

Infrequent PD Testing Results in Machine Failure

Company: California Power Producer
Plant: Confidential
Unit: TG1
Ratings: 13.8 kV, 24 MW, 1800 RPM, epoxy mica insulation
PD Sensors: Epoxy mica capacitors
Date: December 2003

CASE HISTORY

Three EMCs, one per phase, were installed in September 2001, and the first tests taken on September 14, 2001 and again on July 16, 2002. In February 2003 the unit of was tested again for PD activity. At this time, the results showed that the highest PD had a Qm (peak PD magnitude) of 1200 mV on phase A. This Qm is higher than approximately 98% of similarly rated machines in the Iris PD Database. The PD was found to be non-classic, meaning that it was occurring outside of the stator slot (see Figure 1). The highest PD pulses were at the zero crossing which can sometimes be associated with a poor electrical connection.

The PD activity was at a level of 44 mV in July 2002. This means that the PD activity increased more than 24 times in just 7 months. This easily exceeds Iris' normal criteria of a 2 times increase over 6 months.

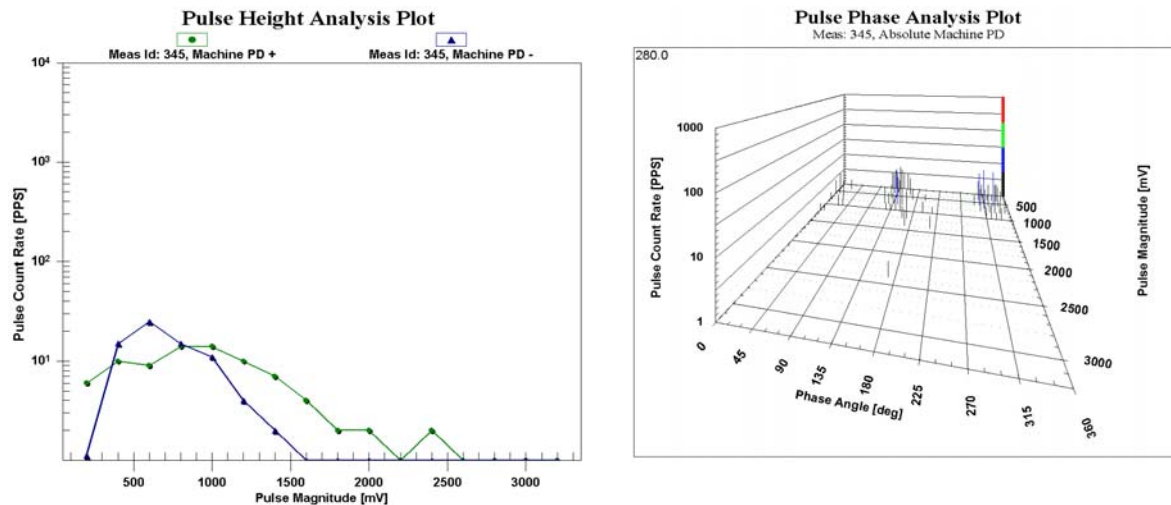


Figure 1. PD data from Phase A - February 11 2003

The machine in questioned failed in the endwinding in November 2003.

The failure could have been anticipated had measurements been taken and the data reviewed on a more regular basis, and more importantly, acted upon. In this situation, the problem can be attributed to something drastic; either a poor electrical connection (caused by an over current event which broke a copper strand or connection), or a foreign object hitting the endwinding).