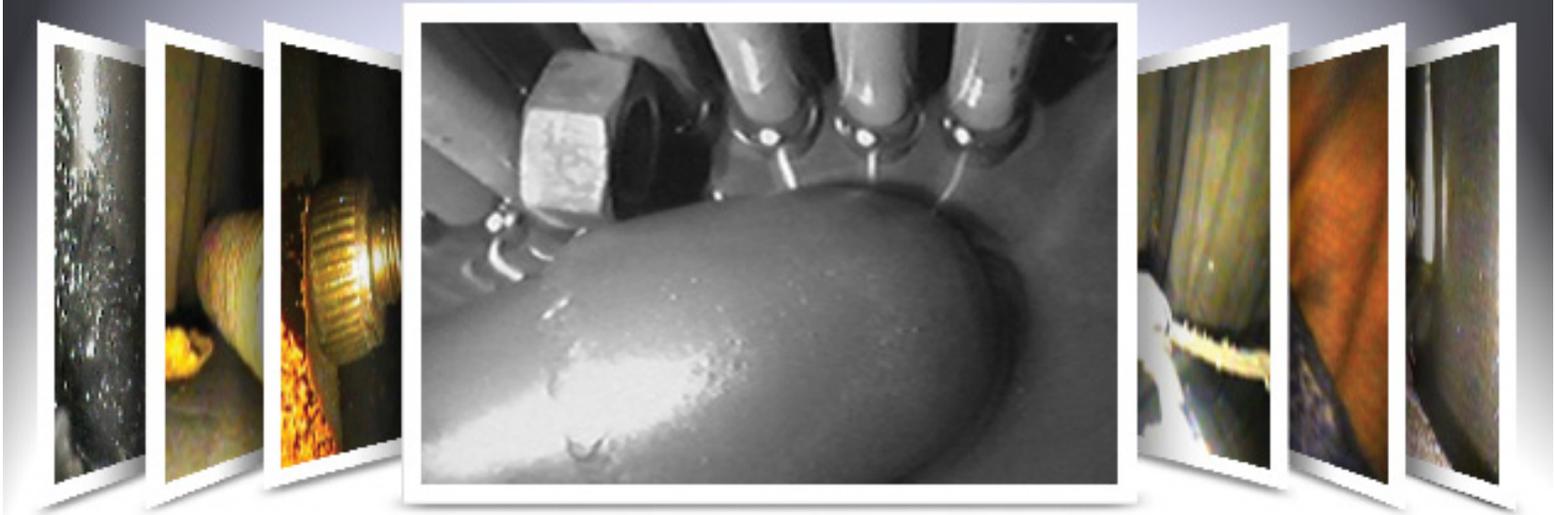


Foreign Object Search and Retrieval (FOSAR)

NUCLEAR SERVICES



Foreign Object Search and Retrieval (FOSAR) is a specialized service within Rolls-Royce steam generator services. It can be performed in any component of a nuclear power plant where foreign materials have the potential to cause mechanical damage.

FOSAR services can be performed to retrieve known objects or as a general service. General service focus includes:

- Determining system cleanliness
- Locating determining anomalous conditions
- Location and removal of foreign objects

Retrieved objects



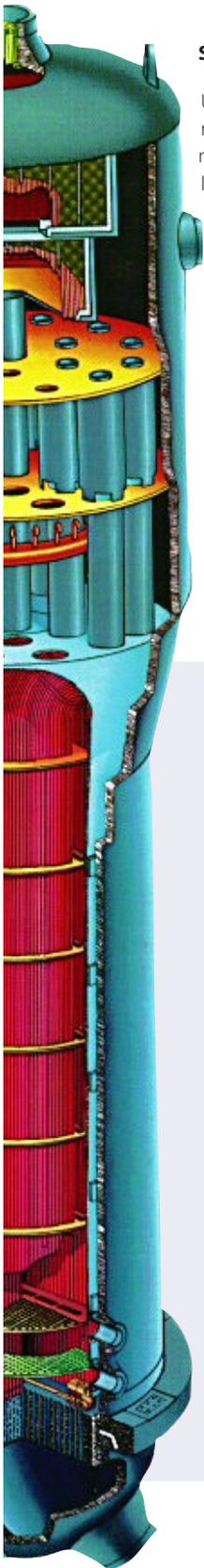
Capabilities include

- Triangular & square pitch steam generators
- Steam generator upper internals
- Facility piping systems
- Reactor vessels and fuel pools
- Steam turbines

Tooling portfolio

- Specialized mini-retrieval tooling
- Articulating video probes
- Ultra slim armored inspection probes
- Robotic pipe crawlers
- Submersible inspection cameras
- Custom Inspection Tooling

Foreign Object Search and Retrieval (FOSAR)



Specialized steam generator capabilities

Utilizing the Brooks line of exclusive inspection and retrieval tooling, Rolls-Royce has the ability to access nearly 100% of a steam generators internals including lower, mid and upper in bundle regions of triangular or square pitched generators. Our steam generator inspection and retrieval capabilities include:

- General steam drum
- J-nozzle
- Feedwater headers
- Primary and secondary moisture separators
- Anti vibration bars
- U-bend region
- Upper in-bundle region
- Tube support plates
- Wrapper supports
- Tubesheet / In-bundle
- Annulus region
- Primary piping

Items retrieved from steam generators



The removal of foreign objects decreases the potential of component failure through impacting or vibration

Specialty tooling and procedure development

Not every inspection can be performed with standard tooling. Challenging tasks may require engineered solutions in the form of custom inspection cameras and retrieval tooling to remotely deployed robotics. Examples of our custom engineering capabilities include the Brooks Pipe Navigator, a sophisticated workhorse for the inspection of industrial piping systems.

Navigators abilities include:

- Full color PTZ Camera
- Multiple contingency end effectors with abilities ranging from gripping, scraping and sucking.
- 360° in-pipe rotational abilities
- 20 lb. payload capacity



Navigator serves as a sophisticated workhorse for the inspection, characterization, cleaning, sampling and measurement of piping systems

Global access to real time image data management

CIS gives Rolls-Royce customers the exclusive ability to view inspection data in real time, cutting characterization and decision making time to a minimum. Quickly access image and tracking data stored on a password protected, secure server, twenty four hours a day, seven days a week from anywhere in the world.

CIS features include

- World wide data access
- Foreign object status
- Historical data storage
- Storage of inspection data and site documents



Manage multiple images and trend system conditions easily with Rolls-Royce Component Information System (CIS).