Case Study: **Hydraulic Piping for Offshore Supply Vessel**: Dubai, UAE

Project No: 0054VA

The project was for the conversion of non-propelled offshore supply ship to Self-propelled offshore supply ship by equipping 4 no's of Hydraulic operated retractable thrusters at 4 corners. These retractable thrusters are to be driven by dedicated 2000HP engine driven HPU which is situated at main deck.

Our scope of work was implementation of Non Welded Hydraulic / High Pressure Piping to connect their HPU's to their Thrusters.

The key points of the projects are as follows-

Sl No	Line Name	Line Size	Line Pressure	TMI Technology Used
1	Main Pump Lines	5" Sch 160, 2" Sch 80	2640 PSI	Retain Ring Flange System (5"), 37 Degree Flare Flange System (2")
2	Steering System Lines	1" Sch 80	2500 PSI	Pyplok®
3	Pressure Lift System	1-1/4" Sch 80	2500 PSI	Pyplok®

The total length of all the piping was about **2250 m**.

The scope of work of the project was as follows-

1. **Design / Engineering:** Based on the preliminary information's that we received from the end user like P&ID of the systems, tentative routing plan, equipment end connections etc. The tentative isometric was provided by the client which then our Engineers verified the plan of the pipe routing based on the space availability. The routing changes were done based on the mutual understanding between the customer designers and our field personnel to achieve proper installation coupled with aesthetic look.

2. **Pipe Fabrication:** After finalising the routing plan and getting the approval from the client for fabrication, our site team along with 5-7 lead Technicians started fabrication of the pipe spools at workshop at the vessel. To achieve the high quality and productive work, fabrication tools like Grooving machine, Flaring machine and Crimping machine were brought to the site and arranged as per a proper workshop plan.
   All the pipe spools were fabricated at the site workshop and were handled such that contamination of the pipe/ tube by environmental dirt, moisture, rust, pollution or by any other means was avoided. After fabrication, each pipe spool was inspected and certified by yard QC.

3. **Installation:** The installation of the QC Inspected Fabricated pipe spools was done according to the piping layout and by following the Tube-Mac Installation Standards and Procedures Manual 2017. The Erection was closely monitored by Tube-Mac and our Technicians.

View of the 5" Sch160 pipe for the main pump lines

The pipe supports were installed as per the standard requirement and design provided by the design team. The piping joints were torqued to the required value after completion of the pipe erection and before doing the pressure test.

View of the small bore lines connected by Pyplok® and supported

4. **Pressure Testing:** The installed pipes were Pressure tested to 1.5 x system working pressure by hydraulic oil and was witness by the yard QC and Marine Class Representative.

5. **Flushing:** As the Pipe bore cleaning was already taken care of (common characteristic of any TMI shipment where the pipes are cleaned externally and internally to remove any dirt or rust before shipping). Along with proper pipe handling during fabrication and erection, achieving the cleanliness level was not a difficult task. The flushing activity took little time and actual cleanliness level (NAS Value) obtained was better than the required level which was positively acknowledged by the yard QC.

6. **Commissioning and Handover:** After completion of flushing activity, the looped piping ends were re-assembled as per the system drawing to their respective equipment ports. The reassembled joints were re-torqued to the required value and the system equipments were run. The customer positively acknowledged the reports after the successful commissioning activity.