



XPLOERER

THE PIPELINE INSPECTION CLASS AUV

EXECUTIVE SUMMARY

The pioneer of subsea external pipeline inspection method through AI-enabled inspection class Autonomous Underwater Vehicle (AUV) named XPLOERER, which has been developed by ROVULA. This technology purposes to reduce operating costs by eliminating the need for a costly supporting DP II vessel as it does not require the vessel to be positioned the vicinity of a platform. The XPLOERER will pave the way for the creation of ecosystem for Subsea Inspection, Repair, and Maintenance (IRM) in the future.

BACKGROUND

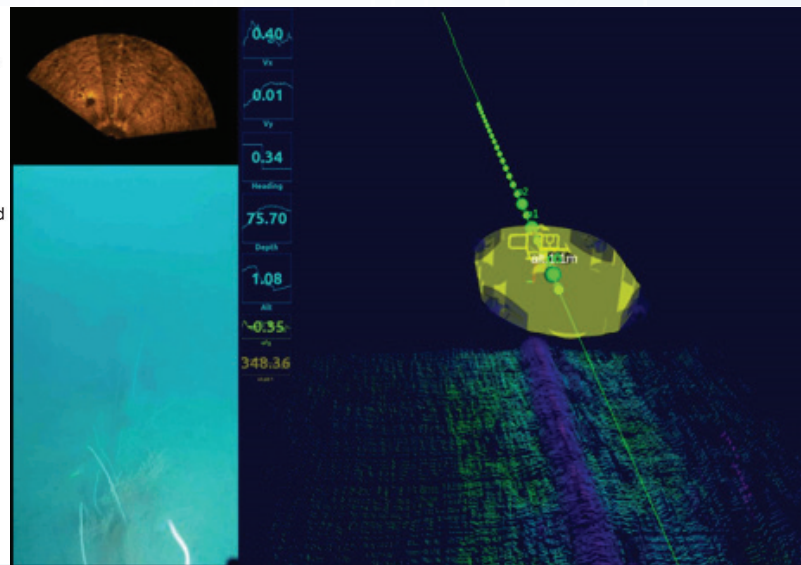
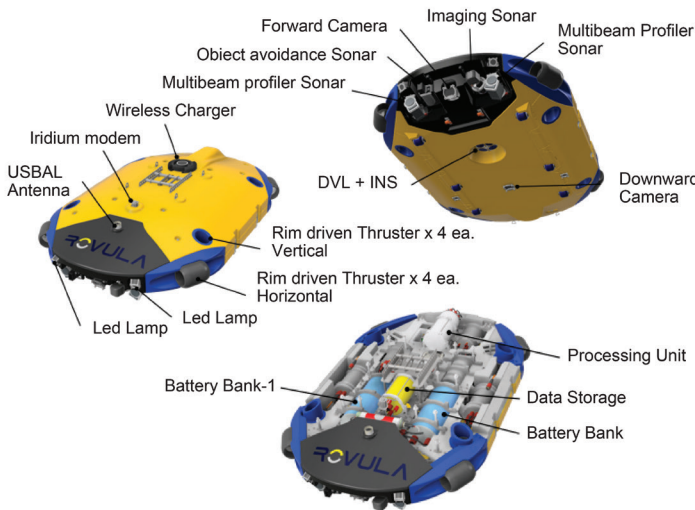
As the major cost of external pipeline inspection by ROV is the ROV Support Vessel, the idea of removing the need of a support vessel was created to reduce the overall operating cost.

OBJECTIVES

The main objective of this development is to reduce the operating cost for the costly external pipeline inspection by using ROV method without due compromise to this quality and safety of the operation.

TECHNOLOGY DETAILS

The XPLOERER is a Pipeline Inspection class AUV (PI-AUV) that can perform an external pipeline inspection equivalent to the ROV, but 2 times faster and more cost effectively. The XPLOERER is equipped with necessary sensors required for pipeline inspection including;



FEATURES

- Navigation
- Electric field gradient and cathodic protection
- Image and VDO recording measurement
- Free-span detection
- CP Stab

OPERATION CONTROL

- Web Application
- Control Dashboard
- Survey Screen
- Mission Planner

In a use case scenario, the XPLOERER was successfully utilized in a pipeline inspection project near a platform. Its capability was effectively Showcased through wireless communication via acoustic waves and the operation was assisted soled by a non-DP vessel. The technology could approach the platform through its autonomous system, while vessel stationed outside the vicinity.

BENEFITS OF TECHNOLOGY

The XPLOERER can eliminate the need of DP II Vessel in operation which reduces the operating cost~ 50% comparing to conventional method. Furthermore, XPLOERER's operation will pave the way for creating a subsea eco-system of Inspection, Repair, and Maintenance in the future.



XPLORER V2.0 SPECIFICATION

PHYSICAL

Weight in air	850 kg
Dimension	1770(W) x 2830(L) x 655(H) mm
Propulsion	x4 Horizontal thrusters x4 Vertical thrusters Rim driven type

PERFORMANCE

Survey speed	0 – 1 knot
Max speed (Forward)	4 knot
Dept rate	300 m
Autonomy time	6-10 hour at inspection speed

NAVIGATION SYSTEM

INS/DVL	Sonardyne, Sprint 500
USBL/A-Modem	Sonardyne, AVTrack 6
Visual aid navigation	Front camera / Imaging Sonar
GNSS/Sat modem/Strobe	Xeos, Apollo

STANDARD PAYLOAD

Multibeam Profiler sonar	Imagenex, 837B Delta T 260kHz
Imaging Sonar	Teledyne, BlueView M900
Object Avoidance Sonar	Imagenex, 837A Delta T 260kHz
Camera HD	x1 Forward looking / x1 Downward looing
LED lighting	x2 Forward looking / x2 Downward looking
Cathodic protection	EFG Probe
Data Storage	SSD 4 units of 1TB RAID 10 configuration by default

ADVANCE FUNCTION

Autonomous pipe tracking	Sensor fusion from profiler, image sonar and pre-loaded map
Autonomous CP Stab*	Visual aid localization and stab
Auto Docking	Machine learning and AR Tag localization

OPTION PAYLOAD

Sub-Bottom profiler, CP Probe Support customization on demand