



Structural Integrity Associates, Inc.®

Experts in the prevention and control of structural and mechanical failures

Phased Array Blade Root Scanner

Axial entry turbine blade roots are among the highest stressed components of L-O steam turbine blade rows, and blade root fatigue cracking, due to centrifugal forces, cyclic loading, and an ageing fleet, is an ever present and growing concern. Depending on the blade geometry, cracks may initiate at any or all of the four root corners and under the convex (suction) side of the blades. However, access to the backside (admission side) of the blade during an insitu examination has proven difficult.

Structural Integrity Associates, a well-established industry leader in the development of specialized inspection technologies for turbine and generator condition assessments, designed a modular scanner and a zonal approach to blade root inspections, where engineers and technicians work side-by-side to ensure that all critical areas, or zones, of the blade root are considered and appropriately interrogated.

Access: Since each blade type, from each OEM is different, requiring a unique scanner, SI decided on a modular approach for the phased array blade scanner. This means that key components of the scanner can be assembled on multiple scanner designs, allowing for freedom of design (for a uniquely fit scanner assembly to your blade) without the need to redesign key components, such as the hook, clamp, and probe holder assembly; making most critical blade root zones accessible.

Examination: Aside from access, which is simply a mechanical issue, each zone requires a unique scan plan, where probe placement, wave-type, beam-angles, scan-range, etc. must all be considered for an optimized zonal inspection. It's not unusual for all four corners and other critical zones to each have a unique scan-plan.

ADVANTAGES:

- Uses linear phased array ultrasonic technology for improved coverage
- Rapid interrogation
- Repeatable results
- Permanent record (when encoded, for base-line data)
- Insitu examinations (no need to remove the turbine, or the casing)
- Enables probe skewing for optimized beam coverage
- Enhanced scanning motion (manual or encoded) for ultimate root coverage

For more information, please contact:

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