HVAC-14 |
| 75 | Filters, Throw Away | Filters Throw Away | FILTER | FT | HVAC-15 |
| 76 | Fire Dampers (In Duct) | Fire Damper All | EMSYS | FD | HVAC-24 |
| 77 | Fire Doors - Sliding Type | Fire Doors - Sliding Type | DOOR | FD | MISC-10 |
| 78 | Fire Doors - Swinging Type, Stairwells And Exit Ways | Fire Door Stairwells And Exitways (Swinging) | DOOR | FS | MISC-9 |
| 79 | Fire Extinguisher | Emergency Systems Fire Extinguishing | EMSYS | FE | EMSYS MMO, PLUM-1 |
| 80 | Fire Pumps, Electric Motor Drive | Fire Pump, Electric Motor Drive | PLUMB | FE | PLUM-11, EMS-8 |
| 81 | Fire Pumps, Internal Combustion Engine Drive | Fire Pump, Internal Combustion Engine Drive | PLUMB | FG | PLUM-12, EMS-8 |
| 82 | Furnace Forced Air Gas Fired | Furnace Forced Air Gas Fired | FURNACE | AA | MS-24 |
| 83 | Furnace Forced Air Oil Fired | Furnace Forced Air Oil Fired | FURNACE | BA | NONE** |
| 84 | Furnace Forced Air Elect Fired | Furnace Forced Air Elect Fired | FURNACE | CA | NONE** |
| 85 | Furnace Forced Air Gas Split System | Furnace Forced Air Gas Split System | FURNACE | DA | NONE** |
| 86 | Furnace Forced Air Oil Split System | Furnace Forced Air Oil Split System | FURNACE | EA | NONE** |
| 87 | Furnace Forced Air Elect Split System | Furnace Forced Air Elect Split System | FURNACE | FA | NONE** |
| 88 | Fusible Link Smoke Vents (Roof) | Fusible Link Smoke Vents (Roof) | BLDG | SV | NONE** |
| 89 | Generators, Emergency, Gasoline Or Natural Gas Engines | Fixed Mount Permanent Generator | GEN | BA | ELEC-2, ELEC-4, EMS-5 |
| 90 | Generators, Emergency, Fixed Diesel | Generator Diesel (Fixed) | GEN | BB | ELEC-3, ELEC-4, EMS-5 |

| Line | Item | eMARS Equip. Description | eMARS Acronym | Class Code | PM Guide No(s) |
|------|---|---|---------------|------------|-------------------------|
| 91 | Generators, Contingency | Portable Generator Less Than And Including 15KW | GEN | AA | MMO* |
| 92 | Generators, Contingency | Portable Generator Greater Than 15KW | GEN | AB | MMO* |
| 93 | Generators, Contingency | Generator Other (Portable) | GEN | AC | MMO* |
| 94 | Grease Traps | Grease Traps | PLUMB | GT | MMO* |
| 95 | Ground Fault Circuit Interrupter (GFCI) | Ground Fault Circuit Interrupter (GFCI) Electrical Receptacle | ELEC | GF | EMSYS MMO, PS FORM 4894 |
| 96 | Building Automation System (BAS) | GMS Building Automation System | GMS | BA | NONE** |
| 97 | Heaters, Baseboard, Electric | Heater Electric Baseboard - 706 | HVACO | EA | HVAC-21 |
| 98 | Heaters, In Duct, Electric | Heater Electric In Duct | HVACO | DA | HVAC-20 |
| 99 | Heaters, Unit, Gas-Fired | Heater | HVACO | AA | HVAC-23 |
| 100 | Heaters, Unit, Steam Or Hot Water | Heater | HVACO | AA | HVAC-22 |
| 101 | Heating Only, Package Unit | Rooftop Heating Only, Gas Fired | HVACPKG | BA | NONE** |
| 102 | Heating Only, Package Unit | Rooftop Heating Only, Oil Fired | HVACPKG | CA | NONE** |
| 103 | Heating Only, Package Unit | Rooftop Heating Only, Elect Fired | HVACPKG | DA | NONE** |
| 104 | Heating/Cooling Units, Package Unit | Rooftop Or Package Heating Cooling, Gas Fired | HVACPKG | EA | HVAC-17 |
| 105 | Heating/Cooling Units, Package Unit | Rooftop Or Package Heating Cooling, Oil Fired | HVACPKG | FA | HVAC-17 |
| 106 | Heating/Cooling Units, Package Unit | Rooftop Or Package Heating Cooling, Elect Fired | HVACPKG | GA | PLUM-9, ELEC-1, PLUM-7 |
| 107 | Heat Pump | Heat Pump Air Source - No Backup | HTPUMP | AA | NONE** |
| 108 | Heat Pump | Heat Pump Air Source - Gas Backup | HTPUMP | AB | NONE** |
| 109 | Heat Pump | Heat Pump Air Source - Oil Backup | HTPUMP | AC | NONE** |
| 110 | Heat Pump | Heat Pump Air | HTPUMP | AD | NONE** |

| Line | Item | eMARS Equip. Description | eMARS Acronym | Class Code | PM Guide No(s) |
|------|---|---|---------------|------------|-------------------------|
| | | Source - Elec Backup | | | |
| 111 | Heat Pump | Heat Pump Gnd Source Clsd Loop No Bkup | HTPUMP | BA | NONE** |
| 112 | Heat Pump | Heat Pump Gnd Source Clsd Loop Gas Bku | HTPUMP | BB | NONE** |
| 113 | Heat Pump | Heat Pump Gnd Source Clsd Loop Oil Bku | HTPUMP | BC | NONE** |
| 114 | Heat Pump | Heat Pump Gnd So. Closed Loop Elec Bkup | HTPUMP | BD | NONE** |
| 115 | Heat Pump | Heat Pump Gnd Source Aquifer No Bkup | HTPUMP | CA | NONE** |
| 116 | Heat Pump | Heat Pump Gnd Source Aquifer Gas Bkup | HTPUMP | CB | NONE** |
| 117 | Heat Pump | Heat Pump Gnd Source Aquifer Oil Bkup | HTPUMP | CC | NONE** |
| 118 | Heat Pump | Heat Pump Gnd Source Aquifer Elec Bkup | HTPUMP | CD | NONE** |
| 119 | Hoist | Trolley Mounted Hoist | HOIST | AA | MMO* |
| 120 | Hoist | Mobile Boom Style Hoist | HOIST | BA | MMO* |
| 121 | Hoist | Other Manual Hoist | HOIST | DA | MMO* |
| 122 | Hot Water Heaters, Converters (Industrial) | Hot Water Heater Converters Industrial | PLUMB | AA | PLUM-9, ELEC-1, PLUM-7 |
| 123 | Hot Water Heaters Commercial Type | Hot Water Heaters Commercial Type | PLUMB | WC | PLUM-10, ELEC-1, PLUM-7 |
| 124 | Hot Water Heaters, Domestic Type | Hot Water Heater (Domestic) - Electric | PLUMB | WC | PLUM-10, ELEC-1, PLUM-7 |
| 125 | Hot Water Heaters, Domestic Type (Gas Or Oil Fired) | Hot Water Heater (Domestic) - Oil Gas | PLUMB | WG | PLUM-10, ELEC-1, PLUM-7 |

| Line | Item | eMARS Equip. Description | eMARS Acronym | Class Code | PM Guide No(s) |
|------|--|---|---------------|------------|----------------|
| 126 | Humidifier | Humidification System | HUMID | AA | NONE** |
| 127 | Dehumidifier | Dehumidifier | HUMID | BA | NONE** |
| 128 | Lawnmowers And Edgers (Gasoline Powered) | Bldg, Outside Equipment | BLDG | BA | MISC-2 |
| 129 | Lead Acid PIV Battery | Battery | BATTERY | AA | MISC-19 |
| 130 | Magnetic Locking System | Magnetic Locking System | DOOR | ML | NONE** |
| 131 | MOPE | Mobile Op Eq, Forklift, Ride Or Walk, Motorized | MOPE | AA | MMO* |
| 132 | MOPE | Toyota Forklift Model 5 | MOPE | AB | MMO* |
| 133 | MOPE | Toyota Forklift Model 6 | MOPE | AC | MMO* |
| 134 | MOPE | Toyota Forklift Model 7 | MOPE | AD | MMO* |
| 135 | MOPE | Toyota Forklift Model 8 | MOPE | AE | MMO* |
| 136 | MOPE | Clark Forklift (All Models) | MOPE | AL | MMO* |
| 137 | MOPE | Crown Forklift (All Models) | MOPE | AM | MMO* |
| 138 | MOPE | Hyster Forklift (All Models) | MOPE | AN | MMO* |
| 139 | MOPE | Yale Forklift (All Models) | MOPE | AO | MMO* |
| 140 | MOPE | Mobile Op Eq Tow Tractor Tugger Power Ox | MOPE | BA | MMO* |
| 141 | MOPE | Toyota Tow Tractor (All DC Models) | MOPE | BB | MMO* |
| 142 | MOPE | Toyota Tow Tractor (All AC Models) | MOPE | BC | MMO* |
| 143 | MOPE | Taylor Dunn (All Models) | MOPE | BD | MMO* |
| 144 | MOPE | Mobile Op Eq Pallet Truck Motorized - Non Motorized | MOPE | CA | MMO* |
| 145 | MOPE | Toyota Riding Pallet Truck (All Models) | MOPE | CB | MMO* |

| Line | Item | eMARS Equip. Description | eMARS Acronym | Class Code | PM Guide No(s) |
|------|---|--|---------------|------------|-------------------------|
| 146 | MOPE | Toyota Walking Pallet Truck (All Models) | MOPE | CC | MMO* |
| 147 | MOPE | Crown Pallet Truck (All Models) | MOPE | CD | MMO* |
| 148 | MOPE | Mobile Op Eq-Other | MOPE | DA | MMO* |
| 149 | MOPE | Mobile Op Eq-Mini Lift FSS Only | MOPE | EA | MMO* |
| 150 | Motors, Over 5hp | Motor Electric Over 5 HP | ELEC | MT | ELEC-1 |
| 151 | Paper Baler | Baler | BALER | AA | MISC-4 |
| 152 | PIVMS | PIVMS | PIVMS | AA | MMO* |
| 153 | Pump, Centrifugal | Pumps, Centrifugal (Not Integral With Motor) | PLUMB | PC | PLUM-7, ELEC-1 |
| 154 | Pump Chiller Water | Pump Chiller Water | PLUMB | PC | NONE**, PLUM-7, ELEC-1 |
| 155 | Pump Condenser Water | Pump Condenser Water | PLUMB | PC | NONE**, PLUM-7, ELEC-1 |
| 156 | Pump Hot Water | Pump Hot Water | PLUMB | PC | NONE**, PLUM-7, ELEC-1 |
| 157 | Pumps, Sump (Life) | Pump, Sump (Sewage Or Life) | PLUMB | PS | PLUM-2 |
| 158 | Pumps, Condensate Or Vacuum | Pump, Condensate Or Vacuum | PLUMB | PV | HVAC-10 |
| 159 | Pump Sewer Ejector | Pump Sewer Ejector | PLUMB | PS | NONE** |
| 160 | UPV | Unfired Pres Vessel All Types - Models | UPV | AA | NONE** |
| 161 | Refrigeration Machines (Absorption Type) | Absorption Unit Cooling Only | HVACABS | AA | HVAC-18, ELEC-1, PLUM-7 |
| 162 | Refrigeration Machine (Centrifugal And Reciprocating) | Water In Evap-Water Cool Condenser | COOL | AA | HVAC-19, ELEC-1, PLUM-7 |

| Line | Item | eMARS Equip. Description | eMARS Acronym | Class Code | PM Guide No(s) |
|------|---|---|---------------|------------|---------------------------|
| 163 | Roof, Inspection: Roof work should only include periodic visual inspection. Any required roof repairs must to be considered under and coordinated through the national roof contract. Note: (All roof types included) | Roofing Built-Up Roof Drains Etc. | ROOF | AA | PLUM-8 |
| 164 | Floor Scrubbers, Automatic, Vacuum, Battery Operated | Floor Scrubber | MOPE | FS | MISC-18 |
| 165 | Snow Blower - Walking Type | Snow Blower - Walking | MOPE | SB | MISC-15 |
| 166 | Split System (Condenser) | Split System Condenser Unit | COOL | SA | HVAC-3 |
| 167 | Split System (Evaporator) | Split System Evaporator Unit | COOL | SB | HVAC-25 , HVAC-26 |
| 168 | Split System (Evaporator) | Split System Evaporator Unit With Electric Heat | COOL | SE | HVAC-25 , HVAC-26 |
| 169 | Split System (Evaporator) | Split System Evaporator Unit With Gas Heat | COOL | SG | HVAC-25 , HVAC-26 |
| 170 | Split System (Evaporator) | Split System Evaporator Unit With Oil Heat | COOL | SO | HVAC-25 , HVAC-26 |
| 171 | Split System (Evaporator And Condenser) | Split System Evaporator Unit With Other Heat | COOL | SZ | HVAC-25 , HVAC-26 |
| 172 | Sprinkler Head (Sprinkled Areas) | Fire Suppression System | EMSYS | FS | EMSYS MMO |
| 173 | Stationary Packers | Compactor | COMPACT | AA | MISC-11, MISC-12, MISC-13 |
| 174 | Sweepers Electric (Battery) | Sweeper Electric | MOPE | SE | MISC-17 |
| 175 | Sweepers (Gasoline Powered) | Sweeper Gas | MOPE | SG | MISC-3 |
| 176 | Tanks | Storage Tank Diesel Fuel | TANKS | CA | NONE** |

| Line | Item | eMARS Equip. Description | eMARS Acronym | Class Code | PM Guide No(s) |
|------|--|--|---------------|------------|---------------------|
| 177 | Tanks | Storage Tank Waste Fuel | TANKS | DA | NONE** |
| 178 | Tanks | Storage Tank Waste Solvent | TANKS | KA | NONE** |
| 179 | Tanks | Storage Tank Engine Oil | TANKS | JA | NONE** |
| 180 | Tanks | Storage Tank Other | TANKS | NA | NONE** |
| 181 | Trailer Restraints | Trailer Restraint | DOCKS | AH | MISC-20, MISC-21 |
| 182 | Transformer | Transformer | ELEC | TR | NONE** |
| 183 | Transformer Switch | Transformer Switch | ELEC | TS | NONE** |
| 184 | Transformer Vault | Transformer Vault | ELEC | TV | NONE** |
| 185 | Traps, Steam (All Types) | Steam Trap, All Types | BOILER | ST | PLUM-6 |
| 186 | Valves, Manually Operated (Mainline Or Critical - Over 2 In) | Valve, Manually Operated Mainline Or Critical Over 2-in. | PLUMB | VC | PLUM-4 |
| 187 | Valve, Fire Control | Fire Suppression System | EMSYS | FS | EMSYS MMO |
| 188 | Valves, Motor Operated | Valve, Motor Operated | PLUMB | VM | PLUM-5 |
| 189 | Valves, Regulating (Steam) | Valve, Regulating (Steam) | PLUMB | VR | PLUM-3 |
| 190 | VFD | Variable Frequency Drive | ELEC | VF | NONE** |
| 191 | VAV | Variable Air Volume Unit | HVACVAV | AA | NONE** |

*MMO: refer to appropriate MMO for task.

**NONE: no guides apply.

5. Include Unfired Pressure Vessel (UPV), if applicable.

6. Use acronym for equipment or system on which this item is installed.

When creating an Equipment Record in the eMARS Equipment Module, the Site will generate one record for each piece or type of equipment depending on the specific equipment.

THIS PAGE BLANK

ATTACHMENT 2
BUILDING AND BUILDING EQUIPMENT
PREVENTIVE MAINTENANCE GUIDES

1.0 GUIDE SET HVAC

1.1 GUIDE NUMBER HVAC-1: AIR-CONDITIONING MACHINE PACKAGE UNITS

Frequency: Annual

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

1. Remove panels. Clean entire unit.
2. Clean drip pans and drains. Check for corrosion.
3. Replace worn belts and adjust proper tension.
4. Lubricate motor(s) and fan(s) bearings.
5. Check motor alignment and verify hardware is tight.
6. Change filters with USPS approved products.
7. Operate unit and check for proper cooling.
8. Check thermostat.
9. Check fan and motor. Clean fan blades, motor, and lubricate bearings.
10. Run machine and check operation, water supply and control valves, suction and discharge pressures, refrigerant level, recheck for leaks, functioning of controls, temperature of discharge, air, etc.
11. Restore panels and clean up area and machine.
12. Identify and report any deficiencies.

1.2 GUIDE NUMBER HVAC-2: AIR-CONDITIONING, WINDOW UNITS

Frequency: Annual

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

NOTE

Review manufacturer instructions.

1. Remove necessary covers.
2. Clean condenser, cooling coil fins, and fans where accessible.
3. Remove dirt or dust from accessible interior parts.
4. Replace or clean filter.
5. Replace covers that were removed, if necessary.
6. Clean area.
7. Start unit and observe operation.

1.3 GUIDE NUMBER HVAC-3: AIR-COOLED CONDENSERS

Frequency: Annual

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

1. Vacuum dirt on coils and fins.
2. Inspect and service unit following manufacturer recommendations.
3. Restore covers that were removed, if necessary.
4. Identify and report any deficiencies.

1.4 GUIDE NUMBER HVAC-4: AIR HANDLERS

Frequency: Annual

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

1.4.1 Fans

1. Clean and inspect fan blades.
2. Clean and inspect fan housing.
3. Restore cover, if necessary.

1.4.2 Bearings

Lubricate bearings following manufacturer recommendations. Do not over lubricate bearings.

1.4.3 Drives (Belt and Direct)

1. Inspect for excessive belt wear indicating misalignment, overloading, or improper belt tension.
2. If belts are worn, they should be replaced to prevent untimely breakdown. Multi-belt drives should be replaced in matched sets. Adjust belt tension as necessary.
3. Check couplings for alignment on direct drives and for tightness of assembly.
4. Restore covers that were removed, if necessary.

1.4.4 Coils

1. Examine coils for leakage and debris.
2. Clean coil exterior using manufacturer's recommendations.
3. Restore cover/panel, if necessary.

1.4.5 Freeze Protection

1. Check pitch of coil to drainage point.
2. Inspect test controls and devices used for freeze protection.
3. Clean face and lubricate following manufacturer recommendation.

1.4.6 Controls

1. Inspect and clean dampers, control linkage, and control motors following manufacturer recommendation.
2. Lubricate as necessary following manufacturer recommendation.
3. Restore covers/panels, if necessary.

1.5 GUIDE NUMBER HVAC-5: BOILERS, OIL FIRED

(Cleaning Fireside only)

Frequency: Annual

Application: This is to provide for fireside cleaning to remove soot and maintain high efficiency.

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, allow boiler to cool, lock out power to oil pumps and blowers, and close and lock out valves. Power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

1. Clean soot from chamber, tubes, and all heat transfer surfaces.
2. Look for signs of overheating, leakage, wear, abrasion, corrosion of pressure parts, or erosion of metal.
3. Clean or replace burner nozzle as necessary.
4. Restore cover/panel.
5. When unit is returned to service, check and adjust burner for optimum combustion efficiency.
6. Identify and report any deficiencies.

1.6 GUIDE NUMBER HVAC-6: BOILERS, CAST-IRON AND STEEL

Frequency: Annual

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, allow boiler to cool, lock out power to oil pumps and blowers, and close and lock out valves. Power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

1.6.1 General

1. Remove boiler from service. Take proper safety precautions before working inside boiler, including tagging of valves and controls, and letting boiler cool down.
2. Remove fly ash and soot from flue passages.
3. Restore cover/panel.
4. Check firesides, valves, and trim, and report any leaks.

1.6.2 Watersides

1. Clean gauge glass and siphon loops to limit controls.
2. See that petcocks and try cocks open freely.
3. If internal inspection is required:
 - a. Remove hand-hole and manhole plates.
 - b. Clean interior of boiler, wash down shell and drums to remove mud, loose scale, and deposits.
 - c. Turbine tubes: check tube ends for leakage and corrosion.
 - d. Restore covers/panels.
 - e. Identify and report any deficiencies.

1.6.3 Exterior and Firesides

1. Examine and clean water column and feed water regulators, high and low side alarms, drains, gauge glasses, siphon loops, petcocks, and try cocks.
2. Look for signs of overheating, leakage, wear, abrasion, corrosion of pressure parts, or erosion of metal.
3. Check tubes for evidence of blisters and pock marks.
4. Check condition of all refractories for cracks, erosion, and caulk. Also, check expansion joints, baffles, dampers and actuating mechanisms, stay-bolts, etc.

5. Test all non-return and stop valves. Clean and replace as necessary.
6. Check fusible plugs, if used. Replace yearly.
7. Check and clean bonnets, flues, and uptakes for defective metal. Replace if necessary.
8. Check exterior structure for strains and tension.
9. Clean and lubricate forced-draft fan.
10. Check condition of door gaskets.
11. Carefully account for all tools before closing up boiler.
12. Restore covers/panels.
13. Identify and report any deficiencies.

1.7 GUIDE NUMBER HVAC-7: BURNER, GAS

Frequency: Annual

WARNING

Activities in this guide require work to be performed with the equipment powered on and covers/panels open. Energized equipment may expose personnel to potential hazards. Follow all manufacturer recommendations. Failure to comply may result in injury or death.

1. Check boiler room for adequate ventilation in accordance with AGA burner requirements.
2. Check operation of all gas controls and valves.
3. Check flue connections for tight joints and minimum resistance to airflow. Ensure combustion chamber, flues, breeching, and chimney are clear before firing.
4. Ensure draft regulators give slightly negative pressure in the combustion chamber at maximum input.
5. On forced-draft burners, gas manifold pressure requirements should correspond with modulating (butterfly) valve in full-open position and stable at all other firing rates.
6. Take CO² flue gas temperature readings to determine efficiency of the unit. CO² for atmospheric gas burners should be 8 to 9.5%; for forced draft burners 9 to 10%. Determine combustion efficiency according to instructions with flue gas test apparatus. Combustion efficiency should be at least 80%. If efficiency is low, check baffling.
7. Check burner for flashback and tight shutoff of fuel.
8. Restore covers/panels.
9. Check operation of controls. Clean and adjust if necessary.
10. Ensure unit operates properly when adjustments are set per manufacturer instructions.
11. Identify and report any deficiencies.

1.8 GUIDE NUMBER HVAC-8: BURNER, OIL

Frequency: Annual

WARNING

Activities in this guide require work to be performed with the equipment powered on and covers/panels open. Energized equipment may expose personnel to potential hazards. Follow all manufacturer recommendations. Failure to comply may result in injury or death.

1. Test and inspect burner (with or without firing) at rated pressure for leaks.
2. Timed trial for ignition for pilots and burners should be in accordance with manufacturer instructions.
3. Check operation of automatic safety controls and combustion flame safeguards for abnormal discharge of oil on ignition failure, and sensors for presence of flame.
4. Check pre-ignition purging capability of burner, combustion chamber, boiler passes, and breeching. Stack dampers should be fully open during purge and light-off period.
5. Check delivery of fuel in relation to its response to the ignition system. Examine electrodes for carbon buildup, dislocation, distortion, and burning of parts.
6. Ensure ignition transformer provides dependable arc. Adjust and regulate as required for clearance and air gap.
7. Clean and adjust draft regulator and air shutter on a natural draft burner to ensure excess air quantities are minimal for complete combustion. Test with gas analyzer.
8. On mechanical draft burners, clean and check power-driven fan blower.

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current MMO providing lockout/restore procedures. Failure to comply may cause injury or death.

9. Check forced-draft fan, clean fan and fan housing, check bearing, pulleys, and belts for wear and lubricate as necessary.
10. Check and clean filters, water separators, and primary and secondary strainers.
11. Clean, check operation, and adjust controls and safeties.
12. Burners designed to change firing rates automatically should be checked for adequate proportioning changes in fuel and air rates.

13. Check constant level device to see that burner maintains proper oil level (within 1/3") at rated output.
14. Ensure energy cannot feedback and energize ignition devices or feed valves after a control shuts off burner.
15. Replace nozzles and check for tight shutoff of fuel.
16. Check stacks for smoke or haze and adjust burner accordingly.
17. Take CO², O², and smoke readings. Compare CO² and flue gas temperature for determination of boiler burner efficiency. CO² should be 9 to 12%. Combustion efficiency should be at least 80%. Determine combustion efficiency according to instructions with flue gas test apparatus.
18. Restore covers/panels.
19. Identify and report any deficiencies.

1.9 GUIDE NUMBER HVAC-9: COILS, PREHEAT, REHEAT, ETC. (REMOTE FROM AIR HANDLER)

Frequency: Annual

Application: This guide applies to coils that are not part of an air-washer or air-handling unit.

1. Vacuum the fins, coils, etc.
2. Remove obstructions to airflow.
3. Check coils. Repair or report any leaks.
4. Test and inspect controls that protect against freezing.
5. Restore covers/panels.
6. Identify and report any deficiencies.

1.10 GUIDE NUMBER HVAC-10: CONDENSATE OR VACUUM PUMPS (ON STEAM RETURN SYSTEM)

Frequency: Annual

1. Operate unit to check for steam binding.
2. Check condensate temperature. Temperature should be approximately
3. 30 degrees F. below steam temperature if traps are not leaking.
4. Examine flanges for steam leaks.
5. Pump receiver down.
6. Turn condensate to sewer.
7. Shut down unit.
8. Clean receiver.
9. Clean and adjust motor float switch and float operation on high-low water level.
Inspect pressure switches.
10. Clean and examine receiver, vent pipe, inlet, and discharge openings for excessive corrosion. Report condition.
11. Check alignment of coupling with straight edge.
12. Lubricate pump and motor.
13. Adjust packing glands and change packing when necessary.
14. Examine vacuum breaker operation.
15. Inspect ball floats, rods, and other linkage. Adjust as necessary.
16. Restore covers/panels.
17. Identify and report any deficiencies.

1.11 GUIDE NUMBER HVAC-11.1: COOLING TOWERS STARTUP (SPRING)

Frequency: Annual

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

NOTE

Perform annual maintenance before cooling season.

1. Remove trash, dirt, and algae from pans, casings, fill, and screens.
2. Check structural members of tower for deterioration.
3. Clean and check operation of the water treatment equipment.
4. Fill tower. Adjust bleed float level. Charge with water treatment chemicals.
5. Examine water nozzles for obstructions and proper water distribution.
6. Check alignment of motor to gear to fan.
7. Inspect motor, motor starter, belts, etc., for proper operation.
8. Restore all covers/panels.
9. Identify and report any deficiencies.

1.12 GUIDE NUMBER HVAC-11.2: COOLING TOWERS SHUTDOWN (FALL)

Frequency: Annual

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

NOTE

Perform annual maintenance before cooling season.

1. Drain and flush down tower. Remove trash, dirt, and algae from pans, casings, fill, and screens.
2. Drain and replace lubricant in gearbox.
3. Restore covers/panels.
4. Identify and report any deficiencies.

1.13 GUIDE NUMBER HVAC-12: FANS, CENTRIFUGAL

Frequency: Annual

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

NOTE

Obtain and review manufacturer instructions.

1. Check over unit thoroughly. Look for signs of rust, corrosion, or deterioration. Inspect interior of housing, if there are openings to do so.
2. Check insulation; repair if needed.
3. Check bearings, shaft, pulley, and alignment with motor. If vibration is excessive, check balance of rotor.
4. Perform required lubrication.
5. Check belts; adjust tension, or replace as required.
6. Vacuum windings, if necessary.
7. Clean complete unit, including fan rotor.
8. Restore covers/panels.
9. Identify and report any deficiencies.

1.14 GUIDE NUMBER HVAC-13: FILTERS, ROLL-TYPE DISPOSABLE MEDIA

Frequency: 4 times annually (quarterly)

Application: To inspect roll filter media.

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

NOTE

Obtain and review manufacturer instructions.

1. Check filter media roll.
2. Replace filter media roll as needed utilizing the work order process.
3. Restore covers/panels.

1.15 GUIDE NUMBER HVAC-14: CONTROLS AND MECHANISMS ROLL TYPE FILTERS

Frequency: Annual

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

NOTE

Obtain and review manufacturer instructions.

1. Inspect framework and structure. Look for loose or missing bolts, air leaks, condition of flashing or caulking, etc.
2. Inspect all moving parts for proper alignment, freedom of motion, excessive clearance or play, etc. Clean, adjust, or tighten as necessary.
3. Inspect powered roll and take up roll for correct tracking of media. On manual operation check wheel or hand crank.
4. On motor drives, check pressure sensing device(s) and/or pressure switches. Test settings for starting and stopping motor.
5. Inspect motor, starter, controls, and selector switch for auto warning or indicator lights.
6. Check oil in gear case. Change or replenish as required. Perform required lubrication.
7. Restore covers/panels.
8. Identify and report any deficiencies.

1.16 GUIDE NUMBER HVAC-15: FILTERS, THROW-AWAY

(Includes package units)

Frequency: 4 times annually (quarterly)

WARNING

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

NOTE

Change filters when the static pressure approaches the design maximum for the unit.

1. Remove and discard old filters.
2. Clean frame with vacuum.
3. Inspect frame, doors, etc.
4. Install new media.
5. Restore covers/panels.

1.17 GUIDE NUMBER HVAC-16: FANS, PROPELLER

Frequency: Annual

This guide is for the large fans used in the workroom or other areas to provide air circulation. Observe current local ECP and ensure all safety requirements are followed.

WARNING

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

WARNING

Visually inspect portable ladders prior to each use. These visual inspections are intended to help ensure that each ladder will be safe during operation. Failure to comply may result in injury. Refer to Handbook EL-803 Maintenance Employee's Guide to Safety, Section VIII for more information and MMO-115-17 Inspection and Usage of Portable Ladders.

WARNING

These procedures may require using a ladder. Using a ladder presents a falling hazard. Never overreach or lean away from the ladder. Precautions must be taken to prevent falls from heights that may cause personal injury. Follow local safety procedures for fall prevention. Failure to comply may cause injury or death and/or equipment damage.

1. Disconnect from electric power and clean entire unit including the blade and motor.
2. Examine line cord for frayed insulation or evidence of deterioration if applicable.
3. Wrench test blade setscrew, motor mount bolts, and blade guard mounting bolts to verify tightness.
4. Lubricate unit and clean up excess lubricant.
5. Restore covers/panels.
6. Operate unit and check for excess vibration and unusual noise.

1.18 GUIDE NUMBER HVAC-17: HEAT/COOLING UNIT, ROOF TOP

Frequency: Semiannual

This applies to roof top heating/cooling units, which are gas-fired heating, and have an air-cooled condenser. Ensure all safety requirements are followed.

WARNING

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

WARNING

Verify with your supervisor that roof access is permitted before attempting to gain access to the roof.

Employees who access a walking-working surface with unprotected sides or edges that are 4 feet or more above a lower level must have one of the following to protect the employee: guardrail systems; safety net systems; or personal fall protection systems, such as personal fall arrest, travel restraint, or positioning systems.¹ Employee must contact a supervisor if this Personal Protective Equipment (PPE) is not available.

1. Remove panels. Clean entire unit.
2. Clean drip pans and drains.
3. Replace worn belts and adjust for proper tension.
4. Clean fans.
5. Lubricate motor(s) and fan(s) bearings.
6. Check alignment of motor and tighten.
7. Change filters.
8. Restore covers/panels.
9. Identify and report any deficiencies.

¹ OSHA 1910.28(b)(1)(i)(A-C) Unprotected sides and edges.

1.18.1 Spring

1. Clean evaporator and condenser coils.
2. Operate unit and check refrigeration.
3. Charge unit as required.
4. Restore covers/panels.
5. Check thermostat.

1.18.2 Fall

1. Clean and check heat exchanger for leaks.
2. Check gas train and safety controls for adequate and proper operation.
3. Adjust pilot or electronic ignition device.
4. Set burner for maximum combustion efficiency.
5. Restore covers/panels.

1.19 GUIDE NUMBER HVAC-18: REFRIGERATION MACHINES, ABSORPTION TYPE

Frequency: Annual

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

NOTE

Consult operating data to determine the temperature difference across the various system components as a guide to determining the condition of the evaporator and condenser tubes.

1.19.1 Evaporator Circuit

1. Check and service evaporator pump, motor controls, starters, etc. Lubricate as prescribed.
2. Clean and flush out seal, water tank seal chamber, and associated lines.
3. Check purge valve diaphragm. Replace if necessary.
4. Inspect ball in check valve.
5. Inspect and clean evaporator spray header, nozzles, etc. Replace defective units.
6. If operating data indicated the refrigerant temperature is slowly rising, test sample for the presence of solution. If excessive, follow manufacturer instructions for distilling refrigerant.
7. Restore covers/panels.

1.19.2 Solution Circuit

1. Check and service solution pump, motor controls, starters, etc. Lubricate as prescribed.
2. Check absorber and generator sight glasses. Replace if required.
3. Check purge valve diaphragm. Replace if required.
4. Inspect and clean solution spray nozzles. Replace defective units.
5. Restore covers/panels.

1.19.3 Condenser Circuit

1. Clean condenser water tubing in the condenser and absorber. Use nylon brush or other soft material.
2. Allow condenser water tubing to dry to determine if scale exists. Have scale chemically tested if necessary. Acid clean if necessary and flush.
3. Restore covers/panels.

1.19.4 Purge System

1. If purge system indicates the system is not tight, follow manufacturer recommendations for removing solution and for leak testing.
2. Clean purge tank, and purge with water following steps prescribed by the manufacturer.
3. Change oil, in purge pump, when it becomes contaminated or emulsified.
4. Inspect discharge valve and oil distributor rubbers; renew if necessary.
5. Restore covers/panels.

1.19.5 Controls

1. Check adjustment of pressure-control, restrictor, high-level cutout, and low temperature cutout.
2. Check all control interlocks for proper operation.
3. Check capacity control valve, linkage, and stem. Lubricate according to manufacturer instructions.
4. Restore covers/panels.
5. Identify and report any deficiencies.

1.20 GUIDE NUMBER HVAC-19: REFRIGERATION MACHINES (CENTRIFUGAL AND RECIPROCATING)

Frequency: Annual

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

1.20.1 Compressor

1. Take sample of oil and have analyzed for acid and metal content. Record the results of the analysis in the eMARS equipment record. Drain, flush, and change oil in reservoirs including filters, strainers, and traps. Do not change oil in reciprocating machines unless contaminated.
2. Clean and inspect main and auxiliary oil pumps, including packing, seals, alignment, pulleys, belts, and couplings.
3. Check speed increaser. Drain oil from gearbox. Flush and inspect gears for indication of wear, pitting, and misalignment.
4. Remove head from oil coolers; inspect and clean tubes as necessary. Change oil filters.
5. Refill oil sump.
6. Remove access caps to compressor internals, and clean where possible.
7. Clean and adjust pilot positioner for guide vanes.
8. Examine bearing for clearances and wear.
9. Clean and lubricate coupling.
10. Check hot and cold alignment between drive and driven compressor.
11. Check all relief valve rupture discs.
12. Test entire system for refrigerant leaks.
13. Calibrate and adjust all gauges and instruments. Calibrate the chilled water inlet and outlet thermometers together by placing the sensing element in a container of melting ice and water. This provides a 32 degrees Fahrenheit temperature for calibration purposes.
14. Check safety controls for setting operation; tighten electrical connections, and clean when necessary.

15. Review manufacturer literature for further details on service required on compressor.
16. Perform maintenance on purge unit in accordance with manufacturer instructions.
17. Restore covers/panels.

1.20.2 Chiller

1. Review chiller performance records. (Inlet and outlet chilled water temperature and refrigerant temperatures).
2. If efficiency is reduced, inspect for control malfunction or sensing element failure.
3. Systems requiring minimum or no raw water make-up should be drained and inspected only in emergencies. The pH should be maintained between 7 and 8. To determine that the system is tight, disconnect automatic make-up water system and feed by hand. Frequency for cleaning on such systems should be once every five years. Note: New installations must be cleaned after one year of operation.
4. Clean tubes with nylon brush or similar material.
5. Blow tubes free of trapped water if unit is to be exposed to freezing temperatures.
6. Replace heads. Install new gaskets.
7. Treat water to control corrosion.

1.20.3 Water-Cooled Condensers

1. Review condenser performance by inlet and outlet temperatures, head pressure, and temperature of refrigerant.
2. Remove condenser heads.
3. Remove mud, debris, scale, and other sediment collected during operation.
4. Clean water boxes and tube sheets.
5. Clean tubes with nylon brush or other similar material, and inspect for signs of corrosion.
6. Blow trapped water from tubes after cleaning if unit is exposed to freezing temperature.
7. Replace heads. Install new gaskets.
8. Chemically test scale, if necessary.
9. If condenser is chemically cleaned, neutralize after cleaning.

1.21 GUIDE NUMBER HVAC-20: HEATER, ELECTRIC, IN-DUCT

Frequency: Annual

1. Vacuum all dust and dirt from coils.
2. Remove airflow obstruction.
3. Visually inspect for cracked or broken insulators, distorted or burned coils, and loose connections. Replace as needed.
4. Inspect operating contacts and replace if needed.
5. Restore covers/panels.

1.22 GUIDE NUMBER HVAC-21: HEATER, ELECTRIC, BASEBOARD

Frequency: Annual

WARNING

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

1. Remove cover; vacuum coil, fins, and cover grill.
2. Replace cover.

1.23 GUIDE NUMBER HVAC-22: UNIT HEATERS (STEAM AND HOT WATER)

Frequency: Annual

1. Clean strainer ahead of valve. Check valve head and seats for wear and cutting.
2. Replace valve(s) as necessary.
3. Steam quality should be examined for foreign matter if valves are being damaged.
4. Examine pilot lines for dirt.
5. Check steam gauges.
6. Check safety or pressure relief valve for relieving and seating.
7. Check diaphragms for failure.
8. Check binding of valve stem.
9. Clean and adjust heater deflector fins and element.

| |
|----------------|
| WARNING |
|----------------|

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

10. Clean fan and lubricate motor.
11. Adjust weighted lever or spring-control tension.
12. Restore covers/panels.
13. Identify and report any deficiencies.

1.24 GUIDE NUMBER HVAC-23: UNIT HEATERS (GAS FIRED)

Frequency: Annual

WARNING

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

NOTE

For infrared units, obtain and follow manufacturer recommendations.

1. Clean and adjust heater deflector fins and element.
2. Clean fan and lubricate motor.
3. Clean burner, chamber, thermo-couple, and control.
4. Adjust pilot or electric ignition device.
5. Inspect vent and damper operation.
6. Restore covers/panels.
7. Remove lockout from unit.
8. Operate unit and adjust burner.
9. Check operation of safety pilot, gas shutoff valve, and other burner safety devices.
10. Identify and report any deficiencies.

1.25 GUIDE NUMBER HVAC-24: FIRE DAMPERS (IN-DUCT)

Frequency: Annual

CAUTION

Never replace fusible link with wire. On first inspection, make sure that the damper is not installed backwards. In all cases, the air movement should tend to close damper.

1. Determine that the access door is reasonably airtight and latches properly.
2. If damper is closed, check for ruptured fusible links, broken attachment, or hinge damage, corrosion, etc.
3. Remove fusible link and check for proper rating.
4. Determine that damper is self-closing and properly latches. Adjust if necessary.
5. Lubricate friction points, and exercise damper to ensure complete freedom of movement.
6. Each year, install new fusible links of proper rating and tensile strength in areas of vibration.
7. Reinstall fusible link (locations where vibration is not a problem).
8. Close access door and check for wind noise.

1.26 GUIDE NUMBER HVAC-25: SPLIT SYSTEM EVAPORATOR UNITS

Frequency: Annual

WARNING

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

1. Remove panels. Clean entire unit.
2. Clean drip pans and drains. Check for corrosion.
3. Replace worn belts and adjust proper tension.
4. Lubricate motor(s) and fan(s) bearings.
5. Check motor alignment and verify hardware is tight.
6. Change filters with USPS approved products.
7. Check filter switch (if equipped)
8. Operate unit and check for proper cooling.
9. Check thermostat.
10. Check fan and motor. Clean fan blades, motor, and lubricate bearings.
11. Run machine and check operation, water supply and control valves, suction and discharge pressures, need for refrigerant, recheck for leaks, functioning of controls, temperature of discharge, air, etc.
12. Check glycol pump for leaks and operation.
13. Check reheat (if equipped)
14. Check unit electrical connections.
15. Restore panels and clean up area and machine.
16. Identify and report any deficiencies.

1.27 GUIDE NUMBER HVAC-26: SPLIT SYSTEM EVAPORATOR UNITS

Frequency: Monthly

WARNING

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

1. Remove panels if necessary to access filters.
2. Change filters with USPS approved products
3. Check fan blades for free and easy movement.
4. Check for oil leaks.
5. Restore covers/panels.
6. Operate unit and check for proper cooling.
7. Identify and report any deficiencies.

2.0 GUIDE SET ELEC

2.1 GUIDE NUMBER ELEC-1: MOTORS

Frequency: Annual

| |
|----------------|
| WARNING |
|----------------|

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

NOTE

This guide is for squirrel-cage, wound-rotor, and synchronous motors in excess of 5-horse power. The maintenance specified by this guide is not intended to require disassembly of the motor.

NOTE

Obtain and review manufacturer instructions.

1. Clean motor with a clean rag or vacuum.
2. Perform lubrication according to manufacturer instructions.
3. Inspect for moisture and protection from water.
4. Check motor mountings, supports, and couplings for tightness or defects.
5. Identify and report any deficiencies.

2.2 GUIDE NUMBER ELEC-2: BACK-UP GENERATOR- GAS OR NATURAL GAS ENGINES

Frequency: Annual

WARNING

This task applies to fixed generators only. Review manufacturer instructions. If local staff does not have appropriate skills for steps below, this maintenance task should be contracted out.

Have approved type fire extinguishers readily available. Do not allow open flames or smoking in area. Use safety-type fuel cans only. Failure to comply may result in personal injury or death, and/or damage to equipment/building.

1. Set distributor point dwell. Replace points, capacitor, rotor, and spark plugs after 100 hours of operation.
2. Set timing and distributor advance. Timing should be set at both idle and operating speed of generator.
3. Adjust carburetor and governor for proper operating speed.
4. Check fuel supply. Replace fuel within the manufacturer recommendations.
5. Change engine oil and filter, and perform other lubrication of engine and generator.
6. Inspect cooling system for leaks, air obstructions, V belt tension, and proper antifreeze solution. Make needed adjustments.
7. Inspect generator winding and clean if needed.
8. Clean commutator and collector rings; check brush wear and tension in accordance with manufacturer instructions.
9. Inspect generator heaters.
10. Restore covers/panels.
11. Identify and report any deficiencies.

2.3 GUIDE NUMBER ELEC-3: EMERGENCY GENERATORS - DIESEL POWER

Frequency: Annual

WARNING

This task applies to fixed generators only. Review manufacturer instructions. If local staff does not have appropriate skills for steps below, this maintenance task should be contracted out.

Have approved type fire extinguishers readily available. Do not allow open flames or smoking in area. Use safety-type fuel cans only. Failure to comply may result in personal injury or death, and/or damage to equipment/building.

1. Change fuel filters.
2. Inspect and adjust rack on unit injector or fuel distributor pump according to manufacturer instructions.
3. Check governor. Adjust for correct speed.
4. Determine fuel level, drain water from tank, and inspect for contamination. Prior arrangements should be made for local procurement of fuel in emergencies.
5. Change engine oil and filter, and perform other lubrication on engine and generator.
6. Inspect cooling system for leaks, air obstructions, V belt tension, and proper antifreeze solution. Make needed adjustments.
7. Inspect generator winding, and clean if needed.
8. Clean commutator and collector rings. Check brush wear and tension in accordance with manufacturer instructions.
9. Inspect generator heaters.
10. Restore covers/panels.
11. Identify and report any deficiencies.

2.4 GUIDE NUMBER ELEC-4: EMERGENCY GENERATORS – ALL TYPES OF ENGINES

Frequency: Monthly

Application: This guide provides for the operation test of emergency generators.

WARNING

This task applies to fixed generators only. Obtain and review manufacturer instructions and specifications. If local staff does not have appropriate skills for steps below, this maintenance task should be contracted.

Have approved type fire extinguishers readily available. Do not allow open flames or smoking in area. Use safety-type fuel cans only. Failure to comply may result in personal injury or death, and/or damage to equipment/building.

1. Drain condensate from bottom of fuel tank and check fuel for quantity and contamination.
2. Check engine oil level
3. Check coolant level and inspect for leaks.
4. Inspect engine air cleaner; replace if dirty.
5. Test and determine specific gravity of starting batteries. Clean terminals. Set proper charge rate after generator has been operated.
6. Examine generator for moisture and/or dirt.
7. Start and operate under full load for 1 hour. It is important that the unit be operated under load. If a portion of the building load cannot be connected, a resistance load should be used.
8. While the unit is operating, thoroughly observe operation for indication of defects or possible malfunctions.
9. After unit has operated for 50 minutes, log the operation to show at least the following information: engine and generator speed in RPM, operating voltage, operating amperes, engine temperature, engine oil pressure, and hour meter readings.
10. After unit has been operated, check lubricant and coolant according to manufacturer's instruction to assure it will be ready to operate in an emergency.
11. Report any needed repairs or observed defects.

2.5 GUIDE NUMBER ELEC-5: ELECTRICAL PANEL INFRARED SCANS

Frequency: Annual

Application: This guide provides for quick cursory scans of facility electrical panels operating up to 480 volts.

| |
|----------------|
| WARNING |
|----------------|

To minimize arc-flash risk, do not remove dead front cover. Failure to comply may result in personal injury or death, and/or damage to equipment.

1. Open circuit breaker access door.
2. A qualified employee should use a thermographic camera to scan and record exterior image of circuit breakers and breaker box.
3. Close circuit breaker access door.
4. Record any observed anomalies.
5. Generate work orders as needed.

3.0 GUIDE SET MISC

3.1 GUIDE NUMBER MISC-1: AIR COMPRESSORS

Frequency: Annual

NOTE

Obtain and review manufacturer instructions.

1. Test the pressure gauge(s) and cutout and cut-in pressure. Use test gauge to test accuracy of gauge on machine. Gauge should be within 10%.
2. Check safety valve.
3. Tank to be inspected and tested by qualified inspector***.
4. On two-stage compressor(s), check intermediate pressure.
5. Listen for knocks and inspect for mechanical failures.
6. Test compression; correct or repair as necessary.
7. On water-cooled compressor(s) check for corrosion.
8. Clean moisture traps in system. Check operation of timed-moisture-release system, if so equipped.
9. Change oil in crankcase.
10. Check controls, belts, pulleys, alignment, etc.
11. Check air-cooled heat exchanger.
12. Check motor, bearings, starting switches, controller, pressure switches, etc.
13. Clean equipment.
14. Comply with lubrication schedule.
15. Restore covers/panels.
16. Identify and report any deficiencies.

*** All inspectors must hold a current certificate of competency issued by the National Board of Boiler and Pressure Vessel Inspectors (NBBI).

3.2 GUIDE NUMBER MISC-2: LAWNMOWERS AND EDGERS

Frequency: Semiannual

Application: Gasoline-powered, hand-operated, rotary mowers, and edgers.

| |
|----------------|
| WARNING |
|----------------|

The mower/edger blade is very sharp. Do not put hands or feet near or under rotating parts. Keep clear of the discharge opening at all times. Failure to comply may result in serious injury.

NOTE

Obtain and review manufacturer instructions.

NOTE

Maintenance should be scheduled once a season. Routine daily lubrication should be performed by operator.

1. Change engine oil. Oil should be changed, and gasoline drained at end of season prior to storing the unit for winter.
2. Service air and fuel filters.
3. Sharpen or replace cutting blade.
4. Clean and gap or replace spark plug.
5. Inspect unit, clean debris from cooling air passages, and make other needed adjustments.
6. Restore covers/panels.

3.3 GUIDE NUMBER MISC-3: SWEEPERS (GASOLINE)

Frequency: 2 – 6 times annually

Application: Gasoline or gas powered riding type sweepers used in driveways, parking lots, sidewalks, etc.

NOTE

Obtain and review manufacturer maintenance recommendations. Daily lubrication should be performed by operator.

1. Change oil, and change or clean filter, as appropriate, every fifty operating hours.
2. Service air and fuel filters.
3. Inspect engine, clean cooling air passages.
4. Clean and gap, or change spark plug.
5. Check oil level in gearboxes.
6. Adjust tension and/or replace V-belts.
7. Adjust brakes, brushes, and operating mechanisms as recommended by the manufacturer instructions.
8. Inspect entire unit.
9. Restore covers/panels.
10. Identify and report any deficiencies.

3.4 GUIDE NUMBER MISC-4: PAPER BALERS

Frequency: Annual

| |
|----------------|
| WARNING |
|----------------|

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

1. Dust or wipe clean all parts of machine.
2. Examine structural features.
3. Inspect upper and lower limit switch, etc. Clean and adjust as required.
4. Check drive unit, mechanical features, and all moving parts.
5. Perform lubrication according to manufacturer's recommendations.
6. Adjust operating mechanism.
7. Restore covers/panels.
8. Identify and report any deficiencies.

3.5 GUIDE NUMBER MISC-5.1: DOCK DOORS, POWER OPERATED

Frequency: Semiannual

Application: Warehouse, large overhead and dock doors.

NOTE

Obtain and review manufacturer instructions.

1. Inspect general arrangement of door and mechanism, mountings, guides, wind locks, anchor bolts, counter-balances, weather stripping, etc. Clean, tighten, and adjust as required.
2. Operate with power from stop to stop and at intermediate positions. Observe performance of various components, such as brake, limit switches, motor, gearbox, etc. Clean and adjust as needed.
3. Check operations of electric eye, treadle, or other operating devices.
4. Check manual operation. Note brake release, motor disengagement, functioning or hand pulls, chains, sprockets, clutch, etc.
5. Examine motor, starter, push button, etc. Vacuum if required.
6. Inspect gearbox. Change or add oil as required.
7. Perform required lubrication.
8. Clean unit and mechanism thoroughly.
9. Identify and report any deficiencies.

3.6 GUIDE NUMBER MISC-5.2: DOCK DOORS, MANUALLY OPERATED

Frequency: Semiannual

Application: Warehouse, large overhead and dock doors.

NOTE

Obtain and review manufacturer instructions.

1. Inspect general arrangement of door and mechanism, mountings, guides, wind locks, anchor bolts, counter-balances, weather stripping, etc. Clean, tighten, and adjust as required.
2. Check manual operation. Functioning of hand pulls, chains/cables, spring counter balance sprockets, roller guides, etc.
3. Perform required lubrication.
4. Clean unit and mechanism thoroughly.
5. Identify and report any deficiencies.

3.7 GUIDE NUMBER MISC-6: DOOR, PEDESTRIAN DOORS, POWER OPERATED MAIN AND DOCK ENTRANCES

Frequency: Quarterly

3.7.1 Hinged Doors

1. Check alignment of door and mechanism. Inspect mountings, hinges, mats, trim, weather stripping, etc. Replace, tighten, and adjust as required.
2. Operate with power, observing operating of actuating and safety mats, door speed, and checking functions.
3. Check manual operation.
4. Inspect power unit, add oil, and tighten hydraulic lines as required.
5. Check operation of controls.
6. Inspect door-operating unit, tighten lines, and adjust as required.
7. Clean and lubricate door pivot points.
8. Identify and report any deficiencies.

3.7.2 Revolving Doors

1. Check alignment of door and mechanism. Inspect mountings, mats, trim, weather stripping, etc. Replace, tighten, and adjust as required.
2. Operate with power, observing operating of actuating and safety mats, door speed, and checking functions.
3. Remove obstructions and clean out track.
4. Fold door. Note action and freedom of motion.
5. Inspect locking device; adjust as needed.
6. Identify and report any deficiencies.

3.8 GUIDE NUMBER MISC-7: DOOR, PEDESTRIAN DOORS, NON-POWERED MAIN AND DOCK ENTRANCE

Frequency: Semiannual

Application: Entrance doors used in main entries to buildings.

3.8.1 Hinged Doors

1. Inspect the frame and supporting structure.
2. Inspect hardware; hinges, latch keeper, lock, etc. Apply appropriate lubricant where needed; wipe off excess.
3. Inspect glass, seals, or retaining pieces. Correct any deficiencies.
4. Operate door to observe functioning of check. Adjust and service as needed.
5. Identify and report any deficiencies.

3.8.2 Revolving Doors

1. Remove obstructions and clean out track.
2. Fold door. Note action and freedom of motion.
3. Inspect locking device; adjust as needed.
4. Clean pivot points and apply appropriate lubricant.
5. Inspect felt or rubber seals.
6. Identify and report any deficiencies.

3.9 GUIDE NUMBER MISC-8: DOCK LEVELERS, POWERED

Frequency: Quarterly

WARNING

According to the current Maintenance Management Order bulletin for Dock Levelers, Safety Lockout, and Maintenance Procedures, the dock leveler must be securely held in its raised position by two separate forms of approved bracing or support (not the leveler's own springs) that cannot be moved or forced out of position. Failure to comply with this bulletin while servicing, repairing, or maintaining dock levelers may result in serious injury or death.

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment and set up barricades as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

NOTE

Obtain and review manufacturer instructions.

1. Inspect structural features, framework, support members, anchor bolts, pit, platform, etc. Examine condition of bumper.
2. Remove dirt and trash from pit, and verify pit drain is open.
3. Inspect motor, controls, starter, pushbuttons, solenoids, etc. Clean, adjust, and lubricate as necessary.

3.9.1 Hydraulic Units

WARNING

Eye protection (goggles or face shield) must be worn when bleeding hydraulic lines. Failure to comply may result in personal injury.

1. Inspect coupling, pump, control valves, piping, relief valve, and reservoir; fill pipe, cap, vents, etc. Clean adjust, and lubricate as needed.
2. Inspect cylinder, ram, packing glands, etc. Add or renew packing as required.
3. Change oil as required.

3.9.2 Electro-Mechanical and Air Bag Units

1. Clean and inspect air bag, coupling, reduction gear, sprockets, chain, gear trains, screw and lever, and/or other mechanical features. Look for misalignment, loose bolts, evidence of binding or wear, excessive clearance, etc. Tighten as necessary.
2. Examine lubrication devices. Service if required.
3. Test operation of ramp in all directions using a load if possible. Ensure ramp holds and does not creep when load is applied or removed. Adjust if necessary.
4. Check manual operation, power disengagement, etc.
5. Lubricate as required.
6. Identify and report any deficiencies.

3.10 GUIDE NUMBER MISC-9: FIRE DOORS - STAIRWELLS AND EXITWAYS (SWINGING)

Frequency: Quarterly*

1. Remove all hold-open devices, except approved smoke or magnetic operated releases.
2. Check hang and swing for close fit. Doors must latch on normal closing cycle and have a neat fit.
3. Remove any obstructions that retard full swing or movement of door.
4. Test operation of panic hardware.
5. Inspect door coordinates on pairs.
6. Check operation of any special devices such as smoke detectors or magnetic door releases.
7. Inspect door for damage.
8. Identify and report any deficiencies.

NOTE

Fire Door Definition: A fire door is a door with a fire-resistance rating (sometimes referred to as a fire protection rating for closures) used as part of a passive fire protection system to reduce the spread of fire and smoke between separate compartments of a structure and to enable safe egress from a building or structure or ship.

A fire door is a door used to reduce the spread of fire and smoke between separate compartments of a structure and to enable safe egress from a building (examples are entrances to stairwells and exit ways, and in the travel path of a corridor) they will have panic hardware.

An access door is installed in openings of fire rated walls/ceilings to provide access to the spaces they protect (examples are doors to offices, pipe shafts, ceiling crawl spaces. etc.).

***Access doors are not required to perform this checklist.**

3.11 GUIDE NUMBER MISC-10: FIRE DOORS - SLIDING TYPE

Frequency: Quarterly

1. Clean track.
2. Lubricate all pulleys.
3. Inspect for damage, worn and binding cable or chain, and proper threading through pulleys.
4. Replace fusible links and other heat-actuated devices that have been painted. Check operation of heat-actuated devices, other than fusible links.
5. Replace damaged or stretched cables or chains. Adjust to proper length.
6. Check counterweight for proper suspension.
7. Operate door by disconnecting or lifting counterweight, or by other appropriate means.
8. Check for proper fit in binders and tight fit of wedge against stay roll. Inspect stay roll for wear.
9. Check for breaks in face covering of doors.
10. Examine metal clad doors for deterioration.
11. Inspect all hardware for damage or wear.
12. Identify and report any deficiencies.

3.12 GUIDE NUMBER MISC-11: STATIONARY PACKERS

Frequency: Weekly

WARNING

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

WARNING

Do not enter the compactor charge box, including the space above the charge box behind the dumper cradle, or receiver box, or enter the charge box through the enclosure or by climbing over or under the dumper unit. This is a permit required confined space. Failure to comply may result in death.

NOTE

Obtain and review manufacturer instructions.

1. Oil shaft bearing under packer with appropriate lubricant.
2. Lubricate container roller fittings in axle.
3. Oil all moving joints on container door latch with appropriate lubricant.
4. Oil all container door hinges with appropriate lubricant.
5. Oil tie rod (lock hook) with appropriate lubricant. Inspect condition of cotter pins.
6. Wipe clean and apply heavy grease along top slide.
7. Wipe clean and apply heavy grease throughout length of slide channel.
8. Inspect cotter pins, closed end of packer cylinder. Look for signs of worn or broken cotter pins.
9. Clear all dirt and debris from under and around compaction unit carriage.
10. Check open-end packer cylinder mounting pin.
11. Close access panels.
12. Identify and report any deficiencies.

3.13 GUIDE NUMBER MISC-12: STATIONARY PACKERS

Frequency: Monthly

WARNING

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

WARNING

Do not enter the compactor enclosure, compactor charge box, the space above the charge box behind the dumper cradle, or receiver box. Do not climb over or under the dumper unit. This is a permit required confined space.

NOTE

Obtain and review manufacturer instructions.

1. Remove breather cap on oil tank. Clean breather holes and replace cap. Do not press on so tightly as to block air passage.
2. Inspect mounting hardware on side and bottom slides. Check for lost or broken cotter pins and loose belts.
3. Check and tighten mounting hardware on scraper bar.
4. Restore covers/panels.
5. Identify and report any deficiencies.

3.14 GUIDE NUMBER MISC-13: STATIONARY PACKERS

Frequency: Quarterly

WARNING

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

WARNING

Do not enter the compactor charge box, including the space above the charge box behind the dumper cradle, or receiver box, through the enclosure or by climbing over or under the dumper unit. This is a permit required confined space. Failure to comply may cause injury or death.

WARNING

Eye protection (goggles or face shield) must be worn when bleeding hydraulic lines. Failure to comply may result in personal injury.

NOTE

Obtain and review manufacturer instructions.

1. Check hydraulic oil for proper level and presence of contamination. Add or change oil as required.
2. Remove, clean, or replace oil filter.
3. Lubricate coupling following manufacturer specifications.
4. Restore covers/panels.
5. Identify and report any deficiencies.

3.15 GUIDE NUMBER MISC-14: POWER LIFTS

(Elevating Work Platforms, Vert-A-Lift, JLG, or other lift devices used in building maintenance)

Frequency: Monthly

WARNING

To prevent tip over, never maneuver the lift while it is elevated or with a person, tools, and materials on platform. Failure to comply may result in injury or death.

WARNING

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

WARNING

Eye protection (goggles and face shield), rubber gloves, apron, and rubber boots must be worn while servicing batteries. Failure to comply may result in injury or death.

WARNING

Battery acid is a corrosive solution. Do not allow eyes, skin, clothing or painted surfaces to come in direct contact with the battery fluid. If the fluid should come in contact with anything, immediately flush the contacted area with water.

NOTE

Daily battery charging, cleaning, and minor maintenance is performed by personnel using the lift.

1. Visually check for needed repairs, leaks, etc.
2. Verify that all equipment hazard decals are in place (crushing, falling, tip-over, electrocution).
3. Verify that operator's manual is legible, complete, and stored in storage container on equipment.
4. Check battery water level and specific gravity.
5. Check electrical terminals. Tighten and clean as required.

6. Check and tighten critical structural bolts.
7. Lubricate in accordance with manufacturer instructions.
8. Restore covers/panels, if necessary.
9. Identify and report any deficiencies.

3.16 GUIDE NUMBER MISC-15: SNOW BLOWER, WALKING TYPE

Frequency: Annually or every 50 run hours

Application: Gasoline-powered, walk-behind type.

NOTE

Routine daily lubrication should be accomplished by the operator.

1. Change engine oil. Oil should be changed, and gasoline drained at end of season prior to storage.
2. Service fuel filters.
3. Check for rust, and apply paint or preservative as appropriate.
4. Clean and gap or replace spark plug.
5. Inspect for proper adjustment and operation.
6. Identify and report any deficiencies.

3.17 GUIDE NUMBER MISC-16: DOCK LEVELERS, MANUAL

Frequency: Quarterly

WARNING

According to the current Maintenance Management Order bulletin for Dock Levelers, Safety Lockout, and Maintenance Procedures, the dock leveler must be securely held in its raised position by two separate forms of approved bracing or support (neither of which are the leveler's own springs) that cannot be moved or forced out of position. Failure to comply with the bulletin while servicing, repairing, or maintaining dock levelers may result in serious injury or death.

WARNING

Energized equipment may expose personnel to potential hazards. Before performing the following procedure, power down and lockout the equipment and set up barricades as prescribed by the local lockout/restore procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may cause injury or death.

NOTE

Obtain and review manufacturer instructions.

1. Clean trash and dirt from pit.
2. Check clevis pins for wear and presence of clevis pin retainers.
3. Check springs and cable for wear.
4. Lubricate moving parts as required.
5. Check for proper operation.
6. Identify and report any deficiencies.

3.18 GUIDE NUMBER MISC-17: SWEEPERS, ELECTRIC (BATTERY)

Frequency: 4 - 12 times per year

WARNING

Eye protection (goggles and face shield), rubber gloves, apron, and rubber boots must be worn while servicing batteries. Failure to comply may result in injury or death.

WARNING

Battery acid is corrosive. Do not allow eyes, skin, clothing or painted surfaces to come in direct contact with the battery fluid. If the fluid should come in contact with anything, immediately flush the contacted area with water.

WARNING

Eye protection (goggles or face shield) must be worn when bleeding hydraulic lines. Failure to comply may result in personal injury.

1. Check battery for correct water level. Add water if required.
2. Check battery terminals and cable clamps for corrosion and looseness.
3. Check hydraulic pump, hoses, lines, fittings, etc. for noise, leakage, and damage.
4. Check condition of tank and dust filter. Clean filter in solvent as necessary.
5. Check belts and chains for proper tension, wear, alignment, and general condition.
6. Check operational controls for proper operation.
7. Check dust skirts for proper adjustment.
8. Check hydraulic fluid and add lubricant #HY-2 as required. Replace filter as necessary.
9. Restore cover, if necessary
10. Follow manufacturer's instructions regarding preventive maintenance.

3.19 GUIDE NUMBER MISC-18: FLOOR SCRUBBER, AUTOMATIC

(Battery-powered scrubber vacuum)

Frequency: 4 - 12 times per year

WARNING

Eye protection (goggles and face shield), rubber gloves, apron, and rubber boots must be worn while servicing batteries. Failure to comply may result in injury or death.

WARNING

Battery acid is a corrosive solution. Do not allow eyes, skin, clothing or painted surfaces to come in direct contact with the battery fluid. If the fluid touches anything, immediately flush the contacted area with water.

NOTE

The daily charging of the batteries shall be performed by the operator.

1. Check condition and adjustment of squeegee brushes, etc. and replace as needed.
2. Check electrical terminals. Clean and renew as needed.
3. Check the specific gravity of battery electrolyte and replace to determine that batteries are good and being properly charged.
4. Visually check machine for need of repairs, leaks, etc.
5. Restore cover/panel, if necessary.
6. Lubricate in accordance with manufacturer's instructions.

3.20 GUIDE NUMBER MISC-19: LEAD ACID PIV BATTERY

Frequency: Semiannual

WARNING

Eye protection (goggles and face shield), rubber gloves, apron, and rubber boots must be worn while servicing batteries. Failure to comply may result in injury or death.

WARNING

Battery acid is a corrosive solution. Do not allow eyes, skin, clothing or painted surfaces to come in direct contact with the battery fluid. If the fluid touches anything, immediately flush the contacted area with water.

CAUTION

Clean batteries within the controlled confines of a battery charging room with proper ventilation and drainage in an acid neutralization pit at least once every six months.

NOTE

Do not remove vent caps during battery charging or washing.

1. Don face shield, goggles, rubber gloves, apron, and rubber boots.
2. Disconnect battery cables from motor by grasping the battery power connector, or connector handle, and separating from motor power connector. Do not pull on battery cables.
3. Remove battery from vehicle.
4. Make sure all vent caps are tight and inspected. If caps show any signs of physical damage, or if in doubt, replace with a new cap (eBUY Plus part number UP1093 VENT CAP BAYONNET 312460).
5. Wash the top of the battery with a solution of 1 pound of baking soda to 1 gallon of water. Utilize a battery washer when available.
6. Rinse with clear water and allow the battery to dry.
7. Replace battery in vehicle.

3.21 GUIDE NUMBER MISC-20: TRAILER RESTRAINTS

Frequency: Quarterly

Perform periodic inspection of components for damage or excessive wear.

1. Check bumper for damage or deformation. Ensure mounting hardware is tight.
2. Check frame, welds, and motor mounts for cracks. Ensure mounting hardware is tight. Ensure concrete anchor bolts are tight and intact.
3. Check electrical boxes and panels for water penetration.
4. Restore covers/panels.
5. Ensure chain tension (if applicable) and brake torque (if applicable) is within manufacture's specifications.
6. Lubricate rollers and drive chains as needed.
7. Generate work orders for any issues needing attention.

3.22 GUIDE NUMBER MISC-21: TRAILER RESTRAINTS

Frequency: Annual

1. Verify hook arm adjustment/alignment is within manufacture's specifications.
2. Generate work orders for any issues needing attention.

4.0 GUIDE SET PLUM

4.1 GUIDE NUMBER PLUM-1: FIRE EXTINGUISHER, PORTABLE, STORED-PRESSURE

Frequency: Annual

NOTE

This maintenance is a thorough examination for deficiencies requiring replacement. Fire extinguishers needing repair are to be replaced. Extinguishers removed from service must be immediately replaced with one of suitable extinguishing capabilities.

The monthly inspection must be performed at the same time as this annual maintenance is performed. Unless otherwise indicated, this guide is applicable to stored-pressure type extinguishers, with or without pressure gauge, regardless of the extinguishing agent used, e.g., multipurpose dry chemical, etc. Review MS-56 for additional information on fire extinguishing equipment.

1. Read Form 4705, Inspection tag and note if hydrostatic testing is required before the next annual maintenance. Report any extinguishers due for testing to maintenance supervisor or control office for replacement before due date. See MS-56 for test frequency.
2. Inspect the shell for corrosion, mechanical damage (denting or abrasion), paint condition, presence of repairs (welding, soldering, brazing, etc.), and broken hanger attachment concealing surface damage (nicks or corrosion).
3. Inspect the nameplate for illegible wording, corrosion, and loose plate. Replace labels with the new, pictographic type. See MS-56.
4. Inspect the nozzle for damage, deformation, cracks, blocked openings, damaged threads (corroded, cross-threaded, or worn), and aging (brittleness).
5. Inspect hose assembly for damaged hose (cut, cracked, worn, or plugged), damaged couplings, or swivel joint (cracked or corroded), damaged threads (corroded, cross-threaded, or worn), and inner tube cut at couplings.
6. Ensure the valve-locking device is in place and inspect for damage (bent, corroded, or binding).
7. If extinguisher has a pressure gauge, tap gauge lightly to determine if pointer is stuck or jammed. Inspect for missing pointer; missing, deformed, or broken crystal; illegible or faded dial; corrosion, dented case, and damaged crystal retainer. Read gauge. If not in operating range, remove and replace extinguisher.
8. If extinguisher is a non-gauge type, inspect for immovable or corroded pressure-indicating stem.

9. Ensure seal or tamper indicator is not missing or broken. Replace extinguisher if seal or tamper indicator is missing or broken.
10. Complete applicable portions of Form 4705, Fire Inspection Tag.
11. Check for proper alarm and signal operation.
12. Tighten loose parts as necessary.
13. Identify and report any deficiencies.

4.2 GUIDE NUMBER PLUM-2: SUMP PUMPS

Frequency: Annual

1. Pump out and remove pit sediment.
2. Inspect and clean strainer.
3. Flush pit and wipe pump down.
4. Repack (if required) and lubricate pumps.
5. Check bail, float, rod, and guides.
6. Inspect motor, switch, controls, etc. Clean, adjust, and lubricate as required.
7. Check pump operation. Observe operation of check valve(s).
8. Inspect piping, pipe supports, etc.
9. Clean up area.
10. Identify and report any deficiencies.

4.3 GUIDE NUMBER PLUM-3: VALVES, REGULATING

(Steam valves at pressure reduction stations)

Frequency: Annual

Application: Single or double seated; diaphragm or spring loaded, pilot operated valves.

1. Clean strainer ahead of valve.
2. Check valve head and seats for wear or cuts.
3. Replace valve(s) as necessary.
4. Examine steam quality for foreign matter if valves are damaged.
5. Examine pilot lines for dirt.
6. Check steam gauges.
7. Check diaphragms for failures.
8. Check binding valve stem.
9. Adjust weighted lever or spring control tension.
10. Identify and report any deficiencies.

4.4 GUIDE NUMBER PLUM-4: VALVES, MANUALLY OPERATED (MAIN LINE)

Frequency: Main line: Annual; other valves over 2 inches: 5 years

Application: For valves not used on Fire Protection systems. Maintenance for valves used on fire protection systems is described under the appropriate guide for the specific item of fire protection equipment.

1. Exercise valve from one limit to the other (fully open to fully closed) to test freedom of motion. Lubricate stem and moving parts with appropriate lubricant.
2. Verify valve seats and holds properly.
3. Check packing gland, adjust, and lubricate. Repack as required.
4. For valves equipped with wheel and chain for remote operation, verify freedom of motion.
5. Identify and report any deficiencies.

4.5 GUIDE NUMBER PLUM-5: VALVES, MOTOR OPERATED

Frequency: Annual

1. Clean unit and examine all parts.
2. Operate from limit to limit. Observe operation - look for binding, sluggishness, action of limits, etc.
3. Verify valve seats and holds properly.
4. Apply appropriate lubricant to moving parts of valve.
5. Lubricate motor and gearbox as necessary.
6. Inspect contacts, brushes, motor controls, switches, etc. Clean and adjust as necessary.
7. Identify and report any deficiencies.

4.6 GUIDE NUMBER PLUM-6: STEAM TRAPS, ALL TYPES

Frequency: Annual (All types, low or high pressure)

Special instructions for all traps:

1. Check trap operation under steam pressure.
2. Remove and replace faulty traps or trap elements.

| |
|----------------|
| CAUTION |
|----------------|

Ensure all safety requirements are followed.

4.6.1 Thermostatic Traps (Bellows or Diaphragm Type)

1. Remove cap or bonnet.
2. Clean interior of trap, valve, and seat.
3. Inspect bellows or diaphragm and note by sound whether it contains liquid charge.
4. Replace bellows or diaphragms as necessary.
5. If valve seat is cut, replace seat.

4.6.2 Float and/or Thermostatic Traps

1. Remove bonnet.
2. Inspect linkage and float operation for leakage, defective operation, or deterioration.
3. Examine, clean, and check operation of bellows as in Step 1 above.

4.6.3 Inverted Bucket Trap

1. Remove bonnet.
2. Clean interior trap.
3. Inspect valve linkage mechanism and seating of valve.
4. Examine condition of bucket.
5. Examine vent or race, inlet, and outlet for evidence of corrosion.

4.6.4 Impulse Trap

1. Remove bonnet.
2. Inspect valve disc, inlet valve, and outlet surface.
3. See that fulcrum point is free of dirt.
4. Clean body of trap.
5. Identify and report any deficiencies.

4.7 GUIDE NUMBER PLUM-7: PUMPS, CENTRIFUGAL

Frequency: Annual

1. While pump is in operation, check performance, bearing temperature, stuffing box operation, pressure gauge, and flow indicators.
2. Shut down, lock out, and drain pump housing. Suction and discharge valves should hold.
3. Remove gland.
4. Examine shaft sleeve for wear; replace as necessary.
5. Adjust gland evenly, finger tighten.
6. On pumps with oil ring lubrication, drain oil, flush, and then fill to proper oil level with new oil.
7. Perform lubrication in accordance with manufacturer instructions.
8. Clean strainers.
9. Put pump into operation. Stop and start pump. Check undue vibration noise, pressure, and action of check valve.
10. If test is satisfactory, start pump again, and adjust to slight leakage through gland.
11. When pump reaches normal operating temperatures, check pump and drive alignment.
12. Identify and report any deficiencies.

4.8 GUIDE NUMBER PLUM-8: ROOF, INSPECTION

Frequency: Semiannual

NOTE

Sites develop local calculations for the roof inspection and justification is required.

4.8.1 Roofing System

WARNING

Verify with your supervisor that roof access is permitted before attempting to gain access to the roof.

Employees who access a walking-working surface with unprotected sides or edges that are 4 feet or more above a lower level must have one of the following to protect the employee: guardrail systems; safety net systems; or personal fall protection systems, such as personal fall arrest, travel restraint, or positioning systems.² Employee must contact a supervisor if this Personal Protective Equipment (PPE) is not available.

WARNING

Comply with all safety rules for working on rooftop. Check all tools and equipment for safe condition (ladders, rope safety lines, etc.). Review EL-801, Supervisor's Safety Handbook. Failure to comply may result in injury or death.

1. Clean all trash and debris from drains.
2. Check each drain for missing, broken or corroded covers, proper drainage, tightness, gravel stop, etc.
3. Carefully inspect roof mat around each drain.

² OSHA 1910.28(b)(1)(i)(A-C) Unprotected sides and edges.

4.9 GUIDE NUMBER PLUM-9: HOT WATER HEATERS (CONVERTERS)

Frequency: Annual

Application: This guide applies to converters and heat exchangers that use steam to heat water for hot water heating systems.

1. With system in operation, check for steam and water leaks (interior and exterior).
2. Drain and flush tanks (storage and expansion).
3. Remove rust and scale; note rate of corrosion.
4. Remove coil or element; clean and examine condition.
5. Clean, adjust, and calibrate as required: thermometers, aquastats, pressure reducing and relief valves and gauges, temperature relief, and steam regulating and control valves.
6. Check operation and condition of all traps.
7. Clean pump. Clean out dirt from motor, check controls, switches, and starters. Check condition of packing or seal and replace as required.
8. Identify and report any deficiencies.

4.10 GUIDE NUMBER PLUM-10: HOT WATER HEATERS - DOMESTIC TYPE

(Gas or Oil Fired)

Frequency: Annual

Application: This applies to domestic-type hot water heaters (residential), which can also be much larger (50 to 400 gallon tanks) and have a circulating pump.

1. Check for leaks.
2. Flush tank to remove scale and sediment.
3. Check thermostat and controls for proper setting.
4. Clean combustion chamber at fireside heat transfer surfaces.
5. Set burner for efficient operation on oil fired units. Take flue gas CO² reading to determine proper burner adjustment.
6. Clean and lubricate circulating pump.
7. Operate try lever on pressure-temperature relief device (valve). Water should now flow freely and stop when try lever is released. Replace valve if defective.
8. Identify and report any deficiencies.

4.11 GUIDE NUMBER PLUM-11: FIRE PUMPS, ELECTRIC MOTOR DRIVE

Frequency: Annual

WARNING

Before performing the following task, power down and lock out the equipment as prescribed by the local energy control procedures developed in accordance with the current local ECP providing lockout/restore procedures. Failure to comply may result in personal injury or death, and/or damage to equipment.

CAUTION

Give special attention to notifying all required officials that the fire pump will be out of service. Notice shall include estimated period of downtime and other special problems that may develop. If these work procedures can cause activation of an alarm and/or supervisory signal, the control center or fire department must be notified prior to starting work.

NOTE

Review manufacturer instructions.

1. Clean motor with clean rag or vacuum.
2. Visually inspect windings for cleanliness. Check for coating of oil or grease without disassembling motor.
3. Perform lubrication according to manufacturer's recommendations.
4. Inspect for moisture and protection from water.
5. Check motor mountings, supports, and couplings for tightness or other defects.
6. Remove lockout and operate pump long enough to observe general operation. Note pressures, sound, vibration, odor, or temperatures.
7. If pump has automatic starting equipment, start it by activating the mechanism so the automatic devices are tested at the same time as the pump.
8. Secure pump and leave in ready-to-run condition.
9. Notify proper officials that unit is back in service.
10. Clean up area and return tools to proper storage.
11. Identify and report any deficiencies.

4.12 GUIDE NUMBER PLUM-12: FIRE PUMPS, INTERNAL COMBUSTION ENGINE DRIVE

Frequency: Annual

WARNING

Have approved fire extinguisher available. Do not allow flames or smoking in area. Use safety fuel cans only. Failure to comply may cause injury, death or building damage.

CAUTION

Give special attention to notifying all required officials that the fire pump will be out of service. Notice shall include estimated period of downtime and other special problems that may develop. If these work procedures can cause activation of an alarm and/or supervisory signal, the control center and the fire department must be notified prior to starting work.

4.12.1 Gasoline or Natural Gas Engines

1. Check distributor point dwell. Replace points, capacitor, rotor, and spark plugs after 100 hours of operation.
2. Set timing and distributor advance. Check at idle and operating speed.
3. Adjust governor and carburetor for proper operation and speeds.
4. Check fuel supply. Replace fuel within the manufacturer's recommendations.
5. Change engine oil and filter, and perform other lubrication of engine and pump.
6. Inspect cooling system for cleanliness, leaks, and anti-freeze solution. Check V-belt for proper tension. Adjust as necessary.
7. Secure pump and leave in ready-to-run condition.
8. Notify proper officials that the unit is back in service.

4.12.2 Diesel Engines

1. Change fuel filters.
2. Inspect and adjust racks, injectors, or unit injectors according to manufacturer's instructions.
3. Check governor for proper speed; adjust as necessary.
4. Check fuel level, presence of water in fuel tank, or other contamination.
5. Change engine oil and filter. Perform other lubrication on engine and pump.

6. Inspect cooling system for leaks, cleanliness, and antifreeze solution. Check V-belt for proper tension. Adjust as necessary.
7. Secure pump and leave in ready-to-run condition.
8. Notify proper officials that the unit is back in service.

4.12.3 Diesel and Gas Engines

1. Check mountings, supports, and couplings for tightness or defects.
2. Remove lockout and operate pump long enough to observe general operation. Note pressure, sound, vibration, odor, and temperatures.
3. If pump has automatic starting equipment, start it by activating the mechanism so the automatic devices are tested at the same time as the pump.
4. Secure pump and leave in ready-to-run condition.
5. Notify proper officials that the unit is back in service.
6. Clean up area and return tools to proper storage.
7. Identify and report any deficiencies.

4.13 GUIDE NUMBER PLUM-13: DRINKING WATER COOLERS

Frequency: Annual

1. Clean coils (vacuum) and fan blades.
2. Inspect P-trap, water supply valves, connections, and bubbler valve for proper operation.
3. Check belt for tightness and wear (if applicable).
4. Lubricate motor (if applicable).
5. Inspect for and repair leaks in refrigerant lines.

4.14 GUIDE NUMBER PLUM-14: EYEWASH

Frequency: Annual

NOTE

Use shower and eyewash flow rate test kit to avoid excessive water spillage.

4.14.1 Plumbed Eyewash Stations

1. Validate that controlled, low velocity flow completely rinses eyes and face, and is not injurious to user.
2. Ensure water flow is sufficiently high to allow user to hold eyes open while rinsing.
3. Ensure spray heads are protected from airborne contaminants, and covers are removed by water flow once unit is activated.
4. Ensure unit delivers at least 0.4 gallons of water per minute (GPM) for 15 minutes.
5. Confirm water flow pattern is positioned between 33" and 53" from the floor and at least 6" from the wall or nearest obstruction.
6. Confirm hands-free, stay-open valve activates in one second or less.
7. Ensure valve actuator is easy to locate and readily accessible to user.
8. Ensure unit washes both eyes simultaneously.
9. Ensure water flow covers the area indicated at no more than 8" above spray heads.

4.15 GUIDE NUMBER PLUM-15: EMERGENCY SHOWERS

Frequency: Annual

NOTE

Use shower and eyewash flow rate test kit to avoid excessive water spillage.

4.15.1 Plumbed Emergency Showers

1. Ensure water supply is sufficient to provide at least 20 GPM for 0.3 hours.
2. Ensure hands-free valve activates in one second or less and remains open until manually closed.
3. Ensure shower delivers 20 gallons of water per minute for 15 minutes in the required pattern.
4. Verify height of water column is between 82" and 96" above the floor.
5. Verify center of the water pattern is at least 16" from any obstruction.
6. Verify accessible actuator is easily located and no more than 69" above floor.
7. Verify water pattern is at least 20" in diameter at 60" above the floor.
8. If provided, ensure shower enclosure has minimum diameter of 34".

THIS PAGE BLANK

ATTACHMENT 3**USPS BUILDING EQUIPMENT ANNUAL STAFFING
WORKHOUR REQUIREMENT FORMS****1.0 STAFFING WORKHOUR REQUIREMENT FORMS**

The following forms are output from the entries made in the staffing software application.

- PS Form 4893 – Annual Building Equipment Operational and Preventive Maintenance Workhour Summary (Figure 3-1)
- PS Form 4893B – Annual Building Equipment Override and Supplemental Maintenance Justification (Figure 3-2)
- PS Form 4894, Page 1 of 2 – Annual Standard Requirement Building Operational Maintenance (Figure 3-3)
- PS Form 4894, Page 2 of 2 – Annual Standard Requirement Building Operational Maintenance (Figure 3-4)
- PS Form 4895 – Annual Workhour Requirement for Central Chill Water Plant Operational Maintenance (Figure 3-5)
- PS Form 4896, Page 1 of 2 – Annual Supplemental Requirement for Building Preventive and Operational Maintenance (Figure 3-6)
- PS Form 4896, Page 2 of 2 – Annual Supplemental Requirement for Building Preventive and Operational Maintenance (Figure 3-7)
- PS Form 4896A, Page 1 of 6 – Annual Standard Requirement Building Preventive Maintenance (Figure 3-8)
- PS Form 4896A, Page 2 of 6 – Annual Standard Requirement Building Preventive Maintenance (Figure 3-9)
- PS Form 4896A, Page 3 of 6 – Annual Standard Requirement Building Preventive Maintenance (Figure 3-10)
- PS Form 4896A, Page 4 of 6 – Annual Standard Requirement Building Preventive Maintenance (Figure 3-11)

FOR REVIEW PURPOSES - BLANK FORM

| U.S. POSTAL SERVICE ANNUAL BUILDING EQUIPMENT OPERATIONAL AND PREVENTIVE MAINTENANCE WORKHOUR SUMMARY | | | | BUILDING(S): | GROSS INTERIOR SQFT: | SPRINKLERS SQFT: | DATE: PREPARED BY: | |
|--|------------------|------------------------|------|-------------------------|-------------------------|---------------------|--------------------------------|------------------------------|
| LINE NO. | WORK DESCRIPTION | PREVENTIVE MAINTENANCE | | OPERATIONAL MAINTENANCE | | | CORRECTIVE/MISC MAINTENANCE | TOTAL ANNUAL WORKHOURS |
| | | 4896A | 4896 | 4894 | 4895 | 4896 | | |
| A | B | C | D | E | F | G | H | I |
| 1 | HVAC | | | | | | | |
| 2 | ELEC | | | | | | | |
| 3 | PLUM | | | | | | | |
| 4 | EMS | | | | | | | |
| 5 | MISC | | | | | | | |
| 6 | SUBTOTALS | | | | | | | |
| 7 | CORRECTIVE | * | * | | | | ** | |
| 8 | MISCELLANEOUS | | | | | | † | |
| | TOTAL WORKHOURS | | | | | | | |
| | TOTAL FTE | | | | | | | |

* 8% of the Subtotal

** 8 Hours per 1000 Gross Interior SQFT

† 0.1 Hours per 1000 SQFT (Sprinkler SQFT)

PS FORM
12/28/2018**4893 - BLANK FORM****Figure 3-1. PS Form 4893 – Annual Building Equipment Operational and Preventive Maintenance Workhour Summary**

FOR REVIEW PURPOSES - BLANK FORM

| | | | | |
|---|--|--------------|-----------------------|--|
| U.S. POSTAL SERVICE ANNUAL BUILDING EQUIPMENT OVERRIDE AND SUPPLEMENTAL MAINTENANCE JUSTIFICATION | | BUILDING(s): | DATE: PREPARED BY: | |
|---|--|--------------|-----------------------|--|

| TABLE A: OPERATIONAL MAINTENANCE | | | | |
|----------------------------------|------------------|----------------|-----------------------|---------------|
| GUIDE CAT/NO | TASK DESCRIPTION | EQUIPMENT TYPE | EQUIPMENT DESCRIPTION | JUSTIFICATION |
| OVERRIDE TASKS | | | | |
| * | | | | |
| * | | | | |
| * | | | | |
| * | | | | |
| * | | | | |
| SUPPLEMENTAL TASKS | | | | |
| * | | | | |
| * | | | | |
| * | | | | |
| * | | | | |
| * | | | | |

| TABLE B: PREVENTIVE MAINTENANCE | | | | |
|---------------------------------|------------------|----------------|-----------------------|---------------|
| GUIDE CAT/NO | TASK DESCRIPTION | EQUIPMENT TYPE | EQUIPMENT DESCRIPTION | JUSTIFICATION |
| OVERRIDE TASKS | | | | |
| * | | | | |
| * | | | | |
| * | | | | |
| * | | | | |
| * | | | | |
| SUPPLEMENTAL TASKS | | | | |
| * | | | | |
| * | | | | |
| * | | | | |
| * | | | | |
| * | | | | |

PS FORM 12/28/2018 **4893B - BLANK FORM**

Figure 3-2. PS Form 4893B – Annual Building Equipment Override and Supplemental Maintenance Justification

FOR REVIEW PURPOSES - BLANK FORM

| | | | | | | |
|---|--|--|--|--|--------------|-----------------------|
| U.S. POSTAL SERVICE ANNUAL STANDARD REQUIREMENT BUILDING OPERATIONAL MAINTENANCE | | | | | BUILDING(s): | DATE: PREPARED BY: |
|---|--|--|--|--|--------------|-----------------------|

| TABLE A: HVAC | | | | | | |
|---------------|---------------------------|----------|-----------|--------------------------|-----------------------|---------------------------|
| GUIDE NO | TASK DESCRIPTION | QUANTITY | FREQUENCY | WORK HOURS (per freq) | ANNUAL TRAVEL TIME | TOTAL ANNUAL WORKHOURS |
| HVAC-12 | FANS CENTRIFUGAL >15HP | | 12 | 0.03 | | |
| NONE | FANS PROPELLER >=24INCHES | | 12 | 0.03 | | |
| SUBTOTAL | | | | | | |

| TABLE B: ELEC | | | | | | |
|---------------|--|----------|-----------|--------------------------|-----------------------|---------------------------|
| GUIDE NO | TASK DESCRIPTION | QUANTITY | FREQUENCY | WORK HOURS (per freq) | ANNUAL TRAVEL TIME | TOTAL ANNUAL WORKHOURS |
| NONE | BATTERY SYSTEM, 24 VOLT | | 1 | 0.08 | | |
| NONE | BATTERY SYSTEM, 48 VOLT | | 1 | 0.16 | | |
| NONE | BATTERY SYSTEM, 120 VOLT | | 1 | 0.33 | | |
| EMS-11 | GROUND FAULT CIRCUIT INTERRUPTER (GFCI) | | 2 | 0.02 | | |
| NOGUIDE1 | MAIN ELECTRICAL CUBICLE/SWITCHGEAR ROOMS (>600VAC) | | 52 | 0.08 | | |
| NOGUIDE2 | SWITCHBOARD ROOMS (<600VAC) | | 52 | 0.05 | | |
| NOGUIDE3 | TRANSFORMER VAULTS | | 52 | 0.06 | | |
| SUBTOTAL | | | | | | |

| TABLE C: PLUM | | | | | | |
|---------------|---|----------|-----------|--------------------------|-----------------------|---------------------------|
| GUIDE NO | TASK DESCRIPTION | QUANTITY | FREQUENCY | WORK HOURS (per freq) | ANNUAL TRAVEL TIME | TOTAL ANNUAL WORKHOURS |
| NOGUIDE4 | HYDRO-PNEUMATIC SYSTEM (INCL FIRE PROTECTION SYSTEM) | | | 0.08 | | |
| NONE | PRESSURE REDUCING AND REGULATING STATIONS - STEAM AND WATER | | 1 | 0.02 | | |
| NONE | PUMPS >5HP, REMOTE FROM OTHER EQUIPMENT | | 1 | 0.03 | | |
| NONE | SUMP PUMP, OPERATIONAL | | 12 | 0.05 | | |
| SUBTOTAL | | | | | | |

| TABLE D: EMS | | | | | | |
|--------------|--|----------|-----------|--------------------------|-----------------------|---------------------------|
| GUIDE NO | TASK DESCRIPTION | QUANTITY | FREQUENCY | WORK HOURS (per freq) | ANNUAL TRAVEL TIME | TOTAL ANNUAL WORKHOURS |
| EMS-4 | EMERGENCY EXIT SIGNS | | 12 | 0.02 | | |
| EMS-10 | EMERGENCY EXIT SIGNS | | 1 | 0.02 | | |
| EMS-12 | EMERGENCY EYEWASH, SELF-CONTAINED | | 12 | 0.02 | | |
| EMS-1 | EMERGENCY EYEWASHES | | 52 | 0.10 | | |
| EMS-3 | EMERGENCY LIGHTS | | 12 | 0.02 | | |
| EMS-9 | EMERGENCY LIGHTS | | 1 | 0.02 | | |
| EMS-2 | EMERGENCY SHOWERS | | 52 | 0.10 | | |
| EMS-14 | FIRE CONTROL VALVE, LOCKED OR SUPERVISED | | 12 | 0.10 | | |
| EMS-14 | FIRE CONTROL VALVE, SEALED | | 52 | 0.10 | | |
| EMS-7 | FIRE EXTINGUISHER, PORTABLE, STORED-PRESSURE | | 12 | 0.02 | | |
| EMS-8 | FIRE PUMPS | | 52 | 0.40 | | |
| SUBTOTAL | | | | | | |

Figure 3-3. PS Form 4894, Page 1 of 2 – Annual Standard Requirement Building Operational Maintenance

| TABLE E: MISC | | | | | | |
|---------------|------------------|----------|-----------|--------------------------|-----------------------|---------------------------|
| GUIDE NO | TASK DESCRIPTION | QUANTITY | FREQUENCY | WORK HOURS (per freq) | ANNUAL TRAVEL TIME | TOTAL ANNUAL WORKHOURS |
| SUBTOTAL | | | | | | |

PS FORM
12/28/2018 **4894 - BLANK FORM**

Figure 3-4. PS Form 4894, Page 2 of 2 – Annual Standard Requirement Building Operational Maintenance

FOR REVIEW PURPOSES - BLANK FORM

| U.S. POSTAL SERVICE ANNUAL WORKHOUR REQUIREMENT FOR CENTRAL CHILL WATER PLANT OPERATIONAL MAINTENANCE | | BUILDING(s): | DATE: PREPARED BY: | |
|---|---------------------------------|----------------|------------------------|---------------------|
| BUILDING | | | | |
| LINE NO. | EQUIPMENT DESCRIPTION | OPERATING DAYS | WORKHOURS (per day) | ANNUAL WORKHOURS |
| 1 | | | 0.5 | |
| 2 | SUBTOTAL | | | |
| 3 | BUILDING CHILLER OPERATING DAYS | | 0.5 | |
| | TOTAL WORKHOURS * | | | |

* Operational Checks are limited to one hour per operating day for the first chiller.
All additional chillers are workloaded at 0.5 hours per operating day.

PS FORM
12/28/2018 **4895 - BLANK FORM**

Figure 3-5. PS Form 4895 – Annual Workhour Requirement for Central Chill Water Plant Operational Maintenance

| TABLE B: OPERATIONAL MAINTENANCE | | | | | | |
|----------------------------------|------------------|----------------|-----------------------|-------------------------|-------------------------|--------------------|
| GUIDE | TASK DESCRIPTION | EQUIPMENT TYPE | EQUIPMENT DESCRIPTION | FREQUENCY (per year) | WORKHOURS (per freq) | TOTAL WORKHOURS |
| | | | | | | 0 |
| | | | | | | 0 |
| | | | | | | 0 |
| | | | | | | 0 |
| | | | | | | 0 |
| | | | | | | 0 |
| | SUBTOTAL | | | | | 0 |

PS FORM
12/28/2018

4896 - BLANK FORM

Figure 3-7. PS Form 4896, Page 2 of 2 – Annual Supplemental Requirement for Building Preventive and Operational Maintenance

FOR REVIEW PURPOSES - BLANK FORM

| | | | | | |
|--|--|--------------|-----------------------|--|--|
| U.S. POSTAL SERVICE ANNUAL STANDARD REQUIREMENT BUILDING PREVENTIVE MAINTENANCE | | BUILDING(s): | DATE: PREPARED BY: | | |
|--|--|--------------|-----------------------|--|--|

| TABLE A: HVAC | | | | | |
|---------------|--|----------|-------------------------|--------------------------|---------------------|
| GUIDE NO. | TASK DESCRIPTION | QUANTITY | FREQUENCY (per year) | WORK HOURS (per freq) | TOTAL WORK HOURS |
| HVAC-1 | AC PACKAGE UNIT <10 TONS | | 1 | 8.50 | |
| HVAC-1 | AC PACKAGE UNIT >=10 TONS | | 1 | 10.00 | |
| HVAC-2 | AIR-CONDITIONING, WINDOW UNITS | | 1 | 0.50 | |
| HVAC-3 | AIR COOLED CONDENSERS <= 10 TONS | | 1 | 0.75 | |
| HVAC-3 | AIR COOLED CONDENSERS >10 TONS and <=30 TONS | | 1 | 1.00 | |
| HVAC-3 | AIR COOLED CONDENSERS >30 TONS | | 1 | 1.75 | |
| HVAC-4 | AIR HANDLERS | | 1 | 2.50 | |
| HVAC-4 | AIR HANDLERS >10HP | | 1 | 4.50 | |
| HVAC-5 | BOILERS, OIL FIRED | | 1 | 10.00 | |
| HVAC-6 | BOILERS, CAST-IRON AND STEEL | | 1 | 10.00 | |
| HVAC-7 | BURNER, GAS | | 1 | 5.00 | |
| HVAC-8 | BURNER, OIL | | 1 | 5.00 | |
| HVAC-9 | COILS, PREHEAT, REHEAT, ETC. (REMOTE FROM AIR HANDLER) | | 1 | 1.00 | |
| HVAC-10 | CONDENSATE OR VACUUM PUMPS (ON STEAM RETURN SYSTEM) | | 1 | 2.00 | |
| HVAC-11.1 | COOLING TOWERS 501 - 1000 TON SPRING STARTUP (1 CELL) | | 1 | 20.30 | |
| HVAC-11.1 | COOLING TOWERS 501 - 1000 TON SPRING STARTUP (2 CELLS) | | 1 | 40.60 | |
| HVAC-11.1 | COOLING TOWERS 501 - 1000 TON SPRING STARTUP (3 CELLS) | | 1 | 60.90 | |
| HVAC-11.1 | COOLING TOWERS 501 - 1000 TON SPRING STARTUP (4 CELLS) | | 1 | 81.20 | |
| HVAC-11.1 | COOLING TOWERS 51 - 500 TON SPRING STARTUP (1 CELL) | | 1 | 10.15 | |
| HVAC-11.1 | COOLING TOWERS 51 - 500 TON SPRING STARTUP (2 CELLS) | | 1 | 20.30 | |
| HVAC-11.1 | COOLING TOWERS 51 - 500 TON SPRING STARTUP (3 CELLS) | | 1 | 30.45 | |
| HVAC-11.1 | COOLING TOWERS 51 - 500 TON SPRING STARTUP (4 CELLS) | | 1 | 40.60 | |
| HVAC-11.1 | COOLING TOWERS <= 50 TON SPRING STARTUP (1 CELL) | | 1 | 4.90 | |
| HVAC-11.1 | COOLING TOWERS <= 50 TON SPRING STARTUP (2 CELLS) | | 1 | 9.80 | |
| HVAC-11.1 | COOLING TOWERS <= 50 TON SPRING STARTUP (3 CELLS) | | 1 | 14.70 | |
| HVAC-11.1 | COOLING TOWERS <= 50 TON SPRING STARTUP (4 CELLS) | | 1 | 19.60 | |
| HVAC-11.1 | COOLING TOWERS > 1000 TON SPRING STARTUP (1 CELL) | | 1 | 26.95 | |
| HVAC-11.1 | COOLING TOWERS > 1000 TON SPRING STARTUP (2 CELLS) | | 1 | 53.90 | |
| HVAC-11.1 | COOLING TOWERS > 1000 TON SPRING STARTUP (3 CELLS) | | 1 | 80.85 | |
| HVAC-11.1 | COOLING TOWERS > 1000 TON SPRING STARTUP (4 CELLS) | | 1 | 107.80 | |
| HVAC-11.2 | COOLING TOWERS 501 - 1000 TON FALL SHUTDOWN (1 CELL) | | 1 | 8.70 | |
| HVAC-11.2 | COOLING TOWERS 501 - 1000 TON FALL SHUTDOWN (2 CELLS) | | 1 | 17.40 | |
| HVAC-11.2 | COOLING TOWERS 501 - 1000 TON FALL SHUTDOWN (3 CELLS) | | 1 | 26.10 | |
| HVAC-11.2 | COOLING TOWERS 501 - 1000 TON FALL SHUTDOWN (4 CELLS) | | 1 | 34.80 | |
| HVAC-11.2 | COOLING TOWERS 51 - 500 TON FALL SHUTDOWN (1 CELL) | | 1 | 4.35 | |
| HVAC-11.2 | COOLING TOWERS 51 - 500 TON FALL SHUTDOWN (2 CELLS) | | 1 | 8.70 | |
| HVAC-11.2 | COOLING TOWERS 51 - 500 TON FALL SHUTDOWN (3 CELLS) | | 1 | 13.05 | |
| HVAC-11.2 | COOLING TOWERS 51 - 500 TON FALL SHUTDOWN (4 CELLS) | | 1 | 17.40 | |
| HVAC-11.2 | COOLING TOWERS <= 50 TON FALL SHUTDOWN (1 CELL) | | 1 | 2.10 | |
| HVAC-11.2 | COOLING TOWERS <= 50 TON FALL SHUTDOWN (2 CELLS) | | 1 | 4.20 | |
| HVAC-11.2 | COOLING TOWERS <= 50 TON FALL SHUTDOWN (3 CELLS) | | 1 | 6.30 | |
| HVAC-11.2 | COOLING TOWERS <= 50 TON FALL SHUTDOWN (4 CELLS) | | 1 | 8.40 | |

Figure 3-8. PS Form 4896A, Page 1 of 4 – Annual Standard Requirement Building Preventive Maintenance

| TABLE A: HVAC | | | | | |
|---------------|--|----------|-------------------------|--------------------------|---------------------|
| GUIDE NO. | TASK DESCRIPTION | QUANTITY | FREQUENCY (per year) | WORK HOURS (per freq) | TOTAL WORK HOURS |
| HVAC-11.2 | COOLING TOWERS > 1000 TON FALL SHUTDOWN (1 CELL) | | 1 | 11.55 | |
| HVAC-11.2 | COOLING TOWERS > 1000 TON FALL SHUTDOWN (2 CELLS) | | 1 | 23.10 | |
| HVAC-11.2 | COOLING TOWERS > 1000 TON FALL SHUTDOWN (3 CELLS) | | 1 | 34.65 | |
| HVAC-11.2 | COOLING TOWERS > 1000 TON FALL SHUTDOWN (4 CELLS) | | 1 | 46.20 | |
| HVAC-12 | FAN, CENTRIFUGAL <7HP | | 1 | 1.75 | |
| HVAC-12 | FAN, CENTRIFUGAL >=7HP | | 1 | 2.75 | |
| HVAC-13 | FILTERS, ROLL-TYPE, DISPOSABLE MEDIA | | 4 | 1.75 | |
| HVAC-14 | CONTROLS AND MECHANISMS ROLL TYPE FILTERS | | 1 | 1.50 | |
| HVAC-15 | FILTERS, THROW-AWAY | | 4 | 0.10 | |
| HVAC-16 | FAN, PROPELLER, PEDESTAL AND WALL MOUNTED | | 1 | 0.75 | |
| HVAC-17 | HEAT/COOLING UNIT, ROOF TOP | | 2 | 8.50 | |
| HVAC-18 | REFRIGERATION MACHINES, ABSORPTION TYPE <= 40 TONS | | 1 | 15.25 | |
| HVAC-18 | REFRIGERATION MACHINES, ABSORPTION TYPE 41 - 100 TONS | | 1 | 19.25 | |
| HVAC-18 | REFRIGERATION MACHINES, ABSORPTION TYPE 101 - 400 TONS | | 1 | 23.00 | |
| HVAC-18 | REFRIGERATION MACHINES, ABSORPTION TYPE > 400 TONS | | 1 | 30.75 | |
| HVAC-19 | REFRIGERATION MACHINES (CENTRIFUGAL AND RECIPROCATING) <= 40 TONS | | 1 | 23.00 | |
| HVAC-19 | REFRIGERATION MACHINES (CENTRIFUGAL AND RECIPROCATING) 41 - 100 TONS | | 1 | 31.00 | |
| HVAC-19 | REFRIGERATION MACHINES (CENTRIFUGAL AND RECIPROCATING) 101 - 350 TONS | | 1 | 39.00 | |
| HVAC-19 | REFRIGERATION MACHINES (CENTRIFUGAL AND RECIPROCATING) 351 - 500 TONS | | 1 | 59.00 | |
| HVAC-19 | REFRIGERATION MACHINES (CENTRIFUGAL AND RECIPROCATING) 501 - 750 TONS | | 1 | 66.00 | |
| HVAC-19 | REFRIGERATION MACHINES (CENTRIFUGAL AND RECIPROCATING) 751 - 1000 TONS | | 1 | 77.00 | |
| HVAC-19 | REFRIGERATION MACHINES (CENTRIFUGAL AND RECIPROCATING) > 1000 TONS | | 1 | 96.00 | |
| HVAC-20 | HEATER, ELECTRIC, IN-DUCT | | 1 | 0.25 | |
| HVAC-21 | HEATER, ELECTRIC, BASEBOARD | | 1 | 0.15 | |
| HVAC-22 | UNIT HEATERS (STEAM AND HOT WATER) | | 1 | 1.00 | |
| HVAC-23 | UNIT HEATERS (GAS FIRED) | | 1 | 1.50 | |
| HVAC-24 | FIRE DAMPERS (IN DUCT) | | 1 | 0.20 | |
| HVAC-25 | SPLIT SYSTEM EVAPORATOR UNITS (ANNUAL) | | 1 | 4.00 | |
| HVAC-26 | SPLIT SYSTEM EVAPORATOR UNITS (MONTHLY) | | 12 | 0.50 | |
| | SUBTOTAL | | | | |
| TABLE B: ELEC | | | | | |
| GUIDE NO. | TASK DESCRIPTION | QUANTITY | FREQUENCY (per year) | WORK HOURS (per freq) | TOTAL WORK HOURS |
| ELEC-1 | MOTORS | | 1 | 1.00 | |
| ELEC-2 | BACK-UP GENERATOR- GAS OR NATURAL GAS ENGINES | | 1 | 2.00 to 6.00 | |
| ELEC-3 | EMERGENCY GENERATORS, DIESEL POWER | | 1 | 3.00 to 8.00 | |
| ELEC-4 | GENERATORS, ALL TYPES | | 12 | 1.00 to 2.00 | |
| ELEC-5 | PANEL, ELECTRICAL (INFRARED SCAN) | | 1 | 0.15 | |
| | SUBTOTAL | | | | |
| TABLE C: PLUM | | | | | |

Figure 3-9. PS Form 4896A, Page 2 of 4 – Annual Standard Requirement Building Preventive Maintenance

| GUIDE NO. | TASK DESCRIPTION | TABLE C: PLUM | QUANTITY | FREQUENCY (per year) | WORK HOURS (per freq) | TOTAL WORK HOURS |
|-----------|--|---------------|----------|-------------------------|--------------------------|---------------------|
| GUIDE NO. | TASK DESCRIPTION | | QUANTITY | FREQUENCY (per year) | WORK HOURS (per freq) | TOTAL WORK HOURS |
| PLUM-1 | FIRE EXTINGUISHER, PORTABLE, STORED-PRESSURE | | | 1 | 0.10 | |
| PLUM-2 | SUMP PUMPS | | | 1 | 3.75 | |
| PLUM-3 | VALVES, REGULATING | | | 1 | 1.00 to 4.00 | |
| PLUM-4 | VALVES, MANUALLY OPERATED (MAIN LINE) | | | 1 | 1.00 | |
| PLUM-4 | VALVES, MANUALLY OPERATED (OTHER VALVES OVER 2 INCHES) | | | 0.2 | 0.50 | |
| PLUM-5 | VALVES, MOTOR OPERATED | | | 1 | 1.50 | |
| PLUM-6 | STEAM TRAPS, ALL TYPES | | | 1 | 0.50 | |
| PLUM-7 | PUMPS, CENTRIFUGAL >=25HP | | | 1 | 6.00 | |
| PLUM-7 | PUMPS, CENTRIFUGAL >5HP AND <25HP | | | 1 | 4.00 | |
| PLUM-8 | ROOF, INSPECTION | | | 2 | 1.00 to 2.00 | |
| PLUM-9 | HOT WATER HEATERS (CONVERTERS) | | | 1 | 4.50 | |
| PLUM-10 | HOT WATER HEATERS, DOMESTIC TYPE | | | 1 | 1.50 | |
| PLUM-11 | FIRE PUMPS, ELECTRIC MOTOR DRIVE | | | 1 | 0.75 | |
| PLUM-12 | FIRE PUMPS, INTERNAL COMBUSTION ENGINE DRIVE | | | 1 | 0.75 to 1.50 | |
| PLUM-13 | DRINKING WATER COOLERS | | | 1 | 1.00 | |
| PLUM-14 | EYEWASH, PLUMBED | | | 1 | 0.30 | |
| PLUM-15 | SHOWERS, EMERGENCY | | | 1 | 0.30 | |
| | SUBTOTAL | | | | | |

| TABLE D: EMS | | | | | |
|--------------|---------------------------|----------|-------------------------|--------------------------|---------------------|
| GUIDE NO. | TASK DESCRIPTION | QUANTITY | FREQUENCY (per year) | WORK HOURS (per freq) | TOTAL WORK HOURS |
| EMS-5 | EMERGENCY GENERATORS | | 12 | 1.00 to 2.00 | |
| EMS-6 | FIRE ALARM BOXES (MANUAL) | | 4 to 6 | 0.10 | |
| | SUBTOTAL | | | | |

| TABLE E: MISC | | | | | |
|---------------|--|----------|-------------------------|--------------------------|---------------------|
| GUIDE NO. | TASK DESCRIPTION | QUANTITY | FREQUENCY (per year) | WORK HOURS (per freq) | TOTAL WORK HOURS |
| MISC-1 | AIR COMPRESSORS | | 1 | 1.00 | |
| MISC-2 | LAWNMOWERS AND EDGERS | | 2 | 1.00 | |
| MISC-3 | SWEEPERS (GASOLINE) | | 2 to 6 | 2.00 | |
| MISC-4 | PAPER BALERS | | 1 | 3.00 | |
| MISC-5.1 | DOCK DOORS, POWER OPERATED | | 2 | 2.00 | |
| MISC-5.2 | DOCK DOORS, MANUAL OPERATED | | 2 | 1.00 | |
| MISC-6 | DOOR, PEDESTRIAN DOORS, POWER OPERATED MAIN AND DOCK ENTRANCES | | 4 | 1.00 | |
| MISC-7 | DOOR, PEDESTRIAN DOORS, NON-POWERED MAIN AND DOCK ENTRANCE | | 2 | 1.00 | |
| MISC-8 | DOCK LEVELERS, POWERED | | 4 | 1.25 | |
| MISC-9 | FIRE DOORS, STAIRWELLS AND EXITWAYS (SWINGING) | | 4 | 0.10 | |
| MISC-10 | FIRE DOORS, SLIDING TYPE | | 4 | 0.10 | |
| MISC-11 | STATIONARY PACKERS (WEEKLY) | | 52 | 1.00 | |
| MISC-12 | STATIONARY PACKERS (MONTHLY) | | 12 | 1.00 | |
| MISC-13 | STATIONARY PACKERS (QUARTERLY) | | 4 | 2.00 | |
| MISC-14 | POWER LIFTS | | 12 | 1.00 | |
| MISC-15 | SNOW BLOWER, WALKING TYPE | | 1 | 1.00 | |

Figure 3-10. PS Form 4896A, Page 3 of 4 – Annual Standard Requirement Building Preventive Maintenance

| TABLE E: MISC | | | | | |
|---------------|---|----------|-------------------------|--------------------------|---------------------|
| GUIDE NO. | TASK DESCRIPTION | QUANTITY | FREQUENCY (per year) | WORK HOURS (per freq) | TOTAL WORK HOURS |
| MISC-16 | DOCK LEVELERS, MANUAL | | 4 | 0.50 | |
| MISC-17 | SWEEPERS (BATTERY) | | 4 to 12 | 1.00 | |
| MISC-18 | FLOOR SCRUBBERS, AUTOMATIC; VACUUM, BATTERY POWERED | | 4 to 12 | 1.00 | |
| MISC-19 | BATTERY, PIV, FLOODED LEAD ACID | | 2 | 0.30 | |
| MISC-20 | TRAILER RESTRAINTS - QUARTERLY | | 4 | 1.00 | |
| MISC-21 | TRAILER RESTRAINTS - ANNUAL | | 1 | 0.50 | |
| MMO09615 | PIVMS VAC (MONTHLY) | | 12 | 0.55 | |
| MMO09615 | PIVMS VAC (QUARTERLY) | | 4 | 0.52 | |
| MMO03718 | COMPACTOR, PTR | | 1 | 27.89 | |
| MMO03218 | COMPRESSED AIR LEAK SURVEY | | 1 | 0.00 to 24.00 | |
| MMO09520 | S6 PALLET JACK - 5 DAY | | 260 | 0.31 | |
| MMO09520 | S6 PALLET JACK - 6 DAY | | 312 | 0.30 | |
| MMO09520 | S6 PALLET JACK - 7 DAY | | 364 | 0.30 | |
| MMO09620 | DAIFUKU PALLET JACK 5 DAY | | 260 | 0.32 | |
| MMO09620 | DAIFUKU PALLET JACK 6 DAY | | 312 | 0.31 | |
| MMO09620 | DAIFUKU PALLET JACK 7 DAY | | 364 | 0.31 | |
| MMO09720 | DAIFUKU TOW MOTOR 5 DAY | | 260 | 0.32 | |
| MMO09720 | DAIFUKU TOW MOTOR 6 DAY | | 312 | 0.31 | |
| MMO09720 | DAIFUKU TOW MOTOR 7 DAY | | 364 | 0.31 | |
| MMO09820 | SEEGRID TOW MOTOR 5 DAY | | 260 | 0.28 | |
| MMO09820 | SEEGRID TOW MOTOR 6 DAY | | 312 | 0.27 | |
| MMO09820 | SEEGRID TOW MOTOR 7 DAY | | 364 | 0.27 | |
| MMO16619 | HOIST, 5 DAY OPERATION | | 260 | 0.15 | |
| MMO16619 | HOIST, 6 DAY OPERATION | | 312 | 0.15 | |
| MMO16619 | HOIST, 7 DAY OPERATION | | 364 | 0.15 | |
| MMO16619 | HOIST, MONTHLY | | 12 | 0.15 | |
| MMO16619 | HOIST, SEMI-ANNUAL (ALL) | | 2 | 0.93 | |
| MMO16619 | HOIST, SEMI-ANNUAL (PENTHOUSE) | | 2 | 0.15 | |
| MMO16619 | HOIST, WEEKLY | | 52 | 0.15 | |
| | FORKLIFT | | 1 | 50.00 | |
| | PALLET TRUCK, MOTORIZED | | 1 | 50.00 | |
| | PALLET TRUCK, NON MOTORIZED | | 1 | 1.00 | |
| | TOW TRACTOR | | 1 | 52.00 | |
| | SUBTOTAL | | | | |

PS FORM

12/28/2018

4896A - BLANK FORM

**Figure 3-11. PS Form 4896A, Page 4 of 4 – Annual Standard Requirement
Building Preventive Maintenance**