



Generator In-Situ Inspection

In-Situ Inspection Technology

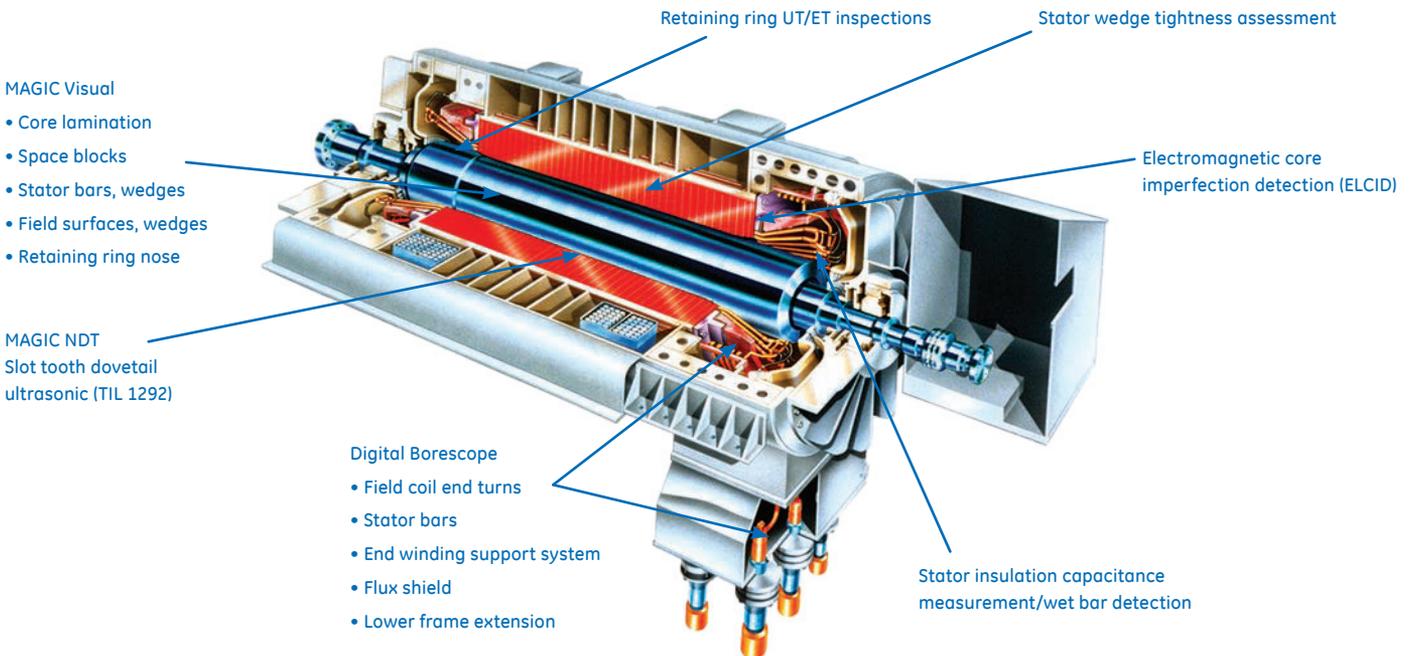
GE is continually advancing the technology of in-situ inspections on turbine generator equipment. In-situ inspections offer component assessment capabilities comparable or superior to traditional rotor-out inspections. GE's line of Miniature Air Gap Inspection Crawler (MAGIC)* robotic inspection devices can be used on generators with entrance gaps as narrow as 0.25 inches. GE can perform robotic inspections for the complete range of small industrial and gas turbine generators as well as for the large fossil and nuclear driven generators. All MAGIC inspections include a detailed visual examination of critical areas. For generators with entrance gaps of 0.50 inches and larger, MAGIC can also perform stator wedge tightness assessments and core insulation inspections (ELCID). Coupled with other standard electrical tests such as wet bar detection, in-situ inspections assist with generator component condition evaluation and provide a detailed assessment with minimum disassembly. This solution optimizes unit availability and reduces

the risk of collateral damage caused by field removal and reassembly. High resolution video and still photo documentation is made available to supplement the detailed generator condition report. A qualified GE Generator Specialist will provide technical advisory services for all MAGIC inspection services.

GE continues to develop new applications for MAGIC. An in-situ ultrasonic inspection for slot tooth cracking can now be performed on generators with diagonal flow cooling design.

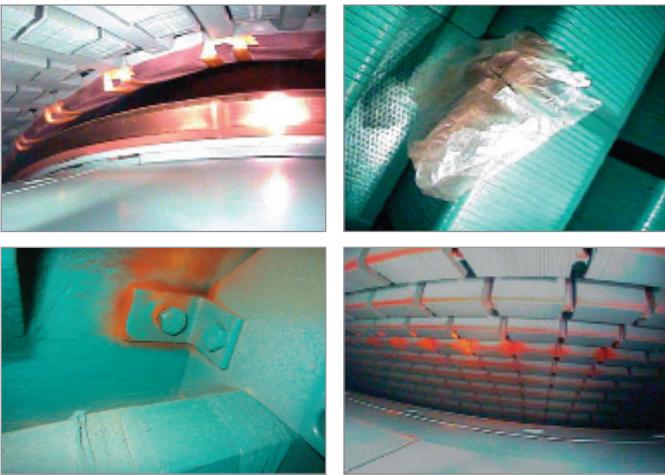
Benefits

- Reduced inspection cost
- Less risk of collateral damage from disassembly/reassembly
- Shorter outage duration
- More time between field pulls
- Periodic monitoring of known conditions



Visual Inspection

MAGIC utilizes a high intensity light source and two high resolution video cameras to view stator core laminations, stator windings, field surfaces, and wedges. A flexible borescope with digital high resolution is used to inspect coil end windings, the inboard ends of the retaining rings, and the stator high voltage leads and connections. A visual inspection of these components can provide data to assess the severity of rotor component heating related to unusual negative sequence operation; investigate high rotor vibration related to cooling flow inconsistencies; and evaluate stator core, stator bar, slot support problems, or surface contamination.

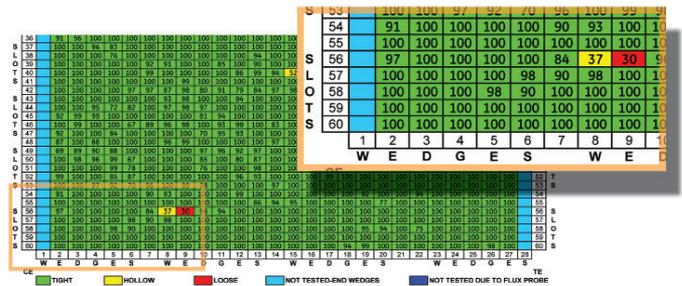


Stator Insulation Wet Bar Detection

Wet bar detection (WBD) requires placing a conductive electrode on the surface of the stator bar's groundwall insulation at the location where the bar exits the core slot. This causes the stator bar insulation system to behave like a capacitor. A change in the measured impedance phase angle is a good indicator of moisture in the insulation and has been used successfully to detect bars damaged by water leaks.

Stator Wedge Tightness Assessment

This test is performed to accurately quantify stator wedge tightness and is used to assess the need for wedge tightening or replacement. A "tight" stator winding can last two or three times as long as a winding that is not firmly held in the stator core. Test results are used to generate a "wedge tightness map," which clearly shows the wedge tightness within the generator.



Electromagnetic Core Imperfection Detection (ELCID)

Damaged core insulation can result in circulating currents that can lead to core overheating and stator damage, or even failure. ELCID uses a low core excitation level to establish a magnetic field within the core. A highly sensitive miniature sensing coil, or chattock, is used along the core surface to detect fault currents that result from core insulation damage. ELCID has been proven to be especially valuable on machines where core loosening has been more prevalent.

To learn more about this offering, contact your GE sales representative or visit powergen.gepower.com.