1.3.58. POD GENERATOR PROJECT: A NUMERICAL ASSESSMENT OF THE INSPECTION OF FATIGUE CRACKS USING TOFD

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Risk based inspection strategies rely on detailed knowledge of the performance of inspection techniques. The objective of the "POD generator" project is to develop a numerical modeling approach to assess effectiveness of specific inspection techniques. Simulation offers flexibly and reliability at acceptable costs. Therefore numerical models have been developed and validated for accurately simulating the physics of inspection techniques. These numerical models are then used to generate quantitative probability of detection (POD) curves. In the case of ultrasonic time-of-flight-diffraction (TOFD) inspections, the human factor is included on two levels. First in the way a TOFD scan is carried out (positioning variations). And secondly, in the fact that simulated inspection results are interpreted by real operators.

This paper shows the assessment of the inspection of fatigue cracks using TOFD using this numerical approach. The influence of high-low, gas inclusions and the human interpretation on the performance of the inspection was investigated by generating multiple POD-curves under different circumstances. This way we show that the numerical modeling approach is an efficient and reliable way of determining the required effort to inspect welds for fatigue cracks under different circumstances.