Indianapolis Public Transportation Corporation (IndyGo)
RFP No. 10-1-260
HVAC Preventive Maintenance and On-Call Facility Repair

ATTACHMENT 3
PREVENTIVE MAINTENANCE MATRIX

Equipment Type	Weekly Maintenance	Semi-Monthly Maintenance	Monthly Maintenance	Quarterly
Heat Recovery Units (HRU)		• Rotate wheel to ensure bearings are properly lubricated.	• Inspect unit for general condition. Any evidence of rust must be cleaned, treated with a rust converter, and painted to ensure adequate protection of the metal. • Clean/remove accumulators of leaves, dirt, and debris from weather hoods, unit interior, coils, and condensing unit. • Repair or replace damaged or deteriorated components, hardware, wiring, or control mechanisms to ensure unit operation. • Inspect all air filters for excessive accumulation of dirt or debris and replace as necessary. • Inspect Unit for unusual noises or vibrations. Pay particular attention to fan and bearing condition. If excessive vibration is detected contact the Des Champs Service Department immediately. • Inspect Motor and fan sheave alignment and set screw torque. Belt groove centerlines must be in line with each other. • Inspect fan belt condition and tension. Belts must be tight enough to prevent slippage while fan in operating at full speed. Belt slippage during fan start-up is normal. Any attempt to tension the belt to prevent start-up slippage may over-tension the belt and cause premature bearing failure. • Inspect fan shaft for evidence of wear or damage, and bearing licking collars for looseness. Retighten locking collars as needed. • Inspect dampers to ensure operation is smooth, dampers move freely through entire range fully, and seals are in good condition. Caution: improper adjustment of damper(s) may cause poor performance. Consult Des Champs Service Department if in doubt as to proper damper operation.	• Inspect hinged door and access panels for air or water leaks. Repair or replace door gaskets as needed. • Lubricate motor. Add grease until grease appears at motor shaft opening in endplate or purge outlet plug. Use Shell Dolium R or Chevron RI grease.
Heating and Ventilating Units (HV)			• Check all valves, piping and connections for leaks. • Check the flame setting. • Check the fuel pressure in the fuel supply line to each heater. • Check the burner manifold pressure at full fire. • Clean the flame sensor(s) or UV sight tube(s). • Inspect filters; clean or replace as necessary. • Inspect the main fan bearings. • Check all dampers, damper actuators, and linkages. Adjust and tighten as necessary. • Ensure that there are no obstruction blocking the air supply to the heater or the air discharge from the heater. • Inspect the area and make sure that no combustible or hazardous material has been stored within the clearances as shown on the unit nameplate.	• Complete the monthly maintenance schedule. • Check the belt tension for the main fan(s) and adjust as necessary. • Check the alignment of the sheaves and adjust as necessary. • Inspect all bearings, set-screws for tightness and lubricate bearings as necessary. • Check the pilot electrical system; adjust as necessary. • Check the pilot assembly; clean and adjust as necessary. • Inspect the burner carefully; clean and adjust as necessary. • Check voltages and amp draw on main fan motor. • Check the operation of all safety controls individually. • Check the operation of the automatic gas shut-off valves and check them for leakage at the pressure test ports. • On vertical units, inspect burner drip leg and drain as necessary.
Exhaust Fans (EF)	Maintenance schedule unspecified for following items: • Lubricate per the Manufacturers Lubrication Conditions Chart or as needed. • Lubricate Motor Bearings per the Manufacturers Relubrication Intervals or as needed. • Lubricate Fan Bearings per the Manufacturers Conditions Chart or as needed. • Inspect bearings as recommended in the Manufacturers Conditions Chart or as needed.		• Inspect fan and clean.	• Inspect fans exhausting corrosive or contaminated air (airborne abrasives).
Unit Heaters (UH)				• Clean-remove grease and dirt on motor during each inspection, or more as needed. • Clean-remove dirt, grease and corrosive substances that may injure finish quarterly or as needed. • Rusted or corroded spots should be cleaned and repainted as needed.
Electric Unit Heaters (EUH)				
Electric Infrared Heaters (IRH)				
Air Handling Units (AHU)	• Observe unit for any change in running condition and unusual noise; adjust as necessary.		• Inspect and clean or replace filters as necessary. • Coat permanent filters with oil after cleaning. • Inspect and change bag filters when pressure drop is 1 in. wg. • Inspect and relubricate fan bearings as necessary. • Inspect and adjust fan belt tension as necessary.	• Inspect fan bearing grease line connections. Lines should be tight to the bearings. • Inspect bearing and motor bracket bolt torque and bearing setscrew torque; adjust as necessary. • Inspect and align fan and motor sheaves. Tighten sheave setscrews to the proper torque. • Inspect and clean drain pans. • Inspect and tighten electrical connections. • Inspect and clean coils as necessary.

Equipment Type	Weekly Maintenance	Semi-Monthly Maintenance	Monthly Maintenance	Quarterly
Make-up Air Units (MAU)			• Perform routine inspection of unit. (Monthly or as required). • Check area around unit to ensure no combustible materials are located within the minimum clearance requirements. • Inspect, service and clean burners and pilot. • Inspect and clean the blower section of the system. • Clean and inspect evaporative cooler per manufacturer's instructions during operating season as necessary. • Inspect and clean Control Dampers. • Inspect and clean Blower Wheels and blades. • Clean and inspect filters; monthly or more if airflow is blocked or if filters are dirty as required. • Check and record operating pressures.	• Inspect and clean the unit before the start and at the end of each heating and cooling season. • Inspect the motors and belts; adjust as necessary. • Inspect and replace filters.
Split System AC Units (AC-ACCU)		• Clean and inspect Catechin air filter.		• Clean and inspect Anti-Allergy Enzyme air filter every 3 months minimum or as needed. • Inspect unit and all components; ensure proper adjustment and function. Adjust as needed.
Split System AC Units (Server Room)			• Check filters for restricted airflow, wipe filter section clean. • Check fan section to insure impellers are free of debris and move freely, bearings are in good condition, belt tension and condition. • Check the humidifier canister for mineral deposits, condition of electrodes, all hoses and fittings are tight, water make-up valve for leaks.	
Rooftop Units (RTU)			• Inspect the return air filters. Clean or replace them if necessary. <u>COOLING SEASON</u> • During cooling season, check the unit's drain pans and condensate piping to ensure that there are no blockages. • Inspect the evaporator and condenser coils for dirt, bent fins, etc. • Manually rotate the condenser fan(s) to ensure free movementand check motor bearings for wear. Verify that all of the fan mounting hardware is tight. • Inspect the F/A-R/A damper hinges and pins to ensure that all moving parts are securely mounted. • Verify that all damper linkages move freely; lubricate with white grease, if necessary. • Check supply fan motor bearings; repair or replace the motor as necessary. • Check the fan shaft bearings for wear. Replace the bearings as necessary. • Check the supply fan belt. If the belt is frayed or worn, replace it. • Verify that all wire terminal connections are tight. • Remove any corrosion present on the exterior surfaces of the unit and repaint these areas. • Generally inspect the unit for unusual conditions (e.g., loose access panels, leaking piping connections, etc.) • Make sure that all retaining screws are reinstalled in the unit access panels once the checks are complete. • With the unit running, check and record the: ambient temperature; compressor suction and discharge pressures (each circuit). <u>HEATING SEASON</u> • Inspect the unit's air filters. • Check supply fan motor bearings; repair or replace the motor as necessary.	
Chiller				
Air Cooled Condensing Unit (ACCU)	• Check oil level in oil separator sight glass • Check liquid line sight glass / moisture indicator • Record system operating pressures and temperatures • Check condenser coils for dirt/debris and clean if necessary			• Check programmable operating setpoints and safety cutouts and ensure they are correct for particular application • Check compressor and cooler heaters for operation
Pumps (HPU)			• Inspect and Lubricate Motor. • Inspect pump for leaky seals or gaskets and loose or damaged components. Replace or repair as required. • Check bearing temperature with a thermometer, <u>not by hand</u>.	• Check the oil on oil lubricated units. • Check grease lubricated bearings for saponification. This condition is usually caused by the infiltration of water or other fluid passing the baring shaft seals and can be noticed immediately upon inspection, since it gives the grease a witish color. • Wash out the bearings with a clean industrial solvent and replace the grease with the proper type as recommended.
Waste Oil Heater	• Clean out ash.			
Boiler				
Door Heaters (DH)				
Air Curtain				
Hot Water Convectors (CONV)				
VAV Boxes (VAV)				
Domestic Water Heater			• Flush tank sediment, remove tank lime scale. • Inspect relief valve. • Clean flue baffle pipe.	• Inspect power burner motor. • Clean flue baffle pipe.

Equipment Type	Weekly Maintenance	Semi-Monthly Maintenance	Monthly Maintenance	Quarterly
Generator				
Air Compressor	• Check air dryer separator daily to be sure automatic drain is discharging. • Blow down air dryer separator. • Clean dust and foreign matter from cylinder head, motor, fan blade, air lines, intercooler and tank. • Remove and clean intake filters. • Check V-belts for tightness.		• Clean off air dryer condenser coil accumulated dust and dirt.	• Change crankcase oil. • Check entire system for air leakage around fittings, connections and gaskets, using soap solution and brush. • Tighten nuts and capscrews as required. • Check and clean compressor valves, replace springs, discs and seals when worn or damaged. • Pull ring on all pressure relief valves to assure proper operation.
Exhaust Fans (EF) (F)	• Establish a schedule for inspecting all parts of the fan. The frequency of inspection depends on the operating conditions and location of the fan.		• Inspect fans exhausting corrosive or contaminated air within the first month of operation. Fans exhausting contaminated air should be inspected every three months. • Regular inspections are recommended for fans exhausting non-contaminated air.	
Uninterruptible Power Supplies (UPS)	• Maintenance on these systems is normally provided by representative services or a company that is authorized and trained to provide service on this type of system.			
Gas Detection System				• Calibrate all sensors. • Visually check the controller and modules for dust or dirt build up. • Lubricate metal to metal parts (module lid). • Inspect modules for moisture or water accumulation.

Equipment Type	Weekly Maintenance	Semi-Monthly Maintenance	Monthly Maintenance	Quarterly
OPTIONAL EQUIPMENT				
Bus Wash System	• Grease centralized bearing lubrication system brush shaft and yoke pivot bearings, use manufacturer recommended grease only. Check for proper grease tube termination at grease fitting and bearing. • Grease air cylinder pivot and rod end bearings with lithium based grease only. • Fill air panel lubricators as necessary with petroleum based hydraulic oil, manfacturer recommended transmission fluid.		• Inspect wash lane, clean and flush drain trough, trough covers, and sump pit. • Clean and flush separator stand underflow tank. • Clean and flush separator stand Liquid Separator Cones. • Inspect separator stand reclaim flow switch paddle operation. • Inspect separator stand reclaim pump for coupling insert wear, coupling alignment, and signs of leakage at mechanical seal. • Inspect wash water storage tank, clean and flush. • Inspect reclaim sump, clean and flush. • Inspect reclaim sump, clean and flush basket strainers (if furnished). • Inspect reclaim sump and flush separator pump suction line. • Change brush motor oil. Approximately two quarts each reducer of manufacturers' recommended brand or equal.	• Inspect the motor and keep the motor clean and the ventilation openings clear. • Check that the interior and exterior of the motor is free of dirt, oil, grease, water, etc. • Use a "Megger" periodically to ensure that the integrity of the winding insulation has been maintained. • Check all electrical connectors to be sure that they are tight. • Use manufacturers' recommended lubrication intervals for all ball bearings and roller bearings.
Cyclone Bus Vacuum			• Grease air cylinder truunion and rod end bearings every month with general purpose lithium grease. • Bellows Swivel Joint Bearings; flange units should be greased with general purpose lithium grease. • Bellows Trolley Wheels; grease with general purpose lithium grease.	
Parts Washer Cabinet			• Inspect and/or adjust PBM (Power Blast Manifold) Swivel. • Clean the Air Intake - Burner Blower Motor. • Measure the Amperage Draw at Wash Pump(s). • Grease the Turntable Drive Bearings with manufacturer recommended grease. • Grease the Upper Manifold Bearing with manufacturer recommended grease.	
Steam Pressure Washer			• Inspect the Pump Motor at regular intervals. The exterior of the motor should be kept free of dirt, oil grease, water, etc. Keep all ventilation openings free from debris. If the motor is equipped with grease fittings, lubricate the motor after every 1000 hours of operation with manufacturer recommended lubricant or equivalent. If the motor is not with grease fittings, the pump motor bearings are permanently lubricated and will not require any additional lubrication.	• Replace pump oil every 3 months or 300 hours of operation, whichever comes first.
Filter Crusher				• Adjust the pressure switch. • Check the hydraulic oil level and refill if low or remove until the proper level is reached. • Replace the spring(s) if the crusher block is stuck in the down position.

ATTACHMENT 3
PREVENTIVE MAINTENANCE MATRIX

Equipment Type	Semi-Annual Maintenance	Annual Maintenance	24 Months
Heat Recovery Units (HRU)	• Lubricate motor base adjusting bolts with WD-40. • Confirm freeze-stat operates properly. • Inspect spray nozzles for accumulation of mineral deposits or blockage. Remove and clean as necessary. • Clean sump strainer and sump of accumulations or dirt and debris. • Inspect Float valve assembly for wear, leakage, and proper operation. Adjust sump fill level to 1/4" below the overflow drain (located in the sump).		
Heating and Ventilating Units (HV)		•Complete the monthly and quarterly maintenance schedules. •Inspect all fan wheels and housings; clean as necessary. •Check that all fan wheels and sheaves are securely set on the shaft. •Inspect all bearings and alignment; adjust as necessary. •Inspect all V-belts, replace if necessary. •Inspect all electrical components, connections and terminals. Clean and tighten as necessary. •Test ignition spark. Adjust gap if necessary. •Clean ignition electrodes and check for cracks. •Test flame safeguard relay and replace components as necessary. •Inspect all regulators, relief valves, motorized valves, solenoid valves, vent valves, manual shut-off valves, and safety shut-off valves. Check their operation and clean as necessary. •Ensure all vents to the atmosphere are clean and free from obstruction. •Inspect and clean all drip legs in the fuel line. •Lubricate fan motor as directed by motor manufacturer. •Inspect fan motor wiring for loose connections. •Lightly oil all door latches.	
Exhaust Fans (EF)	• Inspect bolts and setscrews for tightness. Tighten as necessary. • Inspect belt wear and alignment. Replace worn belts with new belts and adjust alignment as needed. • Inspect bearings as recommended in the Manufacturers Conditions Chart or as needed. • Inspect variable inlet vanes (if supplied) from freedom of operation and excessive wear. The vane position should agree with the position of the control arm. As the variable inlet vanes close, the entering air should spin in the same direction as the wheel. • Inspect springs and rubber isolators for deterioration and replace as needed. • Inspect for cleanliness. Clean exterior surfaces only. Removing dust and grease on motor housing assures proper motor cooling. Removing dirt from the wheel and housing prevents imbalance and damage.		
Unit Heaters (UH)	• Inspect prior to each season, more as needed based on conditions. • Inspect and tighten fan guard as needed. • Inspect and tighten motor bracket as needed. • Inspect fan and adjust for proper clearance, free rotation and firm connection to shaft. • Clean coils as needed and keep reasonably free of dirt, lint, and grease as needed. • Inspect for use of controlled water treatment. • Inspect and clean installed traps and piping.		
Electric Unit Heaters (EUH)		•Electric Circuitry-Inspect control panel wiring to ensure that the insulation is intact and the connections are tight; adjust as necessary. • Electric Circuitry-inspect all heater and relay contacts; if contacts appear badly pitted or burned, replace the contactor/relay. •Cleaning-clean the unit casing, fan and motor. Clean and repaint any rust spots on the casing. •Lubrication-inspect and check lubrication levels per manufacturers requirement; lubricate as necessary.	
Electric Infrared Heaters (IRH)	• Clean reflector surface with a damp cloth. • Ensure heater is secure on all hanging points. • Maintain clearance to combustibles. Immediately remove objects in violation of the clearance to combustibles. Part of pre-season check and as required.		
Air Handling Units (AHU)		•Inspect the unit casing for corrosion. Clean and repaint the surface with rust-resistant primer as necessary. •Inspect and clean the fan wheels and fan shaft. •Inspect and clean the drain pans. •Inspect damper linkages, set screws, and blade adjustment. Clean, but do not lubricate, the nylon damper rod bushings. •Inspect and clean damper operators. •Inspect wiring for damage and repair as necessary. •Inspect and rotate the fan wheel and check for obstructions in the fan housing. The wheel should not rub on the fan housing. Adjust and center as necessary and tighten the set screw to the proper torque. •Inspect and lubricate the motor bearings in accordance with the motor manufacturer's recommendations. •Inspect and lubricate the motor bearings in accordance with the motor manufacturer's recommendations. •Inspect condition of gasketing and insulation around unit, doors and dampers; adjust and replace as necessary. •Inspect flex connections for cracks or leaks; repair or replace as necessary.	

Equipment Type	Semi-Annual Maintenance	Annual Maintenance	24 Months
Make-up Air Units (MAU)	• Inspect and clean DX or chilled water coil twice yearly (if installed). • Verify the fan motor is properly aligned and bolted to the motor frame. • Lubricate fan bearings with manufacturers approved grease. • With power disconnected, manually rotate the fan wheel to check for obstructions in the housing or interference with fan blades or inlet guide vane option. • Check the fan assembly sheave alignment. Tighten set screws to their proper torques.	•Winterize Chilled Water Coil at beginning of heating season. •Check air throughput at beginning of heating season to confirm unit operation is within specified temperature rise range. •Clear Condensate drain pan and p-trap of water at beginning of heating season. Clean out drain and fill p-trap with non-toxic glycol solution. • Check and tighten all set screws, bolts, locking collars and sheaves. • Inspect, clean, and tighten all electrical connections. • Visually inspect the entire unit casing for chips or corrosion. Remove rust or corrosion and repaint surfaces. • Inspect fan, motor, and control contacts.	
Split System AC Units (AC-ACCU)		•Replace air filters every year minimum or as needed.	
Split System AC Units (Server Room)	• Check the compressor section for signs of oil leaks, vibration isolators. • Check the refrigeration cycle suction pressure, head pressure, superheat, evaporator coil clean, insulation intact. • Check the air cooled condensing unit condenser coil clean, motor mount tight, refrigerator lines properly supported. • Check back head pressure control, refrigerant level. • Check electric panel, electrical connections, operational sequence. • Check electric reheat element for corrosion. Clean corrosion and coat with manufacturers' recommendations.		
Rooftop Units (RTU)		• Regular coil maintenance, including annual cleaning, enhances the unit's operating efficiency by minimizing: compressor head pressure and amperage draw; evaporator water carryover; fan brake horsepower, due to increase static pressure loss; airflow reduction. • At least once each year, or more often if the unit is located in a "dirty" environment, clean the evaporator and condenser coils.	
Chiller			
Air Cooled Condensing Unit (ACCU)	• Check compressor superheat on evaporator and economizer TXV's; Check condenser and economizer subcooling • Leak check the chiller	• Sample compressor oil and replace oil if necessary • Disconnect power source and lock out; Check tightness of power wiring connections	
Pumps (HPU)	• Check the packing and replace if necessary. • Take vibration readings on the bearing housings. • Check shaft or shaft sleeve for scoring. • Check alignment of pump and motor. • Inspect all piping supports for soundness and effective support of load. • Drain pump seasonally if in danger of freezing.	• Remove the upper half of the casing. Inspect the pump thoroughly for wear, and order replacement parts if necessary. • Check wear ring clearances. See Engineering Data Section for standadr clearances. • Remove any deposit or scaling. Clean out stuffing box piping.	
Waste Oil Heater		• Service the metering pump. • Clean the check valve/screen. • Clean water/sludge out of oil tank. • Tune-up burner.	
Boiler	• Inspect Spark Igniter. Only performed after initial 6 month period after initial startup. If there is a substantial erosion of the spark gap or ground electrode, the igniter should be replaced. If carbon build-up is present, clean the igniter using fine emery cloth. Repeated carbon build-up on the igniter is an indication that a check of the combustion settings is required. Refer to Chapter 4 of the maintenance manual for combustion calibration. Prior to reinstalling the igniter, a high temperature anti-seize compound must be applied to the igniter threads. • Inspect Flame Detector. Only performed after initial 6 month period after initial startup. Inspect the detector thoroughly. If eroded, the detector should be replaced. Otherwise clean the detector with a fine emery cloth. • Check Combustion Calibration. Only performed after initial 6 month period after initial startup. Refer to Chapter 4 of the maintenance manual for combustion calibration instructions. • Inspect Condensate Drain Traps. Only performed after initial 6 month period after initial startup. If necessary, clean to ensure proper operation.	• Inspect Spark Igniter. If there is a substantial erosion of the spark gap or ground electrode, the igniter should be replaced. If carbon build-up is present, clean the igniter using fine emery cloth. Repeated carbon build-up on the igniter is an indication that a check of the combustion settings is required. Refer to Chapter 4 of the maintenance manual for combustion calibration. Prior to reinstalling the igniter, a high temperature anti-seize compound must be applied to the igniter threads. • Inspect Flame Detector. Inspect the detector thoroughly. If eroded, the detector should be replaced. Otherwise clean the detector with a fine emery cloth. • Check Combustion Calibration. Refer to Chapter 4 of the maintenance manual for combustion calibration instructions. • Inspect and Clean Condensate Drain Traps. If necessary, clean to ensure proper operation.	• Replace Spark Igniter. • Replace Flame Detector. • Inspect Burner. If the burner is being replaced, make sure to align the Spark Igniter and Flame Rod slots in the burner with the heat exchanger top head.
Door Heaters (DH)	• Inspect and clean at least twice per year or as necessary. Remove dirt build up from the inside of the cover housing, air inlet screen, blow wheels and housings, interior of unit and heating coils.		
Air Curtain	• The fan should be inspected to ensure there is no build up of dirt or other deposits on the impeller/motor. • Use an industrial vacuum or compressed air to remove dirt buildup from the inside of the cover housing, air inlet screen, blow wheels/housings, interior of the unit, and heating coils.	• Use an industrial vacuum or compressed air to remove dirt buildup from the inside of the cover housing, air inlet screen, blow wheels/housings, interior of the unit, and heating coils.	
Hot Water Convectors (CONV)	• Cover-clean and inspect for proper fit. Clean and adjust as needed. Semi-annually or as required due to location. • Heating element-clean and inspect. Clean and adjust as needed. Semi-annually or as required due to location.	• At the start of heating season, inspect, test, and repair or replace thermostatic control valves as required	
VAV Boxes (VAV)	• Inspect Units for proper operation and lubricate as necessary. Semi-annually or more if needed by operating environment.		
Domestic Water Heater	• Inspect relief valve • Flush tank sediment, remove tank lime scale. • Inspect power burner and ignition device. • Inspect vent system and barometric damper. • Clean flue baffle pipe. • Inspect bearings. • Inspect cleanliness. Remove dust and grease on motor housing to assure proper motor cooling.	• Check battery charger operation and rate.	

Equipment Type	Semi-Annual Maintenance	Annual Maintenance	24 Months
Generator	• Check battery electrolyte level and condition. • Check and record battery voltage reading. • Clean battery posts and terminals. • Clean battery exterior case. • Check battery charger operation and rate. • Check engine oil level • Check engine for oil leaks. • Visually inspect oil. • Check coolant level. • Check for coolant leaks. • Check coolant hose condition. • Visual inspection of coolant condition. • Check coolant conditioner level. • Check antifreeze protection level. • Check condition of belts. • Check jacket water heater operation. • Inspect radiator core. • Inspect radiator cap. • Check level of fuel storage tank. • Check level of fuel day tank. • Check fuel pressure. • Check for fuel leaks. • Drain water and sediment from above ground fuel tank. • Check governor fluid levels. • Check governor linkages. • Check air filter element. • Inspect air intake piping and intake manifold. • Inspect operation of air intake fams or louvers. • Inspect turbocharger compressor wheel. • Check turbocharger shaft end play. • Inspect exhaust system for leaks. • Check condition of silencer.	• Check battery electrolyte level and condition. • Check and record battery voltage reading. • Clean battery posts and terminals. • Clean battery exterior case. • Check battery charger operation and rate. • Check engine oil level • Check engine for oil leaks. • Visually inspect oil. • Change oil and oil filters. • Take oil sample. • Remove waste oil from customer's location. • Check coolant level. • Check for coolant leaks. • Check coolant hose condition. • Visual inspection of coolant condition. • Check coolant conditioner level. • Check antifreeze protection level. • Check condition of belts. • Check jacket water heater operation. • Inspect radiator core. • Inspect radiator cap. • Replace coolant filter. • Check level of fuel storage tank. • Check level of fuel day tank. • Check fuel pressure. • Check for fuel leaks. • Drain water and sediment from above ground fuel tank. • Check governor fluid levels. • Check governor linkages. • Replace fuel filters • Check air filter element. • Inspect air intake piping and intake manifold.	
Air Compressor			
Exhaust Fans (EF) (F)	•Inspect bolts and setscrews for tightness. •Inspect belt wear and alignment. •Inspect bearings		
Uninterruptible Power Supplies (UPS)			
Gas Detection System			• Replace the lithium battery

Equipment Type	Semi-Annual Maintenance	Annual Maintenance	24 Months
OPTIONAL EQUIPMENT			
Bus Wash System	• Lubricate reclaim pump motor shaft bearings. • Lubricate reclaim pump shaft bearings. • Inspect reclaim pump and clean volute inlet check valve. • Check brush motor oil level and fill if necessary. • Grease brush motor output shaft; use corrosive resistant manufacturers' recommended lithium based grease.		
Cyclone Bus Vacuum	• Grease fan motors outboard shaft bearing using a corrosive resistant lithium base grease, small amounts required.		
Parts Washer Cabinet	• Grease the Turntable Bearings with manufacturer recommended grease. • Measure Voltage at Power Distribution Block. Adjust as required. • Grease Door Bearings with manufacturer recommended grease. • Grease Wash Pump and Pump Motor with manufacturer recommended grease. • Inspect/Clean Float Assembly. • Oil ASE Blower Motor with manufacturer recommended oil. • Oil Burner Blower Motor with manufacturer recommended oil. • Clean or replace Water Solenoid Valves. • Inspect Wash Pump Couplings and replace as required.		
Steam Pressure Washer			
Filter Crusher			