

**CASE STUDY: An Increase In Hydrogen Pressure Reduces PD Levels From Moderate To Negligible In A Large Hydrogen Cooled Turbine Generator**

**Company:** A southeast company    **Plant:** Confidential    **Unit:** N/A

**Ratings:** 626MW Turbine Generator - 18kV, hydrogen cooled, Epoxy-Mica

**Manufacturer:** Confidential    **Related Info:** Installed in 1999    **PD Sensors:** SSC

**Details:** Periodic on-line testing of this generator had revealed high PD, according to the current Iris database. A test in Feb 2000 produced a NQN of 13 and a Qm of 10 mV on C phase. This is higher than 90% of similar machines in the Iris database. It was suggested to the utility that the overall levels of PD within this machine could be reduced with an increase in the H<sub>2</sub> pressure. Although this machine was rated for 60 PSI of H<sub>2</sub> pressure in its cooling system, it was running at only 33 PSI. Subsequent tests a little over three months later revealed an increase in H<sub>2</sub> pressure to 56 PSI reduced the PD to negligible levels. Operating at high pressure will slow the rate of deterioration. This also proves the PD was in the stator winding.

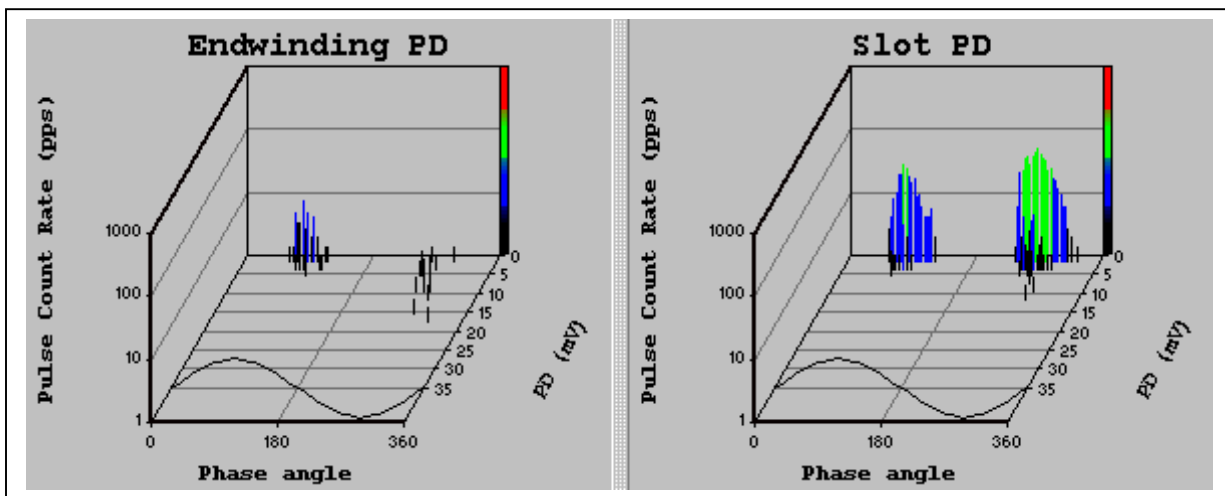


Figure 1 February test – H<sub>2</sub> at 33 PSI

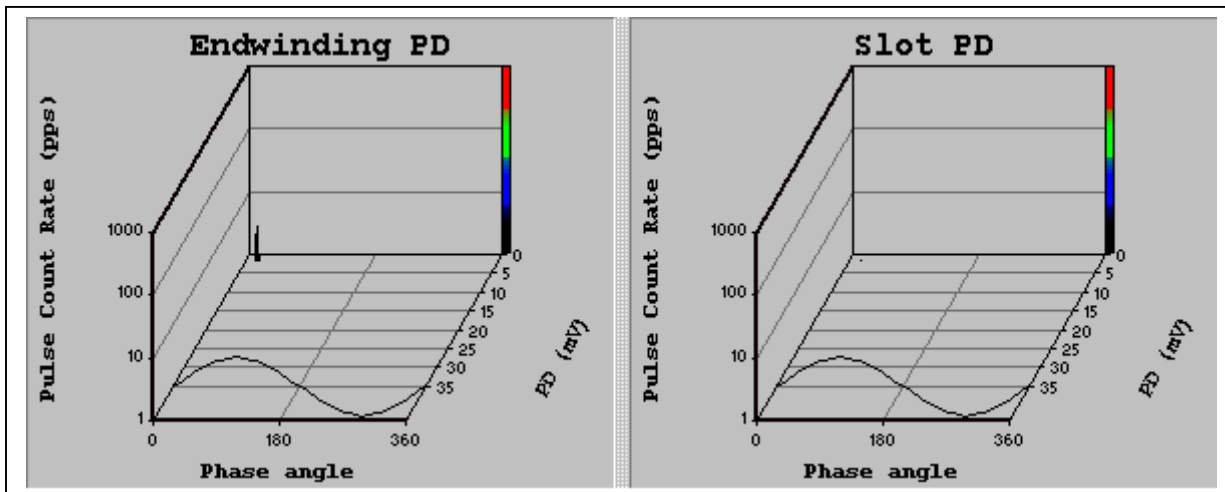


Figure 2 June test – H<sub>2</sub> at 56 PSI

Reference: Iris Power Engineering test archives.