

Establishment of Digital Laminography facility at Malaysian Nuclear Agency

Khairul Anuar Mohd Salleh¹, Shahfuan Hanif A. Hamidi², Uwe Ewert³, Uwe Zscherpel⁴, Ab. Razak Hamzah⁵, Mahamad Noor Wahab⁵, Noorhazleena Azaman⁶, Arshad Yassin¹

¹LENDT Group, Malaysian Nuclear Agency, Malaysia, ¹ Industrial Technology Division, Universiti Kuala Lumpur- Malaysia France Institute, Malaysia, ¹Radiology committee , German Society of NDT (DGZfP) , Germany, ¹Radiological Methods , Federal Institute for Materials Research and Testing, Germany,

¹Fabrication & Joining Section, Universiti Kuala Lumpur- Malaysia France Institute, Malaysia,

¹Fabrication & Joining Section, Malaysian Nuclear Agency, Malaysia

Digital Laminography is a technique that enable the estimation of defect depth from a set of digital radiograph. It allows the engineers or researchers to visualize and measure the depth from the object surface. The technique is applicable to be used in both welded components and non-metal applications such as composite. The technique allows user to understand engineering problem and permits them to further analyze cause of failures. Malaysian Nuclear Agency is pursuing to build and establish the digital laminography at her facility. A gantry is designed to hold a 225kVp X-ray tube that is mechanically moved at a slow speed. A 100 um pixel size Digital Detector Array (DDA) is used to capture the image. This paper will highlights simulation and preliminary assessment done to understand the physics and appropriate steps to build up digital laminography system. It will also highlights the preliminary study of the exposure parameters of laminography technique on carbon steel plate. The important exposure parameters that are considered in this preliminary study are voltage, current, and frame time. The radiographic images with achievable level of contrast sensitivity and image quality are analyzed according to the ISO 17636-2. The results show the exposure parameters has significantly influenced the value of SNRN. Further experimental works are performed using triangulation technique on welded sample. The deviation between the calculated depth of defects and actual results is less than 1.0 mm.