

Attachment 6

to

January 27, 2005

Operator Licensing Focus Group

Meeting Summary



# NRC Simulator Update

**January 27, 2005**

**U. S. Nuclear Regulatory Commission**

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# 10 CFR 55.46 Implementation

- **Plant-referenced simulators inspected for rule compliance**
- **Simulation facilities inspected using IP-71111.11 (Requal Program)**
- **Areas of concern identified**
  - Simulator fidelity
  - Performance testing
  - Simulator negative training

# Positive Developments

- **Constructive interaction between industry and regulator**
- **Simulator issues are being identified and addressed**
- **ANS-3.5 Working Group enhanced standard in problematic areas**
  - Core performance testing
  - Scenario-based-tests
  - Post event testing

# Attention Areas

- **55.46 Regulatory areas of concern**
  - Simulator fidelity
  - Performance tests/testing
  - Negative training
- **ANS-3.5 requirements are not fully appreciated nor understood**
  - Not meeting standard may cause regulatory concerns
  - NRC expects adherence to the standard (e.g., scope & fidelity)

# Simulator Regulatory Schedule

- **Simulation facilities are required to be fully compliant with regulations**
- **Conduct performance testing over the life of the simulator**
- **Correcting discrepancies identified from performance testing**
- **Retain for NRC review tests results**
  - In general, ANS-3.5 driver of tests & documentation requirements

# Regulatory Expectations

- **Plant-referenced simulator that has sufficient scope and fidelity to:**
  - Allow control manipulations (standard more exacting when crediting manipulations)
  - Respond to operator input & to normal, transient, & accidents conditions
  - Support operator training & examinations

# Regulatory Impact

- **Low, if**
  - Ongoing maintenance & testing program has been sound
- **High, if**
  - Not correcting discrepancies
  - Inadequate tests & testing
  - Insufficient scope & fidelity

# Simulator Technology

- Computer capability & capacity no longer impedes scope & fidelity
- Software engineering expertise is more reliable
- Conformance to reference plant design & performance data can withstand scrutiny

# Regulatory References

- **10 CFR 55.46 rule**
  - IP-71111.11 baseline (region) & quarterly (resident) inspections
  - Reactor Oversight Process (ROP)  
Significant Determination Process (SDP)

# Regulatory Simulator Goals

- **No negative operator training due to simulator issues**
- **Sufficient scope and fidelity being maintained**
- **Timely correction of significant discrepancies**
- **Adequate performance testing**
- **Good replication of reference plant**

# Scenario-based-tests (SBTs)

- Applicable to '98 standard
- Acceptability & suitability of SBT for meeting standard testing criteria
  - Demonstrate meaningful & adequate testing
  - Verify simulator's performance as compared to actual or predicted reference plant performance
- SBT should identify specific key parameters, automatic actions, and/or alarms, comparison to actual or predicted performance and evaluation of results

# SBTs - Inspection Results

- **Generally, insufficient & inadequate**
- **Question of acceptability & suitability for meeting standard testing criteria**
  - **Poor demonstration of meaningful & adequate testing**
  - **Poor verification of simulator's performance as compared to actual or predicted reference plant performance**
  - **Lack of identification of specific key parameters, automatic actions, and/or alarms, and documentation of results of comparisons of these to actual or predicted reference plant performance**

# SBTs Treated as Unresolved Item (URI)

- ‘98 standard required comparison to reference plant but does not provide details regarding the extent of the comparison between the simulator & actual or predicted plant performance that is required during SBT
- Some confusion has developed regarding proper interpretation of the standard in this area
  - NRC staff believes that the comparisons, to be meaningful, must include key parameters / automatic actions / alarms as described in section 4.1.4 of the standard
- Pending anticipated enhancements to standard & additional guidance or clarification / interpretation of existing guidance (revise or update RG 1.1 49, Rev 3)

# 10 CFR Part 55 Requirements

- 55.4 states that the definition of “performance testing” means testing conducted to verify a simulation facility’s performance as compared to actual or predicted reference plant performance
- 55.46 (c)(1) states that plant reference simulator must demonstrate expected plant response to operator input and to normal, transient, and accident conditions to which the simulator has been designed to respond
- 55.46.(d)(1) requires performance to provide continued assurance of simulator fidelity
- To be consistent with the definition of “performance testing” in the standard and regulation, such testing must include a comparison of the results of integrated operation of the simulator to actual or predicted reference plant data.