Successful Inspection of Coflexip Flexible Pipe on Seabed with MEC-FIT™

At the request of an operator in Norway, Innospection has recently performed a successful inspection of an 8" Coflexip Flexible Pipeline using the MEC-FIT™ (Magnetic Eddy Current) technique.

The challenge of the inspection was the detection of wire disorganisations and defects such as metal loss or wire cracking in the tighter wire setup of the flexible pipe with a 15° wire angle arrangement. The operational task was the inspection of the major accessible area of the flexible pipe on the seabed, including a larger bend of the exposed section.

The patented MEC-FIT™ technique was developed by Innospection to provide a reliable and technically advanced solution for the inspection of flexible risers operated from offshore installation. This field proven technique combines magnetic field lines with Eddy Current field lines which not only allows the deeper penetration into the various armour layers for defect detection in the inner layers but also enables the optimisation of inspection for a specific layer from which a defect signal is received.

Originally used for the detection of metal loss and cracking in flexible pipes with a 30°-45° wire angle of the armour layers, the MEC-FIT™ technique was successfully verified to be sensitive also in the detection of defects in flexible pipes having a tighter armour wire setup at 15° wire angle. With a signal to background ratio of >6dB, a 90% Probability of Detection was achieved for defect types like single and multiple wire gap in the outer layers, multiple wire gap in the inner layers as well as extra wire on top outer layer at 15° and 35°.

To overcome the subsea deployment challenge, a customised inspection tool known as the MEC-Crawler was built. This tool enables the scanning of the flexible pipe in the axial direction and can also be repositioned to perform the inspection in the circumferential orientation using its hydraulically driven wheels.

The scanner head with a multiple sensor array covers 180mm circumferentially and several axial runs with overlaps were taken to cover the major accessible areas of the flexible pipe. The distances driven are measured with an encoder wheel. An umbilical connected to the inspection tool not only supplied the electrical and hydraulic power but was used also for the routing of the signals via fibre optics to the Eddy Current Data Acquisition system located at the topside.

Feature: MEC-Crawler scanning the bend of the flexible pipe on seabed
Left: Inspection of flexible pipe on seabed with MEC-Crawler