

# Insert Facility Name

## Preventive Maintenance Work Plan

### Frequency Key

W – Weekly   M - Monthly   Q - Quarterly   SA- Semi-Annually   A- Annually   SST - Seasonal Start-Up   SSH - Season Shut Down

### Fans (Supply, Exhaust, Return)(Belt or Shaft Driven)

Critical Tasks	Frequency	Status	Date Completed	Initials
Inspect unit for unusual noise and/or vibration, ensure that it is in good working order.	Q			
If unit is not running or an identified problem requires the unit to be serviced, perform ALL <b>Non-Critical Tasks</b> listed below.	Q			
If present, inspect belts for proper tension and wear (if belts are replaced, record belt type and replacement date on unit)	Q			
Inspect fan and motor assemble for proper alignment.				
Provide lubrication, if necessary.	Q			
Clean entire unit, motor and fan assembly with a damp cloth.	Q			
Check exhaust fan intake grills for dirt/debris.	Q			
<b>Other recommended tasks</b>				
For fans 2HP or more, check load amps.	A			
Inspect fan and motor pulleys for proper alignment.	A			
Inspect fan blades and moving parts for excessive wear.	A			
Inspect all fan wiring for deterioration.	A			
Ensure tightness of all electrical connections.	A			
Inspect motor starter/control center.	A			
Ensure that overload settings are proper	A			
Verify correct operation of starter.	A			
Inspect electrical contact surfaces.	A			
Inspect fan assembly.	A			
Verify tightness of balance weights.	A			

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### Variable Air Volume Terminal Units

Critical Tasks	Frequency	Status	Date Completed	Initials
Observe unit, note any unusual noise and/or vibrations.	SA			
Ensure that unit is supplying air if in demand, vice versa.	SA			
Provide lubrication, if necessary.	SA			
<b>Other recommended tasks</b>				
Inspect all pneumatic/electrical connections, tighten if necessary.	SA			
Observe and inspect VAV control box.	SA			
Inspect all fan wiring for deterioration.	SA			
Inspect motor-shaft connection and ensure tightness.	SA			
Clean dampers and fan blades.	SA			
Inspect controls and cycle actuators to ensure proper operation.	SA			
Verify that dampers open and close fully.	SA			
Inspect all linkages and ensure proper positioning.	SA			

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### Heating and Ventilation Units

Critical Tasks, to be performed monthly	Frequency	Status	Date Completed	Initials
Inspect entire unit for unusual noise and/or vibration, ensure that it is in good working order.	M			
Provide lubrication, if necessary	M			
Check that damper linkages are properly connected and operating	M			
Inspect piping and fittings for leaks (steam, condensate, hot water, chilled water).	M			
Inspect ductwork flexible connectors for abnormalities or leaks.	M			
Inspect felt/rubber gaskets around access doors.	M			
Following inspection, record observations and deficiencies, if any.	M			
Check outside air intake louvers.	M			
<i>If problems are identified and unit requires servicing, perform all Non-Critical Tasks for the problematic components.</i>	M			
Inspect pre and final filters for abnormal accumulation of dirt and debris, replace if necessary. Write installation date on new filters.	Q			
Clean filter rack and vacuum filter section after removal of old filters and prior to installing new filters.	Q			
Inspect filter rack and ensure that air path does not bypass filters.	Q			
Inspect coils (steam, hot water, chilled water) for accumulation of dirt and debris, clean if necessary.	Q			
Inspect/adjust humidifier, if present	Q			
Check access doors for tightness.	Q			
Check fire smoke dampers for proper operation.	A			
Inspect belts for proper tension and wear (if belts are replaced, record belt type and replacement date on unit)	A			
Inspect entire motor and fan assembly, clean with a damp cloth.	A			
Lubricate fan bearings and motors.	A			
Lubricate all moving parts/connections, if necessary.	A			
Operate dampers over the full modulation range, verify proper operation.	A			

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<b>Other recommended tasks</b>				
Inspect all gauges and meters, ensure they are functional, replace if necessary.	A			
Inspect coil fittings, tighten if necessary.	A			
Utilize fin comb to straighten coil fins.	A			
Clean/flush water or y-strainers and drip leg.	A			
Inspect steam traps	A			
Inspect all fan wiring for deterioration.	A			
Tighten all electrical contacts.	A			
Inspect motor starter/control center.	A			
Verify operation of starter and inspect contact surfaces for pitting or wear.	A			
Check damper linkage, set screws and blade adjustment for proper tightness.	A			
Inspect bearing collar set screws on fan shaft, ensure tightness.	A			
Inspect fan and motor sheaves for proper alignment.	A			

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### Unit Heaters

Critical Tasks, to be performed semi-annually	Frequency	Status	Date Completed	Initials
Inspect unit for unusual noise and/or vibration, ensure that it is in good working order.	SA			
If unit is not running or an identified problem requires the unit to be serviced, perform ALL <b>Non-Critical Tasks</b> listed below.	SA			
Clean and re-install permanent filters or replace disposable filters.	SA			
Provide lubrication, if necessary.	SA			
Clean coils by vacuuming or brushing.	SA			
Clean entire unit, motor and fan assembly with damp cloth.	SA			
<b>Other recommended tasks</b>				
Use fin comb to straighten coil fins.	A			
Clean and flush strainers.	A			

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### Pumps

Critical Tasks	Frequency	Status	Date Completed	Initials
Inspect unit for unusual noise and/or vibration, ensure that it is in good working order.	Q			
Provide lubrication, if necessary.	Q			
If unit is not running or an identified problem requires the unit to be serviced, perform ALL <b>Non-Critical Tasks</b> listed below.	Q			
Flush and clean strainers.	Q			
Check operation of gauges and record pressures and temperatures.	Q			
Inspect seals and packing, tighten or replace as necessary.	Q			
Lubricate impeller shaft bearings.	Q			
Inspect motor and pump alignment.	Q			
<b>Other recommended tasks</b>				
Inspect mounting bolts and vibration isolators of the pump under load conditions.	A			
Start and stop pump, noting any vibration and overall performance.	A			
Inspect drive shaft coupling.	A			

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### Heat Exchanger

Critical Tasks	Frequency	Status	Date Completed	Initials
Observe unit in operation, note any unusual noises and/or vibrations.	M			
Inspect for leaks and/or corrosion.	M			
Ensure that temperatures are within proper parameters.	M			
Verify and calibrate all associated controls under load, verify proper sequences of operation.	A			
Inspect gauges and verify proper operation.	A			
Inspect all safety devices for proper operation (vacuum breakers, hi-temperature safeties, relief valves, etc).	A			
Inspect condensate drain system and clean as necessary.	A			
Inspect steam traps for proper operation.	A			
Check inlet and outlet water temperatures to measure performance of heat exchanger. Overhaul if necessary.	A			
Visually inspect shell and tubes for fouling and/or corrosion. Assess tube condition.	If Necessary			
Remove vessel hand-hole covers and inspect for any abnormal conditions (i.e. - scale, corrosion, etc.)	If Necessary			
Clean shell and tubes chemically, if required/necessary.	If Necessary			

\*Non-destructive testing should be performed on the heat exchangers every three years.

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### Cabinet Unit Heaters

Critical Tasks, to be performed semi-annually	Frequency	Status	Date Completed	Initials
Inspect unit for unusual noise and/or vibration, ensure that it is in good working order.	SA			
If unit is not running or an identified problem requires the unit to be serviced, perform ALL <b>Non-Critical Tasks</b> listed below.	SA			
Clean and re-install permanent filters or replace disposable filters.	SA			
Provide lubrication, if necessary.	SA			
Clean coils by vacuuming or brushing.	SA			
Clean entire unit, motor and fan assembly with damp cloth.	SA			
<b>Other recommended tasks</b>				
Use fin comb to straighten coil fins.	A			
Clean and flush strainers.	A			

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### Unit Ventilators

Critical Tasks, to be performed semi-annually	Frequency	Status	Date Completed	Initials
Inspect unit for unusual noise and/or vibration, ensure that it is in good working order.	SA			
If unit is not running or an identified problem requires the unit to be serviced, perform ALL <b>Non-Critical Tasks</b> listed below.	SA			
Clean and re-install permanent filters or replace disposable filters.	SA			
Provide lubrication, if necessary.	SA			
Clean coils by vacuuming or brushing.	SA			
Clean entire unit, motor and fan assembly with damp cloth.	SA			
<b>Other recommended tasks</b>				
Clean condensate drip pan.	A			
Flush condensate drain piping and eliminate potential blockages.	A			
Use fin comb to straighten coil fins.	A			
Clean and flush strainers.	A			
Ensure proper operation of outside air damper and associated linkages.	A			

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### Packaged Units

Critical Tasks, to be performed monthly	Frequency	Status	Date Completed	Initials
Check with operating or area personnel for deficiencies.	Q			
Check unit for proper operation, excessive noise, or vibration.	Q			
Clean intake side of condenser coils, fans, and intake screens.	Q			
Check electrical wiring and connections; tighten loose connections.	A			
Inspect fan(s) for bent blades or unbalance; adjust and clean as necessary.	A			
Check belts for condition, proper tension and misalignment; adjust as required.	Q			
Lubricate shaft bearings and motor bearings.	Q			
Inspect piping and valves for leaks; tighten connections as necessary.	Q			
Replace air filters.	Q			
Check refrigerant pressure; add refrigerant as necessary.	Q			
Clean evaporator drain pan, and drain piping as required.	A			
Cycle the reverse cycle valve to insure proper operation.	Q			
Clean area around equipment.	Q			
Fill out maintenance checklist and report deficiencies.	Q			

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### Steam Powered Domestic Hot Water Heater

Critical Tasks, to be performed weekly	Frequency	Status	Date Completed	Initials
Visually inspect all piping and valves, check for leaks.	W			
Ensure that controls maintain setpoint.	W			
Check insulation on heater, repair as necessary.	W			
Check operation and condition of pressure relief valve.	SA			
With unit under load, inspect for leaks and any signs of abnormal operation.	SA			
Drain unit until all sediment and discolored water is expelled.	SA			
Inspect tank exterior, fittings and hand-holes for signs of corrosion.	SA			
Ensure that mixing valves operate as intended.	SA			
Operate and inspect all control linkages. Adjust and lubricate linkages as necessary.	SA			
Clean, test and inspect sight glasses, valves, fittings, drains and controls.	SA			
Check steam control valves and steam traps for proper operation.	SA			
Check electrical wiring connections on controls and switches.	SA			
Exercise all manual isolation valves, as applicable, over full range and ensure full closure.	SA			

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### Pressure Reducing Valves

Critical Tasks	Frequency	Status	Date Completed	Initials
Operate the controls over the full range of modulation to ensure proper operation of the valve and actuator.	A			
Stroke the valve to ensure it maintains pressure setpoint.	A			
Verify that the control valve is providing tight shutoff of the controlled medium.	A			
Inspect condition of valve actuator.	A			
Check for leaks.	A			
Inspect pilot positioner.	A			
Check/inspect pipe condition immediately after PRV station.	A			

\*Non-destructive testing should be performed on the high pressure steam piping every two years.

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### Split System Air Conditioners

Critical Tasks	Frequency	Status	Date Completed	Initials
Inspect all wiring for deterioration and tighten electrical contacts. Check for corrosion and cleanliness.	M			
Observe unit in operation, note any unusual noise or vibration.	M			
Observe unit in operation, note any unusual noise or vibration.	M			
Inspect and clean condenser coils. Remove accumulated dirt and debris.	M			
Check operation of head pressure controls	M			
Lubricate motor and fan bearings	M			
Observe unit in operation, note any unusual noise or vibration.	M			
Inspect and replace filters if necessary. Write installation date on the filter.	M			
Lubricate fan and motor bearings.	M			
<b>Other recommended tasks</b>				
Check control sequencing	A			
Inspect mounting bolts and tighten if needed.	A			
Verify unit is properly grounded.	A			
Verify proper operation of crankcase heater (if applicable).	A			
Check for refrigerant leaks and repair as necessary.	A			
Check refrigerant levels and recharge if needed.	A			
Check for oil leaks and repair as necessary.	A			
Check compressor oil level (excludes hermetically sealed units), if unit is equipped with a sight glass.	A			
Run machine, check action of controls, relays, switches and safeties or limit switches.	A			
Verify unit operates at the proper suction and discharge pressures. Measure and record each.	A			
Verify unit operates at proper discharge temperature. Measure and record temperature difference across the coil.	A			
Air Cooled Condenser				

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Inspect all wiring for deterioration and tighten electrical contacts. Inspect for cleanliness and corrosion.	A			
Check for arcing on contact.	A			
Inspect condenser fans, bearings, housings, protective shields, motors, drives and/or belts.	A			
Lubricate fan and motor bearings.	A			
Inspect fan and motor starters.	A			
Visually inspect motor starter/control/relay center.	A			
Verify operation of starter and inspect contact surfaces for pitting or wear.	A			
Inspect mounting bolts and tighten if needed.	A			
Vacuum unit and surrounding area.	A			
Clean (pressure wash) and comb condenser coils with a fin comb, if necessary.	A			
Air Handling Unit (Evaporator)				
Inspect bearing collar set screws on fan shaft to make sure they are tight.	A			
Inspect blades and moving parts for cracks and excessive wear.	A			
Inspect fan for vibration or excessive noise.	A			
Inspect all wiring for deterioration and tighten electrical contacts.	A			
Visually inspect motor starter for broken parts, contact arcing or any evidence of overheating.	A			
Inspect dampers and fan blades for dust buildup and clean if necessary.	A			
Vacuum unit and surrounding area.	A			

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### Window Air Conditioning Units

Critical Tasks, to be performed monthly	Frequency	Status	Date Completed	Initials
Inspect unit for proper operation.	M			
Clean coils and fins, straighten with a fin comb.	M			
Clean or change filter.	M			

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### Air Compressors

Critical Tasks	Frequency	Status	Date Completed	Initials
Drain receiver tank and check traps for proper operation.	SA			
Change oil, resume operation and check oil for proper oil level and pressure.	SA			
Change oil filter. After replacement, check for leaks.	SA			
Change air intake filters.	SA			
Check operation of the cut-in and cut-out pressure controls.	SA			
Clean and degrease the compressor cooling fins.	SA			
<b>Other recommended tasks</b>				
Check and adjust belt tension.	SA			
Check belt condition. Replace worn belts with matching sets.	SA			
Check sheave alignment and level of shafts.	SA			
Check operation of unloader and check valves.	SA			
Check high pressure safety relief valve.	SA			
Record compressor run times.	SA			
Check operation of all safety relief valves.	SA			
Inspect coalescent filters and change.	SA			
Record pressure reducing valve settings and adjust as required.	SA			
Check operation of all valve assemblies as required.	SA			
Ensure that lead/lag/sequencing controls are operating compressors efficiently.	SA			

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### Air Dryers

Critical Tasks	Frequency	Status	Date Completed	Initials
Check and record refrigerant pressures and temperatures.	SA			
Clean condenser grills, if necessary.	SA			
Operate drain trap and bypass valve.	SA			

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### Expansion Tanks

Critical Tasks	Frequency	Status	Date Completed	Initials
Inspect tanks for signs of leakage or corrosion.	A			
Verify proper tank level as noted in sight glass.	A			

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### Absorption Chillers

Critical Tasks	Frequency	Status	Date Completed	Initials
Check with operating personnel for deficiencies; check operating log sheets for indications of increased temperature trends.	Q			
Check unit for proper operation, excessive noise or vibration.	Q			
Check pulley alignment and belts for condition, proper tension and misalignment on external purge pump system, if applicable; adjust for proper tension and or alignment.	Q			
Check purge pump vacuum oil level, as required; add/change oil as necessary.	Q			
Lubricate pump shaft bearings and motor bearings.	Q			
Inspect cooling and system water piping circuits for leakage.	Q			
Clean area around equipment.	Q			
Fill out maintenance checklist and report deficiencies	Q			
Check and clean strainers in all lines as required.	A			
Check and service system controls, wirings and connections; tighten loose connections.	A			

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### Centrifugal Water Cooled Chillers

Critical Tasks	Frequency	Status	Date Completed	Initials
Fill condenser and chilled water system.	SST			
Ensure that unit's internal heater is operating properly before start-up.	SST			
Inspect for proper operation of oil cooler.	SST			
Ensure that both chilled and condenser water make-up systems are operating properly.	SST			
Ensure proper operation of vanes and associated linkages.	SST			
Check motor assembly for proper alignment and lubrication.	SST			
Check operation of the lubrication system.	SST			
Inspect for refrigerant/oil leaks. Repair leaks if found.	SST			
Check refrigerant levels and recharge if needed	SST			
Note unit run time, number of starts.	SST			
Check all relays and operating/safety controls.	SST			
Ensure that controls are providing proper/efficient operation of chiller. Check chilled water reset.	SST			
While chiller is operating, document all pressures and temperatures.	SST			
Observe all valves and piping, inspect for leaks, repair if necessary.	SST			
Inspect that all actuators, linkages, moving parts associated with chiller system control are properly adjusted, tighten if necessary.	SST			
Observe chiller components (i.e. - pumps, controls, motors, etc.) for proper operation.	SST			
After first day of operation, flush and drain system to remove dirt and debris.	SST			
Observe unit while in operation, note any unusual noise or vibration.	M			
Inspect for refrigerant/oil leaks. Repair leaks if found.	M			
Observe all valves and piping, inspect for leaks, repair if necessary.	M			
While chiller is operating, document all pressures and temperatures.	M			
Check refrigerant levels and recharge if needed	M			
Flush/clean chilled and condenser water piping strainers.	M			
Inspect lubrication system for proper operation.	M			

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Record run times and starts per chiller.	M			
Inspect for refrigerant and oil leaks. All leaks to be repaired.	SSH			
Check refrigerant levels and recharge if needed.	SSH			
Flush/clean chilled and condenser water piping strainers.	SSH			
Record run times and starts per chiller.	SSH			
Ensure proper operation of freeze protection safety devices.	SSH			
Take precautionary measures to prevent damage to system from freezing during winter months (i.e. - drain piping, utilize glycol).	SSH			
Collect a sample of refrigerant/oil and submit to a qualified laboratory for analysis.	SSH			
Blowdown pneumatic control lines and prepare for winter lay-up.	SSH			
Clean and vacuum all electrical and control enclosures.	W			
Perform meg test on chiller compressor motor and all other associated motors in the chilled/condenser water system. Compare to past readings.	W			
Inspect for refrigerant and oil leaks. All leaks to be repaired.	W			
Check refrigerant levels and recharge if needed.	W			
With chiller locked/tagged out, inspect and adjust the guide vane linkage and operation.	W			
Lubricate all control linkages and moving parts associated with the chiller.	W			
Change compressor oil as specified by manufacturer.	W			
Replace main oil filter.	W			
Replace refrigerant filter/drier.	W			
Check operation of starter and inspect contact surfaces for wear or pitting.	W			
Check overload settings and check/tighten ALL electrical connections.	W			
Solid state starters/VFD's must be serviced and maintained according to unit manufacturer's recommendations.	W			
Inspect all relief valves for lubrication, condenser and evaporator sides. Disconnect piping inspect valve body.	W			
Check and calibrate all temperature sensors utilized for chiller operation (i.e., chilled water, condenser water, refrigerant, oil), if possible.	W			
Check and calibrate all differential pressure and flow switches utilized for chiller operation.	W			

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Check all pressure transducers against a pressure gage. Recalibrate if needed.	W			
Inspect, clean and service refrigerant float system.	W			
Clean evaporator tubes every three years.	W			
Clean condenser tubes every three years.	W			
Perform eddy current testing every three years on both the evaporator and condenser tubes.	W			

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### Reciprocating Air Cooled Chillers

Critical Tasks	Frequency	Status	Date Completed	Initials
Check unit for proper operation, excessive noise or vibration.	M			
Run system diagnostics test.	M			
Check oil level in sight glass of lead compressor only, add oil as necessary.	M			
Check superheat and subcooling temperatures.	A			
Check liquid in line sight glass, oil and refrigerant pressures.	M			
Check contactors, sensors and mechanical safety limits.	A			
Check electrical wiring and connections; tighten loose connections.	A			
Clean intake side of condenser coils, fans, and intake screens.	A			
Inspect fan(s) or blower(s) for bent blades or imbalance.	A			
Lubricate shaft bearings and motor bearings as required.	A			
Inspect plumbing and valves for leaks, adjust as necessary.	M			
Check evaporator and condenser for corrosion.	M			
Clean chiller and surrounding area.	M			
Fill out maintenance checklist and report deficiencies.	M			

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### Cooling Towers

Critical Tasks, to be performed during seasonal start-up	Frequency	Status	Date Completed	Initials
Clean cooling towers by flushing, blowing down all associated piping.	SST			
Inspect sprayer heads.	SST			
Inspect structural supports.	SST			
Inspect and clean louvers.	SST			
Inspect collection trays and suction screens for plugging and clean.	SST			
Inspect and clean drift eliminators.	SST			
Test motor winding continuity on condenser fan motors.	SST			
Inspect fans, bearings, housings, protective shields, motors, drives and/or belts. Lubricate as necessary. Record observations.	SST			
Inspect fan motor starters.	SST			
Visually inspect motor starter/control center.	SST			
Check operation of starter and inspect contact surfaces for wear or pitting.	SST			
Check overload settings and check/tighten ALL electrical connections.	SST			
Vacuum cabinets to eliminate dust build-up.	SST			
Operate gear reducer (where applicable) until oil is warm. Drain oil and refill with new.	SST			
Start unit(s) and operate. If applicable, sequence unit(s) through entire operating range.	SST			
Record and address any abnormal vibrations.	SST			
Observe cooling tower to ensure proper operation. Inspect for unusual noise or vibration.	M			
Inspect and clean louvers, if required.	M			
Check operation of make-up water valve and any associated controls/linkages, lubricate if necessary.	M			
Visually check fan gear reducer/drive oil sample for presence of water and/or sludge.	M			
Check oil level in gear reducer/drive (if applicable). Add if required and record amount.	M			
Provide Water Treatment.	M			
During winter months ensure proper operation of basin heaters, if present.	M			

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Verify that alternating/lead/lag controls are operating the towers properly.	<b>M</b>			
Clean/Flush condenser water strainers/sand filters.	<b>M</b>			
Drain condenser water from cooling towers and any piping that could freeze during the winter.	<b>SSH</b>			
Secure all makeup water systems.	<b>SSH</b>			
Inspect condition of spray nozzles and fill, check all structural supports and bolted connections and tighten as required.	<b>SSH</b>			
Visually inspect the drift eliminators. Remove debris or scale as required.	<b>SSH</b>			
Record and address any abnormal vibrations.	<b>SSH</b>			

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### Gas Fired Domestic Hot Water Heater

Critical Tasks	Frequency	Status	Date Completed	Initials
Visually inspect all piping and valves, check for leaks.	W			
Ensure that controls maintain set point.	W			
Check insulation on heater, repair as necessary.	W			
Drain unit until all sediment and discolored water is expelled.	SA			
With unit under load, inspect for leaks and any signs of abnormal operation.	SA			
Inspect tank exterior, fittings and hand-holes for signs of corrosion.	SA			
Ensure that mixing valves operate as intended.	SA			
Operate and inspect all control linkages. Adjust and lubricate linkages as necessary.	SA			
Inspect and clean combustion air passages.	SA			
Test operation of gas pressure regulator and adjust setting if necessary.	SA			
Clean, test and inspect sight glasses, valves, fittings, drains and controls.	SA			
Inspect ignition and pilot assembly. Clean and adjust igniter if necessary.	SA			
Exercise all manual isolation valves, as applicable, over full range and ensure full closure.	SA			

## Preventive Maintenance Work Plan

### Frequency Key

W – Weekly   M - Monthly   Q - Quarterly   SA- Semi-Annually   A- Annually   SST - Seasonal Start-Up   SSH - Season Shut Down

### Vacuum Pump Units

Critical Tasks, to be performed semi-annually	Frequency	Status	Date Completed	Initials
Inspect operation of vacuum pump for excessive vibration, noise, heat, etc.	SA			
Change oil, resume operation and check oil for proper oil level and pressure.	SA			
Change oil filter. After replacement, check for leaks.	SA			
Change air intake filters.	SA			
Check operation of the cut-in and cut-out pressure controls.	SA			
<b>Other recommended tasks</b>				
Check belt condition. Replace worn belts with matching sets. Check and adjust belt tension.	SA			
Check sheave alignment and level of shafts.	SA			
Check operation of unloader and check valves.	SA			
Record vacuum run times.	SA			
Check high pressure safety relief valve.	SA			
Check operation of motor operation and starter. Record motor amperage and voltage readings per phase.	SA			
Check operation of all safety relief valves.	SA			
Check operation of all valve assemblies as required.	SA			
Clean and degrease the compressor cooling fins.	SA			

## Preventive Maintenance Work Plan

### Frequency Key

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### Steam Boilers

Critical Tasks	Frequency	Status	Date Completed	Initials
<i>Annual tasks should be performed at the end of each heating season and coordinated with annual boiler inspections.</i>	A			
Boiler Shell	A			
Remove the rear and/or side access panel and cleanout.	A			
Access the fireside of the boiler and thoroughly clean all internal surfaces, vacuum surfaces and remove all debris.	A			
Clean spaces leading from exhaust breeching to exhaust flue. Inspect for corrosion or damage.	A			
Inspect and replace, as necessary, all gaskets.	A			
Peripherals	A			
Inspect burner natural gas valves, oil valves, air intake damper and back draft damper linkages, adjust if necessary.	A			
Lubricate all burners, damper actuator linkage moving parts and pivot points.	A			
Exercise joints and remove excess lubricant.	A			
Inspect all fuel solenoid valves for unusual noises, full closure and proper operation.	A			
Check fuel cam profile spring for wear, scoring, discoloration.	A			
Clean and inspect all fuel oil strainers.	A			
Check oil pressure gauge for accuracy.	A			
Check actuator motor for proper operation.	A			
Check ignition electrode/pilot for proper gap/flame, adjust if necessary.	A			
Check/test burner control panel/system for the following indicating lights/safety devices/alarms; flame failure, high/low gas/oil pressure, air switch.	A			
Inspect flame detector lens, clean if necessary.	A			
For electric ignition systems, test and record voltage readings on each side of the ignition transformer.	A			
Inspect combustion fan motor and ensure that fan is secured tightly to shaft. Provide lubrication and clean fan blades. If fan is belt driven, check for proper alignment.	A			

## Preventive Maintenance Work Plan

### Frequency Key

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Check low/high water limit controllers, adjust/tighten linkages if necessary. If probe type, ensure that sensors are clean and free of debris.	A			
Inspect boiler safety relief valve and assure proper operation.	A			
Ensure proper operation of low/high temperature limit controllers.	A			
Tune boiler for operation on the primary fuel. A combustion gas analyzer should be used to check burner efficiency at 25%, 50%, 75% and 100% firing rate.	A			
Other observations should be made during boiler tune-up such as fuel/air ratio, flame color/spread, opacity, stack temperatures and O <sub>2</sub> /Nox/CO/CO <sub>2</sub> concentrations.	A			
Record all observations	A			
Ensure that boiler components are operating in proper sequence.	W			
Visually inspect all control linkages and components for proper operation, lubricate moving parts, if necessary.	W			
Inspect boiler piping, valves and fitting for leaks.	W			
Ensure that boiler pressuretrol set points are not excessively high.	W			
Experiment with lowering set points in order to conserve energy while meeting building demand.	W			
If problems or inefficient operation are identified correct deficiencies immediately.	W			

\*Non-destructive testing should be performed on the boilers every three years.

## Preventive Maintenance Work Plan

### Frequency Key

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### Water Boilers

Critical Tasks	Frequency	Status	Date Completed	Initials
<i>Annual tasks should be performed at the end of each heating season and coordinated with annual boiler inspections.</i>	A			
Boiler Shell	A			
Remove the rear and/or side access panel and cleanout.	A			
Access the fireside of the boiler and thoroughly clean all internal surfaces, vacuum surfaces and remove all debris.	A			
Clean spaces leading from exhaust breeching to exhaust flue. Inspect for corrosion or damage.	A			
Inspect and replace, as necessary, all gaskets.	A			
Peripherals	A			
Inspect burner natural gas valves, oil valves, air intake damper and back draft damper linkages, adjust if necessary.	A			
Lubricate all burners, damper actuator linkage moving parts and pivot points.	A			
Exercise joints and remove excess lubricant.	A			
Inspect all fuel solenoid valves for unusual noises, full closure and proper operation.	A			
Check fuel cam profile spring for wear, scoring, discoloration.	A			
Clean and inspect all fuel oil strainers.	A			
Check oil pressure gauge for accuracy.	A			
Check actuator motor for proper operation.	A			
Check ignition electrode/pilot for proper gap/flame, adjust if necessary.	A			
Check/test burner control panel/system for the following indicating lights/safety devices/alarms; flame failure, high/low gas/oil pressure, air switch.	A			
Inspect flame detector lens, clean if necessary.	A			
For electric ignition systems, test and record voltage readings on each side of the ignition transformer.	A			
Inspect combustion fan motor and ensure that fan is secured tightly to shaft. Provide lubrication and clean fan blades. If fan is belt driven, check for proper alignment.	A			

## Preventive Maintenance Work Plan

### Frequency Key

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Check low/high water limit controllers, adjust/tighten linkages if necessary. If probe type, ensure that sensors are clean and free of debris.	A			
Inspect boiler safety relief valve and assure proper operation.	A			
Ensure proper operation of low/high temperature limit controllers.	A			
Tune boiler for operation on the primary fuel. A combustion gas analyzer should be used to check burner efficiency at 25%, 50%, 75% and 100% firing rate.	A			
Other observations should be made during boiler tune-up such as fuel/air ratio, flame color/spread, opacity, stack temperatures and O <sub>2</sub> /Nox/CO/CO <sub>2</sub> concentrations.	A			
Record all observations	A			
Ensure that boiler components are operating in proper sequence.	W			
Visually inspect all control linkages and components for proper operation, lubricate moving parts, if necessary.	W			
Inspect boiler piping, valves and fitting for leaks.	W			
Ensure that boiler temperature set points are not excessively high.	W			
Experiment with lowering set points in order to conserve energy while meeting building demand.	W			
If problems or inefficient operation are identified correct deficiencies immediately.	W			

\*Non-destructive testing should be performed on the boilers every three years.

## Preventive Maintenance Work Plan

### Frequency Key

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### Submersible Pumps (Sump/Ejector)

Critical Tasks	Frequency	Status	Date Completed	Initials
Check electrical cords, plugs and connections.	SA			
Activate float switches and check pumps for proper operation.	SA			
Lubricate pumps as required.	SA			
Inspect packing and tighten as required.	SA			
Check pumps for misalignment and bearings for overheating	SA			
Clean out trash from sump bottom.	SA			

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### Steam Radiators

Critical Tasks	Frequency	Status	Date Completed	Initials
Remove radiator valve; Install radiator valve	A			
Observe radiator and ensure proper operation. <i>Tasks to be performed during heating season only.</i>	M			

## Preventive Maintenance Work Plan

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### Steam Traps

Critical Tasks	Frequency	Status	Date Completed	Initials
Observe trap, and ensure proper operation. Repair/replace as necessary. <i>Tasks to be performed during heating season only.</i>	A			

\*Non-destructive testing should be performed on the steam traps every year.

## Preventive Maintenance Work Plan

### Frequency Key

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### Emergency Diesel Generator

Critical Tasks	Frequency	Status	Date Completed	Initials
Check with the operating or area personnel for any obvious deficiencies.	M			
Check turbine oil level; add oil as required.	M			
Change turbine oil and oil filter; check transmission oil level.	M			
Check that the crankcase heater is operating properly.	M			
Replace turbine air filter.	M			
Check wiring, connections, switches, etc; adjust as required.	M			
Check starter for proper operation; lubricate as necessary.	M			
Check fuel nozzles, fuel regulator and ignition device condition; service or replace as required	M			
Perform 30 minute generator test run; check for proper operation.	M			
Check and record transmission oil pressure and temperature, and natural gas pressure	M			
Record running time	M			
Check that the charger is operating properly	M			
Check for any signs of corrosion on battery terminals or wires	M			
Check the electrolyte level in the batteries; add if required.	M			
Check the specific gravity of the electrolyte in a 10% sample of the batteries	A			
Check 25% of terminal to-cell connection resistance; rehabilitate connections as required; add anti-corrosion grease to battery terminals and connections.	A			
Measure and record individual cell and string float voltages	A			
Clean area around generator.	M			
Fill out maintenance checklist and report deficiencies.	M			