



Experts in  
**ELECTRICAL  
RELIABILITY**

# ELECTRICAL EQUIPMENT RELIABILITY



How do you define your current challenge? Are you facing the daunting task of starting up a new facility? Perhaps you're looking for innovative methods to maximize the performance of existing operations. Or, is extending the life of an aging plant your priority? Improving your facility's availability and performance are critical in achieving your business goals. Regardless of where you currently are in the lifecycle of your operation, the reliability of your electrical equipment plays a key role in determining your success.

Properly installing, testing, and maintaining your equipment is a viable predictor of future performance. If your facility uses low, medium, or high voltage electrical equipment, consider the benefits of partnering with the company that pioneered electrical equipment testing.

We have served the industrial operations for power, manufacturing, healthcare, data centers, food & beverage, mining, oil & gas, chemical, semiconductor, telecommunications, transportation, and water treatment facilities.

Our combined resources comprise the leading independent electrical testing, maintenance, and engineering service company in the United States. With more than 40 years of experience, you can rely on us to exceed your electrical equipment performance goals. From testing for equipment deficiencies that could disable your system, to complete project execution, we are your single source solution.

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# BETTER TEAM. BETTER SOLUTIONS.

Both processes and equipment eventually degrade and fail. The strategy of exchanging like-for-like only works for so long. You may still produce, but at yesterday's performance levels. By pushing those levels upwards you can achieve short-term savings and long-term profits. The right partner with the right experience can help you achieve these goals.

We utilize the proper mix of expertise, technology, and people. For more than 40 years, we've developed each segment of this mix to create a complete business solution that works within the framework of your financial and performance expectations.

### Backed by the Power of Emerson

We are a wholly owned subsidiary of Emerson, a world leader in bringing together engineering and technology to help businesses automate their production, processing and distribution processes.

### Unparalleled Expertise

Our engineers' and technicians' accreditations and skill levels are considered to be in the nation's top ten percent for the industry. Certified by InterNational Electrical Testing Association (NETA), they have the practical experience to accomplish the most complex projects safely and reliably.

### Unbiased, Objective Results

As an independent third party company, we are committed to providing objective, unbiased test results and recommendations. As a full member of NETA, we perform all testing using objective methods according to NETA specifications with calibrated instruments traceable to the National Institute of

Standards and Technology (NIST).

### Advanced Technology

Continued investment in advanced technology enables us to utilize the latest preventive and predictive technologies to provide the most advanced and cost effective maintenance solutions available.

### Local Support

Whether it's an emergency or an ongoing project, you need service partners who can respond where and when you need them. With strategically located Service Centers, and multiple international alliances, you'll receive local service with worldwide capability.

### Safety

Regardless of location, safety is paramount. All field engineers and technicians undergo rigorous training to ensure their safety and yours.

### Investing in You

Our greatest investment is in the relationships we have built with more than 10,000 repeat customers worldwide. Through these relationships we have built the processes to improve plant availability, increase productivity, and reduce equipment cost-of-ownership. We work with you to improve the availability, safety, and reliability of your power distribution system. With a proven track record in multiple industries, our capabilities cover your entire operation. Examine our resources, expertise, and track record so that you can discover how we can assist your operation with the only results that really count—the bottom line.

## STARTUP & COMMISSIONING: GET IT RIGHT FROM THE START.

Startup is the time to think about future reliability. It's your chance to do it right from the beginning. Engaging our services to startup the entire electrical distribution system aligns the right equipment and systems to ensure your new operation will reach peak performance quickly and easily.

### Startup and Commissioning Services

68% of early equipment failures can be traced to design, installation or startup deficiencies. We help you avoid these pitfalls by developing an overall commissioning plan with step-by-step detailed procedures to provide clear guidance. It ensures newly installed equipment and systems in your new facility meet the design intent and operates efficiently as an integrated system.

Properly done, commissioning projects can pay dividends in the form of decreased rework, fewer change orders, lower operation and maintenance costs, and lower utility bills.

### Optimum Performance.

#### Minimum Time.

Rely on our team to help yours during a critical startup. Our integrated service package combines the right people and the right resources to deliver the shortest possible startup with maximum performance levels.

#### Our Services Include:

- Design Review
- Acceptance Testing & Calibration
- Documentation & Manuals
- Personnel Training
- Maintenance



## PREVENTIVE & PREDICTIVE MAINTENANCE: THE POWER OF TESTING.

It's undisputed. If you have equipment, you will have problems. In fact, 60% of breakdowns are due to poor maintenance and 25% of fires and explosions are electrically induced. What if you could foresee problems like these, days or even months, before they occur? Predictive and Preventive Maintenance enables you to do just that. Our reliability-based maintenance solutions combine the best techniques from each of the traditional maintenance approaches. The result? A comprehensive balanced maintenance strategy that enables you to design a maintenance plan that pinpoints when and where it is needed most.

### Preventive Maintenance

An optimized preventive maintenance strategy evaluates the condition of your equipment and determines the most cost-effective and manageable solution to ensure your equipment's overall performance, safety, and reliability. Let us help you design and implement a preventive maintenance strategy that will reduce your overall maintenance costs and the amount of time spent on unplanned maintenance. More significantly, we can help improve overall reliability throughout your facility.

#### Our Services Include:

- Transformer Testing
- Circuit Breaker Testing
- Low and Medium Voltage Switchgear Retrofitting
- Switchgear Testing
- Cable Testing
- Protective Device Testing
- Ground Fault Systems Testing
- Standby Generation System Testing
- Infrared Scanning
- Battery Testing & UPS Testing
- 24-hour Electrical Emergency Assistance

### Predictive Maintenance

Predictive Maintenance is a window into the future of your equipment's performance. By performing the following, we can help you identify when a failure will occur so you can plan an outage versus dealing with an unexpected failure. This information is essential in making the best use of your maintenance dollars.

- Electrical Testing provides insight into the physical condition of electrical systems and its components
- Oil Analysis examines routine samples of insulating fluid for particulate and contaminants that indicate wear
- Thermography detects heat buildup in switchgear, which is often a precursor to failure
- Ultrasonics detect noise generated by electrical defects including corona discharge, sparks, and flashovers
- Partial Discharge Testing & Monitoring provides a variety of solutions to effectively monitor the condition of electrical assets

## PARTIAL DISCHARGE TESTING & MONITORING:

# DETERMINE THE HEALTH OF YOUR ELECTRICAL ASSETS.

Electrical systems are among the most valuable assets in your plant and can have the biggest impact on your bottom line. Their production and management costs are high, and failures almost always lead to catastrophic losses. Electrical systems are being operated at higher levels, even while systems are aging - which affects both the life and reliability of your assets.

Today's asset managers are facing the increased challenge of maximizing their aging electrical infrastructure with fewer qualified technical in-house resources, stricter regulatory requirements for worker safety, and diminishing maintenance budgets.

Advances in technology, including the use of Partial Discharge Testing, are giving asset managers new approaches to achieve improved reliability and performance of critical assets while making informed decisions on critical maintenance planning.

Because partial discharge activity is often present well in advance of insulation failure, asset managers can monitor it over time and make informed strategic decisions regarding the repair or replacement of the equipment. These predictive diagnostics help companies to prioritize capital and MRO investments before an unexpected outage occurs. Partial Discharge Testing results can help predict future performance and reliability of critical assets, including:

- Cables, Splices, and Terminations
- Power Transformers and Bushings
- Switchgear
- Motors and Generators

### Our Integrated Partial Discharge Solutions

HVM's integrated Partial Discharge Testing and Monitoring solutions include online testing as well as periodic and continuous monitoring of your electrical assets. Depending on your specific operating requirements and application, HVM can customize a program to best fit your needs.

Choose from the following solutions:

- Partial Discharge Testing
  - Handheld Survey
  - Periodic Partial Discharge Testing
  - Continuous Online Monitoring
  - Permanently Mounted Sensors
- Ultrasonics
- Tan-Delta
- Very Low Frequency Testing (VLF)



## TURNAROUND & OUTAGE SERVICES:

# YOU SCHEDULE TURNAROUNDS. NOW PLAN FOR A BETTER RETURN.

Equipment begins to deteriorate the first day it is put into operation, making future maintenance inevitable. Since every hour of extended downtime translates into lost profit dollars, it's essential to examine the quickest possible return to operation. Part of this process is choosing a partner with the critical elements in place to serve your shutdown needs. From best-in-class employees to advanced diagnostics, we can be an integral part of your turnaround team.

### Plan for a Successful Turnaround

An effective turnaround strategy starts with effective planning. Let us help you design and implement a turnaround strategy that will ensure you get the most out of the available time for maintenance. Starting with pre-outage planning, we will conduct preliminary diagnostic testing to evaluate the condition of your equipment and determine the most cost-effective and manageable solution to ensure your equipment's overall performance, safety and reliability.

Risk insurance companies demand periodic predictive electrical inspections and testing to detect deficiencies before they result in unscheduled outages, loss of production, and damaged equipment. During a scheduled outage, it is an ideal time to perform these tests. We inspect, clean, lubricate, calibrate and perform electrical diagnostic testing on breakers, switches, motors, relays, cables, batteries and transformers to ensure proper performance.

### Our Turnaround / Outage Services Include:

- Pre-Outage Diagnostic Testing
- Clean and torque electrical switchgear
- Repair, refurbish, replace obsolete and defective equipment
- Test and calibrate protective devices
- Test low, medium and high-voltage equipment
- Test underground cables using partial discharge testing
- Perform power factor and dielectric testing on transformers
- Perform system integration testing

### Achieve Direct Measurable Bottom Line Results

An effective turnaround that accomplishes all the planned electrical maintenance activities will produce:

- Reduced cost of repairs and downtime
- Improved overall system performance
- Reduced risk of future equipment failure
- Established base-line record utilized as part of an ongoing maintenance program to enhance the safety, reliability and efficiency through future preventive maintenance

## ENGINEERING & CONSULTATION:

# IMPROVING SYSTEM PERFORMANCE.

Prior to spending one more dollar on capital investment, take a closer look at what you already have. By utilizing your existing assets more effectively, you can expect enhanced performance and increased availability.

### Life-Extension Services

Life-extension services provide a wide range of retrofit and upgrade solutions to maximize the value of existing equipment while improving overall system performance. Retrofits add operational flexibility, interchangeability, and communication capabilities to breakers. In many cases, retrofits and upgrades offer new technology at a fraction of the cost of replacement.

Each breaker is disassembled, inspected, refurbished or replaced with correct parts, and rebuilt. The refurbished breaker is fully design-tested and meets all applicable standards.

#### Our Life-Extension Services Include:

- Low and Medium Voltage Circuit Breaker Retrofits, Vacuum and SF6
- Modernization of Outdated and Under-rated Equipment
- Automatic Transfer Switch Retrofits
- Solid State Protective Relay Retrofits
- Emergency Circuit Breaker Rentals and Loans
- Replacement Parts

### Engineering Studies

Engineering studies verify system protection, fault rating of electrical equipment, and the overall reliability of your system. They are key to uncovering the profit in your existing assets or in helping you select electrical equipment if you decide to build a new facility.

Using state-of-the-art hardware and software to analyze the needs of your power system and your facility, our power system engineers provide you with critical information to make informed decisions.

#### Our Engineering Studies Include:

- Short Circuit Studies
- Coordination Studies
- Harmonic Studies
- Load Flow and Power Factor Studies
- Power System Studies
- Arc Flash Studies
- Reliability Studies

### Arc Flash Solutions

Electrical hazards - specifically shock, arc flash, and arc blast - can result in serious injury or death to electrical workers. Ensuring worker safety and meeting the challenges of new arc flash safety requirements can be a difficult task to accomplish in-house without the assistance of resources familiar with industry standards and recommended practices.

#### Our Arc Flash Solutions include:

- Arc Flash Hazard Analysis
- Arc Flash Hazard Labeling Plan
- Site Review / Compliance Assessment
- Design Review
- Single-line Diagram
- Short Circuit and Coordination Studies
- Preventive Maintenance
- Electrical Safety Program Review/Development
- Training
- Personal Protective Equipment Plan
- Optional Annual Re-certification
- Documentation

## EDUCATIONAL SERVICES:

# MAXIMIZE YOUR HUMAN ASSETS.

Companies today are relying on fewer people to do more work. At the same time, what companies ask of people and technology is becoming more complex. This is why the need for proper training is more critical than ever to achieve and maintain cost-effective process operations.

### Educational Services

Creating and training a best-in-class team takes time and financial resources — two things that are typically limited in today's overtaxed workforce. Add the challenges of skilled labor attrition to the mix and you quickly understand the need for effective performance consulting and training.

Our Educational Services team has the capabilities and resources to ensure your workforce receives the most effective training and development to meet today's process challenges. Our instructors and consultants are industry experts who have honed their skills through years of field experience and remain active in their field of expertise.

This insures you receive up-to-date training on both course content and assessment techniques. Whether you choose one of our turnkey packages of customized or standard instruction programs, you'll benefit from the industry leader with expertise in providing quality

electrical testing, maintenance, and engineering services. This is due to the strong emphasis we place on certifications such as Professional Engineers, Certified Test Technicians, and many other accreditations. With this in mind, all courses are specifically designed to support continuing education and re-licensing requirements of most states.

The obvious benefit of customized on-site instruction is that your team is trained on your equipment, operations, and systems but it also eliminates employee travel and living expenses. And, since training is conducted during your employee's normal working hours, no shift differential costs are incurred. When your situation requires more flexibility in custom training for your workforce, our online instruction via WebEx offers the same world-class instruction designed around your schedule.

### Performance Solutions

Performance Solutions is a program designed to help our customers improve the efficiency and performance of your most critical assets, including both people and equipment. The benefits of working with our consultants include improved safety of your personnel, protection of property, and compliance with regulatory codes and standards.

Our Performance Solutions include:

- Skill Assessment
- Task Analysis
- Gap Analysis
- Personnel Safety
- Policy & Procedures
- Regulatory Compliance
- New Equipment Training Assessment
- Maintenance Practices Assessment

### Training Services

HVM's Training Services program is designed to provide the latest, most cost-effective, and flexible electrical training from the industry experts. Our standard and custom training courses can be delivered at your site, our site, or online. Courses are available in the following training areas:

- Electrical Safety
- Arc Flash Programs
- Operational Maintenance
- Certified Technician
- Power Quality
- Specialized Electrical Equipment Courses



For more information about our services and  
how we can help

**hvmcorp.com**

Or call us at (866) HVM TEAM

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**(866) HVM TEAM**  
**www.hvmcorp.com**



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