

PD Testing Finds Problems in Turbine Generators & Monitors Repair Effectiveness

Company: Conectiv
Plant: Hay Road
Unit: Unit #4 (115kVA, 104MW)
PD Sensors: Two 80pF couplers installed directionally
Date: June 2001

CASE HISTORY

After a number of readings, the acquired PD data began to increase on the winding. Specifically, the data showed that the PD activity was high on all three phases of the unit. These Qm values remained constant for approximately 3 months after which the PD activity decreased to a reasonable level – denoted in Figure 1. The thought was that the epoxy injected needed time to cure so it could hold the winding tight in the slot and the higher level PD activity, which was measured previously, was related to the curing of the injected epoxy.

On-line PD measurements showed the PD activity remained stable for approximately one and a half years. Then an increase in PD activity on all three phases was experienced. At that time, the PD activity reached an NQN of 1039 and Qm of 579mV – denoted (2) in Figure 1. This compared to the top 25% of similar machines in Iris PD database. The pulse phase analysis is indicative of phase-to-phase dependent discharge activity with negative and positive PD pulses being centered at 15° and 195° phase angle with reference to the phase to ground voltage.

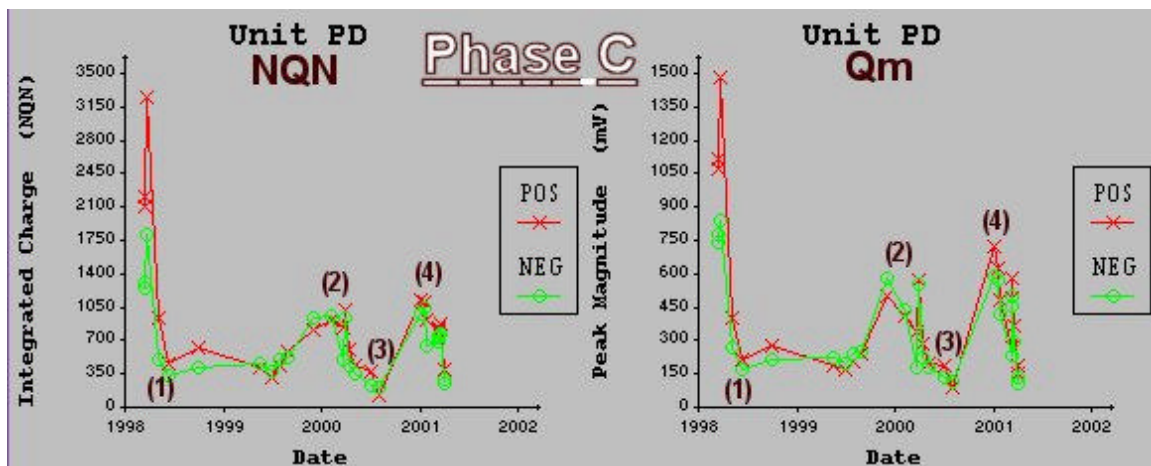
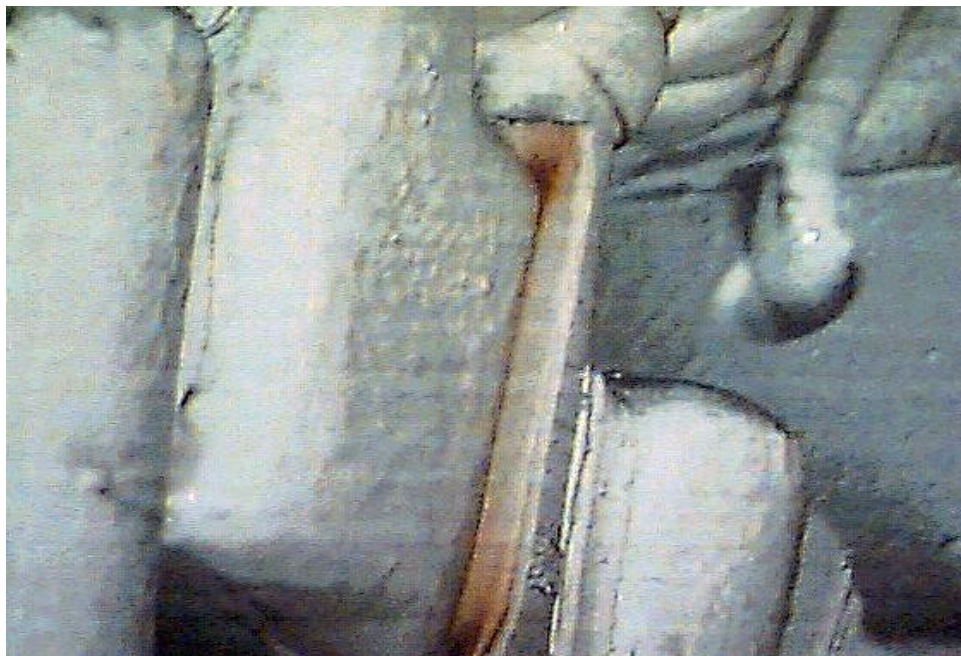
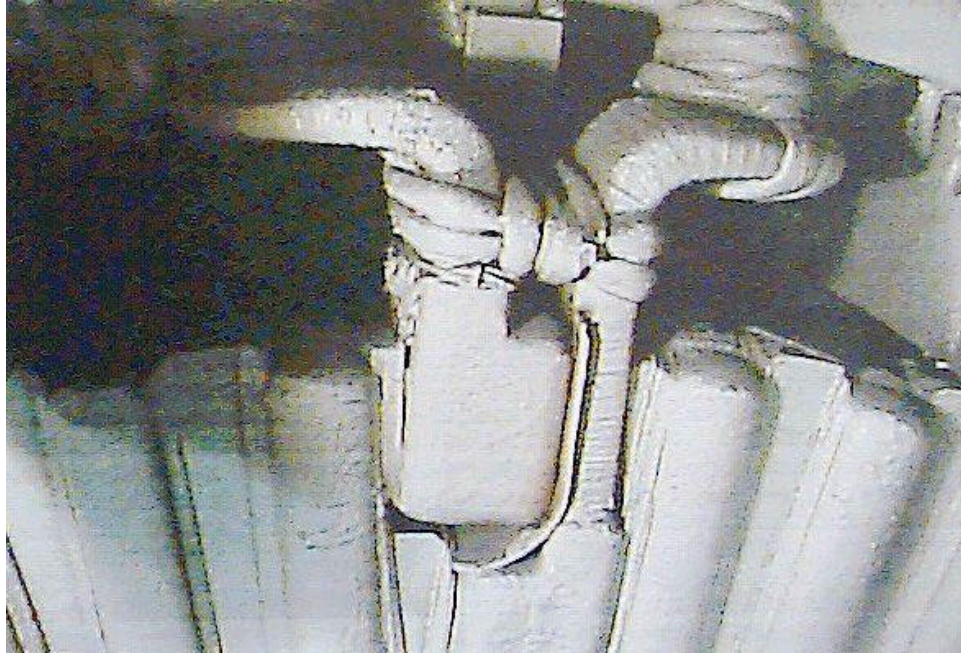


Figure 1: An example of the PD trend for this unit.

The unit was taken off line and inspected. It was found that all six-phase barriers were burnt and close to a flash over (see photo).

The generator vendor came in and did a temporary repair to the barriers. While working on the unit, the winder stated that he felt without the corrective repair the unit would not have run through the summer.

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Reference: J.M. Squitiere Hay Road Unit #4 Partial Discharge Detection, June 2001.
Presented at IRIS Rotating Machine Conference, Alexandria VA.