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FLORIDA INTERNATIONAL UNIVERSITY- APPLIED RESEARCH CENTER

TECHNOLOGY FACT SHEET

D&D Toolbox Project - Technology Demonstration of Decontamination Gels and Strippable Coatings Applied via Remote Sprayer Platform

FIU's Applied Research Center (ARC) is supporting the U.S. Department of Energy Headquarters in its mission to develop a D&D Toolbox Program to limit uncertainty within D&D operations.

Many facilities slated for D&D across the DOE complex pose hazards (radiological, chemical, and structural) which prevent the use of traditional manual techniques. Efficient and safe D&D of the facilities will require the use of remotely operated technologies. In addition, the D&D of a radioactive facility requires that surfaces be cleaned and stabilized to allow demolition to occur while maintaining worker radiation exposure ALARA and without spreading radioactive contamination. One typical step in the D&D process consists of applying a strippable coating (or similar material) to remove loose contamination before demolition. The selected technology was previously demonstrated spraying fixative products at the hot cell mockup facility at FIU-ARC in November 2008. Based on the initial FIU demonstration and specific technical requirements identified at the DOE facilities, DOE requested that the follow-up demonstration be expanded to include strippable coatings and decontamination gels.

Objective

The objective of the technology evaluation was to document the ability of an International Climbing Machine (ICM) remote system to spray three different strippable coating products (Instacote CC Strip, Carboline ALARA 1146, and CBI Polymers DeconGel) onto vertical concrete and metal surfaces.

ICM climbers are remote-controlled climbing machines that weigh approximately 30 pounds and have a pull off strength of over 225 pounds. Held to the surface by vacuum force, the machines adhere to essentially any hard surface such as metal, concrete, or brick. The ICM climbing machines are remotely controlled by an operator from a control station, allowing the machine to access areas unsafe for manual D&D activities. For the purposes of this technology demonstration, the ICM climber was modified with a spray applicator.

Integrated remote spraying platform - scaling up a vertical wall in building module and applying DeconGel to metal panel. Dry DeconGel peeling from metal panel.

Benefits

The integrated remote spraying technology platform:

- Closes an identified technology gap.
- Reduces worker risk – protects workers by performing D&D activity remotely.
- Presents cost savings – associated with not having to utilize multiple human entries using expensive personal protective equipment; supports D&D activities that will reduce S&M costs.
- Reduces environmental risk – by fixing loose/removable contamination there is a reduction in radiation exposure and risk of contamination spreading beyond its contained area.

Accomplishments

The selected technology was demonstrated on June 24-25, 2010, at the ICM facility in Ithaca, NY, under a contract with Florida International University's Applied Research Center. The technology evaluation documented the ability of the remote system to spray the three different strippable coating products (Instacote CC Strip, Carboline ALARA 1146, and CBI Polymers DeconGel) on vertical concrete and stainless steel surfaces. The technology was able to travel across the floor of the building module and climb the walls unassisted while being controlled remotely by the operator. The technology sprayed the products to the vertical wall surfaces and a sufficient thickness of each product was achieved to promote the ability of the product to be stripped from the surface once dry. Overall, the three products sprayed well and were relatively easy to strip, once dry, from the stainless steel and concrete panels. A final report was prepared to document the findings of this technology demonstration. In addition, all information and data gathered will be incorporated into the web-based D&D Knowledge Management Information Tool (D&D KM-IT) and distributed to Hanford's ALARA Center for complex wide distribution.

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