



Preventive Maintenance

Increasing Your Equipment's Lifespan and Efficiency

The proper operation of power and battery systems must be constantly monitored to ensure that equipment is operating as designed and that no malfunctions exist. The best way to identify and eliminate conditions that may cause equipment failure is to implement a regimen of preventive maintenance services.

But specifically, why is Power System and Battery Maintenance important? There are a number of important financial and operational reasons, including:

- Maintaining the integrity of your power system;
- Timely replacement of cells/batteries that are outside performance specifications;
- Adjusting power plant to maximize performance and life;
- Enhancing worker safety by recording/eliminating possible safety issues; and
- Validating equipment warranty.

Integrated Power Sources of Virginia (IPS) offers two preventive maintenance (PM) programs, Valve Regulated Lead Acid (VRLA) batteries and Vented Lead Acid (VLA) batteries, to protect your battery and charger investment and ensure that your equipment is operating at peak performance. One of our PM programs is designed for forklifts and industrial vehicle applications, while our other PM program is tailored to standby power, solar, and mission critical applications.



Forklifts and Industrial Vehicles

Our PM program for forklifts and industrial vehicles is designed to maximize your productivity and reduce costs. We review the utilization of every electric powered vehicle in your facility. Our analysis includes the number of batteries per shift, output and function per charger, battery-to-truck match, and charger-to-battery match. This total operation review allows our technical representatives to determine the most efficient use of all equipment.

Standby Power And Mission Critical Operations

Our PM program for standby power, solar, and mission critical operations such as data centers, hospitals, telcos, and high security applications is designed to eliminate the risk of backup power failure. This program includes a complete range of specialized services and is essential to applications where the interruption of power is not an option.



Shown below are the maintenance services included in our two PM programs.

Preventative Maintenance Program for standby power, solar, and mission critical applications.
VLRA Lead – Acid Stationary Batteries

| | Performance Schedule: | |
|--|-----------------------|----------|
| | Quarterly | Annually |
| • Measure and record battery voltage | x | x |
| • Measure and record charger output current and voltage | x | x |
| • Measure and record voltage of each cell/unit | x | x |
| • Measure and record the total voltage of system | x | x |
| • Visually inspect each cell/unit and all connections in detail | x | x |
| • Measure and record internal resistance of every cell/unit | x | x |
| • Measure and record Micro-Ohm resistance of all connections | | x |
| • Measure and record AC Ripple Voltage | | x |
| • Retorque all connections | | x |
| • Inspect the battery rack and battery area and clean as necessary | x | x |
| • Measure and record negative post connection temperature | x | x |
| • Measure and record ambient temperature within battery room | x | x |
| • Check condition of ventilation equipment | x | x |
| • Check proper operation of eye wash station | x | x |
| • Provide an inspection report of findings and corrective actions | x | x |

Vented Lead – Acid Stationary Batteries

| | Performance Schedule: | |
|--|-----------------------|----------|
| | Quarterly | Annually |
| • Measure and record battery voltage | x | x |
| • Measure and record charger output current and voltage | x | x |
| • Inspect electrolyte levels and add water as required | x | x |
| • Measure and record specific gravity of every 10th cell/unit | x | |
| • Measure and record specific gravity of each cell/unit | | x |
| • Measure and record voltage of each cell/unit | x | x |
| • Measure and record the total voltage of system | x | x |
| • Visually inspect each cell/unit and all connections in detail | x | x |
| • Measure and record Micro-Ohm resistance of every cell/unit | x | x |
| • Measure and record Micro-Ohm resistance of all connections | | x |
| • Retorque all connections | | x |
| • Clean and neutralize jar covers as necessary | x | x |
| • Inspect the battery rack and battery area and clean as necessary | x | x |
| • Measure and record ambient temperature within battery room | x | x |
| • Check condition of ventilation equipment | x | x |
| • Check proper operation of eye wash station | x | x |
| • Provide inspection report of findings and corrective actions | x | x |

Preventative Maintenance Program for Industrial Forklift/Pallet Jack and Industrial Vehicles.

Industrial Forklift/Pallet Jack Batteries:

- Visual inspection of battery's overall condition (safety related problems, over watering, watering system and corrosion build-up, etc.);
- Read and record individual cell voltage-open circuit;

- Read and record cell specific gravity;
- Check for proper electrolyte levels and adjust as required;
- Check DC cables for torn insulation and physical damage;
- Check connectors for damage, including contacts; and
- Provide an inspection report of findings and recommended repair / corrective actions.

Industrial Forklift/Pallet Jack Battery Charger:

- Check DC output and fusing and AC input and fusing;
- Inspect ammeter for proper operation;
- Check control circuit for proper start-up;
- Check DC cables for torn insulation and physical damage;
- Check connectors for damage including contacts;
- Air clean charger (once per year); and
- Provide an inspection report of findings and recommended repair / corrective actions.

Other Related Services:

- Neutralize and clean batteries on-site with our mobile wash station; and
- Remove treated wash solution from customer's premises.

Safety Repairs:

As part of our PM Program for Forklifts / Pallet Jacks and other industrial vehicles, customers agree to pre-approve the following list of safety repairs to ensure compliance with OSHA regulations:

- Repair cut cable with heat shrink tube;
- Replace worn contact tips;
- Replace lost safety shrouds;
- Replace damaged cable;
- Replace lost / damaged vent caps;
- Replace bad AC / DC charger fuses; and
- Replace broken connectors.

As Virginia's power professionals, IPS is not only dedicated to helping our customers identify and integrate the best solutions for their power challenges, but also to helping ensure the maximum possible return on their investments as well as years of trouble-free and dependable service. For over 20 years, unparalleled customer service and satisfaction has been the cornerstone of our business.

Contact us today at 804.359.9471 or sales@ipsofva.com for an appointment to discuss how a PM program from IPS can help reduce premature equipment failure as well as ensure maximum return on your investment dollar.