



WESTCO Electrical & Equipment Corp. Case Study

*Advanced Non-Intrusive
Diagnostics: Preventing
High-Voltage Insulation
Failure with Doble Spark P3*



Engineered for a Secure Future

WESTCO and Doble Engineering's Strategy for Continuous System Reliability in Critical Facilities

The case study focuses on the application of on-line Partial Discharge (PD) testing as a sophisticated diagnostic strategy to maintain the operational integrity of high-voltage (HV) assets, specifically power transformers, in critical infrastructure, such as prominent residential or industrial buildings.

The Challenge: Insulation System Deterioration and Forced De-energization

- Clients operating critical infrastructure face the fundamental challenge of latent defects and the impact of mandatory system shutdowns on continuous operations.
- ✦  **Risk of Production Loss via Compulsory Shutdown:** Preventive maintenance based on traditional, invasive testing methods (e.g., power factor/tan δ) mandates the de-energization of the entire HV system. This forced shutdown immediately results in significant, measurable production loss or major operational disruption, which clients are focused on minimizing.
- ✦  **Invisible Deterioration of Insulation Systems:** Critical HV equipment, such as power transformers, are susceptible to insulation system deterioration. This progressive breakdown manifests as partial discharge (PD) activity—a dielectric breakdown not visible during normal operation—that poses an imminent risk of catastrophic equipment failure.

The Solution: On-Line Partial Discharge Testing using the Doble Spark P3

WESTCO, in partnership with Doble Engineering, deployed a non-intrusive diagnostic solution utilizing the Doble Spark P3—a universal Partial Discharge (PD) and Electromagnetic Interference (EMI) analyzer.

- ✓  **Non-Intrusive and Continuous Operation:** Unlike intrusive tests, the Spark P3 utilized its software defined radio signal detector to perform on-line PD and electromagnetic interference (EMI) analysis while the equipment was operating. This capability immediately eliminated the need for a de-energization shutdown for PM.
- ✓  **Early Detection of Insulation Defects:** The Doble Spark P3 successfully detected and characterized PD signals, identifying a specific internal defect within the power transformer's insulation system. The analyzer, leveraging a wide frequency range (e.g., up to 2 GHz for PD/EMI or using acoustic sensors), pinpointed the precise source of the localized dielectric breakdown that was otherwise undetectable.

DON'T LET INSULATION SYSTEM DETERIORATION PUT YOUR CRITICAL HIGH-VOLTAGE EQUIPMENT AT RISK.

Contact **WESTCO** now to leverage our Partial Discharge testing service and expert analysis for Condition Monitoring. Gain the power of strategic prediction, secure your continuous system uptime, and protect your investments from sudden, costly outages.

CONTACT US:

 +63 (2) 8365-0068

 sales@westco-phil.com



The Impact

Business Result:

Maximized Uptime:

By performing diagnostics on-line, the client avoided a full unplanned shutdown resulting from a catastrophic failure, or a planned shutdown for unnecessary or premature PM. The system remained in a normal operating state, securing continuous revenue generation.

-  **Asset Life Extension:** Early, targeted intervention preserved the critical power transformer asset, preventing the high cost, extensive lead time, and significant logistical challenge associated with emergency replacement (a major Capital Expenditure (CAPEX)).

Technical Result:

Precise Defect Characterization:

The PD test provided early detection of a latent fault in the insulation system. This diagnostic data allowed for the pinpoint localization of the specific defect, transforming a general risk of failure into a specific, manageable maintenance task.

Managed Repair Execution:

The client utilized the diagnostic data to organize a planned, surgical repair of the transformer's internal component during a pre-scheduled, minimal outage window. This Planned Predictive Maintenance (PPM) approach resolved the issue before the insulation system deterioration could lead to a failure condition.

Conclusion

Partial Discharge Testing is a critical component of Insulation System Diagnostics. By enabling non-invasive, on-line assessments using advanced acquisition units like the Doble Spark P3, WESTCO structures a service that delivers the timely technical result of latent fault detection in high-voltage assets. This capability allows the client to transition from risky, reactive maintenance to a structured Planned Predictive Maintenance (PPM) program, securing their continuous operational capability.(PPM) program, securing their continuous operational capability.

DON'T LET INSULATION SYSTEM DETERIORATION PUT YOUR CRITICAL HIGH-VOLTAGE EQUIPMENT AT RISK.

Contact **WESTCO** now to leverage our Partial Discharge testing service and expert analysis for Condition Monitoring. Gain the power of strategic prediction, secure your continuous system uptime, and protect your investments from sudden, costly outages.

CONTACT US:

 +63 (2) 8365-0068

 sales@westco-phil.com