ROTOR PULL PROVED UNNECESSARY

USING RIV AND EL CID

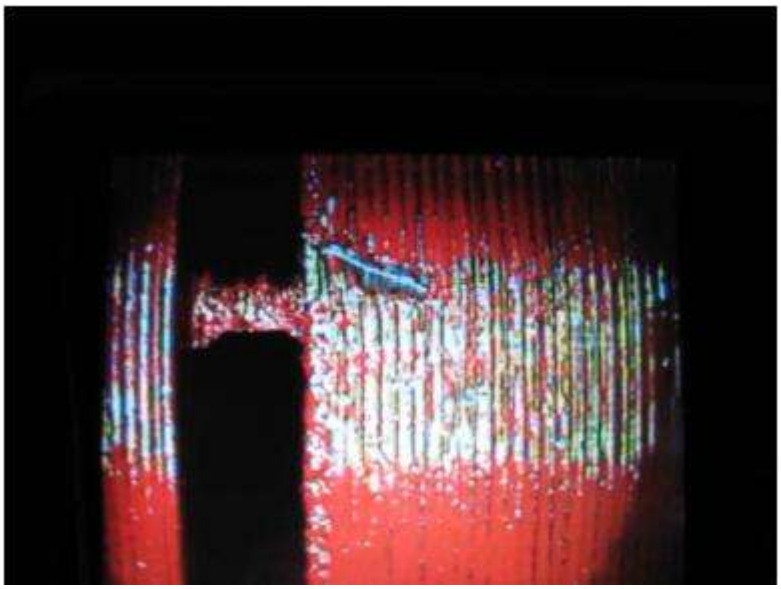

Figure 1. Stator core affected area as seen with EL CID camera

Company: Manitoba Hydro
Ratings: 300 MVA, 13.8 kV, Hydrogen Cooled Synchronous Condenser
Manufacturer: Confidential
Instrument: EL CID, RIV (Robotic Inspection Vehicle) and Camera

Details:

"…A stator ground fault occurred in a hydrogen cooled synchronous condenser rated 300 MVA. This was as a result of a small metallic object that had been left in the rotor during an overhaul. The object had entered the air gap and damaged the end arms of three stator bars, one of which failed... There was concern about possible damage to the stator core and the field poles. A robotic inspection vehicle and camera were rented to examine all 132 teeth of the core over its 3.95 m length as well as the poles. Areas were observed and photographed where there was visual evidence of possible damage. The inspection vehicle was used to move the sensing coil of our digital EL CID along stator core teeth where there was the most evidence of damage. The information obtained indicated that the damage was not sufficient to warrant removing the rotor. This decision greatly reduced the duration and cost of the repair…"

Excerpt from paper "Repair of a Damaged 300 MVA Machine", by W. McDermid et al in IEEE ISEI June 2010