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Thimble Tube Cleaning Machine

Challenge

Thimble tubes become clogged due to buildup of graphite coating on the drive cable that flakes off during normal operations, creating contaminated particles. The buildup of these particles causes the movement of detectors to become hindered and in some cases blocked.

Solution

Framatome's thimble tube cleaning process has a proven performance record of more than 25 years beginning in Europe. In fact, 100 percent of the 58 PWR reactors in France utilize the Framatome tooling and methods for thimble tube cleaning.

Customer benefits

- Operators receive less dose as a result of the 20' cables during the cleaning evolution
- Instant dose rates available by using teledosimetry on the drive unit and impurities collection box
- 100 percent cleaning success rate with lubricated neutronical flux sensors in locations which drive cable experiences issues accessing thimble tube length
- Debris box and vacuum system eliminate FME concerns
- Dry cleaning method coupled with negative pressure provided from the HEPA vacuum reduces the chance for airborne contamination
- Dry cleaning method eliminates insertion challenges

Your performance
is **our** everyday **commitment**

Automated Design Improves Performance

The thimble tube cleaning machine is an automated system that enters through the seal table side, inserting a flexible brush the entire length of the flux thimble tube to be cleaned. It consists of a drive unit and control panel connected by 20’ of electrical cables. The system retracts the debris and captures it in a sealed integrated debris box connected to a vacuum source with a HEPA filter. This closed system avoids the release of contaminated material during the brushing process, and brush assemblies allow disassembly after completion. Disassembling brush assemblies after tooling use avoids contact with the contaminated equipment, reducing dose and keeping it ALARA.

Features

- Drive cable torque limiter connected between drive motor and drive cable gear, which allows disengagement if FME or large resistance is encountered
- Programmable control box counter for each specific thimble tube length
- Tool utilizes stainless steel and nylon brushes
- Dry cleaning method removes the need to flush the system, eliminating challenges caused by water remaining in the tube
- Impurities collection box connected to HEPA vacuum and vacuum tee for continuous negative pressure

Contact: Ben Grambau • Tel: 434.832.3229
Ben.Grambau@Framatome.com • **www.framatome.com/us**

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