

## UNDERWATER REMOTE OPERATED VEHICLE (ROV) FOR PERFORMING NON-DESTRUCTIVE EVALUATION (NDE) OF SUBMERGED PIPELINE STRUCTURES

### IITM Technology Available for Licensing

#### Problem Statement

- Recently, Remotely Operated Vehicles (ROVs) have become the go-to tool for oil and gas construction and maintenance tasks.
- Since, ROV is equipped with sensors for navigation, control and **external ultrasonic inspection** of submerged pipe, therefore it is well suited to work in thousands of metres of water, or just a few, within the energy sector.
- These ROVs can be widely implemented on **mobile platforms** for collecting oceanographic and geophysical data.

#### Technology Category/ Market

##### Category - Robotics, Non destructive Evaluation

**Applications** - Non destructive evaluation & testing, Marine, Ports & Terminals, Deep-sea Pipeline inspection, Advanced ROVs for Industrial applications

**Industry** - NDT, Oil & Gas, Marine, Defense

**Market** - The global remotely operated vehicle (ROV) market to grow from 2022 - 2030 at a **CAGR of 10.50%**. The ROV market's was worth nearly USD 1.6 billion in 2022, which will likely reach USD 3.2 billion by 2030.

#### Technology

- The technology is an underwater remotely operated vehicle to carry out a non-destructive evaluation (NDE) of pipes, using **circumferential guided waves** along with a gripper mechanism which provides the capability of **scanning a structure** from a single location.
- The ROV has a detachable hull with on-board cameras to provide **live-streaming vision** for an on-shore operator through wired cables.
- Further, the ROV navigates underwater with **stability-assist sensors** for easy operation.
- The overall ROV design (Fig.1) is compact and modular to **enable up-gradation of technology** and easy adaptation to more stringent operational requirements.

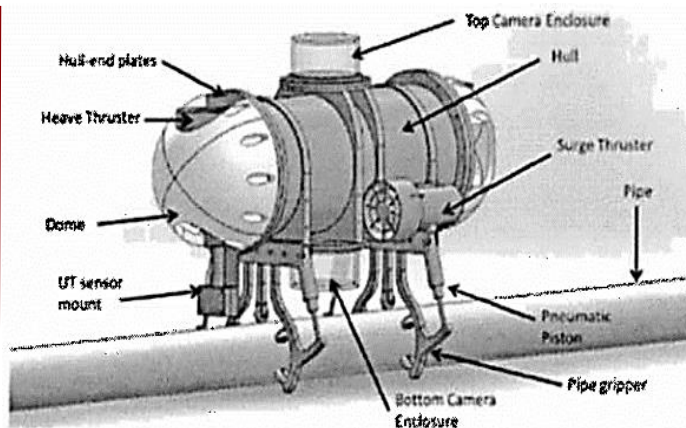


Fig.1. Isometric view of CAD design of the ROV.

#### Intellectual Property

- IITM IDF Ref. 1217
- IN 401043 - Patent Granted

#### Key Features / Value Proposition

- Total length - 700 mm
- Depth range - 60-70 metres
- Total mass - 21 kgs
- ROV is **neutrally buoyant**, which avoids extra power consumption and **ease in maneuvering**.
- Propulsion BTD 150 thrusters
- Propulsion Specifications - 18 volts, maximum **2.2 kgf** continuous thrust
- Vision - 8MP, 1080p HD web camera
- Power Source - Lipo Battery
- Payload capacity - 2.5kgs

#### TRL (Technology Readiness Level)

TRL - 4, Technology Validated in laboratory & field

#### Research Lab

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