IN-SITU LINE BORING AND TAPER BORING FOR FOUR 400-TON DECK REEL HUB BEARING HOUSINGS

2.1 METER DIAMETER BORING FOR TRIYARD SHIPYARD IN VIETNAM

TriYard shipyard in Vung Tau, Vietnam was contracted to build the 48,786 mT pipelaying vessel Lewek Constellation. Having successfully completed the machining of two 4.7 meter diameter stern thruster flanges on the vessel and four 2.3 meter diameter flanges on the vessel's deck reel hubs, Goltens was a logical choice to engage for the boring and tapered boring of the bearing housings for the 400 ton reel hubs. The deck reel height was 16 meters and had width of 22 meters.

The line boring work required was extensive in terms of the material required to be removed and complex in that the diameter of the bearing housing was over 2 meters and required high tolerance tapered boring. Goltens reviewed the requirements and made a proposal to complete the complex job.

TAPER BORING TOOL DESIGN AND MANUFACTURE

The job required the design and manufacture of special boring tools to complete the job. Goltens In-Situ machining engineers developed the G2000, a large scale machine capable of handling both line and taper boring for the diameters required (up to 2.1 meters).

The equipment was manufactured by Goltens' tool making specialists in Singapore and transported to Goltens' workshop in Vietnam for operational testing prior to use.

JOB EXECUTION

Once the tool was tested satisfactorily, the job could begin. To ensure the job was completed per the customer's timeline and budget, Goltens Singapore and Vietnam teamed up to execute the work. The job started in July 2013, when the G2000 was laser aligned on the first deck reel bore.

Goltens machined 36mm of material thickness from the top and bottom side bearing housings. In total, 72mm from each deck reel.

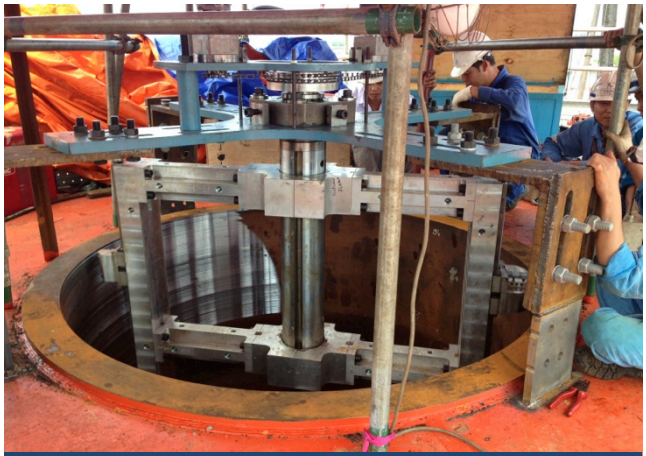
PROJECT FACTS: LEWEK CONSTELLATION

Vessel Type:	Pipelaying
Bearing housing dimension:	ID 2,100mm x 4 (top) ID 2,060mm x 4 (bottom)
Taper boring:	7° x 165mm x 4 (bottom)
Work period:	75 days

2 of 4 – 400 Ton Deck Reels in TriYard Shipyard

G2000 Boring Machine

G2000 Laser Alignment



Line Boring 2.1M dia. Top side bearing housing

LINE BORING AND TAPERED BORING WORKSCOPE:

- Laser alignment of the G2000 boring machine to the reference point provided by the shipyard.
- Machining 4 reel hub housings on top and bottom to drawing dimension (Inside diameter 2,100 mm (top) and 2,060mm (bottom)) – removing a total of 35mm of material from both top and bottom housings.
- Completed taper boring on the bottom of the 4 deck reels at a 7^{o} taper over a length of 165mm
- Performed post-machining laser checks and calibration of each housing to verify results were within specification.

LINE BORING AND TAPERED BORING RESULTS:

The job was successfully completed within 75 days. Goltens' ability to design and build the custom tooling and execute a job of such magnitude in a relatively short time was applauded by the customer.

The final results were delivered per the customer's specification and found to be extremely accurate. Goltens' work was approved by Class (DNV), the owner and the TriYard's Quality Control.

CUSTOMER COMMENT:

"We are very satisfied with Goltens support, working attitude and excellent workmanship"

Mr. David Zhang
General Manager
Triyard SOFEL, Vung Tau

Checking of top bearing housing diameter

Taper line boring of bottom bearing housing

Deck reel foundations