

January 28, 2000

MEMORANDUM FOR: Edwin F. Fox, Jr., Acting Chief
Emergency Preparedness and Health Physics Section
Operating Licensing, Human Performance
and Plant Support Branch
Division of Inspection Program Management
Office of Nuclear Reactor Regulation

FROM: James B. O'Brien, Emergency Preparedness Specialist Original signed by:
Emergency Preparedness and Health Physics Section
Operating Licensing, Human Performance
and Plant Support Branch
Division of Inspection Program Management
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SUBJECT: TRANSMITTAL OF ISSUES RELATED TO NRC'S REVIEW OF
NEI EMERGENCY ACTION LEVEL GUIDANCE

The attached list of issues was e-mailed to Alan Nelson (representative of the Nuclear Energy Institute) on January 28, 2000 in support of a telephone conversation to be held with industry representatives in February 2000 regarding NRC's review of NEI's emergency action level guidance contained in NEI 99-01.

Attachment: As stated

CONTACT: Jim O'Brien, NRR/DIPM
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UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

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**ISSUES ON NEI 99-01 TO BE DISCUSSED DURING
FEBRUARY TELECONFERENCE**

The following issues were identified during the technical staff's review of NEI 99-01 in preparation for endorsing NEI 99-01 in a revision to Regulatory Guide 1.101. The NRC staff plans to discuss these issues with NEI in a teleconference to be held in February 2000.

The challenge of establishing EAL guidance to accurately classify events the shutdown mode of operation is that the significance of an event varies depending upon the plant configuration and time since the reactor has been shutdown. NEI and the industry task force have interacted with the NRC on many occasions in order to explain how their guidance classifies events in the proper emergency classification level. The industry has been very receptive to questions regarding its proposed guidance. The following issues are broken into two categories. The first category relates to areas where EALs may be clarified to refined. The second category relates to areas where the basis for the EALs may be clarified.

ISSUES CONCERNING EALs OR ICs

1. CU4 UNPLANNED Loss of Decay Heat Removal

One of the EALs under this IC is:

Loss of all RCS temperature and RPV level indication

It may be appropriate to add a duration of the loss to this EAL to prevent classifying on momentary losses of indications.

2. CA1 Loss of RCS Inventory

One of the EALs under this IC is:

1. *Loss of RCS inventory as indicated by RPV level less than {site-specific level}.*
(low-low ECCS actuation setpoint) (BWR)
(bottom ID of the RCS loop) (PWR)

The bottom ID of the RCS loop is literally the lowest elevation of the loop (which is near basemat elevation). This should be clarified to indicate that the location of concern is at the RPV penetration.

3. CA4 Inability to Maintain Plant in Cold Shutdown

The EAL under this IC is:

With CONTAINMENT CLOSURE not established an UNPLANNED event results in RCS temperature exceeding the Technical Specification cold shutdown temperature limit for greater than 30 minutes.

It appears that this EAL could be modified to better correspond to the risk from this type of event. For example, the following EALs seem to better characterize the risk of the event at the Alert classification level.

1. An UNPLANNED event results in RCS temperature exceeding the Technical Specification cold shutdown temperature limit for greater than 30 minutes and RCS temperature control not established.
2. With CONTAINMENT CLOSURE and RCS integrity not established an UNPLANNED event results in RCS temperature exceeding the Technical Specification cold shutdown temperature limit.

The first EAL represents a condition where decay heat removal is lost for an extended period of time. The second EAL represents a condition where evaporated reactor coolant may be being released to the environment.

4. CS1 Loss of RPV Inventory

One of the EALs under this IC is:

1. *With CONTAINMENT CLOSURE NOT established:*
 - a. *RPV inventory as indicated by RPV level less than {site-specific level}
(6" below the low-low ECCS actuation setpoint) (BWR)
(6" below the bottom ID of the RCS loop) (PWR)*

Are there instruments available to indicate level 6" below the bottom ID of the RCS loop?

ISSUES CONCERNING THE BASES FOR EALs

1. CU1 RCS Leakage

Issue A:

The Basis for this IC states:

The 10 gpm value for the unidentified and pressure boundary leakage was selected as it

is observable with normal control room indications.

Although 10 gpm can be observable at power operation conditions, it may not be observable at shutdown conditions.

Issue B:

The Basis for this IC contains the following statement:

In cold shutdown the RCS will normally be intact and standard RCS inventory and level monitoring means are available.

During cold shutdown mode the RCS is frequently not intact. It is not clear what is meant by "standard RCS inventory and level monitoring." In cold shutdown, the "standard" monitoring means are not normally used. This issue is also applicable to the basis for CU2, CA1, and CA2.

Issue C:

The Basis for this IC contains the following statement:

If RPV level continues to decrease and reaches the Low-Low ECCS Actuation Setpoint then escalation to CA2 would be appropriate.

This statement should be clarified to identify that it is specific to BWRs.

2. CU2 -- unplanned loss of RCS Inventory

Issue A:

The Basis for this IC contains the following statement:

During refueling the level in the RCS will normally be maintained above the RPV flange.

If the term "refueling" is intended to mean the refueling mode of operation, this statement is not accurate. As soon as the vessel head is detensioned, the plant enters refueling mode and stays there until the head is retensioned. This may be a large part of the refueling mode. This comment is also applicable to the basis for CU4.

Issue B:

The Basis for this IC contains the following statement:

If RPV level continues to decrease and reaches the Low-Low ECCS Actuation Setpoint then escalation to CA2 would be appropriate.

The equivalent setpoint for a PWR should be included in this sentence.

3. CU4 UNPLANNED Loss of Decay Heat Removal

Issue A.

The Basis for this IC contains the following statement:

In cold shutdown the decay heat available to raise RCS temperature during a loss of inventory or heat removal event may be significantly greater than in the refueling mode. Thus the heatup threat and therefore the threat to damaging the fuel clad is lower for events that occur in the refueling mode with irradiated fuel

The heat up threat may also be less in the Cold Shutdown mode (for example after refueling). This statement should be clarified (or perhaps it is not necessary to include it in the basis).

Issue B.

The Basis for this IC contains the following statement:

Entry into the refueling mode procedurally may not occur for typically 100 hours after the reactor has been shutdown.

It may be more appropriate to state a range rather than a single number.

Issue C.

The Basis for this IC contains the following statements:

In addition, the operators should be able to monitor RCS temperature and RPV level so that escalation to the alert level via CA4 or CA1 will occur if required.

.....

However, if all level and temperature indication were to be lost in either the cold shutdown or refueling modes, EAL 2 would immediately result in declaration of a NOUE. Escalation to Alert would be via CA2 based on an inventory loss or CA4 based on exceeding its temperature criteria.

How will this be done with the loss of RHR and no thermocouples?

4. CA1 Loss of RCS Inventory

Issue A.

The Basis for this IC contains the following statement:

These example EALs serve as precursors to a loss of heat removal.

At this low of level RHR is lost in PWRs. This statement should be clarified that these EALs serve as precursors to the loss of ability to adequately cool the fuel.

Issue B

The Basis for this IC contains the following statement:

The PWR Bottom ID of the RCS Loop Setpoint was chosen because at this level remote RCS level indication may be lost and loss of suction to decay heat removal systems may occur.

At this point loss of decay heat removal systems has occurred.

Issue C

The Basis for this IC contains the following statement:

Significant fuel damage is not expected to occur until the core has been uncovered for greater than 1 hour per the analysis referenced in the CS1 basis.

This may not be correct.

MINOR EDITORIAL COMMENTS

Page E.3 Should reference the Final revision of NUREG-1536 rather than the draft revision.