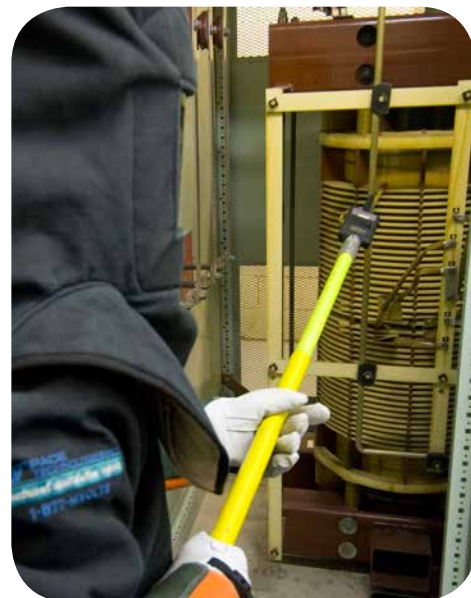




Electrical Distribution Experts

- Fault Locating
- Equipment Testing
- Arc Flash Solutions
- Equipment Repairs
- Gas Leak Detection
- Acceptance Testing
- Upgrades & Retrofits
- Insulating Fluid Analysis
- Commissioning & Start-up
- Cable Terminating, Testing
- Infrared Thermal Scanning
- Corona/Ultraviolet Scanning
- Emergency Response Services
- Predictive Maintenance Testing
- Harmonic & Power Quality Analysis



24-Hour Hotline: 1-877-HI-VOLTS (448-6587)
www.pacetechnologies.com



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Pace Technologies Inc. was established in 1989 and has earned a high level of regard and respect by our clients and peers. Pace Technologies Inc. has always been, and will continue to be, the industry leader in providing professional and quality service. We are dedicated to consistently achieve the following mandates in every aspect of our business:

- To provide the highest quality, truly independent testing services available to all aspects of the electrical industry (commissioning, testing, supervision, modifications, upgrades, etc.).
- To be constantly aware of the changing needs of our clients and capable of adapting to those needs.
- To ensure that client testing needs are met in the safest, most precise, expedient and cost effective manner possible.
- To continually provide technical and safety training to our personnel and to our clients to ensure their safe and prosperous futures together.





Services Overview

Pace Technologies Inc. is engaged in the practice of testing, commissioning, and maintenance of high, medium, and low voltage power systems. We evaluate, advise, and report after technical inspection and testing of individual components and system operation to ensure that power systems operate within or above those specifications outlined by owners and engineers.

When a power system is built or modified it is generally the owner's request to have the system inspected and tested by a testing agent independent of the electrical construction contractor or equipment manufacturer. This ensures the system operates to the owner's satisfaction, as outlined in the Specifications and/or Commissioning Guidelines. Pace Technologies Inc. provides that service as well as future maintenance programs and activities. The members of our company have extensive experience and training in the testing of the oldest and most modern of power systems. Pace Technologies Inc.'s client base is extensive and ever increasing, including:

- Oil and Gas Industries
- Health Care Facilities
- Utilities
- Government Facilities
- Mining
- Large Commercial Facilities
- Industrial Plants
- Manufacturing Facilities



As Pace Technologies Inc. is not a distributor or marketing agent of any manufacturer we provide an extensive, objective evaluation of all power systems in a technical report that reflects all of our findings and recommendations. Pace Technologies Inc. is a group of power systems specialists with considerable experience and insight to service the needs of continually expanding client demand.



Experience & Expertise

Pace Technologies Inc. has earned a reputation of being one of the best electrical distribution companies in the industry. Part of this is because of our vast experience over the last 25 years, but unquestionably, it can be attributed to our people. We believe that if you want to offer the best service, you need to employ the best people, and because of this belief, we have been able to offer the very best in all aspects of our business and have a track record to prove it.

- Years of quality service: since 1989
- **The largest infrared company in Canada**
- Use the most state of the art relay equipment
- Emergency response varying from British Columbia to Alberta to the Northwest Territories
- Can accommodate the smallest jobs such as cable locating and ground grid testing to the largest jobs such as commissioning, maintenance and retrofits
- We do the majority of Z32 hospital specification testing in Alberta
- Quick service call response time
- 90% repeat clients on an annual basis
- Ongoing contracts in the Caribbean, U.S.A. & Middle East



Employee Qualifications

- Master Electricians
- Power Systems Electricians
- Certified Thermographers
- Switchgear Specialists
- Electrical Technologists
- Electrical Engineers
- Drive Systems Specialists





Acceptance Testing

The electrical distribution system is the heart of a facilities operation. Acceptance testing is an ideal solution to determining if your equipment has been installed correctly. Pace Technologies Inc.'s technicians can provide the services required to ensure your new system has been installed correctly and will operate as designed. Pace Technologies Inc.'s technicians perform acceptance testing in accordance with NETA specifications while also referencing the manufacturers' specifications.

Preventative Maintenance Testing

It's natural for electrical equipment to degrade over time, but it doesn't necessarily have to fail. Preventative Maintenance Services from Pace Technologies Inc. will evaluate the condition of your equipment and determine the most cost-effective and manageable solution to ensure its overall performance, safety and reliability.

Elements of a good preventative maintenance program should include the following:



- Typical equipment to be inspected including switchgear, circuit breakers, transformers, switches, etc.
- Establishment of schedules and procedures for routine inspections
- Periodic testing of plant equipment for structural soundness
- Prompt repair or replacement of defective equipment found during inspection and testing
- Inventory of spare parts for equipment that needs frequent repairs
- Use of an organized record-keeping system to schedule tests and document inspections
- Commitment to ensure that records are complete and detailed, and that they record test results and follow-up actions
- Preventative maintenance inspection records should be kept with other visual inspection records

Let us help you design and implement a preventative maintenance strategy that will reduce your overall maintenance costs and the amount of time spent on unplanned maintenance; and more significantly, improve the overall reliability throughout your facility.



Commissioning & Start-up

Nearly 70% of early equipment failures can be traced to design, installation or start-up deficiencies. Similarly, newly launched plants experience many unnecessary outages due to improper coordination and calibration of protective devices, wiring errors, design errors, etc. In other cases, the failures don't occur until months after the facility has gone into operation and the warranties have expired. Loose connections or insulation damage may not show up until more equipment comes online and electrical loads increase.

The inspection and testing performed on an electrical power system and its components before initial energization is perhaps the most important preventative maintenance that the system and/or components will receive during their operational life.

When normal start-up testing isn't performed (usually to save a few dollars), the results can be disastrous. Perfectly good switchgear, transformers or other equipment can be "smoked" due to relatively small installation errors.



Pace Technologies Inc.'s Commissioning & Start-up Services for electrical distribution systems can verify that the equipment has been properly installed. We'll also determine whether any equipment has been damaged during shipment or installation and ensure that your equipment complies with the purchase specifications and design intent.

Using Pace Technologies Inc.'s Commissioning and Start-up services will help ensure that your newly installed equipment operates efficiently as an integrated system. Properly done, commissioning projects can pay dividends in the form of decreased rework, fewer change orders, fewer delays, lower operation and maintenance costs, and lower utility bills.

Commissioning and start-up testing also provides valuable baseline or benchmark information that can be used to evaluate future maintenance decisions.





Emergency Response Services

Unexpected failures can pose serious hazards with potentially devastating effects. From damage assessment and inspection to equipment repair, refurbishment and replacement, Pace Technologies Inc. is your source to get you up and running quickly, ensuring your safe, reliable return to operation.

When you have an emergency, count on Pace Technologies Inc. for expert onsite electrical services within specified service areas. We have technicians available around the clock, seven days a week, for critical emergency needs, including:

- Troubleshooting
- Damage Assessment
- Inspection & Testing
- Equipment Repair / Recondition
- Replacement Equipment
- Spare Parts Support
- Installation
- Commissioning & Start-up



Arc Flash Solutions

Are You Compliant?

Arc Flash is a serious hazard with potentially devastating effects. Ensuring worker safety and meeting the challenges of the arc flash safety requirements can be a difficult task. Trust Pace Technologies Inc.'s experience to deliver the most complete solutions for arc flash compliance. From hazard analysis and labelling to personal protective equipment and training, Pace Technologies Inc. is your source to reduce your risk, provide the industry's best safety programs, and ensure regulatory compliance. Whether you require a complete program or short-term assistance with arc flash calculations, Pace Technologies Inc. has a solution to fit your needs. Select from our menu of services for Arc Flash Solutions.



Arc Flash Solutions (CONT'D)

Arc Flash Hazard Analysis (Study)

CSA Guidelines require facility owners to perform an arc flash hazard analysis prior to allowing a worker or contractor to perform a task on energized equipment. The arc flash analysis identifies the presence and location of potential hazards and provides recommendations for PPE, boundaries for limited, restricted and prohibited approaches, recommendations for flash protection, and safe work practices.



Arc Flash Hazard Labelling Plan

CSA states a warning label must be placed on electrical equipment that may remain energized during maintenance or repair. Pace Technologies Inc. can assist with compliance during each phase of an arc flash hazard analysis. In the initial phase, Pace Technologies Inc. supplies the labels and can also assist in applying the appropriate warning labels and signs.



Site Review / Compliance Assessment

Various Provincial Occupational Health and Safety Administrations (OSHA) are diligent in enforcing the CSA Z462-08 Guidelines. To ensure compliance Pace Technologies Inc. can determine the necessary steps to fulfill the more general statements in the OSHA standards. We conduct a comprehensive assessment at your facility to identify areas of risk and non-compliance. A plan is then formulated to bring your facility into compliance in the most efficient way possible.

Mitigation Services

Pace Technologies Inc. technical staff can conduct a design review of your electrical distribution system to identify areas to reduce potential arc flash hazards. Several areas are evaluated including fault levels, exposure times, remote operations, remote racking, and system grounding. Employing special devices and altering current design can significantly reduce fault levels, arcing time, arc incident energy, and arc blast force. Conducting a design review is the most effective way to uncover potential hazards so these types of solutions can be employed.





Arc Flash Solutions (CONT'D)

Single-Line Diagrams

Current CSA requirements mandate accurate, up-to-date single-line diagrams. These documents are essential for documenting, troubleshooting, and communicating information about your power systems. To meet these requirements, Pace Technologies Inc. can conduct a comprehensive site survey that is essential to develop or to update existing single-line diagrams or complete electrical system drawings.

Short Circuit And Coordination Studies

Pace Technologies Inc. recommends that Arc Flash calculations be completed in conjunction with short circuit calculations and protective device coordination to achieve the most accurate Arc Flash Hazard results. Short circuit and coordination studies verify protective devices and arc hazard ratings, calculate momentary interrupting and relay currents, establish settings for all types of protective devices, and coordinate your entire power distribution system to minimize downtime.

Preventative Maintenance

Pace Technologies Inc. can assist in developing a preventative maintenance program to specifically address arc flash hazards. Our optimized preventative maintenance program evaluates the equipment's condition and determines the most cost-effective and manageable solution to ensure your protective devices operate properly, safely, and reliably eliminating prolonged exposure to arc flash, which could result in disabling injuries or death.



Arc Flash Solutions (CONT'D)

Training

An effective arc flash training program should provide workers the knowledge and understanding of the existence, nature, causes, and methods to prevent electrical hazards. Pace Technologies Inc.'s arc flash training program includes training on arc flash awareness, standards and codes, understanding of arc flash quantities, selection and use of appropriate PPE, reading and following warning signs and labels, methods to reduce risk while working on live exposed parts, arc flash hazard assessment, and documentation.

Personal Protective Equipment

Pace Technologies Inc.'s Personal Protective Equipment addresses all CSA requirements and OSHA standards regarding PPE to ensure compliance. Based on the findings of the arc flash analysis, Pace Technologies Inc. will provide PPE category requirement and recommendations. We can also assist in the selection and supply of recommended equipment on which workers will be trained. Our team will address when the PPE is necessary and what equipment is needed. Pace Technologies Inc.'s approach covers how PPE should be worn, maintained, and disposed of after the equipment life has expired.

Documentation

Proper documentation ensures compliance with OSHA and CSA requirements and facilitates investigation should an arc flash related injury occur. Thorough documentation is one of Pace Technologies Inc.'s strengths. Our arc flash compliance plan consists of a customized written report that includes the result of the arc flash analysis, updated single-line drawings on electrical systems, signs and labels on equipment and hazardous areas. Also included in the documentation are the type, name/ID, incident energy at working distances, flash protection boundary, hazard/risk category, and other pertinent information such as voltage, available fault current, protective device description and its trip time, arc gap, and current. Documentation can also be provided as part of the safety program and documentation of training provided to workers.



Harmonic & Power Quality Analysis

Line Disturbance Analysis

With the increasingly widespread use of sensitive computer equipment, high voltage spikes and disturbances are creating problems in many facilities. Pace Technologies Inc. can apply recording units to your power system to assist in determining the origin of these disturbances. We will also make recommendations as to the most effective methods of reducing these problematic conditions.

Harmonic Analysis

Pace Technologies Inc. can monitor harmonics to determine their frequency and magnitude. Once the extent of the problem is determined we can assist in supplying harmonic suppression systems to reduce the problematic effects of these harmonics.

It has always been one of Pace Technologies Inc.'s mandates to provide state of the art test equipment to meet client needs.

Power Factor Analysis

Pace Technologies Inc. can monitor the power factor of your system to determine its operating characteristics. Recommendations based on the demand versus the power factor as to the size and type of power factor correction equipment to apply can be made subsequent to the monitoring period. Improving a system's power factor can greatly reduce utility charges and increase system efficiency.

We supply and install automatic stepped capacitor banks or static capacitors upon request.



Cable Terminating & Testing

Cable Terminating And Splicing

Pace Technologies Inc. provides high, medium and low voltage cable terminating and splicing services. We provide and install "hand built" or manufactured "kit style" stress relief devices to high voltage cables as well as separable network connectors and load break elbows.

Cable terminating includes:

- Cutting cables to proper length
- Installation of termination kits
- Re-jacketing of exposed shielded portion
- Installation of lugs
- Installation of shield grounding
- Installation of skirts on Class 1 terminations
- Installation of trifurcation boots where required



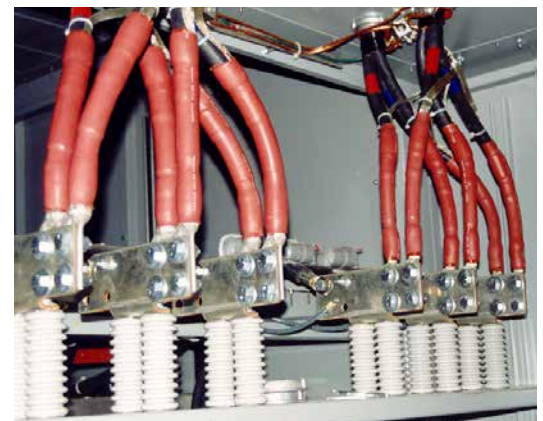
Cable Testing

High, medium and low voltage cable testing services are provided by Pace Technologies Inc. The Voltage Step method is incorporated into all cable testing. We strictly adhere to all precautions and limits as specified in the applicable International Electrical Testing Association Inc. (NETA) Standards for the specific cable. Tests are also performed in accordance with ANSI/IEEE Standard 400. Upon completion of cable testing, results are formally documented and then graphed on our standard form for this purpose.

Pace Technologies Inc. has performed hundreds of cable locations and cable fault locations each year using state of the art equipment.

Cable testing may also include:

- AC dielectric withstand testing
- Fault locating
- Cable location testing
- Time domain reflectometry
- Capacitance/power factor testing
- VLF and Tan Delta





Infrared Thermal Scanning

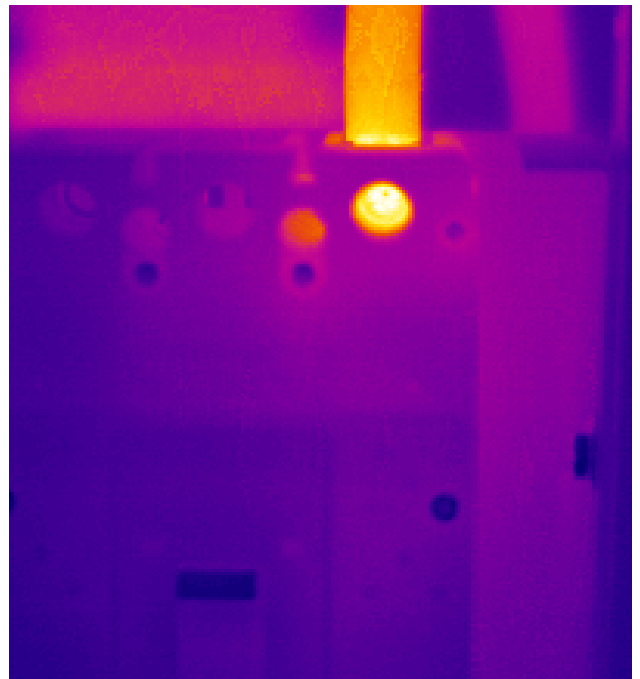
Infrared thermography is a valuable tool in determining the condition of electrical equipment. Basically all objects emit thermal energy which can be viewed with a scanner whose purpose is to convert this electromagnetic thermal energy radiated to electronic video signals.

Results may be interpreted by obtaining a hard copy (photograph or CD) of the thermal image and determining temperatures at the suspect areas.

Pace Technologies Inc. offers highly experienced Certified Thermographers to perform scanning of all electrical equipment. Upon completion of infrared scanning Pace Technologies Inc. will provide a comprehensive report indicating the following:

- Problem area (location of “hot spot”)
- Photographic comparison between conventional and thermographic images of the “hot spot” scanned
- Temperature rise between “hot spot” and normal or reference area
- Cause of heat rise
- Phase unbalance, if present and measurable
- Areas scanned
- Recommendations toward resolving an existing problem (eliminating a “hot spot”) depending on its severity

Large projects such as scanning the entire outdoor distribution system at Syncrude Canada - Mildred Lake have been completed by Pace Technologies Inc.



Infrared Inspection Windows

Inspection in electrical opening high voltage boards, switchgears and transformers, requires access to the equipment. Thermographic inspection windows enable permanent access for the inspection of the equipment inside the enclosure, in a safe and simple way and without disturbing the customers operations. Inspections may be performed at any time during normal operation and give instant and accurate results.

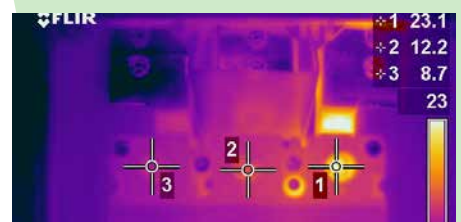
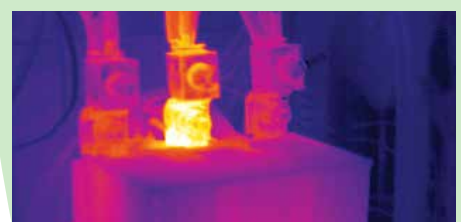
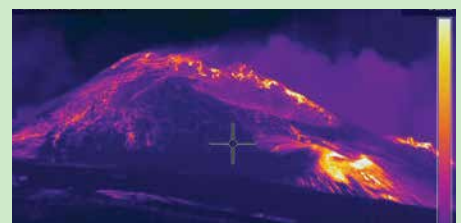
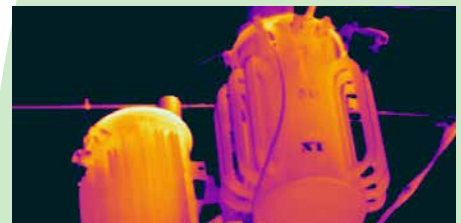
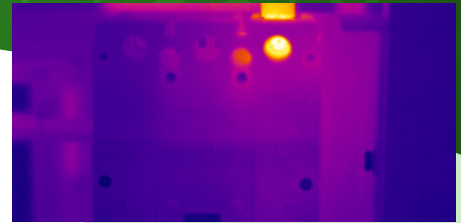
Mechanical Applications

Mechanical applications usually involve rotating equipment. Excessive heat can be generated from friction caused by faulty bearings, inadequate lubrication, misalignment, misuse, and normal wear.

An infrared refractory/insulation survey may include batch and continuous furnaces, heat treatment furnaces, ovens, dryers, kilns, boilers, ladles, hot storage tanks, and insulated pipe. It is desirable that refractory/insulation surveys be performed regularly and initiated at the beginning of the equipment's service life. An early survey serves as a benchmark for all subsequent surveys performed as a part of a trend analysis program.

Building Envelopes/Roof Scans

In buildings, infrared thermography is often used as part of other investigative measures to help locate the source of building envelope concerns. It is also used to measure the success of remedial repairs or retrofits completed on buildings. Entire buildings can be quickly surveyed to determine whether there are any gaps in the air seal, missing or misplaced insulation, improper R-value in the insulation and if the design principles were carried through to the construction.





Corona / Ultraviolet Scanning

Pace Technologies Inc. offers the latest in Ultraviolet (UV) camera technology. These UV cameras are used in power plants, electrical utilities, high voltage laboratories, research institutes, in high voltage railways, mines and private industries to detect corona on high voltage equipment. Pace Technologies Inc. uses the UV camera to provide quick and accurate detection results.

The UV camera is also used during commissioning to find design errors before using the high voltage overhead lines. The use of Corona/Ultraviolet cameras to inspect high voltage transmission lines and grid components has proven to be reliable, accurate and very effective.

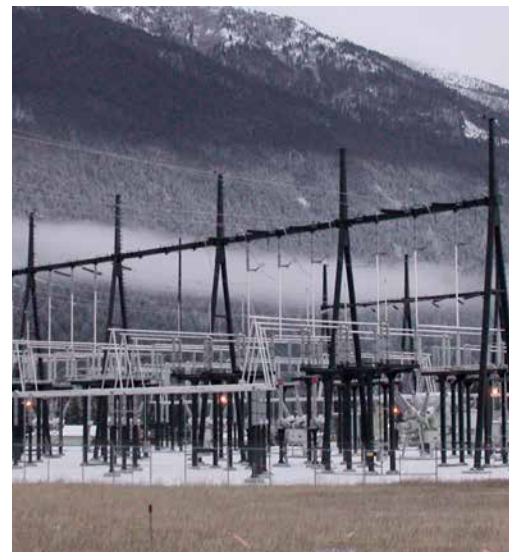
Pace Technologies Inc. Uses The Corona Camera For Cases Such As:

- Degradation of Polymer insulators
- Contamination - coastal salt; industrial vapors and dusts; cement dust; highway road salt; tire dust and car emissions; agricultural dusts and fertilizers
- Cracked porcelain insulators
- Rusted cement and metal caps & pins on porcelain insulators
- RFI, TVI and audio noise sources that lead to customer complaints
- Wrong design and improper installation, that may lead to mechanical and electrical failure, of hardware such as corona ring, conductors ADSS, etc.
- Shorted bells
- Loose hardware such as: spacers, slices, clamps, etc.

Why UV Inspection?

The ability to easily detect corona and arcing sources and pinpoint their locations can save utilities considerable amounts of money. The information obtained by UV inspection leads to:

- Prioritizing maintenance tasks
- Avoiding unnecessary line washings
- Concentrating on the faulty hardware
- Avoiding redundant testing and replacement of line element not directly involved with corona generation



Gas Leak Detection

Many industrial gases and chemical compounds are invisible to the naked eye. Yet companies transport and transform these ingredients every day. Optical imaging using FLIR GasFindIR thermal cameras, offer a number of benefits compared to traditional “sniffers” because they scan a broader area much more rapidly and in areas that are difficult to reach with contact measurement tools. Infrared displays a leak as a plume of vapor in the infrared image. Once a leak is found, from a safe distance, you can use your TVA to quantify the concentration. Our GasFindIR cameras help pinpoint gas leaks before trouble strikes and service is affected. That’s why infrared thermography is important to predictive maintenance programs around the world.



Safely Spot Gas Leaks

Pace Technologies Inc.’s GasFindIR cameras for the oil and gas industry are preventative maintenance solutions that help spot leaks in tanks, pipelines and facilities that will improve safety and profitability and minimize emissions with less risk of business interruption due to actions from regulatory agencies. Capable of rapidly scanning large areas and miles of piping, this highly specialized infrared camera or thermal imager finds gas leaks fast.



Petrochemical & Refineries

The use of infrared cameras has become a standard practice in refineries worldwide. It’s a proactive way to identify sources of VOC emissions and repair leaking components before it is too late.

SF6 Gas Detection

Our GasFindIR LW is a state-of-the-art infrared camera designed to help utility companies to better control Sulfur Hexafluoride (SF6) emissions. The GasFindIR LW infrared camera can sense Sulfur Hexafluoride (SF6), the “Greenhouse Gas” with a global warming potential of 23,900 times the potential of CO2. Preserve the environment now and for future generations!



Transformer Services

Pace Technologies Inc. offers a full complement of services, including installation and commissioning, consulting, and engineering support from small distribution class transformers to large power transformers, generator step ups (GSUs), and dry type transformers ranging from 75kVA to 500MVA and voltage classes of 480V - 500kV. Our Technical Field Services Team is ready to assist in all our clients' needs.

Transformer Field Services

- Commissioning and Maintenance Services
- Degassing and Vacuum Processing
- Moisture Reduction
- Reinhibiting (DBPC)
- Transformer Dry Out
- LFH - Low Frequency Heating
- Insulation Power Factor Testing (Doble)
- Capacitance and Dissipation Factor Testing (Tan Delta)
- Bushing Capacitance and Power Factor
- Excitation Testing
- Transformer Turns Ratio (TTR)
- Winding Resistance
- Insulation Resistance
- Polarization Index
- Sweep Frequency Response Analysis (SFRA)
- Dielectric Frequency Response (DFR)
- Leakage Reactance
- Tap Changer Commissioning
- Insulating Oil Analysis
- Oil Diagnostics and Consulting
- Core Ground
- Phase Relation (IEEE)
- Auxiliary Device Verification (liquid level, top oil, sudden pressure, sudden gas, PRD, etc.)

Consulting

- Oil Consulting - DGA, Liquid Screen, etc.
- Condition Assessments
- Tap Changer Inspection and Maintenance Programs

Engineering

- Transformer Repair & Replacement
- Field Leak Repair
- Transformer Life Assessments
- Hydrant Installation
- ITM (Intelligent Transformer Monitor) Retrofits



High Voltage Circuit Breakers & SF6 Gas Handling

Pace Technologies Inc. can provide high voltage circuit breaker installation, commissioning and maintenance services on all types of live tank and dead tank circuit breakers from 25kV - 500kV. Pace Technologies Inc. employs state of the art SF6, N2, and CF4 gas handling equipment to safely transfer gasses between storage cylinders and the breakers, minimizing the environmental impact of greenhouse gasses.



High Voltage Breaker Commissioning and Maintenance Services

- SF6, CF4, and N2 Gas Filling
- %SF6, Moisture, and Decomposition Measurement
- Insulation Power Factor Testing 10kV (Doble)
- Circuit Breaker Timing Tests with Coil Signatures
- Contact Motion and Travel
- Static and Dynamic Contact Resistance
- Minimum Coil Pickups per IEEE
- Auxiliary Contact Verification
- Verification of SF6 Density Switches (Alarm & Trip Set Points)
- CT Testing
 - Secondary Winding Resistance (All Taps)
 - Core Magnetization Curves (All Taps)
 - Ratio and Polarity Verification
- Synchronous Breaker Control and Point On Wave Switching





After over two decades in the electrical testing industry...

Pace Technologies Inc. has added another phase of service for our valued clients' needs! Now offering:

Mobile Testing Trailer

High Voltage Safety Equipment is a necessity when working on live equipment and with the use of this equipment comes its upkeep and re-certification. Clients were experiencing a number of difficulties with the logistics of this upkeep mainly shipping, loss of materials and lengthy turnaround times.

With our mobile testing trailer Pace Technologies Inc. is proud to introduce a first of its kind High Voltage PPE lab to the electrical industry. It enables us to bring our testing directly to site which eliminates any need for shipping and extended down time for the safety equipment. It features a green testing process without the use of any harsh chemicals.

Testing Services:

- High Voltage Gloves
- Hot Sticks
- Ground Chains



Visit our online store

Pace Technologies Inc. carries a large selection of safety equipment, personal protective equipment, protection relays and metering equipment, infrared windows and more! The latest equipment is just a click away.

www.pacetechnologies.com

CALL TODAY! 1-877-HI-VOLTS

