

# **Tube Support Plate Characterization with the Eddy Current Array Technique**

**Nathan Muthu<sup>1</sup>**

<sup>1</sup>Plant Support - Nuclear Sector, Electric Power Research Institute, USA

Tube support plate (TSP) degradation in balance-of-plant (BOP) heat exchangers have been identified by several nuclear power plants. Unsecured tubes may collide and rupture during normal plant operations causing catastrophic failure to heat exchangers. This can lead to loss of power and/or costly unplanned component or plant shutdown to facilitate repair and replacement activities. Traditionally used bobbin coil probes in an eddy current inspection can detect tube support plate degradation. However, this technique is unable to characterize the extent of support plate contact loss to the tube, support plate thinning, and gap opening. Therefore, a single inspection technique that can provide early information about the TSP and tubing condition is required. Early results will afford engineers to make timely and informed decisions about the next steps to take to maintain the health of their heat exchangers. This ensures safe, reliable, and uninterrupted plant operations and power production. EPRI is conducting research on tube support plate degradation characterization with a combination array and bobbin coil technique. Early research results indicate the extent of TSP contact loss to the tube and support plate thinning can be characterized with the array coils. At the time of this abstract writing, support plate hole enlargement characterization is in its investigation stages with the array coils. The bobbin probe will be used to determine the tubing integrity. The presentation will provide the results of the on-going research with the combination eddy current array and bobbin coils to characterize tube support plate degradation and determine the tubing integrity of balance-of-plant heat exchangers. Keywords: Balance-of-Plant Heat Exchangers Tube Support Plate Degradation Combination Eddy Current Probe Eddy Current Array Eddy Current Bobbin Coil Eddy Current Inspection