



CASE HISTORY ~ CH-063

TFT CREATES CUSTOM “VIII/05/08-9” SEALANT FOR SUBMARINE HEAT EXCHANGER REPAIR

THE CHALLENGE: A nuclear submarine scheduled for deployment in the immediate future had a difficult leak in a critical heat exchanger. This heat exchanger, (“HE”), was in a remote part of the vessel and served a critical purpose. Due to the size and location of the unit, it was not possible to seal the leaking tube using conventional rubber stoppers. Removing the unit for shoreside service would have been enormously expensive and so time consuming that other assets would have had to handle the planned deployment.

THE SOLUTION: TFT was contacted to see if it was possible to provide an innovative polymeric solution which would allow the vessel to be returned to duty. An unusual requirement was that the solution should have a “nuclear” heritage, even though the heat exchanger itself sees no radiation.

A special sealer was made using one of the TFT DBA approved coatings as a starting formula. This sealer had to possess several very special characteristics to allow placement over the leak under difficult application conditions. Among these requirements, the sealer had to be completely tolerant of residual water within the tube. It had to be easily pumpable down a long, narrow pipe, and it had to sufficiently high build to bridge the leak without sagging inside the HE tube. After a concentrated period of lab development, trial samples were flown to the repair facility.

The repair facility developed an installation method which worked well from one water-box more than 2 meters distant from the leak. Initial testing in a mock-up trial was undertaken because this was a “one-shot” repair with no option for failure. The learning curve turned out to be very steep and straightforward using simple equipment and procedures.

When the commitment was made to perform the actual work, it only took a couple of engineers a very few hours to complete. To view the repair, a “CCTV” was snaked through an adjacent tube and aimed at the outlet of the leaking tube in the water-box at the other end of the Heat Exchanger. The installation pipe was then inserted and monitored by CCTV. When in position, the customized

VIII/05/08-09 epoxy sealant was pumped in to fill over the leak and permanently close off the failed HE tube.

The repair was left undisturbed for 24 hours before pressure testing at which time it was pronounced fit for duty.



RESULT: The project was completed in a timely fashion and with a tiny fraction of the costs associated with a more conventional repair. Engineering costs alone would have been enormously more than the polymeric repair described above, not including the additional costs of missing a scheduled deployment.

This repair method could be easily adapted for other heat exchangers in marine or industrial service.

For more information regarding this project, contact:

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YEAR: 2009

USA

We go where others fear to spread!

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