



ROD CONTROL DIAGNOSTICS

Timing, Sequencing, Voltage Calibration, and Current Monitoring of Control Rod Drive Mechanisms (CRDMs)

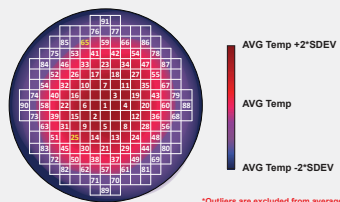
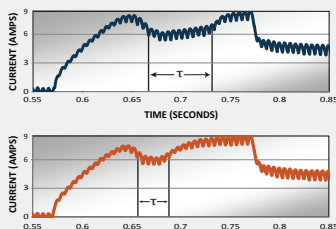
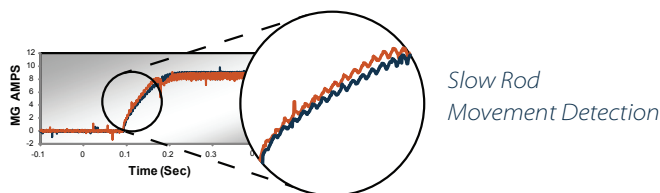
About

Nuclear power plant control rods are stepped into and out of the reactor by control rod drive mechanisms (CRDMs) located on top of the reactor head. The CRDMs receive their power for movement from the rod control system, which receives signals for automatic rod movement from the plant control system. AMS provides a system which can measure the timing and sequencing of CRDM signals and automatically verify they are operating within specification. Additionally, it can provide diagnostic information about the health of the rod control system and can detect early onset of degradation in coils cables, and cabinet electronics.

Features

- Online CRDM Testing
- Measure CRDM Coil Regulated Voltage and Current
- CRDM Timing, Sequencing, Latching
- Firing Angle Verification
- Calculate and Monitor Coil Resistance and Inductance
- Rod Movement Monitoring
- Slave Cyclor Signal Timing
- Load Transfer Time Trending
- Current Noise Monitoring
- Fully Automated
- Continuous Testing and Monitoring
- Automatic Report Generation

Rod Control Diagnostics Data



Load Transfer Time Trending

Map Coil Thermal Degradation

Plant Name			Test Date		Direction: DOWN		RCS Pressure: ~325									
			Procedure: IP/0/B/3220/037		RCS Temp: 175		RCS Flow: 2 RCP's									
			Current				Voltage				Resistance					
Item	Bank	Reel ID	LC Full	SG Full	LC Full	SG Full	LC Full	SG Full	LC Full	SG Full	LC Full	SG Full	LC Full	SG Full		
1	CBA	790	44.31	8.34	8.36	44.7	87.13	10.09	72.39	88.83	65.13	1.31	1.68	8.45	10.83	14.58
2	CBA	791	44.31	8.34	8.36	44.7	87.13	10.09	72.39	88.83	65.13	1.32	1.68	8.47	10.87	14.63
3	CBA	792	44.31	8.34	8.36	44.7	87.13	10.09	72.39	88.83	65.13	1.31	1.68	8.45	10.83	14.58
4	CBA	793	44.31	8.34	8.36	44.7	87.13	10.09	72.39	88.83	65.13	1.32	1.68	8.47	10.87	14.63

** = Current Criteria Exceeded

Monitor Coil Resistance Online

Advantages

- Early Warning of CRDM Degradation
- Early Detection of the Following Common Problems:
 - Sluggish CRDM Mechanism Operation
 - Phase, Firing Card Degradation
 - Slowed or Stuck Rod
 - Gripper Mechanism Obstruction
 - Regulation Component Degradation
- Improved I&C Reliability
- Perform Maintenance during Plant Operation
- Advanced Analysis including Trending Overlays, Current, and Voltage Traces
- Coil Temperature Mapping
- Web Interface
- ALARA

Benefits

- Fewer Dropped Rods
- Intuitive Data Analysis and Problem Reporting
- Improved Maintenance Efficiency
- Better Outage Planning
- Reduces Outage Workload
- Less Maintenance Induced Damage