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PRIMARY WATER STRESS CORROSION CRACKING (PWSCC) PREDICTION GUIDELINES

Keywords: STEAM GENERATOR; STRESS CORROSION CRACKING; MECHANICAL PROPERTIES; INCONEL ALLOYS; ALLOY 600

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Objectives: The objective of the project are:

1) To determine the best available method for developing predictions of PWSCC in Alloy 600 steam generator tubes

2) To provide guidance to utilities for use of the strain rate damage model and the empirical model in predicting the occurrence of PWSCC in steam generator tubing

3) To assemble and provide the needed data for utilities to use when performing PWSCC predictions

Comments: PWSCC is affecting an increasing number of steam generator tubes and other reactor coolant system components made of Alloy 600. Accordingly, there is an increasing need for utilities to predict the occurrence of PWSCC in their plants so they can make plans and take appropriate remedial actions. EPRI investigators reviewed the strain rate damage model and the empirical model for possible use in predicting the occurrence of PWSCC in steam generator tubing. Data needed for evaluation and application of these models were assembled and analyzed. Trial applications of the methods were carried out and compared with laboratory experience.

Potential for dose limitation: The researchers concludes the empirical model is a more practical method for developing PWSCC predictions. It predicts the time to 1% PWSCC based on a material factor. It also provides a statistical description of the increasing fraction of tubes experiencing PWSCC as a function of time. The report provides detailed information and guidance that can be used by utilities when applying the empirical model for prediction of PWSCC in their steam generators.

References: EPRI TR-104030, FINAL REPORT, JULY 1994.

Duration: from: 1992 to: 1994

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