

Autonomous Inspection Vehicle (AIV)

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LIFE-OF-FIELD

SERVICE OVERVIEW

Subsea 7, one of the world's leading subsea engineering and construction companies servicing the oil and gas industry, in collaboration with SeeByte, a leading provider of smart software solutions for unmanned underwater vehicles, has developed an AIV, which has the unique potential to revolutionise Life-of-Field projects.

Key elements include:

- This technology has the potential to revolutionise Life-of-Field (LOF) projects by providing operators with a cost-effective, low-risk inspection system to aid field survey, integrity management and intervention activities
- The AIV has the unique ability to operate directly from a host facility such as an FPSO or Platform as well as from infield support vessels or mobile rigs
- The AIV has no tether which enhances vehicle manoeuvrability and the capability to access confined spaces
- The AIV carries an array of navigation tools and sensors that are powered by its own onboard battery power source, which allows for up to 24 hours of autonomous inspection and potential intervention.

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Mission

As offshore oil and gas exploration and production is evolving into deeper water, more remote locations and with an associated increase in complexity, operators are looking towards a more intelligent and autonomous maintenance environment. Whilst the existing heavy work class ROV and Diver intervention tasks will remain within the current technology, the time has come for the next innovation in terms of subsea inspection vehicles and methods.

Subsea 7's vision is to use our experience and expertise, combined with SeeByte's advanced software capabilities, to bring to the market a hover-capable autonomous and intelligent inspection vehicle. This Autonomous Inspection Vehicle (AIV) is designed to be launched from a host platform, from vessels of convenience or other ROVSVs within the field, in single or multiple vehicle mode).

Base Case Deployment Scenarios

The initial AIV (Mark 1) is capable of undertaking General Visual Inspection (GVI) of subsea infrastructure, including structures and risers within offshore fields. The initial systems will carry the latest 3D sonars and cameras. There are a number of deployment scenarios envisaged:

- The multi-AIV or "Lobster Pot" scenario. A field inspection campaign utilising a low-cost vessel of convenience, deploying 3 or more AIVs to optimise mission coverage. All data will be recovered and sent ashore for processing, only requiring a minimal deployment and maintenance crew onboard
- A similar inspection campaign or smaller packages of work can also be undertaken by a single AIV. These would be deployed from a vessel already within a field and work simultaneously from an RSV which is undertaking a construction campaign with standard WROVs.
- A more permanent deployment on a fixed platform or FPSO; ready to be deployed whenever a specific visual inspection or planned inspection campaign is required – all at the operator's convenience without the need for a vessel mobilisation.

Technical specification

- Depth Rating 3,000m
- Dimensions 1700mm (L) 800mm (H) 1300mm (W)
- Inspection sensors 3D forward looking sonar
Colour inspection class video camera
Profiling sonar & downward look camera
- Communications Acoustic, Wi-Fi, Satellite
- Navigation:
 - General Dead reckoning (1% distance travelled) aiding Sensor data & seabed markers
 - Pipeline Tracking using profiling sonar to optimise video coverage at 1.5-3m range.
 - Riser Tracking using 3D sonar to optimise video coverage at 1.5- 3m range.
 - Structure Tracking using sonar and video to optimise video coverage at 1.5-3m range



AIV with deployment basket



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