



## Generator rotor end ring inspection

Generator rotor end rings are highly stressed, safety critical plant items found in power stations throughout the world. Inspection of these items has traditionally been difficult and has required removal of the rotor from its stator.

### The Problem

A global history of end ring failures due to fretting fatigue cracking and stress corrosion cracking on susceptible austenitic materials. Likely crack initiation sites on the internal ring bores are not accessible for high integrity surface inspection without removal of generator rotor from the stator and subsequent removal of end ring.

### The Challenge

To develop a high integrity end ring inspection that can be carried out with the generator rotors both 'in-situ' and out of stator housings. This negates the alternative high expense and risk of removing end rings from rotors, while overcoming the ultrasonically attenuative nature of their material.

### Our Solution

A bespoke computerised ultrasonic and eddy current inspection procedure linking powerful data acquisition and analysis software with a purpose designed scanner for fast, accurate, end ring inspection results either in situ or ex-situ of stator housings.

### Product

- low profile scanner design fits between end ring and stator
- recorded ultrasonic data displayed in A, B, C, and D scan formats enabling 'focussed' analysis on critical shrink fit areas
- multiple ultrasonic probe array enables a number of simultaneous pulse echo and time of flight diffraction scans
- eddy current probe array used to carry out external surface inspection
- permanent electronic records provide an auditable fingerprint
- system verified on sample end ring with known defects.

### Benefits

- reduced risk of plant damage (instances where generator rotors have been 'dropped' worldwide)
- significant time/cost savings in future targeted monitoring programs
- significant process cost savings in rotor and end ring removal
- significant time savings in shutdown programs
- improved insurance profile.