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ENGINEERING SERVICES & ENVIRONMENTAL COATINGS

PROJECT PROFILE

Project: Battelle-West Jefferson Closure Project **Date:** 2003 - 2006

Project Contractor: Battelle Memorial Institute, Columbus, Ohio
Jefferson North Reactor, Hot Cell, & Fuel Storage Pool Closure

Engineers: Richard (Dick) Hogue; Rock Neveau

Scope of Work:

The fuel storage pool and associated hot cells were used to demonstrate worst case scenarios for damaged BWR and PWR fuel bundle assemblies. This testing resulted in heavy damage to reactor fuel and impregnation of fuel elements within hot cell walls and the bottom of the fuel storage pool.

Provide engineering and recommendations for reactor decommissioning of the fuel storage pool and associated hot cells to include; fuel element and high-level waste characterization and removal, fuel storage pool drain-down and hot cell decontamination.

Engineered Controls:

The reactor and its associated systems were stabilized with *CC FIX™* & *CC WET™*. Structural foam (*Autofroth®*) was delivered into ventilation ducts and plenums. Highly contaminated process piping and off-gas lines were internally stabilized using structural foam and a urethane-based pipe stabilization liquid (*PS-413™*). Polyurea (*InstaCote IC-800*) was applied to reactor vessels and fuel storage pool surfaces. The reactor complex the debris pile was controlled using *CC Demo 100™* during the demolition phase of the reactor complex.

Application technique:

Remote delivery of fixative coatings was performed by misting surfaces using airless paint sprayers and standard polyurea coating equipment (GRACO/GUSMER). The urethane pipe stabilization liquids were pumped into the system and allowed to harden. Fixative coatings were also misted internally into equipment and piping/ventilation systems. *Autofroth®* structural foam was also delivered into ventilation ducts using a BASF SL- 330 foam system. Once remotely stabilized, these contaminated systems (emitting high-levels of radiation) were cut using robotic shears and track-mounted heavy construction equipment.

The large-scale demolition using track-mounted shears and heavy equipment was controlled on a larger scale using high pressure cannons shooting *CC Demo 100™* during the final demolition and waste load-out phases to ensure zero suspension of airborne radioactivity.

Results:

In addition to implementation of recommendations provided by Hogue and Neveau, Neveau provided Radiological Field Operations Management throughout the duration of the decommissioning and demolition process.

The demolition utilized recommended engineered controls and concrete entombment of the fuel storage pool resulted in long-term environmental control of radioactivity that could not practically be removed or remediated. This approach allowed the Battelle-West Jefferson closure project to meet its goal for environmental remediation and stabilization of the site.

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