



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

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FROM: Jack W. Roe, Director
Division of Licensee Performance
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SUBJECT: NRR REVIEW OF REQUALIFICATION EXAMINATION
SCENARIOS

As you are aware, several facility licensees, as well as NRC managers have expressed concern regarding the consistency of simulator scenarios administered during requalification examinations. In early 1991, the Operator Licensing Branch (LOLB) responded by directing a study of selected simulator scenarios for content, adherence to the Examiner Standards, and consistency across the regions. In June 1991, LOLB presented the findings of this study to NRC examiners. It is our intention to provide improved guidance, or endorse appropriate NUREG guidance, for developing scenarios of appropriate scope, depth, and complexity in the next revision to the Examiner Standards. However, in the interim, we want to ensure that simulator examinations with the desired scope, depth and complexity are being administered.

To address this issue, we are initiating a pilot program for six months to audit requalification simulator scenarios prior to the preparation week. About two weeks in advance of prep week activities, LOLB will conduct table top reviews of selected simulator scenarios from scheduled requalification examinations. The review will evaluate the scope, depth and complexity of the scenarios along with any changes proposed by the chief examiner. Feedback will be provided to the region in advance of the examination preparation week.

We will work with the regions to resolve any issues. LOLB will request regional and contract examiners to assist in performing the scenario reviews. This process will allow LOLB to establish a greater level of consistency in the development of simulator scenarios.

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Regional Division Directors

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The assessment method which is provided as an enclosure to this memorandum, uses both the Examiner Standards checklists and evaluation criteria developed as a result of the Simulator Scenario Assessment Study.

Beginning with requalification examinations scheduled for administration in March 1992, we request that the regions ensure that copies of all examination scenarios and any proposed changes that have been identified by the region are provided to William Jean, Chief, Regional Support and Oversight Section. The enclosure lists the appropriate time table for key events during this review process.

Your cooperation is essential to the completion of this review. I thank you for your assistance. Please call me or Bob Gallo if you have any questions.

Jack W. Roe, Director
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Enclosure:
As stated

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SIMULATOR SCENARIO REVIEW METHOD

The simulator scenarios should be provided to LOLB in sets as they are planned for administration. Each scenario selected will be reviewed by an examiner certified on that vendor type. The results of the review will be evaluated by the Chief, Regional Support and Oversight Section. Comments deemed appropriate will be forwarded to the region for resolution. The regions will provide the scenarios to LOLB.

1. Sampling Plan:

- * Licensee Program Currently Evaluated as Satisfactory - normally review 25% of the proposed scenarios.
- * Licensee Program Currently Evaluated as Unsatisfactory - review all proposed examination scenarios.
- * Licensee Programs with Special Considerations (Note 1) - review all proposed examination scenarios.

2. Review Guidelines:

- * Complete a "Simulator Scenario Review Checklist" (Form ES-604-1) for each scenario. ES-604, Revision 6 will be used to determine the acceptability of scenarios.
- * Evaluate each scenario with respect to the following parameters:
 - Individual Simulator Critical Tasks
 - Malfunctions, number and sequencing
 - Events, abnormal and major
 - Emergency Operating Procedures, number and time of usage
- * Compare the resulting data to the attached scenario attributes (for both BWR and PWR scenarios) generated as a result of LOLB reviews of scenarios. However, the attributes will not be used to determine the acceptability of scenarios, but to identify relative complexity.

3. Timetable for Region and LOLB Actions:

30 - 60 days in advance of exam

Examination scenarios forwarded to LOLB.

About 2 weeks prior to prep week

Chief examiner identifies proposed examination scenario changes to Chief, RSOS, LOLB. LOLB identifies reviewer to region.

Prior to prep week

Chief, RSOS, LOLB or designee discuss scenario comments with regional section chief and chief examiner. Pertinent comments on scenario changes are provided to the facility by the chief examiner.

Note 1: Examples:

- First requalification examination administered on plant-reference simulator
- First requalification examination following significant simulator model modifications or major EOP revision
- Significant performance deficiencies during last requalification examination

QUANTITATIVE AND QUALITATIVE SCENARIO ATTRIBUTES

Total Malfunctions: The number of instrument or component failures used to fail pertinent equipment or initiate a transient during the scenario. Each failure should be related to the scenario's objective(s).

- o Range: 4 - 8 per scenario (10 - 14 per set of 2 scenarios)

Examples:

RCIC pump trip pre-inserted to place pump out of service during a small break LOCA. This malfunction is not counted if used during a DBA LOCA scenario during which the pump has no safety significance. Note: Malfunctions entered to initiate a transient may actually require several component failures (e.g. tripping 2 SI pumps to eliminate High Head Safety Injection is one malfunction though 2 component failures are required).

Steamline break that initiates the major transient.

Malfunctions after EOP entry: Failures of instruments or components, either pre-inserted or inserted during the scenario, which become active after the EOPs have been entered and have an influence on the crew's mitigation strategy.

- o Range: 1 - 4 per scenario (3 - 6 per set of 2 scenarios)

Examples:

Failure of a Standby Liquid Control pump during an ATWS.

Failure of Steam Dumps to operate during RCS cooldown activities.

Abnormal Events:

- o Range: 1 - 2 per scenario (2 - 3 per set of 2 scenarios)

Major Transients:

- o Range: 1 - 2 per scenario (2 - 3 per set of 2 scenarios)

EOPs entered:

- o Range: 1 - 3 per scenario, beyond the primary scram procedure. (3 - 5 per set of 2 scenarios)

EOP contingency
procedures:

- o Range: 0 - 2 per scenario (2 - 3 per set of 2 scenarios)

Note: Each scenario set should be designed to require the crew to enter and perform safety related tasks (ISCTs or Crew CTs) in EOP contingency procedures.

EOP run
time (given a 50 minute scenario):

- o Range: 25 - 35 minutes with EOP contingency procedures
- o Range: 20 - 25 minutes without EOP contingency procedures

ISCTs (NUREG - 1021, revision 6):

- o Range: 4 - 10 (10 - 15 per set of 2 scenarios)

Crew CTs (Crew simulator exam - pilot):

- o Range: 2 - 5 (5 - 8 per set of 2 scenarios)

General Guidelines:

- o Scenario events designed to involve all crew members.
- o Scenario is composed of related or linked events.
- o Critical Tasks have a K/A rating of 3.0 or greater and include documentation regarding the safety significance or adverse consequence(s) resulting from a failure to perform the task(s)
- o Scenario set includes sufficient tasks to allow for evaluation of all rating factors (1, 2, 3) associated with each competency on the Simulator Crew Evaluation Form.

EOP Contingency Procedures:

Examples:

GE BWR:

- Alternate Level Control

- Emergency RPV Depressurization
- Steam Cooling
- RPV Flooding
- Level/Power Control
- Primary Containment Flooding

Westinghouse PWR:

- Optimal Recovery Guidelines designated ECA:
 - Loss of all AC power
 - Loss of all AC power Recovery without SI Required
 - Loss of all AC power Recovery with SI Required
 - Loss of Emergency Coolant Recirculation
 - LOCA outside Containment
 - Uncontrolled Depressurization of All Steam Generators
 - SGTR With Loss of Reactor Coolant - Subcooled Recovery
 - SGTR With Loss of Reactor Coolant - Saturated Recovery
 - SGTR Without Pressurizer Pressure Control
- Functional Restoration Guidelines entered due to a RED or ORANGE condition on a Critical Safety Function Status Tree:
 - Response to Nuclear Power Generation/ATWS
 - Response to Inadequate Core Cooling
 - Response to Degraded Core Cooling
 - Response to Loss of Secondary Heat Sink
 - Response to Imminent Pressurized Thermal Shock Conditions
 - Response to High Containment Pressure.
 - Response to Containment Flooding

CE PWR:

- Entry into the Functional Recovery Procedure
- Transition from one Functional Recovery Safety Function success path to another
- Transition from one safety function to another within the Functional Recovery Procedure

B&W PWR:

The B&W structure does not identify procedures that can be considered contingency procedures. However, use of the descriptions given for Westinghouse contingency procedures should provide sufficient guidance.