

## JF Subtech supports subsea ultrasonic flooded member detection

Traditionally, underwater flooded member detection (FMD) is carried out by a remotely operated vehicle (ROV) using a gamma radiation source. This is fast, effective, and requires no cleaning. However, the use of a radiation source also has numerous limitations related to its necessary safety protocols. Recent developments in ultrasonic FMD, along with James Fisher Subtech's (JF Subtech) ROV modifications, has enabled the company to successfully complete a full ultrasonic FMD inspection of an oil production platform in the UKCS using a platform-based ROV.

Project completed      2020

### The challenge

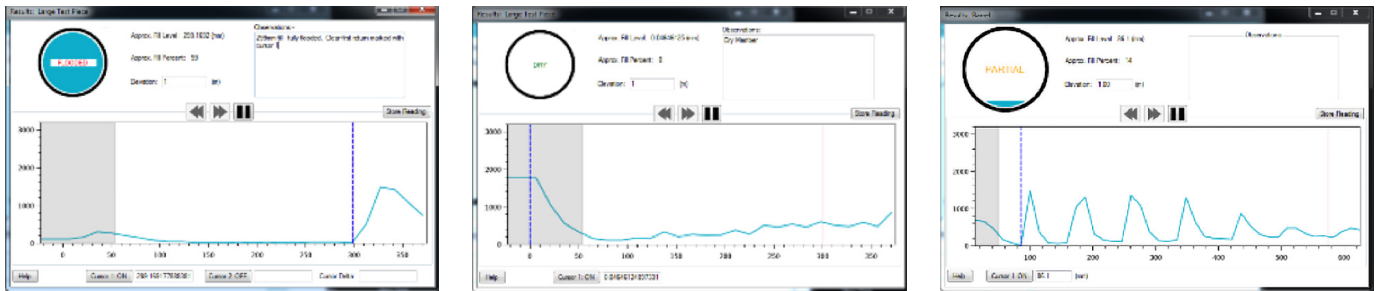
Although the gamma source for FMD emits very low levels of radiation (safe within 1m in air), deploying it requires stringent safety protocols that are costly and labour intensive. The gamma FMD method requires the following protocols:

- Onshore and offshore safety checks
- An additional ROV team member who must be a fully trained FMD operator, as well as a qualified Radiation Protection Supervisor (RPS). This results in larger costs and an increased platform POB (Person On Board) constraint
- A platform qualified RPS who is active at all times while the source is on-board – if the FMD technician is not
- If the ROV is lost or trapped, or the radioactive source is dropped overboard during FMD operations, the operators are obliged to recover it for environmental reasons
- The gamma FMD system necessitates its own transport container, which takes up valuable deck space
- Completing FMD operations requires multiple dives to reconfigure the FMD frame for different member sizes and orientations

The UT FMD method also requires the following protocols:

- Cleaning at the inspection location, which is an inefficient use of time and requires numerous ROV dives
- A method of positioning the UT probe for inspection that accommodates members of various size; the probe has to be positioned at the underside (6 o'clock) position for horizontal members

The UT FMD method is also more time consuming than Gamma FMD. When used previously in 2018 for six members, it took an average time of 30 minutes to complete each one. This is significant in considering that a recent 2020 programme required 103 members to be inspected.



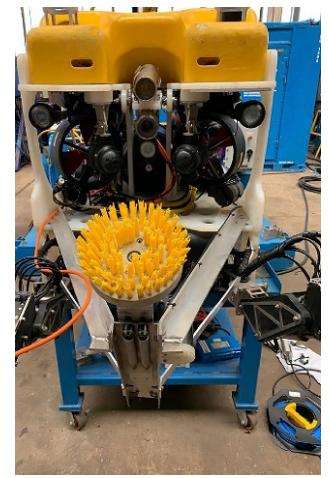
STR software results showing flooded, dry and partially flooded

### The solution

- JF Subtech was tasked with finding a solution that could conduct UT FMD and cleaning at the same time, which would negate the need for completing multiple, time-consuming dives
- The Cougar-XTC Inspection class ROV has a manipulator skid and a rotary cleaning brush mounted to its front. Two manipulators were also deployed; one to hold the UT FMD probe and the other to position a camera to assist with locating the cleaning brush and UT FMD probe
- The UT FMD system was provided by Subsea Technology & Rentals (STR):
  - The system can detect dry, flooded, and partially flooded members
  - The system is pre-calibrated by the manufacturer
  - Tests were conducted onshore prior to mobilisation against a flooded and non-flooded tubular



Manipulator left with camera



Manipulator with UT FMD and rotary wire brush

### The results and benefits

- The 2020 operation was conducted successfully and was completed well within the predefined timeframe for FMD operations of three days, taking just 29.75 hours to finish – including breaks and maintenance
- Feedback from the operator is that JF Subtech’s approach took the HSSE risk of radiation exposure out of the equation, while also delivering a more efficient and cost-effective solution than would otherwise have been possible
- The following results were enabled by performing a UT FMD with a platform-based ROV:
  - The system saved costs as UT FMD and its necessary equipment was less expensive than gamma FMD
  - There was no requirement to manage a gamma radiation source and its associated safety issues
  - It removed the need for additional platform bed space for the RPS, as well as its associated costs
  - It saved deck space
  - It required no major technical innovations to deploy



In-water photo of FMD system. UT FMD to left of screen at 6 o'clock position on member