

Welcome to  
Powertech Labs Inc.



**Powertech**  
[www.powertechlabs.com](http://www.powertechlabs.com)

An orange circle containing the text "30+ Years of Experience" in white.

**30+**  
Years of  
Experience

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# Powertech Labs

## Expertise to Meet Industry Needs and Bring Changes to the Marketplace

Powertech Labs is one of the largest and most diverse testing and research labs in North America.

At Powertech, our people are the heart of the company. Our team consists of talented and experienced scientists, technicians, professional engineers, researchers, and specialists who combine their efforts and expertise to meet the needs of the future in a variety of market segments, including electrical utilities; original equipment manufacturers; industrial; clean technologies; transportation; mining, oil and gas; telecom; and other industries.

Powertech offers expert technical consultation to assist customers with the

most demanding needs in designing tests, navigating international certification or regulatory requirements, interpreting test results, and conducting failure analyses.

These services provide value to our customers, measured in avoided costs, productivity gains, adoption of clean technologies, extension of service life of assets, enhanced performance, optimized maintenance, and energy efficiency.

As needed, Powertech also develops advanced, innovative solutions that address emerging technical problems as they arise, extend the boundaries of technology, and change the market landscape.



# The Powertech Advantage

## Cross-Disciplinary Analysis

**In-depth experience**—more than 30 years' experience, and deep knowledge of industries to meet the latest standards and solve complex problems.

**State-of-the-art facilities**—15 primary labs, with the latest test equipment and staff expertise in high voltage and power, mechanical technology, applied chemistry and materials, gas systems engineering, civil engineering, software technology, and power systems.

**Cross-disciplinary analysis**—close collaboration between technical disciplines enables across-the-board, end-to-end testing of products, components, and materials.

**Pioneering innovations**—ground-breaking firsts that have been adopted by industries around the globe, and that have changed the ways companies operate.

**Global customer base**—more than 300 clients on six continents, including some of the largest and most technologically advanced utilities, grid operators, and OEMs in the world.



## Core Values



**SAFETY**

Integrate safety into everything we do.



**INNOVATION**

Leverage our creativity to deliver practical, innovative solutions.

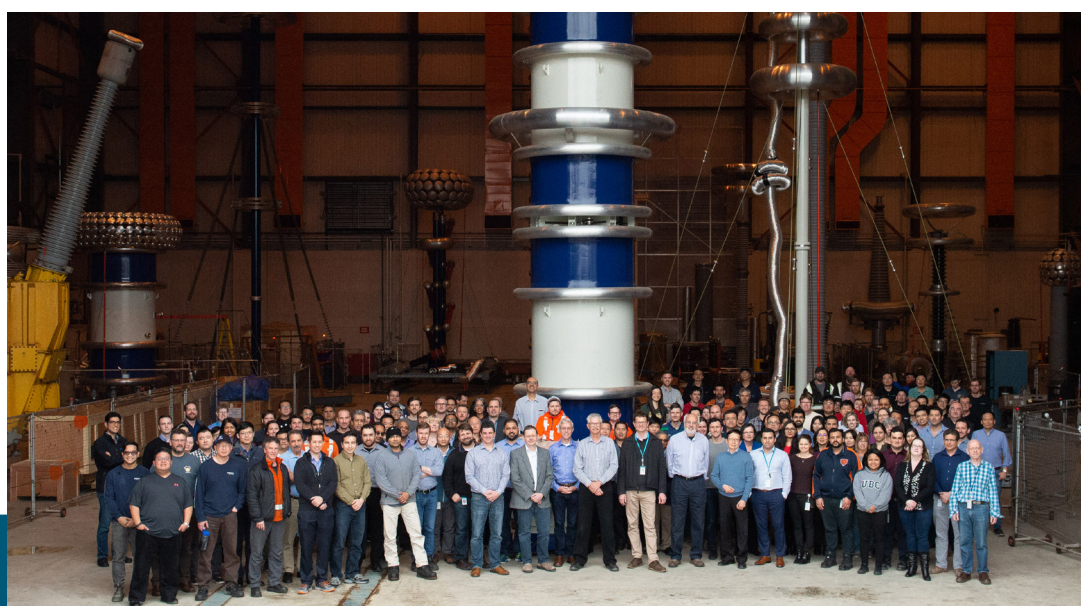


## Our Approach

Conduct our activities in a safe manner, in accordance with international accreditation standards, and with respect toward our environment and communities.

## Vision

Trusted provider of knowledge and innovative solutions supporting the electric utility sector and other technology-oriented industries.



### ACCOUNTABILITY

Take responsibility for our actions and hold others accountable for theirs.



### INTEGRITY

Operate in a manner that is fair and honest, open and straightforward both within the company and with customers.



### SERVICE

Build sustainable relationships through customer engagement.



### TEAMWORK

Work together as “One Powertech” and with others to achieve results.

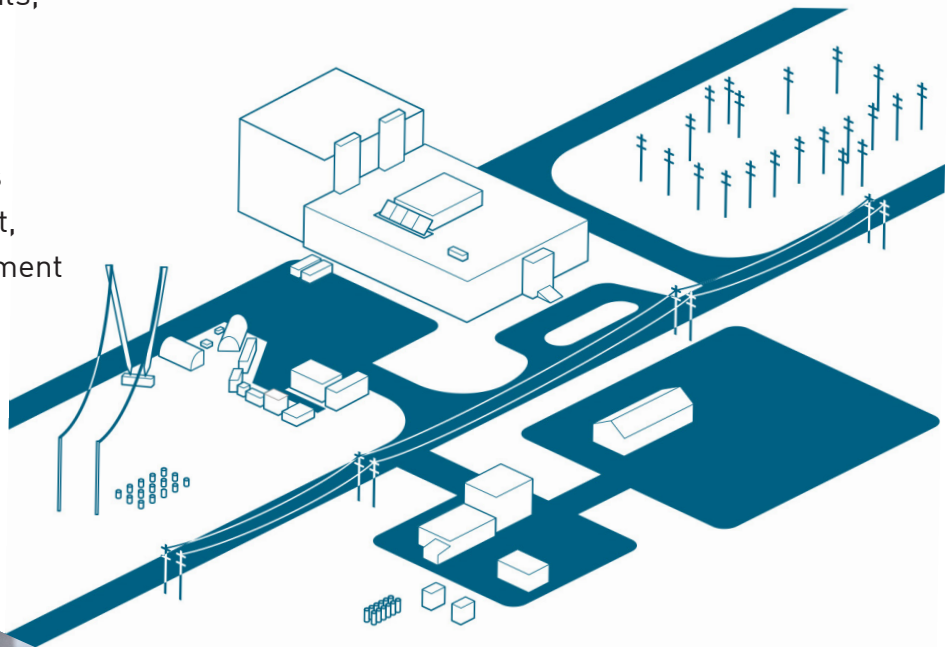
# Business Segments

## Long-Term Relationships Across a Range of Industries

Powertech's independent commercial testing and research facilities offer testing, R&D, and consulting expertise for a broad spectrum of industries under one roof.

We are among the few organizations that have a concentration of multi-disciplinary expertise—including chemical, mechanical, civil, materials, electrical, high-pressure, and instrumentation. We collaborate with utilities, vendors, and OEMs in test planning and execution, results interpretation, product development, interoperability testing, pre-deployment validation, and failure analysis.

Our teams help ensure customers receive the most comprehensive and reliable results to support their business decisions. These services optimally design tests to meet customer needs at minimal costs and reduce the risk of bringing advanced technologies to the industry.







## Utilities

Electric Generation,  
Transmission  
& Distribution,  
Substations, Power  
Systems, Grid  
Operations



## Industrial

Aerospace and  
Defence, Building  
Products,  
Automotive,  
Chemical



## Clean Technologies

Renewable Energy,  
Non-Fossil-Fuel  
Vehicles, Energy  
Storage, IPPs,  
Non-Integrated Micro-  
Grids



## Mining, Oil & Gas

Exploration,  
Extraction,  
Refining



## Electrical OEMs

Equipment  
Manufacturers,  
Component Vendors

# Market Sectors

## Transportation

Hydrogen-Fueled  
Vehicles and Stations,  
High-Pressure Gas  
Components and  
Systems, Electric  
Vehicles



## Telecom

Network Systems,  
Data Transmission,  
Satellite  
Communication

## Other Markets

Nonprofit Organizations,  
Municipalities & Government  
Agencies, University & Research  
Institutions





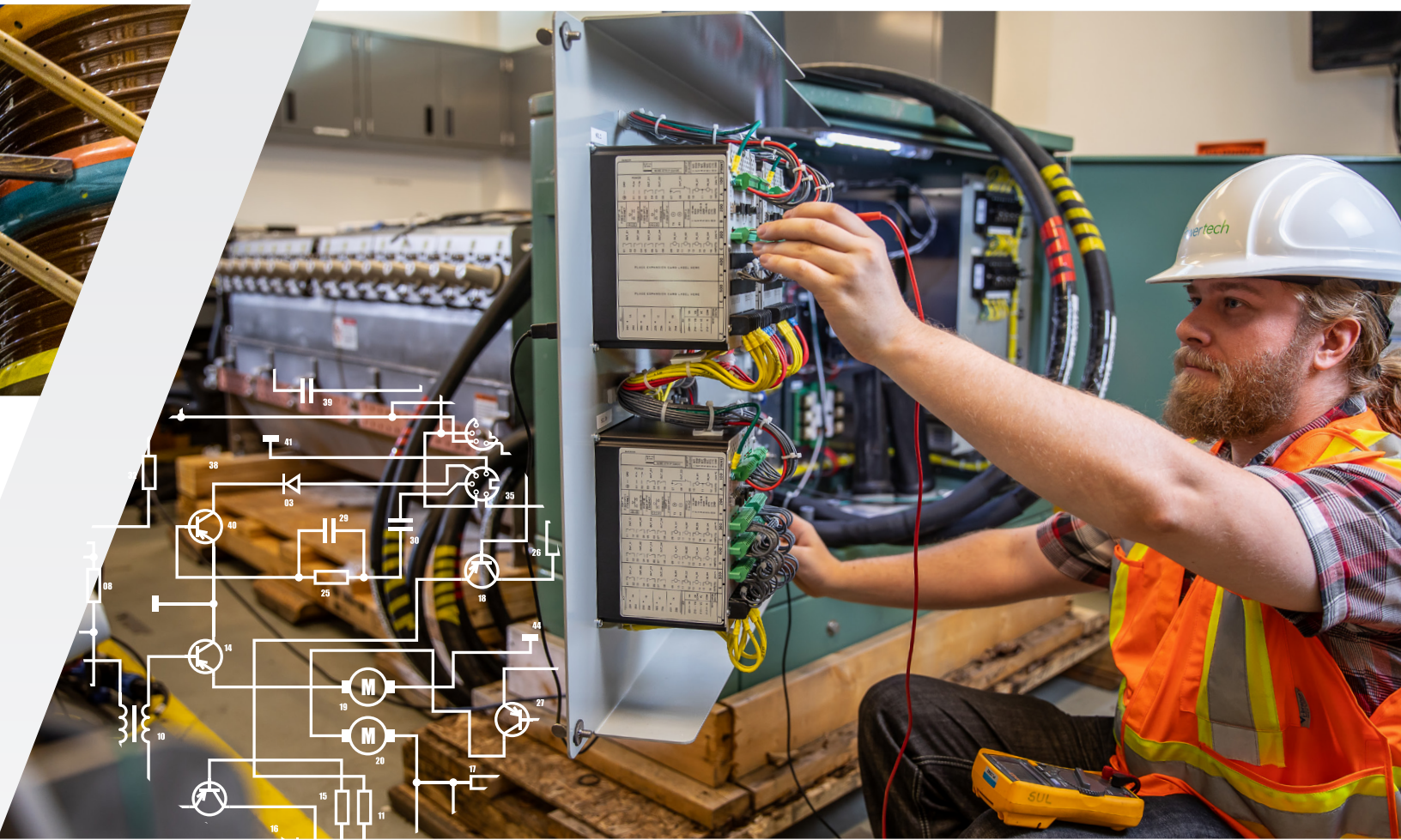
## Utilities

Powertech provides services in product development and testing to ensure utilities meet their needs for customer satisfaction, service reliability, and employee safety.



SERVICES	EXAMPLES
Standard and Custom Laboratory Testing Service	<ul style="list-style-type: none"> <li>› OEM qualification testing and compliance validation</li> <li>› High voltage, high power and high current testing</li> <li>› Insulating oils, fuels, lubricants and coolants analysis and testing</li> <li>› Non-destructive testing (NDT) &amp; evaluation (NDE) services</li> <li>› Testing for tensile, compression, wicket gate bearings and bushing</li> <li>› Accelerated life testing (HALT / HASS) and failure analysis</li> <li>› High pressure testing for H<sub>2</sub> equipment, components and stations</li> </ul>
General Contracting and Consulting	<ul style="list-style-type: none"> <li>› Independent quality assurance, factory inspection and expert witness</li> <li>› Material selection and polymers analysis</li> <li>› Arc flash, soil resistivity and grounding studies</li> <li>› Inspection, repair specification and consulting</li> <li>› Smart grid technology applications</li> <li>› Telecommunication and integration of IoT</li> <li>› Alternative energy integration, energy storage and microgrids</li> <li>› Design, consulting and development of hydrogen systems and components</li> <li>› Advanced transportation infrastructure (EV and H<sub>2</sub>)</li> <li>› System studies, data management and software development</li> <li>› Power system planning, operation and real time simulation</li> <li>› Environmental analytical services, testing and remediation</li> </ul>
Asset Management Services	<ul style="list-style-type: none"> <li>› Asset monitoring, condition assessment, life extension</li> <li>› Reliability and risk assessment</li> <li>› Structural integrity and reliability</li> <li>› Coatings and corrosion assessment, protection and mitigation</li> </ul>
Field Services	<ul style="list-style-type: none"> <li>› On-site asset management, testing, inspection and monitoring</li> <li>› Site supervision and quality monitoring</li> <li>› Confined space and manhole inspection</li> <li>› Safety tool testing and certification (hot-sticks, grounds, etc.)</li> </ul>





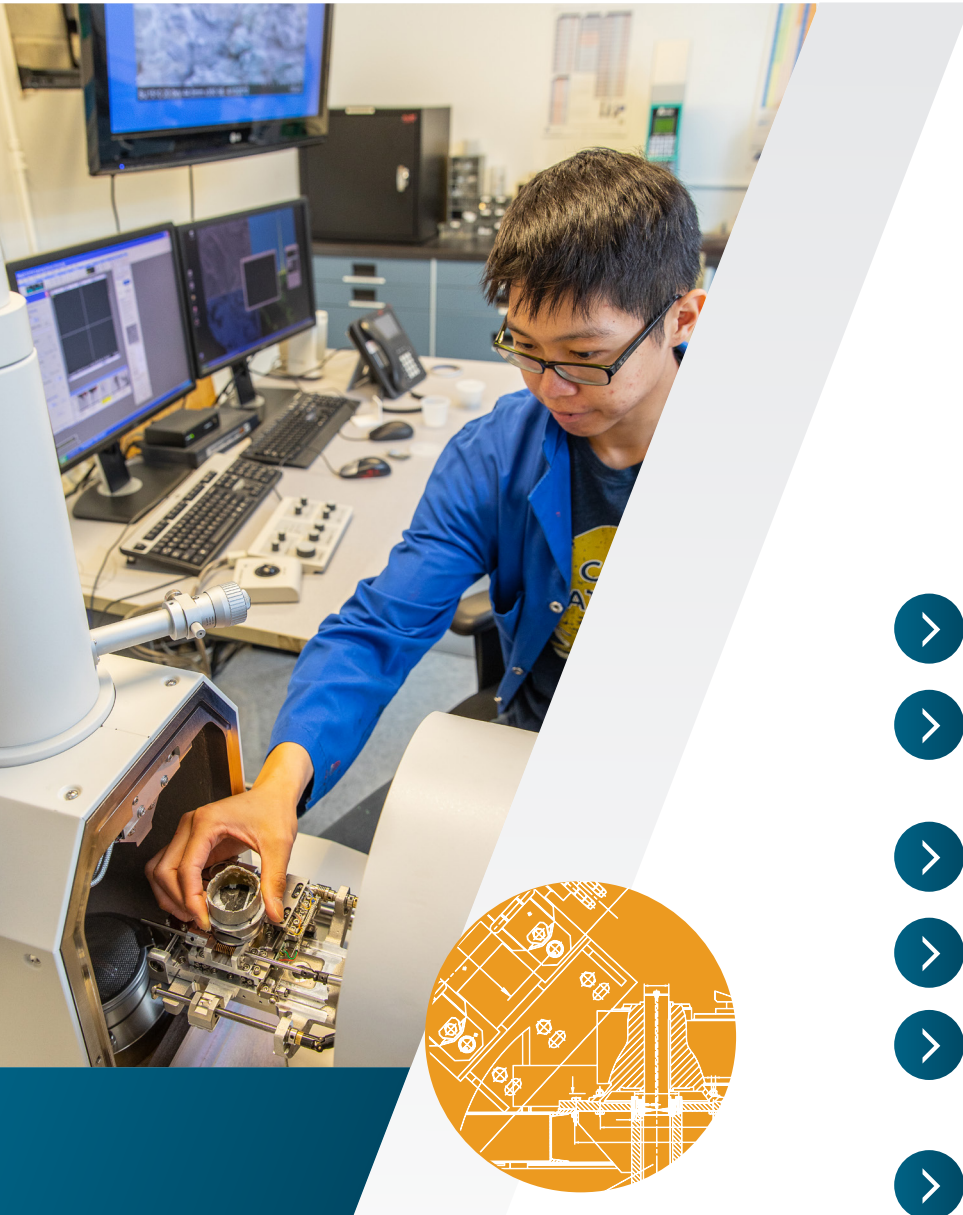
## Electrical OEMs

Original Equipment Manufacturers (OEMs) need to ensure their products operate reliably, safely, and according to design specifications and government and industry standards.

Powertech engineers provide a wide range of electrical, mechanical, chemical, and material testing to satisfy the needs of OEMs:

- Cross-disciplinary testing and analysis are supported by detailed documentation for each test performed.
- In addition to standard industry compliance tests for equipment, assemblies, and components, we offer customized testing and evaluation procedures that minimize the costs of prototype development by identifying the critical performance tests to ensure products successfully pass compliance requirements.





## Industrial

Powertech specialists serve the industrial sector by designing, specifying, and engineering products and components to optimize their performance.

Powertech's independent experts can assist with:

- > Designing to prevent failure
- > Aging and life prediction (accelerated environmental testing)
- > Failure diagnosis and resolution
- > Expert witness
- > Product testing to international standards
- > Material testing and chemical analysis

Powertech has 30+ years of industrial experience and the in-house capability to conduct structural safety and reliability analysis to quantify probability of failure of a structure or component. We also offer a full range of mechanical testing services, including vibration and shock, environmental, and tensile testing.







## Clean Technologies

Powertech has a long history of developing new clean technologies that assist the global utility industry to avoid environmental impacts, increase energy efficiency, and support use of renewable energy. Technologies include:

- Sulphur hexafluoride ( $\text{SF}_6$ ) leak detection from power transformers and other electrical equipment
- Destruction and removal of polychlorinated biphenyls (PCBs)
- Software for grid optimization and integration of intermittent renewable resources
- Communication systems to enable implementation of micro-grids and control automation
- Energy storage devices
- Energy management and demand-side management solutions

Alternate fueling and non-fossil vehicle component testing





## Transportation

Powertech supports trends in non-fossil-fuel vehicles, including hydrogen fuel cell electric and battery electric.



The company has designed and constructed hydrogen fueling stations across North America, and has installed more than 100 direct-current fast-charging electric vehicle stations throughout British Columbia.



Powertech is also a global leader in testing high-pressure components used in alternate fuel vehicles, and is responsible for innovations, including the world's first 700 bar hydrogen fast fill station, one of the first retail-style dispensers, and the first high-speed test device for hydrogen refueling stations.







## Mining, Oil, and Gas

The Mining, Oil, and Gas market consists of companies involved in the exploration, extraction, refining, transportation, and marketing of oil and gas products. These companies must develop and deploy new technologies to improve operational efficiency and safety, and must assess the condition of equipment and components in the field.

- Powertech Labs has the expert staff and knowledge to provide material verification and R&D testing for metals, nonmetallic, ceramics, coatings and contaminants.
- We offer a variety of chemical analysis, metallurgical testing, mechanical testing and corrosion testing services.
- In the event of failure, we offer root cause determination and solutions and prevent recurrence.





## Telecom

Powertech's Communications Lab specializes in telecommunication technologies for critical infrastructure industries.



We have full scale lab facilities for design, network planning, equipment evaluation, and validation of field devices and their communication links.



Powertech also works with the aerospace market sector to ensure its communication equipment operates reliably in challenging environments. In a collaborative work with the major players in the aviation industry, Powertech supported the development of the AeroMACS standard, and is accredited as an AeroMACS Designated Certification Laboratory (ADCL) and WiGRID Designated Certification Laboratory (WDCL) to perform compliance and interoperability testing and certification.







## Other Markets

Powertech conducts product testing, advanced R&D, and consulting services for nonprofit organizations, municipalities and government agencies, and university and research institutions.

We meet the specific needs of these markets through equipment testing, condition assessment, failure analysis, and advanced chemical analysis.

***E.G.***

Powertech specializes in accelerated wear and friction testing for self-lubricating bearings. In fact, it is the exclusive test lab in the world with the unique expertise to conduct life testing of self-lubricating bearings for hydroelectric plants for the United States Army Corps of Engineers.

# INNOVATIONS

## Catalogue of “Firsts”

### HyStEP—Hydrogen Station Equipment Performance

Test device reduces commissioning time of new hydrogen fueling stations from average of several months to one week.



### First 70 MPa Hydrogen Fueling Station

World's first 70 MPa hydrogen fueling station, offering range up to 500 km (300 miles) with under 4 minutes fueling time.



### PCB Online Decontamination

One of a kind system for online extraction of PCB compounds from transformer oil.



### AeroMACS

Only AeroMACS Designated Certification Laboratory in world, capable of testing and certifying equipment using new communications system—Aeronautical Mobile Airport Communications System.



### Testing of Self-Lubricating Bearings

Only lab in world to conduct life testing of self-lubricating bearings for hydroelectric plants operated by U.S. Army Corps of Engineers.



### On-line Dynamic Security Assessment (DSA)

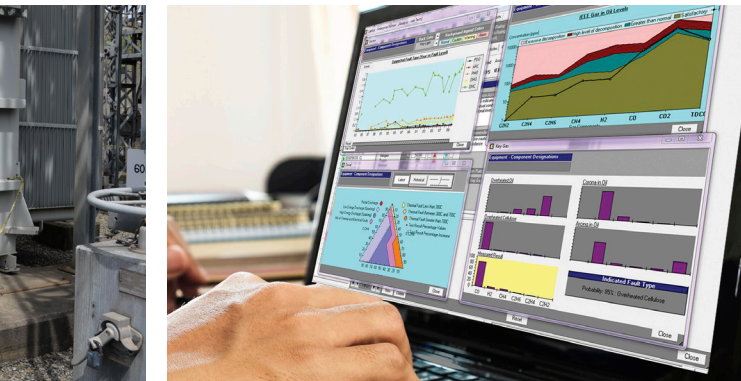
Pioneering technologies for on-line DSA, including tools for voltage and transient security assessment and small signal analysis.



This catalogue of “firsts” profiles new tools based on core fundamental scientific research that have made their mark in the real world.

## Equipment Health Rating (EHR) of Transformers

Unique software to diagnose and assess condition and life stage of power transformers.



## TSAT - RTDS™ Interface (TRI)

Cutting-edge platform allowing analysis of large interconnected power systems through synchronized real-time co-simulations of electromechanical and electromagnetic transients.



# Quality, Industry Standards

## Adhering to Highest Industry Standards

Powertech is accredited according to industrial standards for quality management, environmental management, safety management, and competence of testing.



SAI GLOBAL  
ISO 9001  
Quality

### ISO 9001:2015

Quality management.



SAI GLOBAL  
ISO 14001  
Environmental

### ISO 14001:2015

Environmental management.



### ISO/IEC 17025:2017

Competency of testing labs.

### Participant in UL Third Party Test Data Program



**OQM**  
CERTIFIED

### Coming soon...

### ISO 45001

Occupational health and safety management

\*planned for accreditation late 2020.



## Global Reach

Powertech Labs services more than 300 long-term clients in ten regions, encompassing many Fortune 500s and some of the largest and most technologically advanced companies in the world.



## Where Powertech is Headed in 5-10 Years

Powertech evaluates market needs on a regular basis and adds new services to align with these needs. In the future, our focus will be on advancing innovation in support of electric utilities, expanding the company's global presence,

conducting leading-edge research and development, investing in state-of-the-art technology, and growing without compromising our quality, environment and safety performance or vision.



The logo for Powertech, with 'Power' in blue and 'tech' in green.

# Powertech

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