WELDING AND IN-PLACE MACHINING RETORES BADLY WORN RUDDER STOCK

ON-SITE RECONDITIONING FOR LPG TANKER - BAHAMAS

While in drydock in the Bahamas, after removal of the rudderstock, Ultraship discovered heavy corrosion on the rudder stock bearing surface which required an immediate repair to return to operation. The customer contacted Goltens to review the damage and advise on whether a permanent repair could be completed on-site in the Bahamas.

Goltens reviewed the damage and proposed a repair process that involved machining away the damaged area, building up the shaft with welding and annealing and final machining to the specified dimensions.

PRE-MACHINING

Goltens fabricated custom machining rings for installation and machining of the rudder stock. In-Situ specialists mounted carried out an initial removal of 10.00 mm off the diameter to create a reference point for the machining of the running surface. After removal, all in place machining tools were installed to remove the damaged material. Goltens removed an additional 6.00mm to clean the surface of all corrosion/pitting prior to welding.

SURFACE BUILD UP AND ANNEALING

Utilizing the welding procedures written and approved by Class for the project, Goltens' welders built up machined area to a level that would allow machining to original diameter. Once the buildup was completed, Goltens' team installed ceramic pads and insulation and completed annealing of the welded area to relieve the stress in the welded area prior to machining.

FINISH MACHINING

After successful annealing, Goltens' In-Situ team remounted journal cutting tools and machined the working area to final size. The surface was then polished by hand to final required surface finish with a final diameter of 386.10mm.

THE RESULT

The successful on-site machining repair for the vessel's rudderstock was completed over a 12-day period. Another example of how Goltens' in-place machining capabilities limit cost and downtime for operators.

PROJECT FACTS:	RUDDER STOCK RECON
Customer:	Ultraship
Location:	Grand Bahamas
Vessel Name:	Happy Bird
Journal Dimensions:	386.1 mm

Figure 1: Pre-machining to remove damage from rudder stock

Figure 2: Weld build up of shaft per approved procedure

Figure 3: Pre-annealing/machining welding build up

Figure 4: Installation of Annealing tiles

Figure 5: Insulation applied over annealing tiles for heat treatment of weld

Figure 6: Machining to final diameter of 385.01mm

Figure 7: Finished surface prior to hand polishing