

1.11.7. PIPE MILL OFFSHORE PIPELINE PRODUCTION NDT SYSTEMATICS

Hasting H.S., Dvoreckaja O., Gjerde P.E.,
DET NORSKE VERITAS AS, Stavanger, Norway

Offshore pipelines are subject to strict requirements on design and production, if produced according to Offshore Standard for Submarine Pipeline Systems DNV OS-F101. The reason for strict requirements is a lack of redundancy once the pipeline is installed at the sea bottom. The integrity of the pipeline has to be confirmed and documented as good as possible before installation, in order to avoid costly repairs at a later stage. The integrity of the final pipeline is ensured by NDT during production. Accordingly, DNV OS-F101 does specify requirements on NDT performed during production of offshore pipelines at pipe mills and for girth welding during installation.

NDT is performed on produced offshore pipes at pipe mill. The object of inspection is to ensure high quality of the welds and the machining of the weld bevels, and to ensure fitness for the final pipe laying offshore. Pipe production demands repetitive and predictive inspection tasks, which opens up for some automation of inspection. In order to optimise the performance of inspection, several NDT methods are used. Methods that have found applications for pipe mill inspection are for instance automated and manual ultrasonics, radiography, eddy current and MPI, in addition to visual inspection. Planning and performance of inspection is aimed at all relevant flaws that might appear during pipe production, and to cover the entire pipe. At the same time, inspection has to be optimised in terms of efficiency in order to avoid unnecessary delays in pipe production. For long seam pipes, inspection of the long seam weld is an important part of the inspection scope. A suitable and efficient NDT method for such inspection is Automated Ultrasonic Testing (AUT), as AUT offers possibility of reliable and efficient inspection. The AUT scanner is set up and calibrated for detection of relevant longitudinal and transversal weld defects. DNV OS-F101 specifies several requirements for equipment and calibration of long seam weld AUT inspection, to ensure that the entire weld is inspected. For seamless pipes, AUT might find application in inspection for laminations. AUT has also found an application for pipe end inspection for laminations and cracks. Manual ultrasonic testing and radiography are often applied as supplementary inspection techniques to the AUT. Magnetic particles might be applied for inspection after surface cracks at long seam weld and for cracks at pipe end bevel. For the latter, eddy current has also been used. The DNV OS-F101 aims to be applicable for all possible NDT set ups that can be found at different pipe mills. The requirements and the philosophy behind the requirements given in this widely used and accepted standard will be discussed in this paper.