



A ROBOTICS SUCCESS: Deployment of the Remote Underwater Characterization System

The Problem: Characterization and inspection of water-cooled and moderated nuclear reactors and fuel storage pools require equipment capable of operating underwater. The need is for a more mobile method of performing close-up inspection and radiation measurements in confined spaces underwater.

The Technology: The Remote Underwater Characterization System (RUCS) is a small, remotely operated submersible vehicle intended to serve multiple purposes in underwater deactivation and decommissioning (D&D) operations. It is based on the commercially available "Scallop" vehicle produced by Inuktun Services, Ltd., British Columbia, Canada. The U. S. Department of Energy Office of Science and Technology Robotics Crosscutting Program (Rbx) modified the commercially available system to add radiation sensors, auto-depth control, and add vehicle orientation and depth monitoring at the operator control panel. The RUCS is designed to provide visual and gamma-radiation characterization, even in confined or limited-access areas.

The Deployment: The RUCS was deployed in August 1998 at the Idaho National Engineering and Environmental Laboratory (INEEL). The deployment took place in a canal containing two defueled test reactors at the INEEL TRA-660 facility. The RUCS was used to visually survey the canal and its contents, and it was also used to gather

characterization data on the reactors and equipment on the floor of the canal. The RUCS has subsequently been incorporated as a standard operational item in the INEEL D&D activities and has been used in several additional deployments.

The Benefit: The RUCS was simpler to deploy



than the baseline approach of mounting an underwater camera or underwater radiation detector to a cable or a long (15 to 20 ft) rod. It also reduced the number of personnel that had to be suited up in the canal area, saving labor and

reducing the potential for personnel exposure and contamination. Its small size and maneuverability allowed it to operate beneath overhead structures and behind the reactors.

Future Advances through Rbx

Initiatives: The close working relationship developed between the Rbx and the INEEL D&D field projects continues to encourage and facilitate acceptance of new technology solutions by field personnel. Rbx-developed capabilities are being provided in future commercial products through technology transfer to commercial vendors.

For more information on this project please contact:

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