

Open Phase Protection

OPP System

The OPP System can be used to detect, alarm, and actuate in response to single and double open phase conditions in the offsite power circuit(s). The OPP System is specifically designed to detect open phase conditions on industry-recognized types of transformers where an open phase under no-load or lightly-loaded conditions might be undetectable by traditional voltage or current measurements.

The OPP System takes advantage of the known characteristics of the transformer that occur during single and double open phase conditions with or without a ground fault during all loading conditions.

The PSStech implementation of the EPRI open phase detection method allows for a fail-safe and redundant detection design.



POWER SYSTEM SENTINEL TECHNOLOGIES, LLC (PSStech) is an engineering services and manufacturing company classified as a small business. Our senior technical staff has more than one hundred years combined knowledge in design, protection, and analysis of electrical power systems. Born out of a need to protect the nuclear industry, PSStech was founded to provide nuclear generating stations with a novel approach to protecting transformers against open phase conditions.

Based on collaborative research with Electric Power Research Institute, PSStech conceptualized, designed, manufactured, and commissioned more than one hundred Open Phase Protection Systems in the course of four years to meet the industry's commitment to the NRC. These systems currently monitor transformers in forty percent of operating US Nuclear Plants.

- The PSStech OPP System is currently protecting 39 commercial nuclear plants in the United States, representing 135 OPP channels with more than 3 million hours of operating time.
- The PSStech OPP system is designed to meet NEI 13-12, NRC BTP 8-9, and WANO SOER 2015-1 Rev 1.
- The PSStech OPP system can be applied on any size transformer with a wye (star) connected winding.

PSStech OPP System Advantages

- PSStech offers both digital and analog OPP systems designed for outdoor substation environments.
- The digital OPP system is designed to meet the cybersecurity requirements of NEI 08-09.
- The analog OPP system is implemented with 100% analog components to eliminate cybersecurity requirements.
- Available in single- and multi-channel systems.
- The PSStech OPP System is very simple to install. The system requires minimal transformer outage time to install, and it can be completely installed with the transformer in service except for the neutral cable connection.
- PSStech can provide the OPP system in custom or standard configurations.

Service Features and Benefits

EXTENDED WARRANTY

PSStech offers an extended warranty program. The extended warranty covers issues outside the scope of PM service resulting from OPP System defective parts, components, or materials. Parts, labor, and travel are covered by the extended warranty.

PREVENTATIVE MAINTENANCE

While PSStech's OPP systems are produced to the highest standards in the nuclear industry, it is recommended that system owners enter into a Preventative Maintenance (PM) service agreement to ensure that the OPP system performs as expected over its lifespan.

For more information on any of our products or services please visit us on the Web at:
www.psstech.com



The PSStech system combines active and passive protection, and is the preferred method over passive only protection. Due to the simple, minimally intrusive installation, this design requires minimal outage time and maintenance. The PSStech system uses neutral current injection and according to a report by the International Atomic Energy Agency (IAEA): *"The star point injection method is especially useful for low load and no-load transformer situations. The star point injection method and zero sequence current measurement in the star point connection, in combination, provide a robust detection system."*

PSStech KEY DIFFERENTIATORS

- Highly competent and experienced personnel including PhD and licensed professional engineers
- Quality Program commensurate with ASME NQA-1, 10CFR50 Appendix B, and CSA N299
- Certified Project Managers
- Field Personnel experienced in vast working environments including Nuclear Facilities, Electric Power Substations, and Industrial Plants
- Manufacturing capabilities including fabrication, wiring, and complete testing

SERVICES AVAILABLE

Technical Support
Preventative Maintenance
Spare Parts
Application Support
Hardware Support
Extended Warranty

PSStech
Guarding the Grid

101 Styline Drive
Warrior, Alabama 35180
Phone +1.205.631.3357