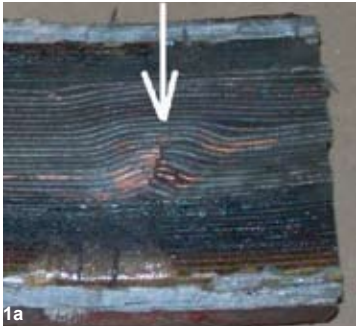




# NATIONAL ELECTRIC COIL®

**Our Experience Generates Results!**

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



(1a) Lengthwise cross-section of hydrogen-cooled bar showing strand breakage in the interior strands. (1b) Another example of strand breakage. (2) Blocking at series connections. (3) Installation of large support rings reduces vibration. (4) Installing on-line vibration monitoring system to confirm the success of new bracing design. Graph at right shows less than 2 mils vibration, confirming the success of the retrofit.

## SES 500: NECCOBrace™ End Turn Support System for Generator Designs Prone to Vibration

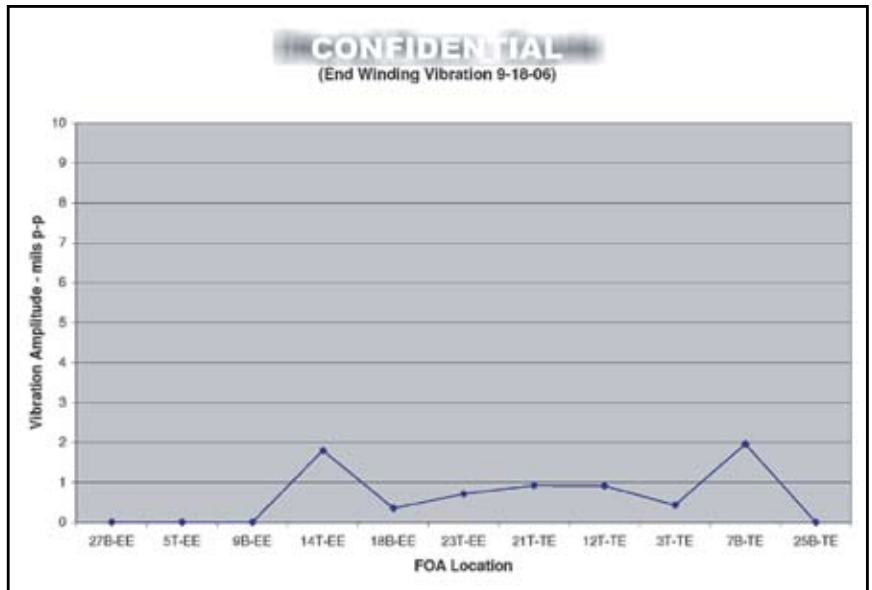
### Application:

Generators with at least 20 years of service and rated higher than 200 MWs may experience high readings for end turn vibration. High end turn vibration can lead to strand breakage, shorting and forced outages. At work are the natural frequencies in the end basket, which can approach 120 hertz (Hz), the same as the double operating frequency. As windings approach resonance, vibration can cause movement approaching 20 to 30 mils. Visual inspection of the winding can confirm the existence of this condition. Dusting, greasing and broken strands are common indicators.

### The NEC Analysis & Specialized Engineering Solution™

National Electric Coil has developed machine-specific solutions to prevent future stator end turn vibration problems, based on our many years of experience with stator coils and rewinds. Our

NECCOBrace™ system, shown in the three-dimensional drawing at the left, minimizes end turn vibration to the lowest possible values. Utilizing a system of radial tie clamps, axial uncoupling braces, and special blocking at the series connections and near the core, the end turns can be stabilized to significantly reduce vibration and the associated problem. On-line verification of vibration levels is possible with the installation of fiber optic transducers, and proven results have been indicated.



### NEC Qualifications & Resources

National Electric Coil has specialized in the manufacture of generator windings for the last 90 years. These include windings for air-cooled generators, as well as inner-gas and water-cooled windings.

### 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 or Steve Jeney at (614) 488-1151 x105, sjeney@national-electric-coil.com.



Specialized Engineering Solution™ 500-ΩH-0206