

WOG/NRC Meeting to Discuss the WOG Post Accident Monitoring Instrumentation Redefinition Program

October 18, 2004



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WOG Post Accident Monitoring Instrumentation Redefinition Program

Objective

- Determine the Post Accident Monitoring (PAM) instrumentation that should be included in the Technical Specifications based on Accident Management usage

Background

- WCAP-11618 identified the RG 1.97 Type A PAM instrumentation in the W STS (NUREG-0452)
- RG 1.97 Type A PAM instrumentation satisfied Criterion 3 of the Interim Policy Statement Criteria
- WCAP-11618 also identified the RG 1.97 Category 1 PAM instrumentation in the W STS (NUREG-0452)



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WOG Post Accident Monitoring Instrumentation Redefinition Program

Background (cont.)

- RG 1.97 Category 1 PAM instrumentation did not satisfy any of the Interim Policy Statement Criteria and were not important to risk
- WOG proposed to relocate the RG 1.97 Category 1 PAM instrumentation in the W STS (NUREG-0452) out of the Technical Specifications
- NRC review of WCAP-11618 was unable to confirm that RG 1.97 Category 1 PAM instrumentation were not important to risk



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WOG Post Accident Monitoring Instrumentation Redefinition Program

Background (cont.)

- NRC review of WCAP-11618 stated that recent PRAs have shown that RG 1.97 Category 1 instrumentation were risk significant, and that the Owners Groups should develop further risk-based justification to support relocating any or all RG 1.97 Category 1 instrumentation from the STS
- Tech Spec 3.3.3, "PAM Instrumentation," in NUREG-1431, Rev. 0 issued in 1992 contains a Reviewer's Note that states that all plant specific RG 1.97 Type A and Category 1 instrumentation should be included in the Technical Specifications



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Background (cont.)

- PAM Instrumentation contained in NUREG-1431, Rev. 0 issued in 1992 was based on design basis accident analysis requirements and generic insights from PRAs available at that time



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WOG Post Accident Monitoring Instrumentation Redefinition Program

Approach

- Review PAM instrumentation as it is currently used in Accident Management
- Review of Accident Management used to justify the elimination of Post Accident Sampling System



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Approach (cont.)

- Develop generic methodology that reviews:
 - Design Basis Accidents
 - Emergency Response Guidelines
 - PRA
 - Severe Accident Management Guidance
 - Emergency Plan



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WOG Post Accident Monitoring Instrumentation Redefinition Program

WCAP-15981, "Post Accident Monitoring Instrumentation Redefinition for Westinghouse NSSS Plants"

- Submitted for NRC review and approval on September 17, 2004 via WOG-04-474
- Contains generic methodology for determining the PAM Instrumentation that should be included in the Tech Specs
- Does not require a revision to Regulatory Guide 1.97
- TSTF to be submitted following NRC acceptance of WCAP-15981



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WOG Post Accident Monitoring Instrumentation Redefinition Program

Recommended PAM instrumentation for NUREG-1431

- Power Range Neutron Flux
- Steam Generator Pressure* (new)
- Refueling Water Storage Tank Level* (new)
- High Head Safety Injection Flow* (new)
- Reactor Coolant System Pressure (WR)
- Containment Pressure (WR)
- Penetration Flow Path Containment Isolation Valve Position
- Containment Area Radiation (High Range)
- Pressurizer Level
- Steam Generator Water Level (WR)
- Core Exit Temperature
- Auxiliary Feedwater Flow



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WOG Post Accident Monitoring Instrumentation Redefinition Program

PAM Instrumentation Contained in NUREG-1431 (WCAP-15981, Table 3)

| | |
|------------------------------------|---|
| Power Range Neutron Flux | Containment Pressure (WR) |
| <i>Source Range Neutron Flux</i> | Containment Area Radiation (High Range) |
| <i>RCS Hot Leg Temperature</i> | Pressurizer Level |
| <i>RCS Cold Leg Temperature</i> | Steam Generator Water Level (WR) |
| RCS Pressure (WR) | <i>Condensate Storage Tank Level</i> |
| <i>Reactor Vessel Water Level</i> | Core Exit Temperature (Quadrants 1-4) |
| <i>Cont. Sump Water Level (WR)</i> | Penetration Flow Path CIV Position |
| Auxiliary Feedwater Flow | |

** Instrumentation to be Relocated **



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WOG PAM Instrumentation Redefinition Program

| PAM Instrumentation Contained in NUREG-1431 | DBA | PRA | AM | | EP | | |
|--|-----|-----|------|------|-----|-----|------|
| | | | EOPs | SAMG | EAL | CDA | ODCM |
| Power Range Neutron Flux | | √ | √ | | √ | | |
| Source Range Neutron Flux | | | | | | √ | |
| RCS Hot Leg Temperature | √ | | √ | √ | √ | √ | |
| RCS Cold Leg Temperature | | | √ | | √ | | |
| RCS Pressure (Wide Range) | √ | √ | √ | √ | √ | | |
| Reactor Vessel Water Level | | | √ | | √ | √ | |
| Cont. Sump Water Level (WR) | | √ | | √ | | | |
| Containment Pressure (WR) | | √ | √ | √ | √ | | √ |
| Cont. Isolation Valve Position | | √ | | | √ | | |
| Cont. Area Radiation (Hi Range) | | | | | √ | √ | √ |
| Pressurizer Level | √ | √ | | | | | |
| SG Water Level (WR) | √ | √ | √ | √ | √ | | |
| Condensate Storage Tank Level | | | | | | | |
| CET (Quadrants 1-4) | | | √ | √ | √ | √ | |
| Auxiliary Feedwater Flow | | √ | √ | | √ | | |



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WOG Post Accident Monitoring Instrumentation Redefinition Program

Alternate PAM Instrumentation

(WCAP-15981, Table 13)

| Primary Instrumentation | Alternate Instrumentation |
|-----------------------------------|---|
| SG Water Level (WR) | SG Narrow Range Level AND Auxiliary Feedwater Flow Rate |
| Power Range Neutron Flux | Intermediate or Source Range Indications AND either the Rod Position Indicators OR Rod Bottom Lights |
| Cont. Area Radiation (High Range) | Portable Radiation Monitors |
| High Head Safety Injection Flow | High Head Safety Injection Pump Amperage AND SI Pump Discharge or Header Pressure AND Automatic SI valve position |
| Auxiliary Feedwater Flow | Motor Driven Pumps: Pump Amperage AND Pump Discharge Pressure OR flow control valve (SG supply) position |
| | Turbine Driven Pump: Pump Discharge Pressure OR steam supply valve position AND flow control valve (SG supply) position |



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WOG Post Accident Monitoring Instrumentation Redefinition Program

Plant Specific Implementation

- Apply generic methodology on a plant specific basis to determine which RG 1.97 instruments satisfy 10 CFR 50.36 Criterion 3 (Type A) and Criterion 4 (Category 1)



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WOG Post Accident Monitoring Instrumentation Redefinition Program

Lead Plant License Amendment Request to be submitted for NRC review and approval

- Apply generic methodology to Beaver Valley Unit 1 and 2
- Determine which Beaver Valley Unit 1 and 2 RG 1.97 instrumentation satisfy 10 CFR 50.36 Criterion 3 (Type A) and Criterion 4 (Category 1)



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