



Case Study: **Geo-Technical Research Vessel (GTRV) - Fugro Voyager And Fugro Scout:** Mangalore, INDIA

FUGRO N.V a leading Geotechnical Survey Services Company was building a Geo-Technical Research Vessel in one of India's leading Shipyard 'TEBMA Shipyards.Ltd' (www.tebma.com) located in Mangalore. Incidentally this was the first Geo-Technical Research Vessel to be ever built in India. This type of Vessel demanded quality work, reliability and cleanliness since it was housing sophisticated mechanical equipments / machineries like drill machinery, winches, cranes, pipe handlers etc. TMI, along with Cenergy Offshore, was selected to implement the first Vessel within a tight schedule.

Project covered end-to-end implementation of the Hydraulic / High Pressure systems on the Vessel at site. This project involved planning, procurement and execution collectively by TMI and Cenergy Offshore & required a team of 5-7 lead Technicians to work at site.

The scope of work was as follows:-

- a) Implementation of Non Weld Hydraulic / High Pressure Piping systems for machineries like high capacity winches, sophisticated cranes , drill equipments, iron rough neck, pipe handlers through different pipe sizes.
- b) Detailed engineering by TMI / Cenergy Offshore team in close co-ordination with the End User / Shipyard.

The key points of the project were:-

- a) Involvement of intricate jobs like fabricating and routing/laying out of pipes in hard to access areas and tanks.
- b) Carrying out flushing and pressure testing of the entire hydraulic system in a limited duration.
- c) Implementation of all TMI products like 37 Degree Flare Flange System, Retain Ring Flange System and Pyplok® in the vessel.

The various steps involved were as follows-

1. **Design / Engineering:** This was a large scale project and pre-design or pre-fabrication of pipes were not feasible. Our Engineers surveyed the vessel and implemented a plan for the pipe routing based on the Hydraulic Schematic Drawing issued. All critical and technical matters were discussed and clarified by working closely with the End-User / Shipyard.

2. **Pipe Fabrication:** Since this was a large scale hydraulic piping project which involved confined spaces, the pipes had to be fabricated on site. All the installation tools like grooving machine, flaring machine and Pyplok® were brought to the site and stationed there. Bending of pipes up to 4" were done at the site using the TMI site bender by our side and for large bore (above 4") was done at our Austrian facility. Complex bends had to be fabricated to pass through tanks. Overall the pipes had to be fabricated to precision since adjustable allowance on such a sophisticated vessel was very minuscule.
3. **Erection:** Erection involved erecting the hydraulic pipes in confined spaces (tanks) and open areas (Main Deck). This process had to be closely monitored since the O-rings are the sealing agents for the hydraulic piping. Erection was closely monitored by our trained Technicians.
4. **Flushing:** As flushing is one of the most crucial stage in the installation of Hydraulic / High Pressure Piping, the lines were looped carefully and were meticulously checked by our Field Technicians. It was then flushed in record time (this is because TMI Hydraulic Piping Systems are mechanically cleaned and shipped with proper protection). The cleanliness level (NAS Value) obtained was better/cleaner than the required level which was positively acknowledged by the client.
5. **Pressure Testing:** The Pipes (Pressure Line) were pressure / proof tested up to 4000 psi. All the standard procedures like evacuating any personnel in the vicinity of the Pipelines which are being tested were followed. The testing was successfully done.
6. **Commissioning:** All the equipments / machineries were run after the Hydraulic Piping System was handed over. We received appreciation from the Yard/Client as the commissioning took place in a clean and neat manner with no pipe leaks.
7. **Hand Over:** After successful commissioning, as per our standard procedure all the spares, documentation, reports were handed over to the End-User / Shipyard and a copy was kept with Cenergy Offshore / TMI for future reference & traceability.

The first project was completed successfully in record time which resulted in the End-User / Shipyard awarding us with the Hydraulic / High Pressure Piping systems for the second Vessel (FUGRO Scout), which too was completed in record time. The Shipyard / End-User has also given us good testimonials regarding the reliability of our products and the quality of work done.