

CHARACTERIZATION OF EDDY CURRENT SIGNAL FROM QUATREFOIL TUBE SUPPORT PLATE FLOW HOLE BLOCKAGE OF STEAM GENERATOR TUBES

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Over the past years, several cases of steam generator problems associated with the presence of secondary side deposits have been reported. In case of Westinghouse Model F steam generators, quatrefoil tube support plate design was expected to have better flow path avoiding deposit of particles and the possibility of tube corrosion. But as operating time increases, recent experiences of Model F steam generators reveal that water level oscillation can occur because of quatrefoil flow hole blockage, which causes degradation in the thermal performance of steam generators and necessitates quatrefoil flow path blockage monitoring.

These oxides which block quatrefoil flow hole or form scaled deposits on tube surface are difficult to remove and require strong cleaning method such as chemical cleaning which needs a lot of time and high cost. Therefore, it would be desirable to measure and analyze the rate of blockage in various aspects to estimate the most appropriate time of secondary side cleaning.

Technologies to measure and analyze scaled deposits on tube surface have been already developed and applied to field services, but methods to measure tube support flow hole blockage are still underdeveloped or on trial in several ways.

In this paper, a mock-up has been set up to characterize parameters of scaled deposit and to generate baseline data as a reference for field data analysis. Also, eddy current data have been acquired through experiment to observe eddy current signal characteristics from various shape of quatrefoil flow hole blockage, suggesting field analysis guidelines for signal calibration and evaluation.