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Experimental Verification of Model-Based Interpretation of the Bobbin Coil ECT Signal for Quantitative Characterization in NPP SG Tubes

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Abstract

The model-based inversion tools for eddy current signals have been developed by the novel combination of neural networks and finite element modeling for quantitative flaw characterization in steam generator tubes. In the present work, interpretation of experimental eddy current signals was carried out in order to validate the developed inversion tools. A database was constructed using the synthetic flaw signals generated by the finite element modeling. The hybrid neural networks of a PNN classifier and BPNN size estimators were trained using the synthetic signals. Experimental eddy current signals were obtained from axisymmetric artificial flaws. Interpretations of flaws were carried out by feeding experimental signals into the neural networks. The results of interpretations were excellent, so that the developed inversion tools would be applicable to the interpretation of experimental eddy current signals.