

1.4.22. SIMULATION SUPPORTED RELIABILITY ANALYSIS IN RADIOGRAPHY

Jaenisch G.-R., Bellon C., Ewert U.,
Federal Institute for Materials Research and Testing (BAM), Berlin, Germany

Efficient and reliable nondestructive evaluation techniques are necessary to ensure the safe operation of complex parts and construction in an industrial environment. Radiography is one of the classical nondestructive testing techniques widely applied in industry. Over the years modeling became more and more important in modern NDE. It is increasingly used to optimize techniques for complex applications and to support the preparation of written procedures. Hence, computer modeling is nowadays able to handle all significant properties of a NDE system with sufficient accuracy. In case of radiographic applications the model includes the radiation source, the interaction of radiation with material, the detection process, and the geometrical description of the part or the construction. As known from practice the last can be very complex and requires a description that allows the handling of arbitrary geometries. The link between NDE models and CAD provides the ability to quantitatively evaluate complex inspection procedures. Depending on the formulated inspection problem or the influencing factors that should be accessed by modeling an appropriate physical model has to be chosen to describe the underlying interaction mechanisms. The developed simulation capabilities are used to assess the reliability of the radiographic inspection of thick section welds for a special application and to determine the probability of detection (POD) for flaws of different size and shape.