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## 2022 TECHNICAL AWARDS ENTRY FORM

Entry Deadline: Friday 22<sup>nd</sup> April 2022

Please tick which categories you are entering (entries may be submitted in multiple categories)

Landbased Pipeline Project Award

Landbased Pipeline Technology Award

Utility Pipeline Project Award

Utility Pipeline Technology Award

Subsea Pipeline Project Award

Subsea Pipeline Technology Award

iICE Award

Subsea Hydrate Plug Detection and Sizing via ROV using the ARTEMIS vPUSH system

1. **Brief title of entry:**
2. **Company name:** TSC Subsea .....
3. **Signed:** Jonathan Bancroft .....
4. **Date:** 22.04.2022 .....
5. **Company contact name:** Jonathan Bancroft .....
6. **Telephone:** +44 (0) 1908 317444 .....
7. **Email:** sales-ts@tscsubsea.com .....

8. **Precis of your entry (50 words):** TSC Subsea was engaged in 2021 by a leading global Oil and Gas operator with assets off Angola, West Africa. The enquiry was for a pipeline external scanning system with inbuilt technology capable of deployment by ROV to locate and size a substantial hydrate plug suspected to be located somewhere within a 12km stretch of subsea 13" pipeline.



## 9. Summary of entry:

Continued...

Looking more closely at the 13" pipeline specification, not only was it at 1,300m water depth and buried below the seabed, it had a thick subsea protective coating of 3LPP (three-layer Polypropylene). This type of coating typically rules out ultrasonic (UT) inspection due to lack of penetration capability, leaving only radiography-based CT tools, which bring many HSEQ risks and conditions. CT based systems are also typically very slow, making it unviable in this instance. Another stipulation was the Operator wanted dredging kept to a minimum, only exposing the top half section of the pipeline.

TSC Subsea have several proprietary inspection technologies, one being Acoustic Resonance Technology (ART), an ultra-broadband acoustic method which offers significantly higher penetration capabilities compared to UT systems due to ART's low frequency ranges. Up to this point TSC Subsea had only deployed the ART technology within the ARTEMIS system for stationary scanning of 1-meter sections of subsea pipelines and risers, before having to reposition. We hoped we could extend the technologies application range and committed to the project.

Lab testing was carried out over several months to prove the technology was capable of not only inspecting through the 3LPP coating but also to prove ART could accurately locate and size the hydrate plug within the pipeline, based on testing with ice plugs.

With the ART testing successful, the challenge became the deployment and scanning. TSC Subsea worked closely with DOF Subea UK, the ROV and vessel provider to design a system capable of being pushed by the WROV at speeds of over 40m per hour.

The resulting ART vPush design encompassed four ART sensors using two detection methods, focused on the top half of the pipeline making it very robust and reliable with both sets of sensors being triggered off the same target. It also met the speed criteria, essential for making the project commercially viable.

Late 2021 the pipeline was partly excavated along the full 12km, exposing the top section. TSC Subsea then mobilized the new ART vPush system and personnel onboard DOF's Scandi Seven vessel and proceeded to scan the partially exposed pipeline.

The campaign was very successful and an industry first by utilizing a non-radiographic method to accurately scan 12km's on heavy coated pipeline in just 33 hrs. Locating and accurately sizing the hydrate plug.

The new ART vPush system is now a firm part of our portfolio, offering global operators an accurate, fast and reliable system for hydrate detection and sizing. Only scanning the upper section of pipeline, offers significant savings in vessel and ROV time for dredging. The speed of the system also adds significant savings and as ART has no radioactive source, it significantly reducing risk and HSEQ requirements.

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### Ancillary Entry Information

(Entry restricted to normal type face and font size on this form plus no more than 3 pages of A4 drawings or photographs)



CAD concept design.



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ART vPush scanning pipeline

*J Bancroft*

22/04/2022



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