



Presented at NDE2002, to predict. assure. improve. www.nde2002.org
National Seminar of ISNT, the Indian Society for Non Destructive Testing
Hotel Taj Connemara and Raja Mutiah Hall, Chennai, 05. – 07. 12. 2002

Development and Application of Plus Point Eddy Current Test Coil for Flaw Characterisation

Arbind Kumar, R. S. Vaghasia*, U. N. Tripathi and B. K. Shah

Atomic Fuels Division, Bhabha Atomic Research Center
Trombay, Mumbai - 400 085

* QA Directorate, NPCIL, Mumbai - 400 094

Abstract

Flaw characterization by Non-Destructive Testing (NDT) is a challenging task. Determination of size, shape, orientation and location of flaw by NDT techniques is required for remaining life assessment (RLA) of the components based on fracture mechanics. Eddy current testing (ECT) is used for detection and characterization of surface and subsurface flaw in conducting materials.

It is difficult to determine the orientation of a flaw by conventional differential circular ECT coil. The circumferential crack may be missed during testing due to same orientation of crack and flow of eddy current in circumferential direction parallel to coil winding. The permeability variation due to cold work and welding also affects the eddy current signal obtained during testing using conventional circular coil. Hence a new plus point coil is designed and fabricated to overcome these limitations. Advantages of plus point coil are: (i) it can differentiate the defects oriented in two perpendicular directions, (ii) there is no effect of permeability variation on plus point coil signal and (iii) the lift-off effects gets nullified in plus point coil.

This paper deals with the design and development of eddy current plus point test coil, test parameter selection and analysis of signals obtained during testing of welded steel plate containing flaws of different sizes in two perpendicular directions.