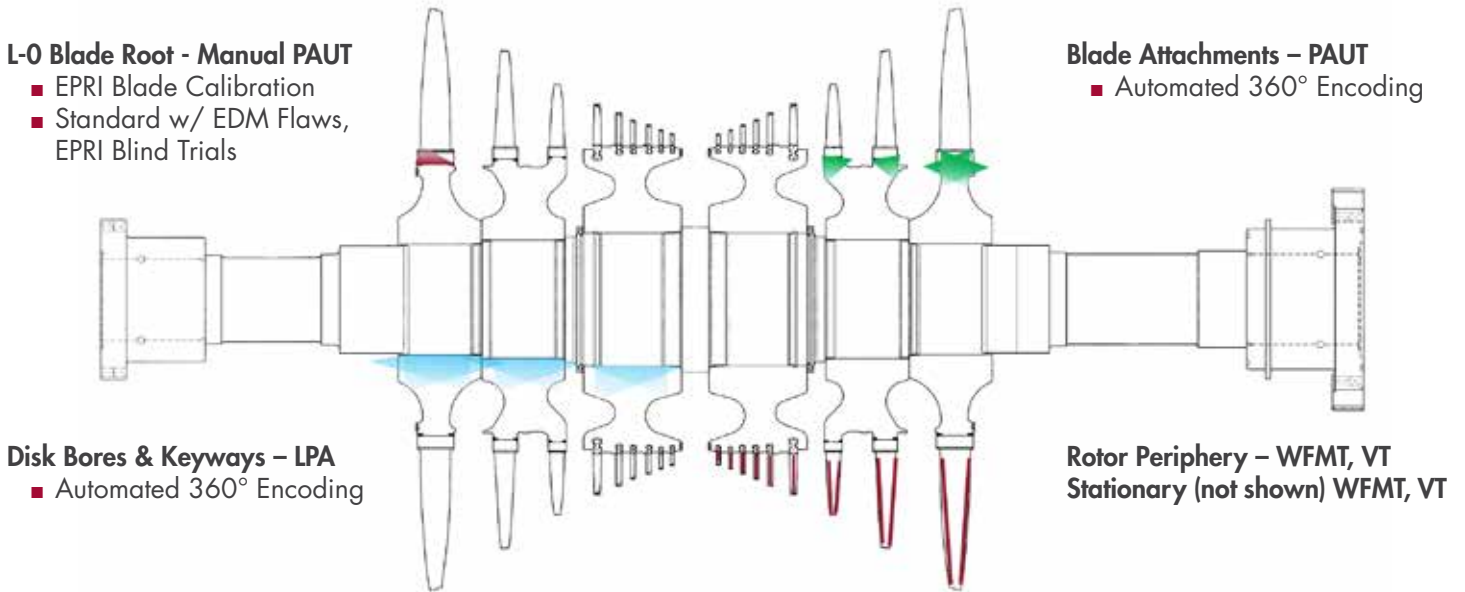


# TURBINE & GENERATOR SERVICES ADVANCED NDE AND ENGINEERING ASSESSMENTS

Siemens 13.9m<sup>2</sup> LP Rotors

Structural Integrity (SI) provides comprehensive, fully integrated solutions for life assessment, inspection, failure analysis, and online monitoring of steam turbine rotors. SI has decades of experience and a deep understanding of the design, operation, maintenance, and industry issues facing owners of popular designs, including Siemens 13.9m<sup>2</sup> LP rotors. Our holistic approach ranges from proactive management plans to conducting scheduled inspections to emergent analysis of findings, offering unprecedented value with an emphasis on minimizing outage impacts while maximizing the life of existing rotors in a safe, risk-informed fashion.

## SI provides Comprehensive NDE and Engineering Assessments for Siemens 13.9m<sup>2</sup> LP Rotors



## Newly Redeveloped PAUT Technique Provides 100% Disk Bore Coverage with Overlap/Redundancy in High-Stress Regions

- Primary probe provides larger near field increased coverage & reduced risk of signal attenuation losses.
- Scan plan includes 17 probe locations with 51 scans per flow, 102 scans per rotor.
- Overall sectoral angles allow for scan redundancy/overlap of critical regions.
- Contingencies in place to address attenuation and geometric variation risks.



\*Grit blasting of flow pass surfaces and all disks required for comprehensive inspection. Partial in-situ inspection available as an option.

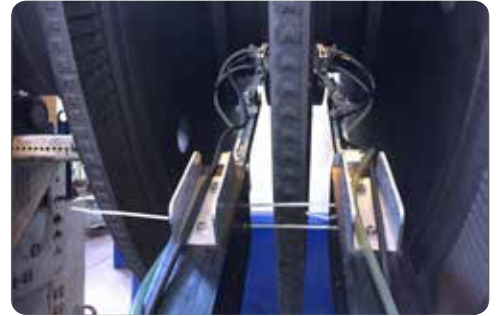
## SHRUNK-ON DISK BORE KEYWAYS

Shrunk-on disk bores/keyways are susceptible to stress corrosion cracking (SCC) due to the high stresses of the shrink-fit and potentially poor water/steam chemistry. SI's re-developed phased array examination protocol provides 100% coverage of the bore region on all wheels and keyways, with overlap redundancy.



## BLADE ATTACHMENTS

Our EPRI-demonstrated process makes use of linear phased array technology to analyze the rotor wheel blade attachments (dovetails). This inspection focuses on the detection and subsequent sizing of cracks within the blade attachments. By trending crack growth and performing a fracture mechanics analysis, SI can provide the critical information needed for owners to successfully manage the run/repair/replacement decision process concerning these rotors.



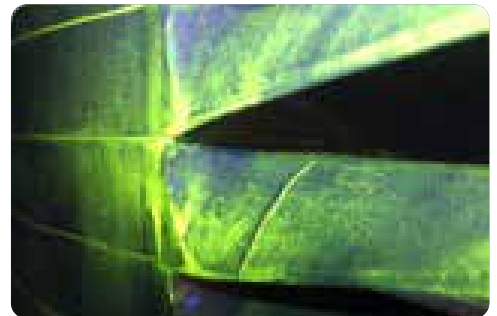
## BLADE ROOTS

Due to the large blade size and rotation speeds of the Siemens 13.9m2, the L-0 curved, axially mounted blade roots are subjected to high centrifugal forces. These forces often leave the blade root susceptible to low cycle fatigue (LCF), high cycle fatigue (HCF), stress corrosion cracking (SCC) and result in blade root cracking. SI performs a proven manual phased array examination of each blade root to detect and size blade root cracking.



## WET FLUORESCENT MAGNETIC PARTICLE TESTING (WFMT)

SI provides a complete assessment of the rotor surfaces via a thorough visual and WFMT inspection of all accessible surfaces. A portable high amperage magnetic testing (MT) machine and multi-turn cables provide the flexibility to do in-situ inspections and provide rapid results.



# LET US DEMONSTRATE THE VALUE OF AN INTEGRATED TURBINE & GENERATOR ASSET MANAGEMENT PROGRAM



**DAVID DECHENE**  
*Manager, Turbine & Generator NDE*  
✉ [ddechene@structint.com](mailto:ddechene@structint.com)  
☎ 704-883-2372



**DANNY STONE**  
*Consultant*  
✉ [dstone@structint.com](mailto:dstone@structint.com)  
☎ 304-919-0177