

Global Instrumentation and Control

Flux Mapping System – Flux Mapping Console and Detector Drive System Upgrades, Enhancements and Replacements

Innovative – Practical – Phased

Background

Westinghouse has been providing its Flux Mapping System (FMS) for pressurized water reactors (PWRs) since the beginning of the commercial nuclear power industry. The FMS provided by Westinghouse and systems based on the Westinghouse technology and design are in operation in nearly 50 percent of the operating plants worldwide. Replacement systems and upgrades also have been provided to PWR FMSs.

Description

Westinghouse and Triumph Controls are a long-established original equipment manufacturer (OEM) team providing flux mapping, movable incore detector system expertise. With a teaming agreement in place, the two companies are positioned to provide next-generation flux mapping solutions to customers.

The total FMS consists of:

- Flux Mapping Console (FMC)
- Detector Drive System (DDS)
- Movable Incore Detectors

Benefits

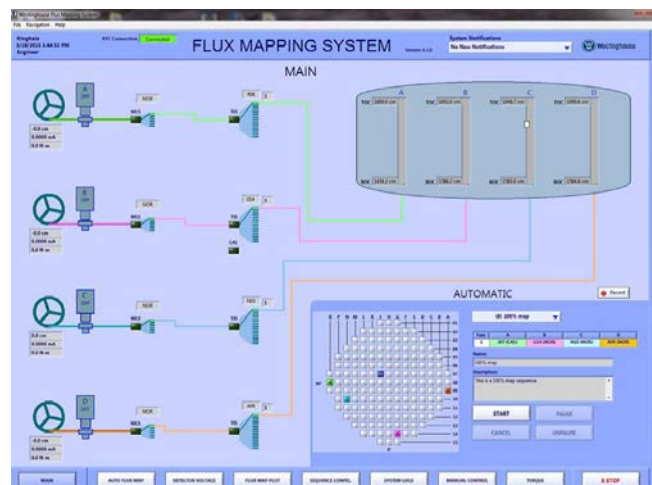
The FMS provided by Westinghouse offers the following benefits:

OEM Team

- Plant and FMS design experience with over 120 operating plants
- Time tested and reliable with proven technology and designs
- Systems in operation for over 40 years
- Continuous support for life of plant
- Intimate knowledge of plant configurations
- Complete technical support and training through design, installation and commissioning
- ISO 9001 Certification

Flux Mapping Console (FMC)

- Seamless integration with existing cabinet and field wiring
- System-level extensive diagnostics
- Adaptable to two-, three- and four-loop plants
 - interfaces with existing or new DDS
- Employs off-the-shelf hardware and software
- Easy to operate
- Fully automatic flux map
- Automatic detector plateau curve
- User configurable map sequences
- Multiple flux map sequence storage
- Long-term storage of data and events
- Thimble out-of-service feature
- Interface to BEACON™ Core Monitoring System, INCORE and plant computer
- Automatic stuck detector recovery
- Automatic top-of-core detection



Flux Mapping Main Display

Detector Drive System (DDS)

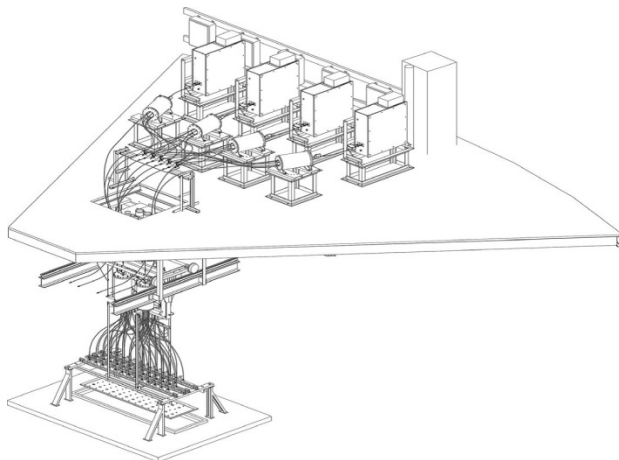
- Configurable redundancy
- Reduced detector change-out time
- Fewer components
- High cable drive efficiencies
- Reduced radiation exposure
- Accurate detector position feedback
- Flexible installation arrangement
- Constant torque on detector drive cable

Integrated System Design

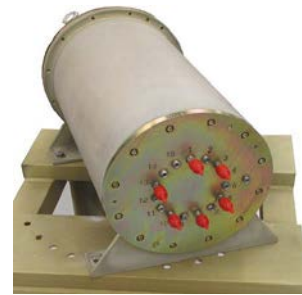
- Improved reliability
- Fewer components
- Reduced footprint
- Modular design
- Reduced spare part requirements
- Enhanced performance
- Reduced maintenance and decreased life-cycle costs
- One drive can map entire core
- Full flux map in less than one hour
- Torque monitoring of detector drive cable
- Integrated system test in the factory

FMS Renewal

- Full replacement available
- Phased upgrades of existing systems also an option



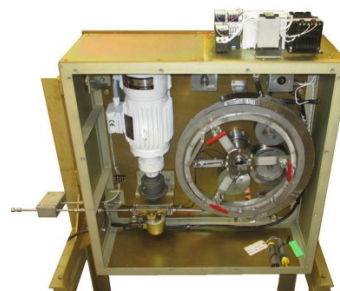
DDS Layout Sketch



6/15 Path Transfer



FMC



Drive Unit

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