

GENERATOR ROTOR WEDGE SLOT DOVETAIL

Inspection And Repair Options

Crack Detection on Dovetail Load Surfaces:

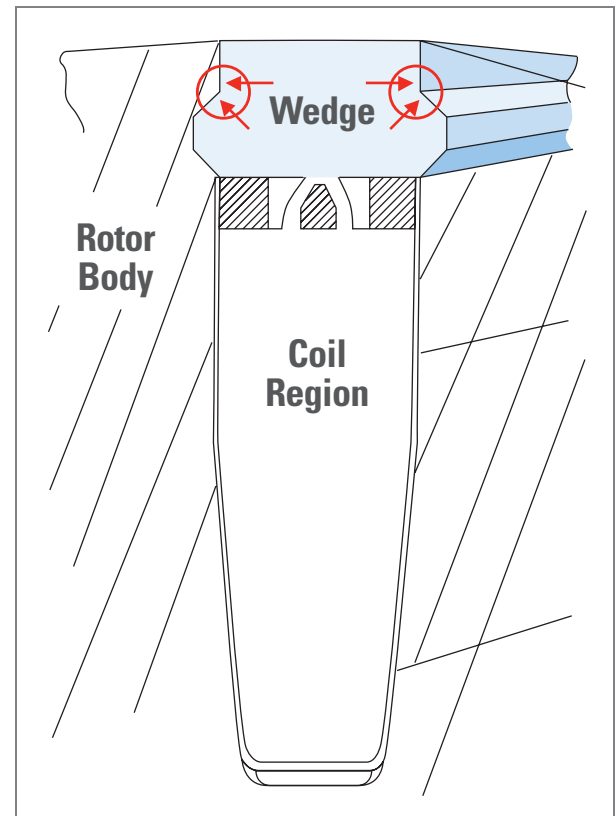
MD&A provides permanent and economical solutions for addressing the potential fretting or cracking of generator rotor slot dovetail surfaces.

Cause Identification:

Crack indications located along the wedge loading surfaces are the result of a combination of factors. These include fretting created at the butt-ends of the field wedges, excessive starts / stops, and cyclic stresses resulting from rotor "bending" while on turning gear. Negative sequence current events have also been found to aggravate the effects.

Units that may experience dovetail cracking on the rotor teeth include:

- Generators with excessive start / stop cycles
- Generators with excessive turning gear operation
- Units that have been subjected to negative sequence events resulting in arc strikes to the dovetail surface, the rotor teeth or the mating surfaces of the slot wedges
- Rotors whose geometry can be described as "long and thin" resulting in a higher susceptibility to bending
- Rotors containing steel wedges are more severely affected than those containing only aluminum wedges



Indications and cracks have been detected in the dovetail region of generator field forging. Areas most likely affected include loading surfaces at wedge butts as indicated in the above illustration by red arrows.

Engineered Repair Alternatives

MD&A provides economic alternatives for addressing issues associated with generator rotor dovetail load surface cracking.

MD&A's methods meet all OEM requirements and includes testing of critical regions which may be susceptible to cracking.

Recommendations for addressing these issues may vary depending on a variety of factors. The objectives of MD&A's recommendations are:

- To provide reliable alternative repairs for our customers
- To meet or exceed OEM recommendations
- To provide inspection and repairs that are cost effective, reliable and meet the operating needs of the owner

MD&A Inspection Scope and Repair Options Include:

- Work can be performed at the owner's site or in our St. Louis repair facility
- Remove retaining rings and slot wedges, as needed
- Visual inspection of all rotor dovetail surfaces and wedges
- NDE of wedge slot dovetail load surfaces using Eddy Current Testing
- Replacement of steel wedges with newly designed aluminum wedges which incorporate larger end radii
- Redesign of wedge lengths when appropriate to move the location where fretting can occur
- Machining of the affected load surface areas to remove indications, if any, and / or provide increased reliability when appropriate



MD&A TURBINE-GENERATOR REPAIR FACILITY

3804 Weber Road • St. Louis, MO 63125 • Ph: 314-880-3000 • Fax: 314-638-3473 • www.MDAturbines.com