Automatic Subsea Scanner

F-EIM

The Eddy current Inspection Machine, F-EIM is an automatic subsea scanner that can detect surface breaking cracks on subsea-structures by use of Eddy Current Testing, ET. Especially suitable on coated structures and welds with tight access/complex geometry (e.g. tubular nodes double curvature).

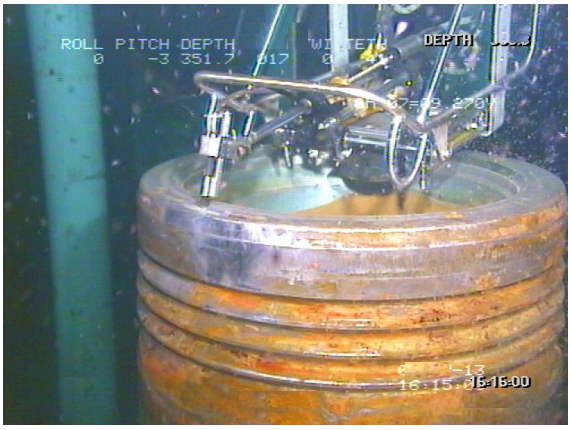
Operation

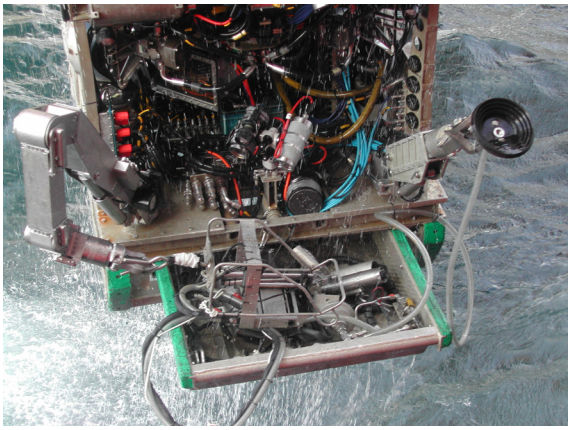
Pre-dive preparations

- Verification of scanner operation and communication through the ROV umbilical.
- Calibration of ET-system and establishment of the reference levels according to agreed specifications.

Diving

- The scanner is positioned on the object to be investigated by the ROV manipulator. To attach the scanner to the object a suction pump is activated. The ROV disconnects the manipulator, leaving only the umbilical and suction hose as the connection between the two, allowing the ROV to operate more freely as the scanning operation proceeds. The supporting object's surface is not required to be cleaned thoroughly as there is active suction under the operation.
- The operator manually drives the probe along the weld/weld-toe and a few geometrical references are recorded for calculation of the scan trajectory. The width of the scan is specified.
- Automatic scan of the specified geometry as the system moves the eddy current probe along the calculated trajectory, and for a required number of trajectories to cover the specified width. The probe is spring loaded to ensure contact.
- An assessment of the recorded EC-data is performed during and after the scan is complete, allowing re-scanning of indications to verify any crack-like detection.
- The scanner can quickly be moved to the next inspection area, when the assessment of the data and area is complete.





Features

- The ROSCAN system; comprising of a real-time subsea computer that controls a digital NDT system and several stepper motors which drive the scanning movement.
- Topside workstation for real-time control and evaluation.
- Communication and installation supported through either:
  – ROV
  – Diver.
- Low weight and small size. Subsea computer in a titanium container: Ø190 L=500 mm, weight is ~20 kg/44 lb in air.
- Depth compensated marinised stepper motors.
- Easily interfaced by any work class ROV. Communication through either:
  – a twisted pair in the ROV umbilical current loop
  – RS485
  – RS232.
- One integrated suction pad (125 mm) keeps the scanner in position, allowing the ROV manipulator to let go after positioning.
- 3-axed scanning motion ensures quick adaption to most geometries and inspection requirements.

Mechanical Design

When installed in the covering frame, there are ROV handles:

- on top,
- from both sides,
- from behind.

When installed in the covering frame, the scanner size is 600 x 400 x 400 mm.
Weight in air is 7 kg.
Scan area is 200 x 200 mm.

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