



Methodology for non-destructive assessment of integrity of steam generator shell welds

Steam generator shell welds

145

S. Thirunavukkarasu, B.P.C. Rao and G.K. Sharma

Nondestructive Evaluation Division,

Indira Gandhi Centre for Atomic Research, Kalpakkam, India

Viswa Chaithanya

Vellore Institute Technology University, Vellore, India

C. Babu Rao, T. Jayakumar and Baldev Raj

Nondestructive Evaluation Division,

Indira Gandhi Centre for Atomic Research, Kalpakkam, India

Aravinda Pai and T.K. Mitra

Bharatiya Nabhikiya Vidyut Nigam Ltd, Kalpakkam, India, and

Pandurang Jadhav

Larsen & Toubro, Powai, India

Abstract

Purpose – Development of non-destructive methodology for detection of arc strike, spatter and fusion type of welding defects which may form on steam generator (SG) tubes that are in close proximity to the circumferential shell welds. Such defects, especially fusion-type defects, are detrimental to the structural integrity of the SG. This paper aims to focus on this problem.

Design/methodology/approach – This paper presents a new methodology for non-destructive detection of arc strike, spatter and fusion type of welding defects. This methodology uses remote field eddy current (RFEC) ultrasonic non-destructive techniques and K-means clustering.

Findings – Distinctly different RFEC signals have been observed for the three types of defects and this information has been effectively utilized for automated identification of weld fusion which produces two back-wall echoes in ultrasonic A-scan signals. The methodology can readily distinguish fusion-type defect from arc strike and spatter type of defects.

Originality/value – The methodology is unique as there is no standard guideline for non-destructive evaluation of peripheral tubes after shell welding to detect arc strike, spatter and fusion type of welding defects.

Keywords Structural integrity, Steam engineering, Eddy currents, Ultrasonics, Welding

Paper type Technical paper



The authors thank Mr S. Ponneseivassan, Mr M.M. Narayanan and Mr P. Krishniah from Nondestructive Evaluation Division (NEDD) of IGCAR, Kalpakkam, for their help during testing of the steam generator tubes at manufacturing site. The authors also thank Mr Vijay Kunkekar and Mr Sandeep Korantak of M/s. Larsen & Toubro, Powai, Mumbai, for design and fabrication of calibration specimens and for many useful discussions. One of the authors, Viswa Chaithanya, thanks M/s. Extende, Paris, for providing training in CIVA software at their facility in Paris.

International Journal of Structural Integrity
Vol. 2 No. 2, 2013
pp. 145-157
© Emerald Group Publishing Limited
1757-9864
DOI 10.1108/17579861111132940

Fursa et al. Published online: 12 Jun Article. Evaluation of three nondestructive testing techniques for quality assessment of asphalt pavements. Lin et al. Lift-off nulling and internal state inspection of multi-layer conductive structures by combined signal features in pulsed eddy current testing. Huang et al. Non-Destructive Evaluation (Vol 2) [Andreas Mandelis] on conferenciainternacionalapte2017.com *FREE* shipping on qualifying offers. Detection of defects in electrosag butt welds before and after heat treatment: Belyi, V.E. Russian Journal of Nondestructive Testing, Vol. 30, No. 10, pp. This fourth edition volume offers updates and new technical content throughout. The chapter on physics has been extensively revised and includes new. The NDT Handbook covers all major methods of nondestructive testing, each Vol. 1, Penetrant Testing [in print, October] Vol. 2, Leak Testing [in print. Non-destructive evaluation of reinforced concrete structures, Volume 2: Non-destructive testing methods reviews the latest non-destructive testing techniques for. Electromagnetic Nondestructive Evaluation (ENDE) provides an important method for assessing the (print) (online) This volume presents selected papers from the International Workshop on Non-destructive Testing of Fibre-reinforced. Plastics Composites, Vol. 2. John Summerscales, Editor. Elsevier Applied Science Publishing Co., Ivenue of the Nondestructive Testing Handbook 3rd: Volume 5: Electromagnetic Testing Testing, Reliability, and Application of Micro- and Nano-Material Systems II. The AMMTIAC Quarterly, Volume 2, Number 4. 3. INTRODUCTION tions, the nondestructive evaluation (NDE) of fiber reinforced polymer composites. Homepage of EFNDT, the European Federation for Non-Destructive Testing. An updated document (rev1) about Schedule 2 of the EFNDT MRA is now. Engineering Science and Mechanics, Nondestructive evaluation, Failure, Flaw detection, Probability, . Figure 2 illustrates the inspection of a weld in a nuclear power plant, such .. that the beam intensity is slowly varying over the volume of. Testing. February , Volume 49, Issue 2, pp Cite as Keywords . nondestructive testing acoustic methods concretes experimental studies. Index Terms Non-destructive evaluation, polymer composite materials VOL. 5 , NO. 5, SEPTEMBER Non-Destructive Evaluation of Polymer Composite. Journal of Nondestructive Evaluation, Diagnostics and Prognostics of Engineering Systems. Newest Issue: (November , Volume 1, Issue 4). Issues In. Nondestructive evaluation (NDE) techniques are used widely in many American Society for Quality Control. TECHNOMETRICS, MAY , VOL. 38, NO. 2. volume partially or in full for thin components, but that the penetration depth is . Figure POD plots for four different non-destructive evaluation methods on.

[\[PDF\] Por caminos errantes](#)

[\[PDF\] The Art of Oratorical Composition, Based Upon the Precepts and Models of the Old Masters](#)

[\[PDF\] Demain Je Serai Africain \(French Edition\)](#)

[\[PDF\] HIFA 13 Fils du Martel, Stoclet: La Naissance, L'Education Et La Jeunesse de Pepin, Dit Le Bref \(V. 7](#)

[\[PDF\] Elevator magic \(MathStart\)](#)

[\[PDF\] Misc. Tractors Allison Twin Disc Powershift Trans Model TT2421-1 \(Special Order\) Service Manual](#)

[\[PDF\] The Storm Cloud Of The Nineteenth Century: Two Lectures Delivered At The London Institution February](#)