

57972 *Holmstrom, J-E.*

Quantitative radiography of welds – dose rate, dose and contrast of X-ray equipment and films (In German, English abstract)

Materialprüfung, Vol. 37, No. 4, pp. 123-126 (Apr. 1995)

The investigations compare the dose rates of different X-ray units, determine the effectiveness of the dose on radiographic films and analyse their different contrast behaviour. The contribution reports on forty years of experience and gives a systematic insight into the relations of the essential parameters of radiography.

57966 *Weber, T.V.*

Penetrating the intricacies of weld radiograph interpretation

Welding Journal, Vol. 74, No. 5, pp. 33-39 (May 1995)

Several tips and techniques are presented to aid in the interpretation of radiographic test film

57700 *Bernardi, R.T.*

Steel weld inspection with digital radiographic line scanning

ASNT 1993 Spring Conference and 2nd Annual Research Symposium, Nashville, Tennessee (United States), 29 Mar. –2 Apr. 1993, pp. 78-80. ASNT (1993) ISBN 0-931403-13-8

Bio-Imaging Research, Inc. (BIR) has recently developed and fielded an automated digital radiographic (DR) weld inspection system called RLS (Radiographic Line Scanner). RLS is being used for integrity verification of 16 mm (5/8 inch) thick plasma arc steel butt welds to a radiographic inspection quality of 2%–1T. The system inspects these welds with a throughput of 30 mm (1.2 inches) of weld length per minute, and provides real time, scrolling display of the image during inspection. The present RLS mechanical configuration moves the weld past a stationary radiation source and detectors; a configuration moving the source and detectors past a stationary weld is also possible, with the same imaging quality.

57694 *Venkatraman, B.; Rao, C.B.; Bhattacharya, D.K.; Raju, B.; Sethi, V.K.*

Microfocal radiography of tube to tubesheet welds of steam generators of prototype fast breeder reactor

Non-Destructive Evaluation and Quality Assurance. Edited by C.R.L. Murthy, B. Raj, O. Prabhakar and A. Sreenivasulu. pp. 231-237. Interline Publishing (1993) ISBN 81-7296-010-7

The tube to tubesheet weld joints in the steam generators of Prototype Fast Breeder Reactor are critical and require high quality non-destructive test methods for ensuring their integrity. The configuration of the weld joint is such that conventional radiography cannot be applied due to problems of accessibility and poor resolution. Hence, microfocal radiography with rod anode is the solution for the examination of such welds. This paper details the work carried out on more than 100 trial tube to tubesheet weld joints for the standardisation of radiographic procedures. It also shows how this technique has been responsible in improving the weld parameters.

57693 *Holmstrom, J E.*

Quantitative radiography of welds – dose rate, dose and contrast of x-ray equipment and films (In German, English abstract)

Materialprüfung, Vol. 37, No. 3, pp. 64-68 (Mar. 1995)

The investigations compare the dose rates of different X-ray units, determine the effectiveness of the dose on radiographic films and analyse their different contrast behaviour. The contribution reports on forty years of experience and gives a systematic insight into the relations of the essential parameters of radiography.

57460 *Venkatraman, B.; Sethi, V.K.; Jayakumar, T.; Raj, B.*

High-definition radiography of tube-to-tubesheet welds of steam generator of prototype fast breeder reactor

Insight, Vol. 37, No. 3, pp. 189-192 (Mar. 1995)

In the steam generator of the Prototype Fast Breeder Reactor (PFBR), steam is generated by the transfer of heat from secondary sodium to water. Due to the inherent dangers of sodium-water reaction, the integrity of weld joints separating sodium and water/steam is of paramount importance. This is particularly true and very important for the tube-to-tubesheet joints. This paper discusses the use of projective magnification technique by microfocal radiography for the quality evaluation and optimisation of the welding parameters of such small tube-to-tubesheet welds of the steam generator of PFBR.

57217 *Nuding, W.; Link, R.; Sauerwein, C.; Schroder, P.; Wiacker, H.; Schroder, G.*

TIG welding recovery and high resolution on-line x-ray inspection of turbine blades

6th European Conference on Non Destructive Testing, Nice (France), 24–28 Oct. 1994. Vol. 1, pp. 683-684. ECNDT (1994)

The paper describes the development of a prototype of an integrated inspection and repair station for turbine blades. The defects are detected using high resolution realtime radioscopic. For this purpose an inspection system consisting of an x-ray device, a real-time radioscopic system with 1024 x 1024 pixels and a manipulator has been built up. To guarantee reproducible conditions during the inspection a special, water-cooled high-capacity tube head for the microfocus x-ray tube had to be developed. The X-ray inspection is also executed remotely controlled and the results are displayed on a television monitor, while the evaluation is done by a human inspector. A detected defect is marked and the image processing computer calculates its position in the object and its size. The coordinates of the defect are used for the automated repair by a welding robot, which has been developed by the other partners in this project.

57203 *Blettner, A.; Chauveau, D.; Becker*

Robot for computerized real time radiographic inspection of on shore pipe welds

6th European Conference on Non Destructive Testing, Nice (France), 24–28 Oct. 1994. Vol. 1, pp. 225-228. ECNDT (1994)

This system is planned for real time X-ray testing of pipe welds: Diameter : 6" and 8", 2,5 ≤ thickness ≤ 10 mm. Functional and technical specifications sheets were established together with Gaz de France. The main specifications of working conditions are as follows: Testing is possible from – 10sup(o)C to 50sup(o)C, site inspection at not readily accessible locations (unsealed road), inspection of suspended pipes 400 mm above ground level, inspection rates > 80 welds per day. The robot is positioned on to the pipe by the operator by means of the handling device and loaded into position (no weight if supported by the pipe). The mobile equipment carrying the X-Ray emitter and the radioscopic receiver is a cross country vehicle equipped with a crane. Results and images of X-ray testing are recorded on a digital optical disk.

55772 *Basler, G.*

Radioscopic control system of welded joints (In Romanian; English abstract)

Simpozionul Asociatiei Romane de Examinari Nedistructive, Hunedoara (Romania), 11-13 May 1994. Vol. 1-A, pp. 108-113. ARoEND (1994)

The paper is devoted to the radioscopic control system of welded joints. It describes and analyses the geometric, electronic and optic enlargements and the image integration, all this in order to improve the image. The results offered by such installations in comparison with the radiography are presented.

55766 *Negut, M*

Non-destructive X-ray examination of a welded joint of the product "gamma ionising type CIG-P 321"

Simpozionul Asociatiei Romane de Examinari Nedistructive, Hunedoara (Romania), 11-13 May 1994. Vol. 1-A, pp. 92-96. ARoEND (1994)

This product is a high sensitivity gamma radiations detector for surveillance of gamma radiation fields from different zones and work spaces of a nuclear power plant. The performance of the welded work is based on welding technology developed according the requirements of a ASME Section VIII qualified welding procedure. The welded joint is 100% X-ray controlled according to the prescription. The non-destructive examination results are presented in the testing report.

55764 *Wessel, H.; Nockemann, C.; Tillack, G-R.*

The influence of image digitisation and calibration of a scanning system upon weld inspection

Advances in Signal Processing for Nondestructive Evaluation of Materials, Quebec (Canada), 17-20 Aug. 1993. pp. 133-144. Edited by X.P.V. Maldague. Kluwer Academic Publishers (1994) ISBN 0-7923-2765-9

The capability of a high-resolution scanning system for industrial radiographic films was tested dependent upon the specification and calibration of the system using ROC method.

55333 *Khaled, T.*

An investigation of pore cracking in titanium welds

Journal of Materials Engineering and Performance, Vol. 3, No. 1, pp. 21-36 (Feb. 1994)