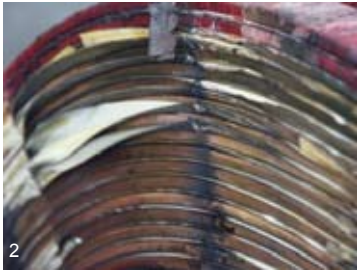




# NATIONAL ELECTRIC COIL®

**Our Experience Generates Results!**

800 King Avenue, Columbus, Ohio 43212 USA • 3330 East 14th Street, Brownsville, Texas 78521 USA



(1-2-3) Turn insulation migration found during incoming inspection is quite evident in the end turn areas. (4) Extent of damage found in slot when turns were removed. This rotor was rewound using NEC's long-term solution to the problem. (5) Rewound rotor prior to shipment.

## SES 200: Rotor Turn Insulation Migration

### Cause:

- Rotor turn insulation adhesive breakdown

### Effect:

- Shorted turns
- Reduction in excitation capacity
- High vibration

### Identifying the Condition:

- Boroscope inserted up and underneath the retaining rings
- Removal of the retaining rings



## The NEC Analysis & Specialized Engineering Solution™

Turn insulation migration can seriously affect the operational performance of the generator rotor. As the turn insulation “squirts out,” bare copper is exposed and shorted turns result. Coils with shorted turns actually run cooler than the coils without shorted turns. This temperature imbalance, from one side of the rotor to the other, can cause the rotor to bend, increasing the rotor vibration to unacceptable levels, if enough shorted turns exist.

The insulation slippage is caused by an adhesive breakdown, causing the resin bond between the insulation and the copper to separate. Because of the wide extent of the problem, NEC developed its Specialized Engineering Solution™ (SES) for generator field endwinding insulation migration. The success of the NEC's solution has been demonstrated in more than ten rotor rewinds in the last few years.

NEC's SES™ not only incorporates a superior adhesive to hold the insulation in place, it also employs a unique, specially-designed positive locking system. The system's design prevents the insulation from migrating out of the end turns.

Additionally, NEC utilizes other corrective design and procedural improvements, as part of its rewind for these machines. These include:

- Improvements in blocking design, which eliminate metal rivets that can tear retaining ring insulation, along with the use of double, redundant Nomex® tabs.
- Special techniques for removing and installing the one-piece slot wedges common to these rotors

## NEC Qualifications & Resources

National Electric Coil has specialized in the repair and refurbishment of generators for the last 90 years, including the manufacture and reinsulation of rotor windings. NEC's Turbogenerator Rotor Facility includes a high-speed balance pit with capabilities for performing any running electrical tests.

## Call Us Today!

If you have additional technical questions, please call or email Bill Moore at (614) 488-1151 x125, [bmoore@national-electric-coil.com](mailto:bmoore@national-electric-coil.com) or Steve Jeney at (614) 488-1151 x105, [sjeney@national-electric-coil.com](mailto:sjeney@national-electric-coil.com). NEC can help you with the initial inspection for this problem. NEC also can perform a full rewind, including high-speed balance, to permanently correct this problem.

Specialized Engineering Solution™ 200-TE-1008

[www.National-Electric-Coil.com](http://www.National-Electric-Coil.com) • [sendinfo@National-Electric-Coil.com](mailto:sendinfo@National-Electric-Coil.com) • Phone: (614) 488-1151 • FAX: (614) 488-8892