

# PARTIAL DISCHARGE

*our speciality*



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*By Greg Linton, HV Diagnostic Services Ltd*

The benefits of condition based testing and preventative maintenance are well understood within our industry. HV Diagnostic Services staff pioneered Partial Discharge testing in New Zealand and have completed approximately 4500 switchboard surveys since 1998, with over 600 conducted last year alone. We have a proven track record and have enjoyed frequent successes using internationally recognised test methodologies and equipment.

An annual HV Diagnostic Services PDL switchboard survey is a cost effective means to ensure ongoing equipment reliability and, with the Partial Discharge Locator, is fast allowing many site visits per day; you will not be paying for equipment set-ups nor the waiting time for results to 'cycle-in' at each site.

#### REMOVAL OF COVERS IS UNNECESSARY

A TEV measurement is made with the switchboard live, on all individual chambers of every switch panel rather than just a HFCT clipped onto a cable screen, and we do not require anything to be insulated from the main switchboard earth. Transient Earth Voltage testing is complimented with a thorough Ultrasonic examination that will identify any areas with surface discharge tracking problems. Removal of covers at this early stage is completely unnecessary, particularly with for instance, air termination boxes that are not sealed by gasket.

Colour coded substation reports allow easy identification of those displaying high levels and are available as either a bound hard copy or more popular these days, the easy-share electronic file. Each Substation record includes recommendations and, if maintenance is required, where this should be concentrated and what to look for. We regularly work with our customers to identify the component under stress and often provide follow-up testing to ensure it has been effectively dealt with.

#### EXTENDED MEASUREMENT PERIOD

Should further investigation be required, one of our Partial Discharge Monitors can be hired and local staff trained in its installation / set-up who then become responsible for moving it between those substations identified. Periodic continuous monitoring over a week is essential for capturing intermittent activity while the extended measurement period covers all changes to external conditions that affect Partial Discharge behaviour. The additional information supplied by the PDM allows for greater interpretation and assists the decision making process.

HV Diagnostic Services, as New Zealand's Distributor for EA Technology UK, can also access the wider product portfolio available from the world-renowned Power Engineering firm including technical expertise and consultancy services in the many areas they operate.

#### AFFORDABLE EARLY WARNING SYSTEM

Their market leading instrument range continues to expand with the addition of the brand new UltraTEV Alarm (pictured above). Based on the hugely successful UltraTEV, the 'Alarm' is designed for permanent installation allowing continuous monitoring for insulation deterioration and is an affordable early warning system for HV switchgear. Each Alarm 'Node' has a TEV and Ultrasonic detector and can operate as a stand-alone unit. Of greater value however, is the ability to network them and, via a central Hub interface directly to SCADA or using the optional GPRS add-on, allow users to receive alarm messages via SMS or email.

Offering genuine specialist experience and delivering realistic outcomes, our test services contribute to improved reliability and planning. For a commercially viable quote, please contact Greg Linton to discuss your specific requirements.

#### A TYPICAL SCENARIO

*...from discovery to remedy*

During a North Island Zone substation visit in June 2006, Ultrasonic activity was detected from a Busbar transition chamber between two banks of differing age and model switchgear. An outage was scheduled and carried out in July where deterioration to the compound filled insulation boots on the Bus connectors was discovered. Cracks were visible in one along with melting pitch from another, it was decided that all three be replaced. A follow-up survey in August confirmed the success of this preventative maintenance in removing a major vulnerability from their network.

