FIU | Applied Research Center
FLORIDA INTERNATIONAL UNIVERSITY

U.S. DEPARTMENT OF ENERGY

DEACTIVATION & DECOMMISSIONING

FIU PROJECT: Waste and D&D Engineering and Technology Development: *Radiation Hardened Foam Plug Technologies to Support D&D of Nuclear Pipes*

CLIENT: U.S. Department of Energy EM
FIU PRINCIPAL INVESTIGATOR (PI): Dr. Leonel Lagos
SRNL PI: Dr. Jennifer Wohlwend
SITE: Savannah River Site and DOE Complex-wide
COLLABORATOR: Savannah River National Laboratory

Description:

FIU, in collaboration with SRNL, is testing and evaluating commercial-off-the-shelf intumescent and polyurethane foam technologies with the capability to immobilize and/or isolate dispersible radioactive contamination deposited within 3-dimensional void spaces of various volumes to improve engineering controls currently in place to remove contaminated piping systems for disposal. The suitable technology will initially support the dismantling of pipework at F/H labs, but it has complex-wide applications as well. SRS site and safety personnel stated the technology must be a permanent, non-removable, long-term material that is compatible with hot tap procedures and possesses excellent mechanical properties so that it could potentially serve as an effective plug to mitigate the release of residual radioactive contamination during the dismantling of nuclear pipework and ducts.

Benefits:

- Addresses a high priority requirement identified by DNFSB and SRS personnel.
- Has potential for broader applications to satisfy Basis for Interim Operations and safety basis requirements across the entire DOE EM Complex.
- Provides a proven, cost-effective technology solution for immobilization of radioactive contamination in 3-dimensional, irregularly shaped void spaces where current fixative technologies are not applicable.
- Is compliant with ASTM E3191, Standard Specification for Permanent Foaming Fixatives Used to Mitigate Spread of Radioactive Contamination.

Accomplishments and Path Forward:

- Phase I and II testing by FIU and SRNL resulted in the down-selection of a viable foam technology that is compatible with safety basis requirements and hot tap procedures.
- A full-scale cold demo at FIU's Outdoor Test Bed facility is planned for FY'24 / FY'25.
- An operational deployment and hot demonstration of the technology is planned at F/H Labs in FY'26.

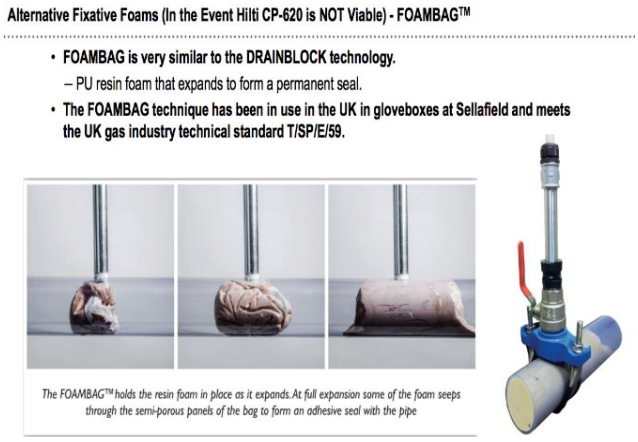

Fig. 1: Concept of deployment for FOAMBAG technology using proven hot tap procedures.

ABOUT

Since 1995, the Applied Research Center at Florida International University has provided critical support to the Department of Energy's Office of Environmental Management mission of accelerated risk reduction and cleanup of the environmental legacy of the nation's nuclear weapons program. ARC's research performed under the DOE-FIU Cooperative Agreement (Contract#DE-EM0005213) can be classified as fundamental/basic, proof of principle, prototyping and laboratory experimentation.

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