

Fiber Optic Probes Measure Stator Bar Vibration

One of the primary concerns in large generator design is vibration. Excessive vibration can lead to premature breakdown of insulation and other materials, ultimately resulting in early failure of the generator itself.

Problem

A leading manufacturer of power generating equipment required a sensing system able to measure stator bar vibration in a partial generator mockup. Specifically, the company's multi-day testing program demanded a sensing system that was

1. immune to the large magnetic field generated by live stator bars
2. capable of withstanding high heat built up from prolonged testing, and
3. compatible with a proprietary stator bar insulating material combining mica, cloth, and epoxy

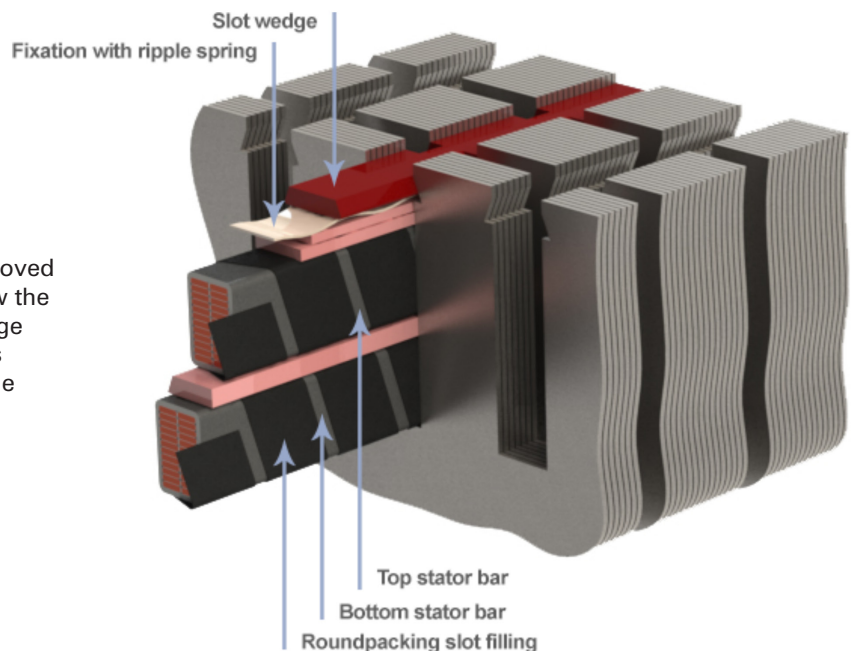
Solution

The MTI 2100 Fotonic Sensor, with reflected compensated (RC) probes, satisfied the necessary requirements. The fiber optic probes, custom designed to fit the generator stator slots, are not impacted by heat or magnetic fields. In addition, the RC probes need no calibration with the customer's proprietary insulation, which – with its cheesecloth consistency – is a difficult optical target. The probes automatically compensate for and adjust to the insulation's rough surface.

Benefits

The MTI 2100, with reflected compensated probes, provides a 2 mm measuring range, upper frequency response of 100 kHz, and 40 um resolution, surpassing the application requirements. The company instrumented the generator mock up with 24 probes to achieve the desired test results.

Sections of the slot wedge are removed allowing the probes to directly view the insulated stator bar. A second wedge holds the probes in place, provides the gapping, and ties the probe to the generator laminations.



MTI Instruments, Inc.

325 Washington Avenue Extension Albany, NY 12205
 Toll-Free: 1-800-342-2203 | Tel: 518-218-2550 | Fax: 518-218-2506
 sales@mtiinstruments.com | www.mtiinstruments.com