

March 30, 1992

Docket No. 50-289

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Dear Mr. Broughton:

SUBJECT: REVIEW OF TMI-1 EMERGENCY ACTION LEVEL REVISION -
REQUEST FOR ADDITIONAL INFORMATION (TAC NO. M82279)

The staff has completed its review of the Emergency Action Levels (EALs) in Revision 6 of the Three Mile Island emergency plan. As a result of our review we have determined that additional information is required. The additional information required is discussed in the enclosure.

Please advise of when you intend to submit the requested information.

The requirements of this letter affect fewer than 10 respondents, and therefore, are not subject to Office of Management and Budget review under P.L. 96-511.

Sincerely,

/s/

Ronald W. Hernan, Sr. Project Manager
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Office of Nuclear Reactor Regulation

Enclosure:
As stated

cc: see next page

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REGULATORY REVIEW
OF THE THREE MILE ISLAND EALS
IN GPU NUCLEAR EMERGENCY PLAN REVISION 6

I. Background:

GPU Nuclear submitted changes to the TMI emergency action levels (EALs) for NRC approval on October 14, 1991. GPU Nuclear determined that the changes incorporated in Revision 6 do not decrease the effectiveness of the Emergency Plan and continue to meet the standards of 10 CFR 50.47(b) and 10 CFR 50.54(q). However, the licensee has requested NRC approval before implementing the EAL changes in Revision 6. On December 10, 1991, NRC Region I requested assistance from NRC headquarters for review of the EAL changes in Revision 6. Division of Reactor Projects forwarded the EAL changes to Emergency Preparedness Branch under TAC number M82279. Following is a review of the EAL changes in Revision 6. Only those EALs which needed further clarification or where additional information is required are discussed below.

II. Revision 6, Changes and Comments

A. GENERAL OBSERVATION

The licensee has introduced mode-dependency into its EAL scheme. By this introduction, some EALs are proposed to apply only in the cold shutdown and refueling modes, and others to power operation, hot standby, startup, hot shutdown and heatup/cooldown modes. This approach implies that the licensee attributes a different level of risk to different modes of operation.

The guidance on EALs in Appendix 1 of NUREG-0654 is not mode-dependent. Attachment 2, entitled "The Synopsis of changes to TMI EALs in 1000-PLN-1300.01," submitted by the licensee, did not provide adequate justification for such a major transformation to a mode-dependent EAL scheme.

The NRC staff is studying shutdown risk to gain more insight on the risks associated with shutdown and to provide a basis for developing a comprehensive set of shutdown EALs. Except as noted below, the staff did not attempt in this review to make a determination as to the adequacy of the proposed mode dependency in the EAL scheme. The staff will determine the adequacy of mode-dependent EALs when the shutdown risk study is completed and guidance for shutdown EALs are issued.

Some of the EALs in Revision 6 use the phrase "AND/OR" in their logic. The staff has considered the use of "AND/OR" in the EAL logic to be the equivalent of an OR statement (i.e., horizontal acceleration > 0.01g AND/OR vertical acceleration of > 0.02g is the equivalent of horizontal acceleration > 0.01g OR vertical acceleration of > 0.02g). The use of "AND/OR" statements are not appropriate in an EAL classification scheme. The licensee should clearly state the minimum classification conditions in the EALs.

B. CONTAINMENT INTEGRITY

1. Current 2.1 for Alert classification states:

Reactor trip AND ECCS initiation due to high Reactor Building pressure, greater or equal to 4 psig but < 30 psig.

Proposed A2.1 states:

ECCS actuation due to high Reactor Building pressure (greater or equal to 4 psig but < 60 psig).

COMMENT:

The Reactor Building pressure value is proposed to increase from 30 to 60 psig. The Reactor Building design pressure is given in EPIP-TMI-.01, Revision 0, under G2.1 to be 55 psig. Under the "Basis" of G4.2, the licensee acknowledges that the containment is considered breached at pressure levels greater than the design pressure (55 psig). The only justification given for this increase is found in Attachment 2, entitled "Synopsis of changes to TMI EALs in 1000-PLN-1300.01." Under section 5.2 of this document, it is stated that the increase to 60 psig followed a review of PRA data. We find the justification inadequate and consider this change to be an apparent decrease in the effectiveness of the emergency plan. The licensee should provide additional information to support this proposed EAL change.

EPIP-TMI-.01, Revision 0, section A2.1, states that A2.1 is meant to satisfy Alert items 4 and 5 in Appendix 1 of NUREG-0654. These example initiating condition are:

- 4) Steam line break with significant (e.g., greater than 10 gpm) primary to secondary leak rate
- 5) Primary coolant leak rate greater than 50 gpm.

The licensee does not provide any information as to how a steam line break outside containment is covered by A2.1. Nor is it clear how A2.1 addresses primary to secondary leakage. The licensee should provide additional information or clarification for this proposed EAL change.

2. Current 2.1 for Site Area Emergency states:

Reactor Building spray initiated AND
Reactor Building pressure greater or
equal to 30 psig

Proposed S2.1 states:

Reactor Building pressure greater or
equal to 60 psig

COMMENT

Change of the Reactor Building pressure level from 30 to 60 psig constitutes an increased level of challenge to the containment integrity without any apparent compensation or justification. As such, this change appears to decrease the effectiveness of the emergency plan.

3. Current 2.1 for General Emergency states:

Significant levels of radiation in the reactor containment building AND A POTENTIAL LOSS of containment integrity exists as indicated by:

RB pressure greater or equal to 30 psig
or RB hydrogen concentration greater or
equal to 3 percent by volume.

AND

Containment post accident (CAT-PAS) results indicate: greater or equal to 2,300 uCi/cc Total Noble Gas Concentration OR CAT-PAS results are NOT available with: High Alarm ...

Proposed G2.1 states:

Significant levels of radiation in the reactor containment building AND A POTENTIAL LOSS of containment integrity exists as indicated by:

RB pressure greater or equal to 60 psig OR RB hydrogen concentration greater or equal to 4 percent by volume.

AND

CAT-PAS... (same as above)

COMMENT

The change in RB pressure level from 30 psig to 60 psig is not adequately justified and therefore this change appears to decrease the effectiveness of the emergency plan.

C. PRESSURE, TEMPERATURE, AND INVENTORY CONTROL

1. Proposed A5.1 states:

A VALID RC/OTSG Leak rate greater or equal to 50 gpm, determined by Leak Rate Test OR Visual Inspection as indicated by:

Increased MU flow in excess of letdown flow by 50 gpm with MUT level decreasing at greater or equal to 1.67"/min AND the RCS is NOT trending toward saturation.

COMMENT

Although this EAL is not changed in content in Revision 6, the licensee should provide a basis for requiring the makeup tank (MUT) level decrease if it can determine an increased makeup (MU) flow in excess of letdown by 50 gpm. The licensee should clarify if the MUT level alone determines the MU flow.

2. The current 5.3 Alert classification (non-isolable steam leak AND HSFS actuation) is proposed to be eliminated. Instead, U5.2 (an Unusual Event classification) is proposed which contains the current U5.3 and expands on the rapid depressurization of the steam system.

COMMENT

Notwithstanding the corresponding example initiating condition for an Unusual Event (#17) given in Appendix 1 of NUREG-0654, the downgrading of this EAL from an Alert to an Unusual Event appears to decrease the effectiveness of the emergency plan.

3. The proposed U5.2.1 states:

Reactor Trip AND UNPLANNED VALID automatic ECCS initiation.

COMMENT

EPIP-TMI-.01 states that this EAL is intended to satisfy NUREG-0654 Unusual Event #1, "ECCS Initiated and Discharge to Vessel". The licensee should either include "inadvertent" initiation of ECCS in the proposed EAL or provide a justification for its omission.

D. ELECTRICAL POWER

1. Current 6.2 for Alert and Site Area Emergency appear to have been revised in Revision 6. However, these changes were not highlighted and there is no discussion in the Synopsis of changes on these EALs.

COMMENT

The licensee should provide a basis for these changes.

E. INSTRUMENTATION AND ACTUATION SYSTEM

1. Proposed U7.2 addresses plant shutdowns required by Technical Specification 3.3.

COMMENT

It is not clear that TS 3.3 also includes requirements for the fire protection system as called for by NUREG-0654 Unusual Event #9. The licensee should provide the additional information.

2. Proposed A7.2.1 states that it only applies to the cold shutdown and refueling shutdown modes.

COMMENT

NUREG-0654 Alert # 10 states, "Complete loss of any function needed for plant cold shutdown." The licensee has narrowed the application of this EAL to shutdown and refueling modes only. The licensee should either expand the EAL to apply to other modes of operation or provide an acceptable justification for its omission.

3. Proposed S7.2 states:

Failure of any ECCS (including HPI, LPI and Core Flood) to start and run following an automatic system initiation, with an ECCS setpoint exceeded, such that the number of components available is below the minimum assumed for accident analysis as determined by the Shift Supervisor/ Emergency Director.

COMMENT

Although this EAL is not proposed to change in this Revision, an inconsistency has been identified. According to EPIP-TMI-.01 Revision 0, this EAL is intended to satisfy NUREG-0654 Site Area Emergency #9, which states, "Transient requiring operation of shutdown systems with failure to scram (continued power generation but no core damage immediately evident)." The proposed S7.2 does not include indicators of a failure to scram after a valid scram signal. The licensee should either modify this EAL or provide additional justification for its revision.

F. NATURAL AND MAN-MADE PHENOMENA

1. Proposed S8.2.3 is indicated to apply to power operation, hot standby, startup and heatup/cool-down modes.

COMMENT

Proposed S8.2.3 should add hot shutdown mode, notwithstanding the NRC position on mode dependency.

2. Proposed U8.3 states a valid fire inside the Protected Area that cannot be controlled within 10 minutes of initiation of fire suppression activities.

COMMENT

This implies that the fire might last longer than 10 minutes and the length of time is irrelevant as long as it is under control. This is inconsistent with NUREG-0654 Unusual Event #10. The licensee should either modify this EAL or provide further justification.

III. Summary and Conclusion

The staff has identified several proposed EAL changes in Revision 6 of the GPU emergency plan for TMI which appear to decrease the effectiveness of the emergency plan and thus are not consistent with the requirements of 10 CFR 50.54(q). The staff also identified several inconsistencies in some proposed EALs with the guidance in Appendix 1 of NUREG-0654. The licensee is requested to provide additional information or clarification to support the proposed EAL changes as indicated in the review comments before the NRC staff can approve the changes.