Abstract

This paper expounds the 3D modelling of the MFL imaging system to monitoring the outer
Modelling of MFL System to Inspect Ferro Magnetic Tubes

surface defects in Ferro-magnetic Steam Generator Tube (SGT). It features a new flaw detection technique in conjunction with the Magnetic Flux Leakage (MFL) inspection and Digital Imaging. It delivers information of the defective tube surface in the form of a digital image. The impact of variation in the dimension of flaws on the MFL signal is additionally analysed for enhancing the reliability of detection of various defect characteristics. Modelling of MFL imaging system has been done using COMSOL 4.3 for prediction of leakage fields of defective SGT.

References

- Xiang LI, CHEN Liang, QIN Guangxu, FENG Peifu and HUANG Zuoying 2008 Steel pipeline testing using magnetic flux leakage method. IEEE transaction.
- Ahmad khodayari, James P. Reily, Natalia k Nikolova, 2009 Machine learning techniques for the analysis of magnetic flux leakage images in pipeline inspection. IEEE trans on magnetics vol 45, no 8
- Muhammad Afzal, Satish upda 2002 Advanced signal processing of magnetic flux leakage data obtained from seamless gas pipe line. NDT&E, pp. 449-457
- Wong Toh Ming, 2004 Design and construction of magnetic flux leakage inspection System for ferro magnetic material. Dissertation, University of Technology Malaysia.
- Xinjun WU, Jiang XU, Yanling WANG, 2004 Signal processing methods for magnetic flux leakage testing based on bispectrum. Huazhong University of Science and Technology.
- Huang Zuoying, Que peiwen 2006 3D FEM analysis in magnetic leakage method.
Modelling of Mfl System to Inspect Ferro Magnetic Tubes

NDT&E, pp. 61-66.
- Nathan Ida, William lord 1983 3D finite element prediction of magnetic leakage field. IEEE trans on magnetics vol 19 no 5
- Maryam Ravan, Reza Khalaj Amineh, 2010 Sizing of 3D arbitrary defects using magnetic flux leakage measurements. IEEE trans on magnetics, vol 46, no 4,
- COMSOL 4. 3 Multiphysics modelling and simulation www. comsol. com

Index Terms
Computer Science  Electronics

Keywords
Magnetic Flux Leakage  Steam Generator Tube  Digital Imaging  Comsol 4. 3  3d Modelling

Defect Characterisation.