

Flux Thimble Cleaning

Background

Periodic cleaning of flux thimble tubes enhances safe operation of the flux mapping system and provides functional availability of each. Cleaning reduces blockage and sticking problems with flux thimble detectors, promotes greater ease of movement of the detector through the thimble and minimizes buildup of various lubricant deposits.

Description

Flux thimble cleaning is performed prior to core unload with the reactor coolant system depressurized. The interconnect tubes are disconnected from the seal table and the 10-path carriage moved to the refueling position. The flux thimble detectors must be fully retracted to their normal fueling positions and the flux thimbles fully inserted.

Flux thimble tube cleaning is performed in three phases:

- Dry brushing the thimble tubes with stainless steel brushes
- Flushing the thimble tubes
- Drying the thimble tube with laboratory-grade gas and a cotton brush to remove additional debris and moisture

Benefits

The Westinghouse cleaning system combines dry brushing and wet flushing. Dry brushing thimble tubes dislodge solid deposits that may have accumulated in the flux thimble tubes. Wet flushing, using the same system, flushes out additional debris that becomes dislodged during the dry brushing process.

Deliverables

Westinghouse responsibilities include:

- Technical support
- Approved field service procedure for flux thimble tube cleaning
- Shipment of equipment to and from site
- Special cleaning equipment, including dry brush, flushing, swabbing and drying systems
- Technicians to operate the special cleaning equipment

Final report utility responsibilities include:

- Establishing radiological conditions within the containment before, during and after cleaning
- Providing a utility coordinator to assist in establishing a schedule
- Providing access to the drive-unit and thimble-end areas (seal table side)
- Draining down the cavity to the flange level or below
- Verifying that the thimble tubes are fully inserted
- Making equipment and personnel available to monitor radiation and contamination levels during the cleaning operations
- Providing mechanical, electrical and craft labor personnel
- Providing plant services (power, light, and compressed air)
- Rolling back the bottom-mounted instrumentation rack
- Providing quality assurance/quality control, as necessary
- Providing consumables
- Providing for the decontamination of tools/equipment