

Steam Generator Scale Profiling

Background

Secondary side tube deposits can have an adverse effect on steam generator (SG) operation. Unless properly maintained, SGs can be subject to performance degradation as a result of tubing corrosion and steam pressure reduction.

To develop the appropriate maintenance plans, plant operators need an accurate understanding of the deposit condition within the SGs. Westinghouse SG Scale Profiling utilizes low-frequency eddy current data to provide a comprehensive view of the distribution patterns of secondary side deposits in the SG. Plant personnel can then use this information to support their recommendations for secondary side outage services, allowing for enhanced evaluation and optimization of cleaning processes.

Description

Scale Profiling uses the low-frequency eddy current data that is collected from routine SG inspections to profile magnetite that has deposited on SG tubes, generating mathematical models of tube scale distributions. Visualization software provides volumetric representations of the deposit profile and pinpoints the areas of heaviest deposits. The data are also used to estimate the deposit inventory in each SG.

Additionally, rotating pancake coil (RPC) eddy current test data are utilized to assess deposit blockage in tube support plate (TSP) flow paths and at tube-to-tubesheet locations.

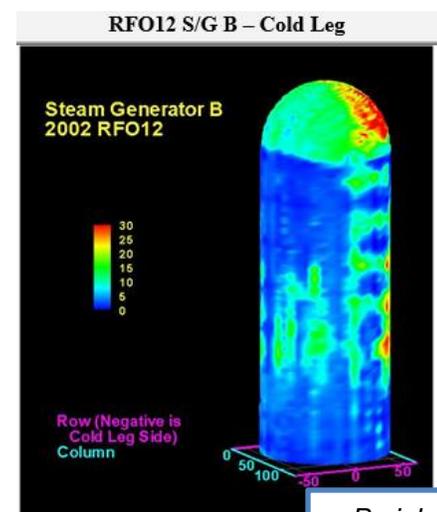
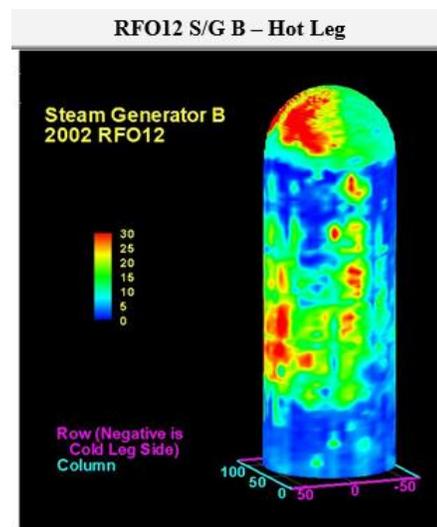
Benefits

Westinghouse SG Scale Profiling is a valuable planning tool that provides information regarding:

- Deposit accumulation throughout the tube bundle and top of tubesheet
- Need for and effectiveness of chemical cleaning operations
- Comparison of deposit distributions between SGs

- Comparison of distribution changes between inspections or following chemistry changes
- Deposit blockage in TSP flow holes and at top-of-tubesheet

Applied on a routine basis, Scale Profiling, corrosion product transport mass balance, and visual inspections work together to provide a more complete assessment of the SG condition and the effectiveness of your maintenance program.



Peripheral
Visualizations

Deliverables

The results of Scale Profiling are documented in a detailed report provided to the utility. This report contains:

- Development of scale deposit visualizations and animations using low frequency bobbin data
- Assessment of tube support plate flow hole and tube-to-tubesheet deposits using RPC data
- Comparison with visual inspections
- Estimates of deposit loading and distribution
- Recommendations for deposit management strategies

Experience

For more than 20 years, Westinghouse has completed numerous Scale Profiling assessments for various SG models, such as Westinghouse, Combustion Engineering, and Babcock and Wilcox designs. Various plants perform Scale Profiling on a routine basis as part of their strategic SG planning.

