

CASE STUDY: Warning given of serious PD problems on large turbo, with global VPI stator, followed by in-service stator failure.

Company: National Power, UK

Plant: Confidential

Unit: GT1

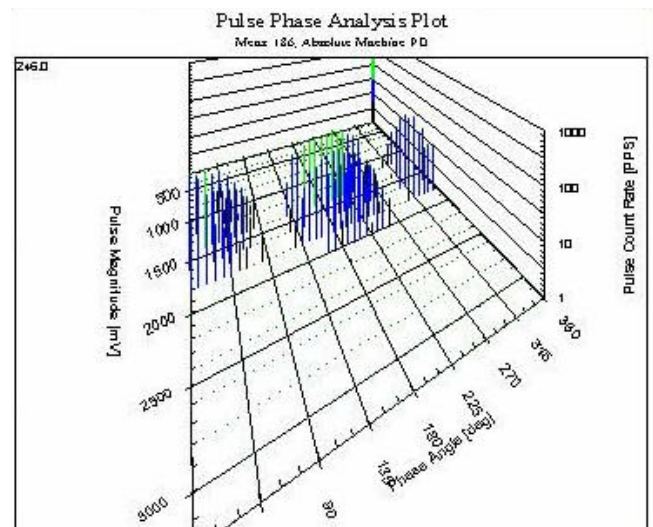
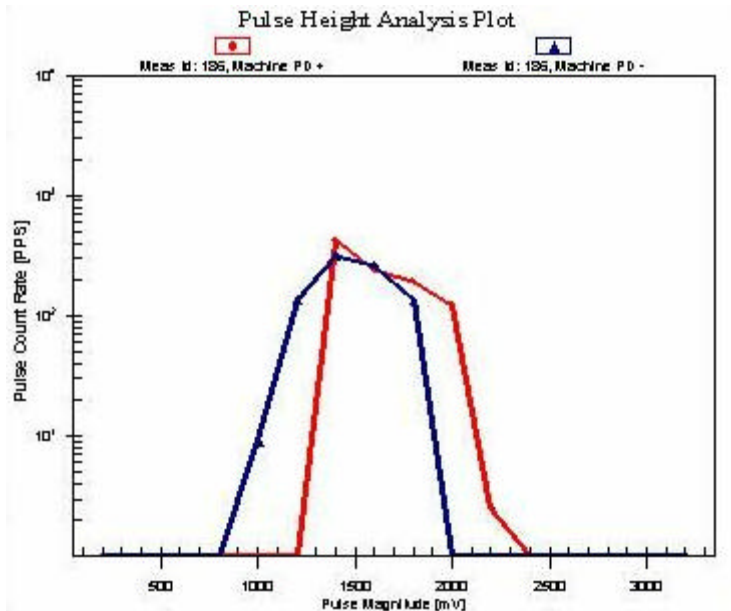
Ratings: 200 MVA Turbo Generator, 16 KV, 3000rpm air cooled

Manufacturer: Confidential

Related Info.: Global VPI stator; installed 1993.

PD Sensors: Two 80 pF couplers per phase

Details: PD monitoring on this large, air-cooled generator had revealed exceptionally high PD, according to the current Iris database. A test in July 1998 showed a Qm of 2187 mV on B phase (see figure). This is higher than 98% of similar machines in the database. There was a complicated pulse phase analysis (3D) plot – indicating at least two deterioration processes in the stator. Stator failure occurred in the Spring 1999, after about 35,000 hours of operation and about 200 starts. Investigation by plant staff revealed the failure occurred due to bar looseness in the slot (in spite of the global VPI) and slot discharge. Examination also revealed considerable endwinding PD – although the failure was not due to this.



Reference: D.G. Morrison, "Experience with Modern Air-Cooled Generator Stator Windings", EPRI conference on Electric Generator Predictive Maintenance and Refurbishment", Tampa, January, 2003.