



CASE HISTORY ~ CH-018

CUSTOM FORMULATED UNDER-WATER ADHESIVE PROVIDES PERMANENT SEAL FOR NUCLEAR BARRIER

THE CHALLENGE: A seismic analysis at the Hanford Nuclear Site revealed the need for an additional barrier in a spent fuel storage tank. This was necessary to prevent the possibility of serious leakage from the tank in the event of an earthquake.

SONSUB, a leading designer and operator of custom-built remote equipment for use in hostile environments, designed the barrier for installation in the spent fuel pool. A critical part of the design involved the installation of a permanent seal between mating faces of the barrier underwater in heavily radioactive water.

THE SOLUTION: SONSUB worked with TFT to design the underwater robotic applicator using a TFT custom formulated epoxy adhesive. Strict parameters were given to TFT describing radiological resistance, viscosity, cure time, gel structure and even the specific gravity of the product in order that performance would be "right first time". Once the commitment to proceed underwater had been made there was to be no second guessing or turning back.

The product eventually produced was designated 1/022/lab. This material was loosely based on TFT's BIO-DUR 561, an underwater product which has received "Safety Level 1" acceptance for use in the most severe nuclear environments after passing DBA testing.

Viscosity was modified to allow easy pumping through a 30' line however gel structure was maintained to prevent sagging.

This material was thoroughly tested under safe conditions before being taken to Hanford for the actual installation.

SONSUB designed and operated a system to modify existing fuel storage racks, cut away old gasket material, remove old epoxy paint and corrosion and to install stainless steel gasket seal surfaces – all using remote controlled robot equipment.



All debris generated during the cutting and cleaning was captured by a continuously operating vacuum filter with the scavenged water being returned to the basin after cleaning. Debris was placed in a special container for permanent storage within the basin.

RESULT: The new stainless steel gasket surfaces were installed with the 1/022/lab sealing material perfectly applied and cured underwater.

This complex project was a good example of cooperation between the Department of Energy – the owner of the Hanford facility, SONSUB - a major underwater contractor, and TFT – a specialist epoxy formulator.

For more information regarding this project, contact:

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PRODUCT: BIO-DUR 561

YEAR: 1999

LOCATION: TRI STATE, WASHINGTON

We go where others fear to spread!

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CH-018_BD561_SUNSUB ADH_1999 DRAFT

Page 1 of 1