

Inspection of Offshore Wind Generators

Non-destructive Examinations with Remotely Operated Vehicles

Underwater inspections and non-destructive examinations (NDEs) of offshore wind generators can be efficiently performed with remotely operated vehicles (ROVs).

Challenge

NDEs, for example, on welds in load-bearing structures of offshore wind turbines, are required by specifications and need to be done on a regular base.

External conditions (e.g. tides, swell, maritime vegetation), and limited accessibility inside pile structures are challenging for inspection execution by industrial divers.

To guarantee verifiable surface conditions, additional measures like removal of organic matter and cleaning of surfaces from corrosion are necessary prior to inspection/NDE performance.

Solution

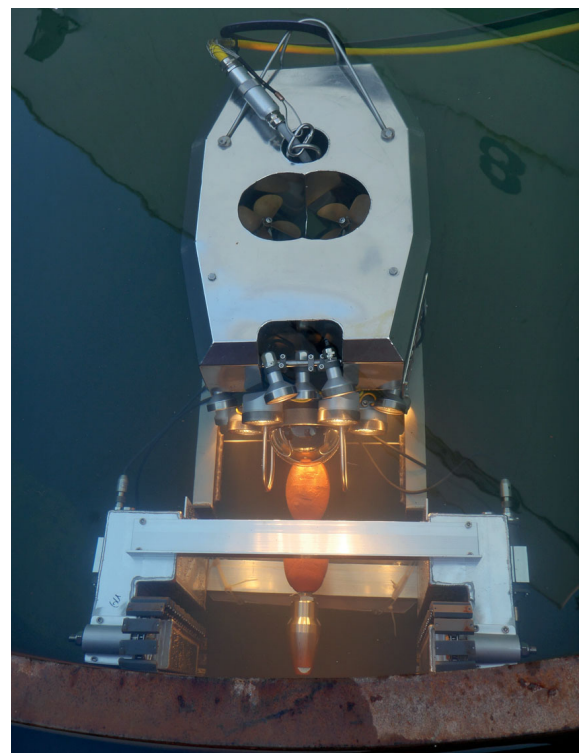
Framatome performs qualified NDEs using a wide variety of underwater carrier systems. The combination of service-proven and in-house developed submarine and magnetic crawler systems allows NDE of welds inside pile structures of offshore wind generators.

- Pre-cleaning of the welded joint by high pressure blasting guarantees the required surface conditions. Admixing of abrasives reduces the high pressure of the water jet.
- 100% visual testing (VT) of the welded joint is performed with service-proven underwater pan/tilt camera systems.
- Eddy-current examination, which detects sub-surface defects according to DNV specifications is carried out for NDE.

The NDE of welded joints can be supplemented by other inspections such as VT of submarine cables or the surface coating at the splash zone.

Further applications are pH and conductance measurements and the check of the cathodic corrosion protection system of monopile structures.

Framatome offers application-specific development and qualification according to specific rules and standards.



ISOMER for weld inspection inside pile structures

Customer benefits

- Custom-made solutions in the field of remote-controlled VT and NDE under water
- Performance of inspections in hardly accessible areas (e.g. inside piles) via ROVs
- Development, qualification and implementation on site
- Decades of experience in NDE and application of ROVs
- Field service

Your performance
is **our** everyday **commitment**

Technical information

ISOMER – combination of submarine and magnetic crawler technology

Carrier system for:

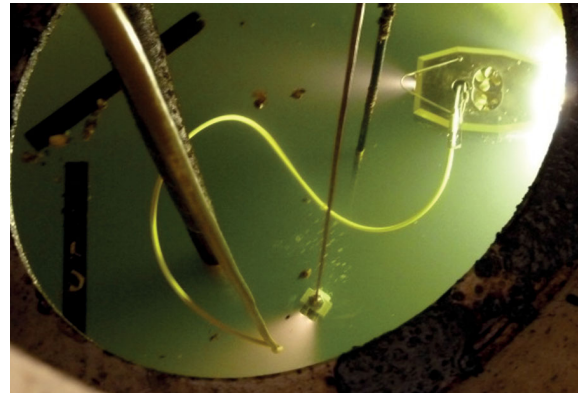
- High pressure cleaning lance
- Underwater inspection camera
- Eddy-current probe

Dimensions:

- L x W x H = 940 x 630 x 450 mm

Features:

- Balancing of the carrier system dead-weight by design offloats and cables
- Pre-cleaning of the surface by high pressure water jets with a maximum pressure of 600 bar
- Admixing of abrasives depending on required cleanliness conditions of the test area
- VT with service-proven underwater camera systems
- Integrated pan/tilt mechanism and zoom function
- Non-destructive weld examination by eddy-current testing based on DNV specifications



ROV inside pile application



Inspection camera image

Key figures

More than **15** years of experience with ROV applications in nuclear sites worldwide

Application of submarine system under water down to **40** m depth

References

Application of ROVs in about 40 nuclear power plants worldwide: execution of standard recurrent visual inspections and NDEs as well as tailored solutions for cleaning, removal of foreign objects and repair

ROV offshore applications:

- Underwater VT on offshore wind turbine piles
- VT of pile internals/anodes in the North Sea
- Harbor sheet pile wall high pressure cleaning
- Pile segment cutting (test application)

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