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Validation Of Digital Radiography For Castings.

NDT Inspection & Testing Ltd, one of the largest independent inspection service providers in the UK, has carried out extensive work to validate the use of computed radiography in the inspection of aerospace castings. Using state-of-the-art, equipment, the company has established equivalence between the results of a digital inspection and those of conventional, wet film radiography.

Computed radiography is fast being introduced throughout the industrial and process sectors, as inspectors, manufacturers and asset owners realise the significant benefits offered by the technology. There are potential benefits in terms of cost savings, as there are fewer consumables, space savings, as there is no need for film development facilities and environmental benefits, as no chemicals are used. Moreover, inspection productivity is considerably improved, there are quantifiable energy savings because of the shorter exposure times and, not least, digital storage and archiving of inspection results is more accessible and compact than with wet film.

However, although there are now accepted International standards covering computed radiography, many organisations still rely on conventional film radiography as their prime inspection method. To help overcome this resistance to the transition to digital radiography, NDT Inspection and Testing has worked with one of its major customers to help establish the validity of the technique to carry out radiographic inspection of critical, cast components for the aerospace sector. (Porosity is caused by air inclusions at the casting stage, while shrinkage, which can take place during casting, as different areas of the pouring cool at different rates, causes structural weakness. Metallic and non-metallic inclusions can also occur during the casting process.)

This validation procedure involved first carrying out radiography of a particular component using conventional film. The same component was then inspected using computed radiography and the two images were compared. Adjustments were then made to the radiographic source settings, in terms of the power used, the focal distance from the component, the exposure time etc., while the digital viewing system was also adjusted in terms of its x-ray parameters. The new image was again compared with the original film image and this process was repeated until there was no technical difference between the two images. The digital radiography settings were then stored and these were used as the developed technique for inspecting that particular component.

NDT Inspection & Testing is a centre of excellence for industrial radiography, both digital and wet film, advanced ultrasonic imaging and a wide range of inspection services using traditional and state-of-the-art solutions to address inspection problems. Its operations are supported by an advanced, computer-based, parts-tracking system, which has been developed in-house to increase productivity, accountability and traceability. The company was recently awarded Merit status for its NDT operations at its Queensferry, Worcester and Sittingbourne sites by Nadcap, the international program which allows industry oversight of the quality control of specific manufacturing processes and products in the aerospace sector. Merit status extends the interval between audits and is widely acknowledged as an endorsement of a company's quality performance commitment to its customers. The company is also UKAS-approved to ISO EN 17025 and has quality approvals from a number of major aerospace companies as well as Boeing, including Airbus, Raytheon, Rolls Royce, BAE Systems and their prime contractors.

