

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-7111.11 (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.**