

The Development of Ultrasonic Technologies for Solving Subsea Condition Monitoring Challenges!

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New challenges are revealed as more equipment and functions, such as multiphase pumps, valves, separators and cyclones etc., are moved subsea. This creates an increased focus on flowing behavior in subsea structures and the ability to do real time monitoring of the condition of such installations. Such developments are pushed forward as a result of cost savings required by the oil companies, in combination with the continuous global demand for oil and gas.

The paper discusses new ultrasonic instrumentation technologies and algorithms available for monitoring the flow and equipment conditions at subsea installations, such as vibration, leak and sand, either for permanently or as temporary solutions. Many new fields with their challenging conditions have totally different requirements with respect to safety, integrity and control. Online and real-time monitoring is needed, with vibration and sand data available as critical input data used to control and handle these installations the best way possible.

Sand, flow and vibration can all be critical factors with regards to safety, economy and flowing restrictions. The behavior of any reservoir with regards to flow (gas, oil and water) is at least to some degree understood and engineering companies can design facilities in accordance with these challenges.

The sand monitors made available in mid 1990's, made it possible to utilize the information from these sensors related to sand being produced from the wells. The latest developments in sand monitoring subsea will also be presented in the paper.

Finally, the paper will present the ongoing development of a subsea ultrasonic corrosion-erosion monitoring system, working principle, functionality, advantages and challenges.