

Under-Core Plate Foreign Object Search and Retrieval (FOSAR)



Field
Services

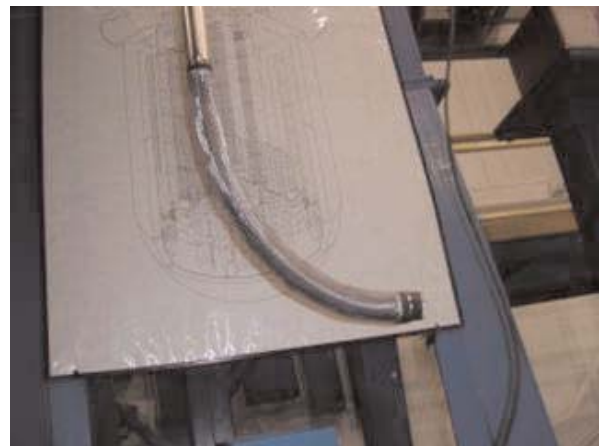
Background

A critical aspect of refueling is to ensure that the fuel is protected from possible damage as a result of foreign material in the reactor coolant system. To this end, video inspections are performed on and beneath the lower core plate prior to reloading fuel assemblies into the core. Top of the core plate search and retrieval activities can be easily performed using conventional equipment such as underwater cameras for visual inspections and air-operated vise grips or underwater vacuums for retrieving objects. However, under-core plate inspections are difficult to perform with conventional equipment because the area is only

accessible through small holes in the core plate. To improve the inspection accuracy and retrieval ability in the under-core plate region, Westinghouse now offers the under-core plate FOSAR system composed of the following:

- Articulated retrieval tool (ART)
- ROS™ D-40 radiation-tolerant camera
- Tri-Nuclear™ Model UFV-260-gpm vacuum system (supplied by utility)

Developed in partnership with ROS Incorporated, the under-core plate FOSAR is unique in its ability to search and retrieve materials beneath the lower core plate. The under-core plate FOSAR has an 18-inch articulated vacuum end effector that increases the ability to retrieve objects located under the core plate.



Articulated retrieval tool (ART)

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Benefits

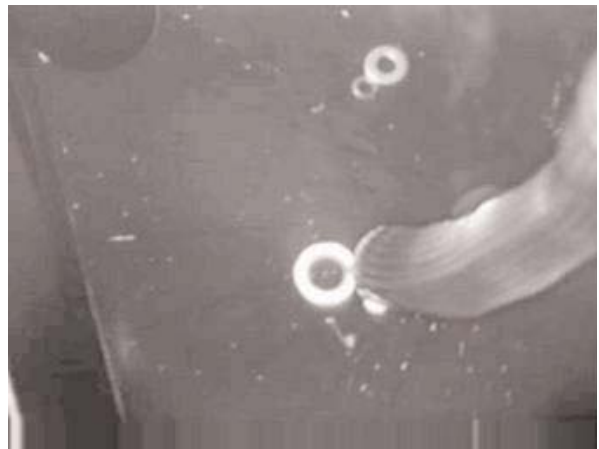
Reduced radiation exposure, shorter, less costly outages, and fewer preventable fuel defects highlight the benefits gained from the enhanced FOSAR afforded by this system.

Description

The system incorporates a small high-resolution, radiation-tolerant camera that features DVD recording capability. The camera is deployed independently of the ART. This tool is the heart of the system and embodies a flexible motorized articulated vacuum tip affixed to the end of a straight rigid pole. The straight section and the articulated end effector measure 11 feet in length. The rigid top section includes the vacuum hose adapter and the motors used to precisely manipulate the articulated section via a system of internal cables. A single 60-foot, multi-pin underwater cable connects the in-water system with the surface electronics. A utility supplied Tri-Nuclear vacuum/filtration system completes the system.

Deliverables

With the exception of the vacuum pump and associated filters and suction hose, Westinghouse provides all articulated retrieval tooling, radiation-tolerant camera equipment, and procedures to deploy, use, and recover the under-core plate FOSAR system.



ART in use to retrieve foreign material

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