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

MAR 0 8 1991

MEMORANDUM FOR: William T. Russell, Associate Director
for Inspection and Technical Assessment
Office of Nuclear Reactor Regulation

FROM: Jack W. Roe, Director
Division of Licensee Performance
and Quality Evaluation
Office of Nuclear Reactor Regulation

SUBJECT: ASSESSMENT OF THE SCOPE, DEPTH AND COMPLEXITY OF DYNAMIC SIMULATOR EXAMINATIONS

As a result of my memorandum to you dated January 1, 1991, I directed the Chief, Operator Licensing Branch (LOLB) to form a panel of certified examiners to assess the dynamic simulator examination program as it pertains to requalification examinations being administered by the five Regional Offices. Enclosed is a memorandum that provides the panel's findings and recommendations.

The panel concluded that simulator scenarios of varying complexity levels are being administered. However, the variations appear to be a function of the facility at which the examination was administered rather than regional influence. There appear to be two causal factors:

1. The variation in scenario complexity is a function of event sequencing and requirements for operator actions in the EOPs. The total number of individual simulator critical tasks (ISCTs) and simulator malfunctions is not always indicative of scenario complexity.

2. Many ISCTs are not being properly identified in accordance with Revision 6 of the Examiner Standards. Many tasks which do not possess the requisite criteria are being designated as ISCTs. Conversely, a few tasks which meet the criteria are not being identified as ISCTs.

With respect to concerns regarding use of ISCTs, the panel determined that appropriate application of the Revision 6 ISCT methodology would help alleviate the industry criticism that operators are subject to an excessive number of ISCTs. If Revision 6 guidance is applied judiciously to scenarios of appropriate depth and complexity, a reasonable number of ISCTs per operator should result.

The panel made six recommendations listed in a bullet format on pages 2 and 3 of the enclosed report. I have carefully reviewed and considered the panel's findings, and I concur with the recommendations. I have categorized these recommendations below in terms of how they should be implemented.

For those recommended clarifications to existing methods that may not require a change to the Examiner Standards, I have asked the Chief, LOLB to discuss the issues with both industry and the examiners. This will be accomplished during

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the March LOLB Counterpart meeting, the NUMARC conference in May and the Examiners' Conference in June. The items that will be covered in this manner are improved guidance on constructing scenarios and ISCTs, incorporating safety significance and adverse consequences into the scenarios (Bullets 3, 5 and 6). After these discussions, we will make a recommendation on any changes that will be needed to the Examiner Standards.

Several of the recommendations made by the panel will require changes to the Examiner Standards and will necessitate both industry and examiner feedback. These are operating and staff crew rotation practices and level of incorporation of EOPs into scenarios (Bullets 1, 2 and 4). I have asked the Chief, LOLB to develop proposed Examiner Standard revisions and provide them to industry representatives and the examiner community with the eventual goal being issuance of a revision to the Examiner Standards. Depending on the feedback that is received, some changes may be recommended prior to issuance of revision 7 to the standards (e.g., staff crew rotation practices).

In the interim, I have asked the Chief, LOLB to distribute the results of the panel's assessment to all examiners for their information.

Original signed by

Jack W. Roe, Director
Division of Licensee Performance
and Quality Evaluation
Office of Nuclear Reactor Regulation

Enclosure:
As stated

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ENCLOSURE

February 26, 1991

MEMORANDUM FOR: Jack W. Roe, Director
Division of Licensee Performance
and Quality Evaluation, NRR

THRU: Robert M. Gallo, Chief
Operator Licensing Branch
Division of Licensee Performance
and Quality Evaluation, NRR

William Dean, Chief
Regional Support and Oversight Section
Operator Licensing Branch
Division of Licensee Performance
and Quality Evaluation, NRR

FROM: John Munro, Panel Chairman
Regional Support and Oversight Section
Operator Licensing Branch
Division of Licensee Performance
and Quality Evaluation, NRR

SUBJECT: SIMULATOR SCENARIO ASSESSMENT

In a memorandum dated January 24, 1991, William Dean directed the review of selected simulator scenarios to evaluate simulator scenario consistency. Enclosure 1 details the methodology utilized in the assessment. A panel consisting of six certified examiners (J. Munro, J. Pellet, L. Miller, I. Kingsley, F. Victor and D. Draper) reviewed sixty-six (66) scenarios representative of eleven requalification examinations. The requalification scenarios were assessed for consistency by evaluation of the following content areas:

- o ISCT identification per NUREG-1021, Rev. 6 criteria
- o Malfunctions, number and sequencing
- o Events, abnormal and major
- o EOPs, number and time of usage

The results of this assessment are tabulated in Enclosure 2. By reviewing the data and incorporating judgements on the scenarios by the panel of examiners, several important conclusions are highlighted.

- o Scenario complexity varies by facility rather than by Region. Note the difference in data between Facilities A and B.

- o The panel concluded that counting ISCTs, malfunctions or other discrete scenario variables was not always indicative of complexity. Scenario complexity was determined to be a function of event sequencing and requirements for operator action(s) in the EOPs. Specifically, activation of malfunction(s) after initial EOP entry complicates the mitigation strategy and increases operator usage of

EOPs and associated contingency procedures. Enclosure 3 provides a comparison of the evaluation scenarios provided by two facilities for a Design Basis Accident LOCA.

- Many ISCTs are not being properly identified in accordance with the most recent Examiner Standards guidance. ISCTs are tasks which, if omitted or incorrectly performed by an operator, will result in adverse consequence(s) which significantly alter the event mitigation strategy to the detriment of plant or public safety. The panel identified numerous tasks that did not meet this definition or the criteria for critical tasks detailed in ES-604, Rev 6, Attachment 1. The panel also identified some additional scenario tasks that met the criteria for ISCTs. In many instances, the tasks had been identified for evaluation but not as critical, e.g., trip of RCPs during LOCA. Enclosure 4 provides a sample of ISCTs that the panel determined should be either deleted or added to the reviewed scenarios.

The panel recommends that the following programmatic changes and clarifications be implemented to better assure examination consistency.

- Specify that one scenario have the operators enter and perform safety related tasks (ISCTs) in AOPs and EOP contingency procedures. Specify that the second scenario also perform ISCTs in AOPs and EOPs; however, entry into the EOP contingency procedures "by design" would be precluded. Two scenarios will normally provide an adequate scenario set for a four person operating crew consisting of two SROs and two ROs. Perform both scenarios with the operators manning their normal shift positions.

- Specify that the scenario planned for the usage of EOP contingency procedure(s) expend 50 - 60 percent of scenario run time or twenty--five to thirty (25 - 30) minutes in the usage of these EOPs. The second scenario should be designed to expend 30 - 40 percent of scenario run time or fifteen to twenty (15 - 20) minutes in the usage of EOPs.

- Specify that scenario sets be reviewed for sufficient tasks to allow for evaluation of all rating factors (1, 2 or 3) associated with each competency on the Simulator Crew Evaluation Form. Specifically, the tasks should be designed such that improper crew action(s) (or omission of crew action(s)) will result in some degree of degradation of the facility or adverse effect to the public.

- Review the rotation practices for a staff crew of four to five SROs. Currently, the operators rotate through all crew positions. Requiring four to five scenarios exposes each operator to a high number of ISCTs and requires extensive simulator examination time.

- Specify that the safety significance or adverse consequence(s) be provided with the scenario for all identified ISCTs. Reemphasize to all examiners and facilities that all ISCTs must possess the four criteria discussed in ES-604, Attachment 1.

o Add clarification to the existing Standard to preclude "generic" designation of ISCTs. Indicate the following examples of generic tasks to be unacceptable as critical tasks:

- Verification of automatic actions.
- Enter and perform EOPs and EOP transitions.
- Enter and classify the Emergency Plan for an Unusual Event.
- Enter and take action in accordance with Technical Specifications.

All of the above operator tasks may be considered ISCTs when the specific actions are listed and the task is evaluated for safety significance within the context of a particular scenario. The following examples of tasks are acceptable as ISCTs:

- SRO directs initiation of Drywell Sprays when torus pressure exceeds 13 psig in accordance with EOP-2.
- Transfer Terry Turbine steam supply from steam generator #1 to #4.
- Declare a Site Area Emergency based on RCS leak greater than make-up capacity.

The Examiner Standards specify that the NRC and facility evaluators review scenarios to assure they are neither too complex nor too simple. The guidance was written with sufficient latitude to incorporate differences in EOP content, simulator capability and professional judgements on depth of coverage. The result has been an inconsistent approach to simulator scenario development. This problem is exemplified by the identification of ISCTs that in 45 percent of the cases did not adhere to the guidance in ES-604, revision 6. The recommended corrective action is to provide more specific guidance, as stated above, thereby improving the objectivity and consistency of examination scenarios.

William M. Ross

for John F. Munro, Panel Chairman
Regional Support and Oversight Section
Operator Licensing Branch
Division of Licensee Performance
and Quality Evaluation, NRR

Enclosures:
As stated