Tutorial Session
Panel Discussion on LTC Diagnostic Information

Part 1 - Monday April 15, 4:45 - 6:00 PM, Salon 2/3
Part 2 – Tuesday April 16, 4:45 - 6:00 PM, Salon 2/3

LTC DIAGNOSTICS

Fredi Jakob
Weidmann-ACTI

Dissolved gas analysis, DGA, was first developed as a diagnostic tool for power transformers. The method was not initially applied to load tap changers, LTC's, since it was assumed that fault gases were produced during normal tap changes. Subsequent work has shown that the fault gas patterns are significantly different when normal units are compared to problem LTC's.

The major non-mechanical problem observed in LTC's is related to buildup of deposits on the contacts. The initial deposition of material on the contact leads to increased contact resistance, which leads to heating and production of carbon particles from the thermal degradation of insulating oil. This process continues until the LTC is in a condition of "thermal runaway".

Diagnostic interpretation of fault gases produced by normal and problem LTC's is empirical in nature. Interpretation protocols are either generic or unit specific. Problem units generate more "hot metal" gases, methane, ethane and ethylene, than normal units. Protocols that have been developed include establishment of generic and unit specific gas levels for problem units. Ratios of heating to arcing gases have also been studied. Particle size distributions and particle characterization methods are also useful diagnostic tools.

CLASSIFICATION OF LOAD TAP CHANGERS IN REGARDS TO DISSOLVED GAS ANALYSIS

Dr. Dieter Dohnal
Maschinenfabrik Reinhausen GMBH

The different Load Tap Changer designs are identified and discussed in regards to the generation of gases under normal service conditions.

NOVEL DIAGNOSTICS FOR ON-LOAD TAP CHANGERS (OLTCS) BASED ON GAS-IN-OIL (DGA) AND ADDITIONAL OIL QUALITY DATA

Hans Schellhase
Powertech Labs Inc.

This presentation and the Panel Discussion (Question and Answer Period) will provide the fundamentals of diagnostics based on:

(i) Laboratory Investigations
(ii) Field-Case-Studies and
(iii) LTC – Database

The structure and diagnostic value of the LTC-database will become clear during the discussion of specific field examples of equipment in fault and/or failure modes. Depending on the interest of the audience, the integrity of the existing database, the roles of makes/models in interpreting field data is open as an interesting topic.

USING FLUID ANALYSIS TO ASSESS LTC CONDITION

Dave Hanson
TJ/H2b Analytical Services, Inc.