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JOHNSON,A.R. Project Directorate I-3

See Rpt.

SUBJECT: Forwards response to NRC 940901 RAI re EALs,EALs annotated classification criteria based on response to NRC RAIs,Rev 1 to OSSI-92-402A-4-REG, "RE Ginna EALs Technical Bases" & Rev 1 to OSSI 92-402A-2-REG, "Fission Product Barrier...."

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ROBERT C. MECREDY
Vice President
Nuclear Operations

November 7, 1994

U.S. Nuclear Regulatory Commission
Document Control Desk
Attn: Allen R. Johnson
Project Directorate I-3
Washington, D.C. 20555

Subject: Emergency Action Levels
Response to Request for Additional Information
R.E. Ginna Nuclear Power Plant
Docket No. 50-244

Ref.(a): Letter from A. R. Johnson (NRC), to R. C. Mecredy (RG&E), Subject: "Request for Additional Information on R.E. Ginna Emergency Action Levels (TAC No. M89506)," dated Sept. 1, 1994

(b): Letter from R. C. Mecredy (RG&E), to A. R. Johnson (NRC), same subject, dated October 5, 1994

Dear Mr. Johnson:

Reference (a) requested within 30 days that RG&E provide additional information with regard to the proposed Emergency Action Levels (EAL) for the R.E. Ginna Nuclear Power Plant. Reference (b) requested an extension of an additional 30 days in order to coordinate our proposed EALs with those of other nuclear utilities in the state of New York.

Attached are the following in response to Reference (a):

Attachment A - Response to the Request for Additional Information: A response to each general and specific NRC comment has been provided.

Attachment B - R.E. Ginna Emergency Action Levels: Annotated Classification Criteria Based on Response to NRC RAI.

Attachment C - Emergency Action Levels Technical Bases, Revision 1.

Attachment D - Fission Product Barrier Evaluation, Revision 1.

Attachment E - R.E. Ginna Plant Specific EAL Guideline (PEG), Revision 1.

For the purpose of this submittal the EAL Tables, Attachment B, contain annotated cross-references to the NUMARC IC#s, such as [SA2], [SS2], [SG2]. We do not plan, however, to include these

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references within the EAL implementing procedures. The NUMARC IC#s are included as part of the Technical Bases (Attachment C).

Very truly yours,

Robert C. Mecredy

GAH\352

xc: Mr. Allen R. Johnson (Mail Stop 14D1)
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Washington, D.C. 20555

U.S. Nuclear Regulatory Commission
Region I
475 Allendale Road
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Ginna Senior Resident Inspector

50-244 GINNA RG&EC

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION RE EMERGENCY ACTION LEVELS

REC'D W/LTR DTD 11/7/94...9411090265

Attachment A

R. E. Ginna Emergency Action Levels

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

Docket 50-244

GENERAL RAIs

General RAI #1

"The R. E. Ginna EAL tables (both Categories and Subcategories) omitted the full text of the NUMARC Initiating Conditions. For example..."

"In accordance with NUMARC/NESP-007, ICs are: "one of a predetermined subset of nuclear power plant conditions where either the potential exists for a radiological emergency, or such an emergency has occurred." EALs are: "a pre-determined, site-specific, observable threshold for a plant IC that places the plant in a given emergency class." The use of ICs is advantageous from a human factors perspective. Grouping EALs under ICs will indicate to those who must use EALs how an EAL (or several diverse EALs) is related to the plant condition of concern. This will assist the emergency director in the use of judgment in making the correct event classification. The lack of ICs for loss of fission product barriers is of particular concern to the staff. It is important that personnel who perform event classification, and those who communicate the classification to offsite authorities, clearly understand the condition of each fission product barrier as reflected in the EAL. This association between barriers and EALs is not readily apparent in the Ginna methodology."

"The lack of ICs in the licensee's classification scheme represents a significant departure from the NUMARC guidance and is unacceptable. The licensee should include ICs with their EALs to demonstrate the relationship between the EALs and their associated classification"

Response to General RAI #1

As stated in the RAI, ICs are a subset of power plant conditions which represent a potential or actual radiological emergency. EALs are "a pre-determined, site-specific, observable threshold for a plant IC that **places the plant in a given emergency class**." When a site-specific, observable threshold (EAL) is reached, entry into its associated emergency class is required irrespective of the IC from which the EAL is derived. As stated in the RAI, ICs provide criteria that may be relevant to emergency classification based on the users "judgment." Therefore, it follows that use of judgment may be required for those conditions in which no "pre-determined, site-specific, observable threshold" can be defined.

Since ICs lack "site-specific, observable thresholds" for emergency classification, for those postulated conditions in which no site specific observable threshold exists, the users judgment must be based on the generic definition of the associated emergency classification.

EAL Category 9.0 "Other" defines EALs in each emergency class which are based upon the user's judgment. Category 9.0 is used when the plant condition does not meet any of the EAL thresholds of Category 1.0 through Category 8.0 but it is determined that the plant condition meets either the emergency class definition criteria or the NUMARC/NESP-007 fission product barrier loss or potential loss criteria. To address the concerns raised by the staff in this RAI, the bases document has been revised to include each of the NUMARC/NESP-007 ICs. Specific reference to these ICs is now incorporated in the judgment EALs providing a mechanism for the user to determine how an EAL (or several diverse EALs) is related to the plant conditions of concern.

General RAI #2

"Absent from the R.E. Ginna IC and the supporting EAL were the NUMARC criteria of "Actual or Imminent" and "Using Actual Meteorology." The basis document included the criteria regarding meteorology, but would have to be referred to by the classifier in addition to a classification implementing procedure.

The licensee should assure that cross referencing requirements are minimized by including all necessary attributes of ICs and EALs in one location."

Response to General RAI #2

Though not specifically stated, it is inferred that this RAI is in reference to EALs 5.2.4 and 5.2.5.

For any actual or imminent release, dose projections performed in accordance with EPIP 2-18, "Control Room Dose Assessment, EPIP 2-4 "Emergency Dose Projections - Manual Method, EPIP 2-5 "Emergency Dose Projections - Personal Computer Method, or EPIP 2-6 "Emergency Dose Projections - MIDAS Program, use of actual meteorology is specified. Therefore, implicit in the performance of any dose projection is the use of actual meteorology.

To address the staff's concern that classification based upon these EALs be as the result of an "actual or imminent" release of gaseous radioactivity, the EALs have been revised to include the "Actual or Imminent" terminology.

General RAI #3

[para. 1]
"The licensee's failure to include a fission product barrier evaluation matrix constitutes a significant departure from the methodology in NUMARC/NESP-007. NESP-007 specifically included barrier evaluation in its classification methodology to complement the symptomatic and event-based ICs, especially for the higher classifications. The fission product barrier matrix provides multiple indicators to operators to assess the status of each of the barriers and classify the emergency based upon their integrity. The matrix also provides the ability to dynamically assess how far present conditions are from escalating to the next higher emergency class. "For example, if Fuel Clad barrier and RCS barrier 'Loss' EALs existed, This would indicate to the Emergency Director that, in addition to offsite dose assessments, continual assessments of radioactive inventory and containment integrity must be focused on. If, on the other hand, both fuel clad barrier and RCS barrier 'Potential Loss' EALs existed, the Emergency Director would have more assurance that there was no immediate need to escalate..."."

[para. 2]
"The licensee has indicated that their proposed fission product barrier EALs reduce the burden on the operators in evaluating the fission product barriers, however, the use of nine separate categories of EALs by the licensee will still require someone to refer to several different categories to perform a dynamic assessment of the fission product barriers. Further, the scheme is internally conflicting because of the multiple categories. For example, if coolant activity was > 300 μCi/cc DEI-131 and primary system leakage was > 46 gpm, either of these conditions would be an Alert per the licensee's EAL tables. However, the collective failures would not necessarily result in a site area emergency (SAE) declaration, as is required by NUMARC criteria.

[para. 3]
"In the bounding analysis that was performed to evaluate the numerous combinations of conditions of the three fission product barriers, several assumptions were made that were not adequately justified or led to the elimination of some combinations that were bounded by the condition. For example, under the remarks section of the Ginna Fission Product Barrier Evaluation:

[Subpara. 1]
3. *The initiation signal...*

Containment isolation signals can also occur due to loss of containment cooling or faulted steam generator

[Subpara. 2]
4. In order to reach...

No technical supporting information was provided to support the assertion that a core cooling or heat sink RED path must exist. The licensee also did not adequately demonstrate that this condition is indicative of a loss of the fuel clad barrier.

[Subpara. 3]
10. A Core Exit Thermocouple reading...

Entry into Core Cooling-RED path also requires the loss of all RCPs and is not indicative of a potential loss of containment. Therefore, declaration of a General Emergency would be unwarranted.

[Subpara. 4]
11. ...Thus, entry into Core...

The NUMARC guidance for potential loss of the containment due to degradation in the Core Cooling CSF specifically requires that functional recovery procedures have been ineffective for 15 minutes. Severe accident analyses have concluded that functional restoration procedures can arrest core degradation within the reactor vessel in a significant fraction of the core damage scenarios, and that the likelihood of containment failure is very small in these events. Therefore, it is appropriate to provide a reasonable period of time to allow function restoration procedures to arrest the core melt sequence. Whether or not the procedures will be effective should be apparent within 15 minutes.

[Subpara. 5]
12. Core Cooling-Orange on the CSFST...

The "Loss" EAL for the RCS barrier in NUMARC/NESP-007 that addresses RCS leakage is under the heading "RCS Leak Rate." The wording is "RCS leak rate GREATER than makeup capacity as indicated by a loss of RCS subcooling." In NUMARC's technical basis it states the "loss of subcooling is a fundamental indication that the inventory control systems are inadequate in maintaining RCS pressure and inventory against the volume loss through the leak." Thus, loss of subcooling is a valid indicator for loss of the RCS barrier <u>when an RCS leakage condition exists.</u> NUMARC does not state that loss of subcooling can only occur due to a loss of the RCS pressure boundary as is implied by the statement above. The licensee must technically justify that a loss of subcooling can only occur when there is a breach of the RCS barrier.

[Subpara. 6]
22. *This combination of conditions would produce...*

The NUMARC guidance has been developed to specifically provide for multiple redundant indications of loss or potential loss of the three fission product barriers. It is unacceptable to simply eliminate a combination of conditions because of its redundancy to other EALs.

[Subpara. 7]
23. *EAL# FC6.1 is equivalent to...*

This comment applies to the combination of a loss of the RCS barrier as indicated by containment radiation monitor readings and a loss of the fuel clad as indicated by other site-specific indications. The licensee has eliminated it based upon its redundancy to an containment radiation monitor EAL for loss of the RCS and Fuel Clad. As stated in the previous comment, it is unacceptable to simply eliminate a combination of conditions because of its redundancy to other EALs.

[Subpara. 8]
45. *Any combination of PC4.1 and either...*

PC4.1 states, "Release of secondary side to atmosphere with primary to secondary leakage greater than tech spec. allowable." This condition is not reflective of a loss or potential loss of the RCS barrier. Thus, declaration of a General Emergency would not be warranted in conjunction with a loss of the fuel clad.

[Para. 4]
Both the NUMARC guidance and Appendix E to 10CFR Part 50 require the use of multiple indicators for evaluating plant conditions. The licensee should consider a different format (Barrier analysis) for the fission product barrier EALs that maximizes the number of parameters or indicators available, minimizes the time to classify, and assures multiple conditions are readily evaluated and properly classified.

Response to General RAI #3

[Para. 1]
NUMARC/NESP-007 neither states nor infers that the generic fission product barrier matrix is intended or required to be implemented on a site-specific basis. On September 22 - 23, 1992 the Emergency Action Levels Implementation Workshop was conducted by NUMARC. Specifically stated in presentations and in the workshop training materials (Section 3 page PF-39, page BF-30 and the PWR Fission Product Barrier Matrix Breakout Session Guide Section 7) attached, was the fact that the matrix format is not required. It only requires that compliance with all combinations are documented. NUMARC/NESP-007 does not preclude the development of EALs based on an evaluation of fission product barrier loss/ potential loss conditions as part of the development process. The fission product barrier loss matrix as presented in NUMARC/NESP-007 was " chosen to clearly show the synergism among the EALs and support more accurate dynamic assessments." Further, NUMARC/NESP-007 states "The guidance presented here is not intended to be applied to plants as-is. The EAL guidance is intended to give the logic for developing site-specific EALs using site-specific EAL presentation methods." The Fission Product Barrier Evaluation and the subsequent binning of the Ginna fission product barrier based EALs into categories was specifically performed to support the user's ability to "dynamically assess how far present conditions are from escalating to the next higher emergency class." By defining logical event categories and subcategories in which to place these EALs, the ability to perform a dynamic assessment is enhanced. The usability and correctness of the Ginna method of EAL presentation has been demonstrated and documented in numerous dynamic simulator scenarios during EAL validation exercises.

The NUMARC/NESP-007 matrix format requires the user to evaluate thousands of combinations of conditions that may have no logical relationship. Such a format is a hindrance, not an aid, in making timely, accurate, and consistent emergency event classifications. To our knowledge, neither NUMARC nor plants that have adopted the NUMARC/NESP-007 fission product barrier matrix format have attempted a dynamic test of their EALs for the purpose of demonstrating and assessing their usability characteristics. To the contrary, it is recognized that some BWR and PWR plants have suspended implementation of NUMARC/NESP-007 based EALs or have canceled their implementation because their users find the format confusing, unworkable, and prone to misclassification.

The Fission Product Barrier Evaluation demonstrates that the Ginna fission product barrier-based EALs are technically correct and meet the intent of NUMARC/NESP-007. To address the staff's concerns, those EALs which are derived from the Fission Product Barrier Evaluation have been annotated to indicate the fission product barrier loss/potential loss which they represent. In addition, the bases document has been revised to include the fission product barrier loss/potential loss indicators in a matrix format.

[Para. 2]
NUMARC/NESP-007 states "The presentation method shown for Fission Product Barriers was chosen to clearly show the synergism among the EALs and to support more accurate dynamic assessments." It does not state or imply that this method of presentation is necessary either to depict the synergism or to provide the ability for dynamic assessments. Rather, it is provided as a guide for the EAL writer to ensure that the selected presentation methodology properly reflects the desired synergistic quality and assessment capability. While NUMARC/NESP-007 does not define the term "dynamic assessment", it is assumed that it means the ability to evaluate fission product barrier loss and potential loss indicators under evolving plant conditions. Unlike the NUMARC/NESP-007 matrix format, the Ginna EAL presentation method places similar EALs into categories and subcategories that focus the user's attention to the specific EAL threshold that corresponds to the plant condition of concern. This provides a logical classification and escalation path of related indicators and thus allows for rapid assessment of emergency conditions associated with fission product barrier loss. It is important to note that the Ginna EAL categories and subcategories are not simply representations or abbreviations of the NUMARC/NESP-007 ICs. Rather, each Ginna category and associated subcategory is a pathway from broad indicators of potential emergency events to a set of specific threshold conditions that require emergency classification.

The EALs derived from the Fission Product Barrier Evaluation take into account the intended 'synergism' of the fission product barrier basis information which cannot be adequately addressed by the NUMARC/NESP-007 matrix format. An example would be a condition in which RCS leakage into containment is in excess of normal makeup capacity (RCS potential loss) in conjunction with a secondary side release with primary to secondary leakage in excess of technical specifications (Containment loss). Under a matrix format, this combination of conditions would require a Site Area Emergency (SAE) declaration because NUMARC/NESP-007 requires an SAE for the potential loss of the fuel clad or RCS with the loss of another barrier. This is clearly not intended. NUMARC/NESP-007 containment loss indicator #4 basis states that the Site Area Emergency associated with the containment loss indication is intended to be escalatory from RCS breaches associated with SG tube ruptures.

The Fission Product Barrier Evaluation does not rely on single indications as stated in the RAI. For the majority of the bounding conditions defined in the Fission Product Barrier Evaluation the indicators subsumed into other combinations of conditions consist of those indicators which are either:

- Completely bounded by another combination for the same indicator, or
- Are a subset of another indicator.

In the case cited (>300 μCi/cc DEI-131 in conjunction with primary system leakage > 46 gpm), the combination was omitted in the Fission Product Barrier Evaluation because this condition would result in exceeding the 100 R/hr SAE EAL. The 100R/hr SAE EAL is based on >300 μCi/cc DEI-131 in conjunction with primary system leakage into containment.

To address the staff's concerns, the EALs have been revised to add this combination as a specific fission product barrier EAL. This EAL has been added in light of the assumptions which are made in the derivation of the containment radiation monitor value associated with the fuel clad loss EAL as well as variables in the bounding assumptions (i.e. differences in time after shutdown and coolant volume released).

[Para. 3]
[Subpara. 1]
Loss of containment cooling will not result in a containment pressure (4.0 psig) sufficient to result in a containment isolation. In addition, procedural requirements require the containment to be vented under this condition to maintain pressure well below the isolation setpoint.

A faulted steam generator could result in a containment isolation signal. To address those conditions in which a valid containment isolation signal is not the result of a breach of the RCS, but as a result of a faulted SG inside containment, classification would be made based on EAL 4.1.1 which has been modified to address CI or CVI isolation failures, regardless of initiating event.

[Subpara. 2]
NUMARC/NESP-007 states in the basis for containment barrier loss #1: "Conditions leading to containment RED path result from RCS barrier and/or Fuel Clad Barrier Loss. Thus, this EAL is primarily a discriminator between Site Area Emergency and General Emergency representing a potential loss of the third barrier." Therefore, entry into Containment RED path by itself is intended to result in a General Emergency.

As stated in the Ginna PEG, in order to reach containment RED path, a containment pressure of 60 psig must be reached. This pressure is well in excess of the maximum pressure attained from the DBA LOCA and is greater than the maximum pressure attained for all analyzed steam line breaks inside containment specified in the Ginna FSAR. Therefore, to attain such a containment pressure, the energy source must be as a result of a severely degraded core (metal water reaction) in conjunction with RCS breach or a severe ATWS condition in conjunction with RCS breach. Per NUMARC/NESP-007 IC SS2 such an ATWS leads to imminent or potential loss of fuel clad. The wording of EAL 1.5.1 has been modified to specify "RED path F-0.5, CONTAINMENT resulting from loss of reactor coolant" to preclude classification of a General Emergency for conditions not associated with RCS and fuel clad boundary breach.

Reference in this justification to core cooling and heat sink RED path has been deleted from the Fission Product Barrier Evaluation.

[Subpara. 3]
Per the Ginna EALs, core cooling RED only requires declaration of a Site Area Emergency. Justification #10 in the Fission Product Barrier Evaluation referenced in this RAI was in error and should have read "... and warrants declaration of a Site Area Emergency." The Fission Product Barrier Evaluation has been revised to correct this error and to reference the proper justifications.

[Subpara. 4]
Per the Ginna EALs, core cooling RED and functional restoration procedures not effective within 15 minutes is the threshold for a General Emergency. Justification #11 referenced in this RAI has been revised and the Fission Product Barrier Evaluation has been revised to reflect the proper references.

[Subpara. 5]
The justification was not intended to infer that a loss of RCS subcooling can only occur from a loss of RCS. Rather, that any core cooling ORANGE or RED path represents a loss of subcooling resulting from a loss of RCS. Justification #12 has been reworded to reflect the following basis.

ORANGE path core cooling is entered when either CET > 700°F or RVLIS water level < top of fuel (RED path if both conditions exist or CETs > 1200 °F). The RCS pressure corresponding to 700 °F is approximately 3100 psig. This pressure is more than 600 psig greater than the pressurizer safety valve lift pressure and 365 psig greater than the RCS safety limit. If the RCS is intact under this condition, RCS barrier loss is imminent. RCS inventory is never intentionally reduced to the top of fuel (43% RVLIS) under hot conditions or power operations. A reduction in RCS volume of this magnitude indicates a significant breach of the RCS barrier since no intentional valving configuration would result in such a decrease. Any condition which results in an inventory loss of this magnitude must be attributed to an RCS breach caused by a RCS line break or unisolated primary system discharging in excess of makeup capacity. It would be extremely poor judgment to assume that a loss of the RCS barrier has not occurred under either of these conditions. It should be noted that vessel water level below the top of fuel is considered a RCS barrier loss in the BWR fission product EALs. There is no difference in the mechanisms which could cause vessel level to drop below the top of fuel between BWRs and PWRs. Important to this basis is, for the purpose of emergency declaration, the potential release of fission products to the environment. In the case where the fuel clad is actually or potentially breached, the assumption that the fission products would be contained, even in the absence of other RCS loss indicators not immediately apparent, with vessel level below the top of fuel is inappropriate. Figure 4.16 of NUREG 1228 "Source Term Estimation During Response to Severe Nuclear Power Plant Accidents" shows how each of the critical safety functions is related to fission product barrier maintenance as regards preventing radioactivity

releases. Core heat removal (core cooling) along with RCS pressure control and RCS heat removal (heat sink) are shown to be directly related to RCS boundary maintenance.

It should also be noted that NUMARC/NESP-007 considers RED path heat sink a potential loss of RCS, yet the conditions requiring entry into this path are based on insufficient SG level and feedwater flow. These conditions are not direct threats to RCS barrier integrity but may lead to RCS pressure conditions which in turn may lead to RCS barrier breach. NUMARC/NESP-007 provides no technical basis to support how a RED path heat sink represents a potential loss of RCS boundary. It would appear that the RCS inventory loss conditions requiring entry into core cooling ORANGE or RED path are much more directly indicative of actual or potential RCS breach than is entry into RED path heat sink.

[Subpara. 6]
The Fission Product Barrier Evaluation and EALs associated with the combinations referenced have been revised to include the specified combinations: Coolant activity > 300 µCi/cc I-131 equivalent in combination with primary system leakage > 46 gpm, RCS subcooling < EOP FIG. MIN. SUBCOOLING, RED path integrity or Containment radiation monitors > 10 R/hr.

[Subpara. 7]
The Fission Product Barrier Evaluation and EALs associated with the combinations referenced have been revised to include the specified combinations: Letdown line monitor > 10 R/hr in combination with primary system leakage > 46 gpm, RCS subcooling < EOP FIG. MIN. SUBCOOLING, RED path integrity or Containment radiation monitors > 10 R/hr

[Subpara. 8]
This condition was identified after the submittal was made and has been corrected. The conditions referenced by this justification represent a loss of RCS in conjunction with a loss of containment and thus were revised to reflect a Site Area Emergency. EALs derived from combinations of unisolable secondary side line break with SG tube rupture in combination with any fuel clad loss/potential loss indicators result in a General Emergency.

[Para. 4]
It is still appropriate to define, where possible, distinct EALs which are indicative of multiple barrier loss/potential loss. This minimizes the time to classify while assuring multiple conditions are readily evaluated and properly classified. Based on exhaustive operator interviews, the use of a fission product barrier matrix format has been determined to be overly burdensome and confusing for the user resulting in missed or incorrect classifications. This concern has been expressed by other licensees who have attempted to implement NUMARC/NESP-007 fission product barrier EALs with only a matrix format.

Because of the complexity of the NUMARC/NESP-007 fission product barrier loss/potential loss definition of the Site Area Emergency, some licensees have attempted to deviate from NUMARC and simplify the fission product barrier loss/potential loss definition by removing the intended reduced weighting of the containment. The reduced weighting of the containment at the SAE classification is a significant part of the basis in the intended synergism between barrier loss indicators. The Ginna Fission Product Barrier Evaluation maintains this intended synergism of NUMARC while eliminating the inherent complexity. The Ginna EAL format has been validated by operating crews utilizing scenarios in the plant-specific simulator to test each EAL. The results of this validation have been documented and feedback incorporated into the EALs to further ensure their usability.

General RAI #4

"In several instances that are specifically commented on, the licensee has departed from the NUMARC guidance of basing classifications upon observing the integrity of the three fission product barriers, and made classifications based on one indicator, especially in the case of Critical Safety Function Status Tree (CSFST) status. For example, if the CSF for containment is on a RED path, a general emergency is declared. This approach is inconsistent with NUMARC guidance that requires evaluation of each barrier. The licensee should assure that all barriers are evaluated when arriving at a classification rather than simply observing one status indicator. This comment relates to the comment above.

Response to General RAI #4

NUMARC/NESP-007 Section 3.9 states:

> *"Plant emergency operating procedures (EOPs) are designed to maintain and/or restore a set of CSFs which are listed in the order of priority of restoration efforts during accident conditions."...*
>
> *There are diverse and redundant plant systems to support each CSF. By monitoring the CFSs instead of the individual system component status, the impact of multiple events is inherently addressed, e.g. the number of operable components available to maintain the function.*
>
> *The EOPs contain detailed instructions regarding the monitoring of these functions and provides a scheme for classifying the significance of the challenge to the functions. In providing EALs based on these schemes, the emergency classification can flow from the EOP assessment rather than being based on a separate*

EAL assessment. This is desirable as it reduces ambiguity and reduces the time necessary to classify the event."

As stated by NUMARC, each CSF is supported by diverse and redundant plant systems. The entry conditions for CSFSTs are also supported by diverse and redundant instrumentation. Containment RED path is not a single indicator but a defined, measurable and operationally significant condition which is known to be indicative of multiple fission product barrier losses. The Ginna EAL scheme does not rely solely on this condition to determine when a general emergency due to the loss of fission product barriers must be declared. Nor does it preclude the declaration of a general emergency based on other fission product barrier loss EALs which may or may not manifest themselves under a given condition. The Ginna EAL scheme does require classification of a General Emergency because, in and of itself, this condition represents a loss of the fuel clad, RCS barriers and a potential loss of containment barrier.

General RAI #5
The technical bases for those site-specific EALs proposed by the licensee concerning secondary side releases consider the condenser air ejector as a potential release pathway. The "Questions and Answers on NUMARC/NESP-007, published in June of 1993, specifically exclude the condenser air ejectors as a prolonged secondary side release pathway. The licensee should provide justification for including this pathway as a discriminator for those EALs or revise their technical bases to eliminate the reference.

Response to General RAI #5
This condition was identified after the staff submittal and has been corrected.

General RAI #6
In several EALs proposed by the licensee, entry into a Core-Cooling ORANGE or RED path was considered to be at least a potential loss of the RCS barrier. However, the core cooling critical safety function was not considered by NUMARC/NESP-007 as a discriminator for the RCS barrier integrity and its use by the licensee was not adequately justified. The licensee should provide additional information that clearly demonstrates that a core cooling ORANGE or RED path is indicative of a failure of the RCS barrier or revise those EALs that incorporate this concept to be consistent with the NUMARC guidance.

Response to General RAI #6
Refer to Response to General RAI #3 [Para. 3] [Subpara. 5]

SPECIFIC RAIs

Specific RAI #1

The NUMARC example AU1-1 states in part:

"A valid reading..."

The licensee equivalent EAL for effluent monitors, Unusual Event, 5.1.1 states in part:

"A valid reading..."

NUMARC specifies that a site specific procedure be used to assess the release. The licensee's PEG provided procedures for release assessment, but these procedures were not incorporated into the EALs nor included in the technical bases. The NUMARC note regarding declaration if the assessment is not accomplished within 60 minutes was not included in the EAL, but was discussed in the technical bases. It is important that a dose assessment is performed using actual meteorology and a best estimate of the actual radionuclide mix to determine if the effluent release will lead to escalation of the emergency due to adverse conditions.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria, or provide technical justification for the deviation.

Response to RAI #1

EAL # 5.1.1 has been revised to reference performance of an assessment of the release. The EAL has also been revised to include criteria requiring declaration if the assessment is not accomplished within 60 minutes.

Specific RAI #2

The NUMARC example AA1-1 states in part:

"A valid reading..."

The licensee equivalent EAL for effluent monitors, Alert, 5.1.2 states in part:

"A valid reading..."

NUMARC specifies that a site specific procedure be used to assess the release. The licensee's PEG provided procedures for release assessment, but these procedures were not incorporated into the EALs nor included in the technical bases. The NUMARC note regarding declaration if the assessment is not accomplished within 15 minutes was not included in the EAL, nor discussed in the technical bases. It is important that a dose assessment is performed using actual meteorology and a best estimate of the actual

radionuclide mix to determine if the effluent release will lead to escalation of the emergency due to adverse conditions.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria, or provide technical justification for the deviation.

Response to RAI #2
EAL # 5.1.2 has been revised to reference performance of an assessment of the release. The EAL has also been revised to include criteria requiring declaration if the assessment is not accomplished within 15 minutes.

Specific RAI #3
The NUMARC criteria for Initiating Condition AA3 states in part:

"Release of radioactive..."

The licensee equivalent EAL for Area Radiation Levels, Alert, 5.3.3 states in part:

"Sustained abnormal area radiation levels >8 R/hr..."

The licensee's EAL did not include the NUMARC criteria for establishing or maintaining cold shutdown conditions. The referenced table 5.3 was not included in the EAL, but was in the technical bases.

The licensee should revise this EAL to be consistent with the NUMARC criteria and provide the referenced table in the EAL or provide technical justification for the deviation.

Response to Specific RAI #3
EAL 5.3.3 has been revised to include the wording "required to establish or maintain cold shutdown." The referenced table has been included with the EAL.

Specific RAI #4
The NUMARC example AS1-1 states in part:

"A valid reading..."

The licensee equivalent EAL for effluent monitors, Site Area Emergency, 5.1.3 states in part:

"A valid reading..."

NUMARC specifies that a site specific procedure be used to assess the release. The licensee's PEG provided procedures for release assessment, however, this was not incorporated into the EALs. The NUMARC note

regarding declaration if the assessment is not accomplished within 15 minutes was not included in the EAL and not discussed in the technical bases. The effluent setpoints for the site area emergency EAL are based upon FSAR source terms and average annual meteorology and, therefore, may significantly differ from the actual release conditions. Thus, escalation to a site area emergency due to effluent releases should be based upon an assessment of potential offsite doses as determined by actual source term and meteorology. The primary purpose of the effluent setpoint is to trigger this assessment, not to upgrade the emergency class. Classification through use of the effluent monitor reading alone is only expected when dose assessments can not be completed within the required time.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria, or provide adequate justification for the deviation. The licensee should also provide information on the source terms(s) utilized to determine the values in table 5.1.

Response to Specific RAI #4
EAL # 5.1.3 has been revised to reference performance of an assessment of the release. The EAL has also been revised to include criteria requiring declaration if the assessment is not accomplished within 15 minutes.

The source terms utilized to determine the value in Table 5.1 are those utilized in the Ginna dose projection procedure EPIP 2-18 "Control Room Dose Assessment. The EPIP 2-18 dose assessment methodology uses effluent monitor dose conversion factors which were derived using NUREG-1228 Table 2.2 fission product inventories and assumed release fractions specified in table 3.12 of NUREG 1465 "Accident Source Terms for Light Water Nuclear Power Plant" for in-vessel severe core damage.

Specific RAI #5
The NUMARC criteria for Initiating Condition AG1 states in part:

> "Boundary Dose Resulting from an Actual..."

The licensee equivalent EAL for effluent monitors, General Emergency, 5.2.5 states in part:

> "Dose projections or field surveys which..."

NUMARC specifies the use of actual meteorology for the dose projections. The licensee EAL did not reflect the use of actual meteorology for dose projections, however the licensee discussed the requirement for use of actual meteorology in the technical bases.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria, or provide adequate justification for the deviation.

Response to Specific RAI #5
The site specific procedures which may be utilized to assess a release EPIP 2-18, "Control Room Dose Assessment, EPIP 2-4 "Emergency Dose Projections - Manual Method, EPIP 2-5 "Emergency Dose Projections - Personal Computer Method, or EPIP 2-6 "Emergency Dose Projections - MIDAS Program all specify the use of actual meteorology. Therefore specific reference to its use is unnecessary.

Specific RAI #6
The NUMARC example AG1-1 states:

"A valid reading..."

The licensee equivalent EAL for effluent monitors, General Emergency, 5.1.4 states in part:

"A valid reading..."

NUMARC specifies that a site specific procedure be used to assess the release. The licensee's PEG provided procedures for release assessment which was not incorporated into the EALs. The NUMARC note regarding declaration if the assessment is not accomplished within 15 minutes was not included in the EAL nor discussed in the technical bases. The effluent setpoints for the general emergency EAL are based upon FSAR source terms and average annual meteorology and, therefore, may significantly differ from the actual release conditions. Thus, escalation to a general emergency due to effluent releases should be based upon an assessment of potential offsite doses as determined by actual source term and meteorology. The primary purpose of the effluent setpoint is to trigger this assessment, not to upgrade the emergency class. Classification through use of the effluent monitor reading alone is only expected when dose assessments can not be completed within the required time.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria, or provide adequate justification for the deviation. The licensee should also provide information on the source terms(s) utilized to determine the values in table 5.1.

Response to Specific RAI #6
EAL # 5.1.4 has been revised to reference performance of an assessment of the release. The EAL has also been revised to include criteria requiring declaration if the assessment is not accomplished within 15 minutes.

The source terms utilized to determine the value in Table 5.1 are those utilized in the Ginna dose projection procedure EPIP 2-18 "Control Room Dose Assessment. The EPIP 2-18 dose assessment methodology uses effluent monitor dose conversion factors which were derived using NUREG-1228 Table 2.2 fission product inventories and assumed release fractions specified

in Table 3.12 of NUREG 1465 "Accident Source Terms for Light Water Nuclear Power Plant" for in-vessel severe core damage.

Specific RAI #7
The licensee's EAL 4.1.3, "Containment Integrity Status," states:

> "Either:
> CI or CVI valve(s)..."

The relationship between CI and CVI valves was not explained in the technical bases to demonstrate how failure of either one to close will provide a pathway outside containment. The licensee should provide information on these two systems and their interfaces, if any. The licensee should provide information on the entry conditions for a LOCA to demonstrate these entry conditions are commensurate with a potential loss or loss of the RCS barrier.

The second argument does not provide a threshold for the amount of primary system leakage outside containment. The licensee should include a threshold that operators can utilize to evaluate this argument against the guidance in NUMARC/NESP-007 for loss or potential loss of the RCS barrier.

Response to Specific RAI #7
Containment Isolation (CI) and Containment Ventilation Isolation (CVI) valves are those valves associated with the CI and CVI logic. CI and CVI are protective systems designed to close containment isolation valves in those systems which either come into direct contact with primary pressure (CI) or the containment atmosphere (CVI) and penetrate the containment barrier. These valves are designed to close under conditions which are indicative of a LOCA (any automatic SI signal). Failure of one or more of these valves to close following a confirmed LOCA does not by itself provide a pathway outside containment. As long as one valve in the line is closed, or if both valves fail to close but no downstream pathway exists, classification under this EAL would not be required. The criterion "AND Radiological pathway to the environment exists" provides this discriminator. There is no interface between the CI and CVI systems but each is comprised of diverse systems which provide the containment isolation function under LOCA conditions. The determination of the existence of a LOCA is consistent with the diagnostic activities specified in E-0 'Reactor Trip or Safety Injection'.

The criterion "Inability to isolate any primary system discharging outside containment" addresses any breach of the RCS and containment which is not protected by the CI or CVI systems or which results from an interfacing system LOCA (not addressed by NUMARC). No leakage threshold is specified since leaks outside containment, particularly under dynamic conditions, are difficult to quantify and may manifest themselves with diverse symptoms. Symptoms of a primary system discharging outside containment may be indicated via mass balance, decreasing RCS inventory without corresponding containment response, or area temperatures and

radiation levels outside containment. It is for this reason that Shift Supervisor/Emergency Coordinator judgment is intended to be used in evaluating this criteria.

Specific RAI #8
The NUMARC criteria for "Fuel Clad Barrier Example EALs" (Table 4, Fission Product Barrier Reference Table), "1. Critical Safety Function Status" states in part:

LOSS	POTENTIAL LOSS
Core Cooling-Red	Core Cooling-Orange OR Heat Sink-Red

NUMARC Table 4 also states:

ALERT:
Any Loss or ANY...

The licensee equivalent EAL, CSFST status, 1.2 Core Cooling for SAE states in part:

ORANGE or RED path in F-0.2, CORE COOLING

The phrase "ORANGE or RED path in F-0.2, Core Cooling," was inconsistent with the text of NUMARC Table 4 in that an Orange or Red path for core cooling was not considered in the guidance as a loss or potential loss of the RCS barrier. The basis document provided the following justification for this departure:

"CSFST Core Cooling - ORANGE..."

The assumption that the RCS barrier is lost when a Core-Cooling Orange or Red path exists was not adequately justified. The licensee should provide additional justification to show that the additional conservatism afforded by relying on the singular CSF of this EAL clearly demonstrates a challenge to both the RCS and Fuel Clad barriers, or modify the EAL scheme to be consistent with the NUMARC criteria.

Response to Specific RAI #8
Refer to Response to General RAI #3 [Para. 3] [Subpara. 5] for justification of use of ORANGE or RED path core cooling as a RCS loss indicator. Use of this CSF as a RCS loss indicator is not a conservatism, but rather one of multiple indications of potential Fuel Clad and RCS barrier loss available to the user. While this CSF indicator by itself requires declaration of a Site Area Emergency, it is not inconsistent with NUMARC. For example, NUMARC/NESP-007 specifies RED path Heat Sink as both a potential loss of fuel clad and RCS barriers. Even though NUMARC/NESP-007 does not

provide a basis for how RED path heat sink relates to RCS barrier potential loss, none the less, a Site Area Emergency is required based on this singular CSF.

Specific RAI #9
The NUMARC criteria for "Fuel Clad Barrier Example EALs" (Table 4. Fission Product Barrier Reference Table), "4. Reactor Vessel Water Level," states in part:

LOSS	POTENTIAL LOSS
Not Applicable	Level LESS than (site-specific) value

NUMARC Table 4 also states:

ALERT:
Any Loss or ANY...

The licensee equivalent EAL, Category 3.0, Reactor Coolant System, for SAE 3.1.3 states in part:

"RVLIS cannot be maintained..."

COMMENT In the absence of other EAL thresholds being exceeded, the NUMARC criteria provides for declaration of an Alert on loss of one barrier, i.e., when water level drops to top of active fuel. The licensee's EALs required a declaration of a SAE. This inconsistency with the NUMARC criteria was not technically justified in the bases document. Furthermore, the licensee treated reactor vessel level as an EAL reflecting Reactor Coolant System integrity, whereas the NUMARC criteria utilizes level as a fuel integrity EAL. The licensee should provide additional justification to show that the added conservatism afforded by relying on the singular EAL of reactor vessel water level for declaration of a Site Area Emergency is warranted, or modify the EAL scheme to be consistent with the NUMARC criteria.

Response to Specific RAI #9
As described in Response to General RAI #3 [Para. 3] [Subpara. 5], RCS inventory is never intentionally reduced to the top of fuel (43% RVLIS) under hot conditions or power operations. A reduction in RCS volume of this magnitude indicates a significant breach of the RCS barrier since no intentional valving configuration would result in such a decrease. Any condition which results in an inventory loss of this magnitude must be attributed to a RCS breach caused by a RCS line break or unisolated primary system discharging in excess of makeup capacity. It would be extremely poor judgment to assume that a loss of the RCS barrier has not occurred under this condition. Important to this basis is, for the purpose of emergency

declaration, the potential release of fission products to the environment. In the case where the fuel clad is actually or potentially breached, the assumption that the fission products would be contained, even in the absence of other RCS loss indicators, with vessel level below the top of fuel is inappropriate. As stated above, it requires a significant RCS inventory loss to attain this level. Therefore, considering vessel level below the top of fuel a loss of RCS is not conservative, but appropriate.

It should also be noted that vessel water level below the top of fuel is considered a RCS barrier loss in the BWR fission product barrier EALs. There is no difference in the mechanisms which could cause vessel level to drop below the top of fuel between BWRs and PWRs.

There is also a conflict within NUMARC/NESP-007 regarding vessel water level. As stated in the RAI, NUMARC/NESP-007 would only require declaration of an Alert due to vessel level below the top of fuel based on fission product barrier loss. The fission product barrier loss EALs only apply under power operations and hot condition. Yet system malfunction IC SS5 requires declaration of a Site Area Emergency for vessel level resulting in core uncovery when in cold shutdown or refueling modes. This would mean that without other RCS loss indicators, if the vessel level dropped to below the fuel under hot conditions, the emergency would have to be upgraded to a Site Area Emergency if the plant achieved cold conditions.

Specific RAI #10
Table 4 in NUMARC/NESP-007 requires the declaration of a General Emergency when there is:

> Loss of ANY Two Barriers
> AND
> Potential Loss of Third Barrier

The licensee's EAL 4.2.2, "SG Tube Rupture w/ Secondary Release," states the a General Emergency will be declared when:

> "Release of secondary side to atmosphere..."

This EAL provides indications of loss of the fuel clad barrier and loss of the containment barrier. The licensee's use of 0.1 gpm primary to secondary leakage as an indication of a potential loss of the RCS barrier was not adequately justified. The licensee should provide additional information that demonstrates the adequacy of this threshold for potential loss of the RCS or revise the EAL to be consistent with the NUMARC guidance.

Response to Specific RAI #10
This condition was identified after the submittal was made and has been corrected. The conditions referenced by this justification represent a loss of RCS in conjunction with a loss of containment and thus were revised to

reflect a Site Area Emergency. EALs derived from combinations of unisolable secondary side line break with SG tube rupture in combination with any fuel clad loss/potential loss indicators result in a General Emergency.

Specific RAI #11
The NUMARC criteria for "Containment Barrier Example EALs" (Table 4, Fission Product Barrier Reference Table), "1. Critical Safety Function Status," states in part:

LOSS	POTENTIAL LOSS
Not applicable	Containment-Red

NUMARC Table 4 also states:

UNUSUAL EVENT:
ANY Loss or ANY Potential Loss of Containment"

The licensee equivalent EAL, CSFST status, 1.5 Containment for GE states in part:

"RED path F-0.5, CONTAINMENT"

The bases document states in part:

"CSFST Containment - RED path is entered..."

Section 3.9 of the NUMARC discussion concerning Emergency Action Levels states in part:

"It reasonably follows that if any CSF enters a RED..."

However, the licensee stated in the basis document, it is not possible to reach that condition without other indicators. Classifications based upon the NUMARC guidance are not made based upon sole indicators such as "CSFST Containment - RED," but rather a combination of indicators. Therefore, the licensee should provide additional justification to show that the added conservatism afforded by relying on the singular CSF of this EAL for declaration of a General Emergency is warranted, or modify the EAL scheme to consistency with the NUMARC criteria.

This comment also applies to EAL 4.3.1, "Combustible Gas Concentration."

Response to RAI #11
Refer to Response to General RAI #3 [Para. 3] [Subpara. 2]. It would be inappropriate not to declare a General Emergency based on a valid indication of containment pressure in excess of 60 psig resulting from a loss of reactor coolant, regardless of the availability of other fuel clad and RCS barrier loss EALs. It is understood that if other applicable fuel clad and RCS barrier loss

indicators are available, they would serve to confirm their respective barrier losses. But NUMARC/NESP-007 does not require confirmation by multiple barrier loss indicators for a single barrier. That is, any one valid barrier loss indicator is sufficient to consider that barrier lost. The basis supporting declaration of a General Emergency upon entry into RED path containment is that it is indicative of loss of both fuel clad and RCS with potential loss of containment.

The only source of significant hydrogen concentration in containment is severe fuel damage resulting from metal-water reaction and subsequent discharge into the containment atmosphere. A containment hydrogen concentration of 4% corresponds to at least 25% metal-water reaction (Figure 3 EPIP 2-16 "Core Damage Estimation") and is well into the possible uncoolable core geometry region (Figure B-10 NUREG/BR-0150, Vol. 1, Rev. 2). Failure to declare a General Emergency, based on a valid indication, under these conditions is inappropriate.

Specific RAI #12
The licensee's PEG bases for RCS Leak Rate, RCS 2.2 states in part:

> "...two charging pumps are required for normal liquid inventory control."

The PEG bases for SG Tube Rupture, RCS 3.2 states in part:

> "...one charging pump is required for normal inventory control."

The licensee should correct the inconsistency and assure that any deviation from NUMARC criteria of exceeding the capacity of one charging pump in the normal charging mode are technically justified.

Response to Specific RAI #12
The RCS 3.2 bases has been revised to be consistent with RCS 2.2. Ginna, by design, normally has two charging pumps running. The specified leak rate is the capacity of one charging pump as specified by NUMARC/NESP-007 since both pumps are required to maintain normal CVCS operation.

Specific RAI # 13
The licensee used Table 4.1, Fuel Clad Loss Indicators, and Table 4.2, Fuel Clad Damage Indicators, in the EALs as follows:

> Table 4.1 Fuel Clad Loss Indicators
>
> 1. Coolant activity...
>
> Table 4.2 Fuel Clad Damage Indicators
>
> • ORANGE or RED path in F-0.2,...

COMMENT The licensee's technical bases, as well as EALs, for general emergency 4.1.4 referred to Table 4.1 as fuel clad "loss" indicators; general emergency, 4.1.5 referred to Table 4.2 as fuel clad "damage" indicators. No distinction between "loss" and "damage" used in the EAL table titles was made.

The licensee should clarify the difference between fuel clad loss and fuel clad damage.

Response to Specific RAI #13
Table 4.1 identifies fuel clad loss indicators for use in combination with the RCS loss and the containment potential loss indicator ("Safety injection signal due to LOCA with less than minimum operable containment heat removal equipment"). Table 4.2 includes fuel clad loss and potential loss indicators for use in combination with RCS loss and containment loss indicators. RED path core cooling has been added to the fuel clad loss indicator list consistent with the fission product barrier matrix. The term "fuel clad damage indicators " was used to represent both fuel clad loss and potential loss indictors. The term 'fuel clad loss indicators" was used to represent fuel clad loss indicators only.

Specific RAI #14
The NUMARC criteria for Fuel Clad and RCS Barrier Example EALs utilizing Containment Radiation Monitoring as the EAL thresholds state in part"

> "FUEL CLAD BARRIER EXAMPLE EALs..."...

The equivalent R.E. Ginna EALs (Category 2.0, Reactor Fuel) state in part:

> "2.3 Containment Radiation..."
>
> "2.3.1 Alert..."
>
> "2.3.2 Site Area Emergency..."

"2.3.2 General Emergency..."

There were no equivalent Category 3.0 Reactor Coolant System EALs. However, the PEG for the RCS Barrier EALs (RCS4.1) utilizing Containment Radiation Monitoring as the EAL threshold states in part:

"Containment radiation monitoring..."

The PEG Bases information accompanying the EAL states in part:

"The 10 R/hr reading is a..."

The Technical Basis information for Category 2.0 Reactor Fuel, EAL 2.3.1, states in part:

"The 10 R/hr reading is a value..."

No additional justification information was included in either of the bases information as to why a RCS leak EAL was included in the Reactor Fuel category, and omitted from the Reactor Coolant System category.

The licensee should include the NUMARC criteria for discerning reactor coolant system leaks utilizing containment radiation monitoring or provide justification for omitting it from the RCS category. The licensee should also provide the site specific analyses for calculating these containment radiation monitor setpoints.

Response to Specific RAI #14

As discussed in Response to General RAI #3 [Para. 3] [Subpara. 2], the Ginna EAL presentation method places similar EALs into categories and subcategories that focus the user's attention to the specific EAL threshold that corresponds to the plant condition of concern. This provides a logical classification and escalation path of related indicators and thus allows for rapid assessment of emergency conditions associated with fission product barrier loss. It is important to note that the Ginna EAL categories and subcategories are not representations or abbreviations of the NUMARC/NESP-007 ICs. Rather, each Ginna category and associated subcategory is a pathway from broad indicators of potential emergency events to a set of specific threshold conditions that require emergency classification.

To address the Staff's concern regarding the ability to discern that EAL 2.3.1 is representative of an RCS leak, all fission product barrier derived EALs have been annotated to indicate the fission product barrier loss/potential loss that they represent.

The values for EALs 2.3.1, 2.3.2 and 2.3.3 were derived from the R-29/R-30 "Dose Rate versus Time After Shutdown" curves, Attachment 10 to EPIP 2-16

"Core Damage Estimation." These curves are taken from "Technology for Energy Report No. R-81-012."

EAL 2.3.1:
Using the 100% coolant release line, the corresponding dose rate is approximately 10 R/hr at 1 hour after shutdown. This value was also selected because of it's operational significance, entry into FR-Z.3 "Response to High Containment Radiation Level"

EALs 2.3.2 and 2.3.3:
Using the RG 1.25 100% gap release line and 4 hours after shutdown, the corresponding dose rate is approximately 5000 R/hr. The EAL 2.3.3 value of 1000 R/hr represents 20% of the 100% value. The EAL 2.3.2 value of 100 R/hr represents 2% of the 100% value. Four hours after shutdown was conservatively assumed since actual containment samples results would likely be available to assess core damage within this time frame. Also, the rate of decay of containment dose rates with time beyond four hours is minimal.

Specific RAI #15
The NUMARC criteria for Containment Barrier Example EALs utilizing Containment Radiation Monitoring as the EAL thresholds state:

> CONTAINMENT BARRIER EXAMPLE EALs
>
> 5. Significant Radioactive..."

The equivalent R.E. Ginna EALs (category 2.0, Reactor Fuel) stated:

> "2.3 Containment Radiation..."

There were no equivalent Category 4.0 Containment EALs. However, the PEG for the Containment Barrier EALs (PC5.1) utilizing Containment Radiation Monitoring as the EAL threshold stated:

> "Containment radiation monitoring..."

The PEG and Technical Bases information accompanying this EAL stated:

> "The 1000 R/hr reading is a value ..."

Section 3.8 of the NUMARC discussion concerning Emergency Class Thresholds addressed the subject of significant radioactive inventory within containment is not possible unless a major fuel cladding failure has occurred. Thus it is possible to consider accepting an EAL that is inconsistent with Table 4 (i.e., a GE vs. UE) for the same rationale as in Comment #9. That is, such an EAL is conservatively anticipatory since the containment with large radioactive inventory is "...an extreme challenge to a plant function necessary

for the protection of the public..." However, as the licensee stated in the basis document, it is not possible to reach this condition without other indicators. Classifications based on the NUMARC guidance are not made based upon sole indicators such as Containment radiation monitor R-29/R-30 reading > 1000 R/hr, but rather a combination of indicators.

The licensee should provide additional justification to show that the added conservatism afforded by relying on the singular radiation monitor reading of this EAL for declaration of a General Emergency is warranted, or modify the EAL scheme to be consistent with the NUMARC criteria. The licensee should also provide the site specific analyses used to determine the containment radiation monitor setpoints.

Response to RAI #15
Refer to Response to Specific RAI #14.

The value of 1000 R/hr, which is indicative of significant radioactive inventory in containment (20% clad damage), bounds the values of both the RCS loss (10 R/hr) and the fuel clad loss (100 R/hr) EALs. Exceeding this value requires declaration of a General Emergency. NUMARC/NESP-007 does not specify that multiple fission product barrier loss indicators must be present to consider that barrier lost. The logic term used between each fission product barrier loss/potential loss indicator in Table 4 is "OR". This means that any one indicator is sufficient to consider the barrier lost or potentially lost. Furthermore, NUMARC/NESP-007 does not state that the same indicator should not be used to indicate the loss of more than one fission product barrier.

NUMARC/NESP-007 also states in part:

> *"5. **Significant Radioactive Inventory in Containment"***
>
> *"The (site-specific) reading is a value which indicates significant fuel damage well in excess of the EALs associated with both loss of Fuel Clad and loss of RCS barriers. As stated in Section 3.8, a major release of radioactivity requiring offsite protective actions from core damage is not possible unless a major failure of fuel cladding allows radioactive material to be released from the core into the reactor coolant. Regardless of whether containment is challenged, this amount of activity in containment, if released, could have such severe consequences **that it is prudent to treat this as a potential loss of containment, such that a General Emergency declaration is warranted.** ..."*

It is also important to note that it is not expected that emergency classification would be based on containment radiation alone. Provided that other indicators are available, classification would be confirmed by those redundant indicators. But, in the event of a severe accident, many of the other indicators of multiple fission product barrier loss may not be available.

Therefore, it would be appropriate to rely on this single indicator since it is indicative of multiple fission product barrier loss/potential loss.

Specific RAI #16
The NUMARC example for SU4-1 states:

> (site-specific) radiation monitor..."

The licensee equivalent EALs under 2.1.1, "Coolant Activity," and 2.2.1, "Failed Fuel Detectors" state:

> "Coolant sample activity..."

The licensee should provide additional information to justify the AND logic in the second argument of EAL 2.1.1. The licensee should also demonstrate how EAL 2.2.1 is equivalent to EAL 2.1.1.

Response to Specific RAI #16
Ginna Technical Specification 3.1.4.1 for coolant activity specifies two limits. The first limit is specified as 84/E-bar μCi/cc total specific activity. The second limit is defined as >0.2 μCi/cc I-131 equivalent and the conditions of section 3.1.4.3b are exceeded. Section 3.1.4.3.b allows continued operation under this condition for up to 168 hours provided the I-131 equivalent activity is below the limit shown on Figure 3.1.4-1. The Figure 3.1.4-1 activity limit is a function of rated thermal power.

EAL 2.2.1 specifies a Letdown monitor R-9 reading of >2 R/hr. EPIP 2-16 "Core Damage Assessment" Section 6.2.1 specifies that this value corresponds to 1% fuel rod cladding defects. The Ginna Technical Specifications Section 3.1.4 coolant activity basis states in part: "The total activity limit for the primary system corresponds to operation with the plant design basis of 1% fuel defects." (FSAR Table 9.2-5).

Specific RAI #17
NUMARC IC SS5, "Loss of Water Level in the Reactor Vessel That Has or Will Uncover Fuel in the Reactor Vessel," provides the following example EAL for declaration of a Site Area Emergency:

> Loss of Reactor Vessel..."

The licensee equivalent EAL under 2.4.3, "Refueling accidents or Other Radiation Monitors," states, for an Alert:

> "Report of visual..."

The licensee's technical basis for this EAL specifically includes declarations for fuel uncovery in the reactor vessel. This deviation from NUMARC was

not justified. The licensee also did not include the anticipatory wording of NUMARC which requires declaration when indicators show that the fuel will be uncovered.

The licensee should provide justification for these deviations or revise the EAL to be consistent with the NUMARC guidance.

Response to Specific RAI #17
EAL 2.4.3 is not the equivalent of NUMARC IC SS5. The technical basis specifies that this EAL is derived from NUMARC IC AA2.2. The basis was revised to delete reference to fuel located in the reactor vessel as opposed to reactor cavity.

The EAL derived from NUMARC IC SS5 is 3.1.3 "RVLIS cannot be maintained > 43% with no RCPs running OR With the reactor vessel head removed, it is reported that water level in the reactor vessel is dropping in an uncontrolled manner and core uncovery is likely." This EAL provides the anticipatory wording of NUMARC IC SS5. The term "cannot be maintained" is defined in the definition section of the technical bases: "The value of the identified parameter(s) is not able to be kept above /below specified limits. This determination includes making an evaluation that considers both current and future system performance in relation to the current value and trend of the parameter(s)..." The mode applicability was expanded to ALL in consideration for the inclusion of water level below top of fuel as an RCS potential loss indicator (refer to Response to Specific RAI #9).

Specific RAI #18
The NUMARC examples AA2-3 and AA2-4 were not addressed in the licensee's classification scheme. These example EALs state:

"Water level less than..."

The licensee should include site-specific EAL for these examples or provide technical justification for their omission.

Response to Specific RAI #18
As stated in the basis for IC AA2 in the Ginna PEG: "There is no indication that water level in the spent fuel pool or refueling cavity has dropped to the level of the fuel other than by visual observation. Since AA2.2 addresses visual observation of fuel uncovery, EAL AA2.3 is unnecessary. Since there is no level indicating system in the fuel transfer canal, visual observation of loss of water level would also be required, EAL AA2.4 is unnecessary." Therefore, EAL 2.4.3 addresses the concerns of these example EALs.

Specific RAI #19
The NUMARC example for SU1-1 states:

"The following conditions exist..."

The licensee's equivalent EAL for Loss of AC Power Sources, Unusual Event. 6.1.1 stated:

"Loss of ability to supply..."

The NUMARC criteria specifically requires a site specific minimum emergency generator supply to the emergency busses. The licensee did not provide a site specific minimum emergency generator electrical supply to the emergency buses in the EAL. The PEG specified that both emergency diesel generators are capable of supplying power to the safeguard buses. The NUMARC criteria requires that emergency generators are actually supplying power.

The licensee should provide additional justification for the deviation from the NUMARC criteria or revise that EAL to achieve consistency.

Response to Specific RAI #19
The statement "At least (site-specific) emergency generator are supplying power to emergency buses" serves no purpose. This EAL is concerned only with the loss of off-site AC power capability. If one of the emergency diesels is not supplying its emergency bus under hot conditions then an Alert would be declared based on EAL 6.1.3 (SA5). NUMARC provides no criteria for the condition in which offsite AC power capability is lost and one emergency diesel generator is not supplying it's emergency bus under cold conditions. If neither emergency diesels are supplying their emergency busses, either an Alert would be declared based on EAL 6.1.2 or a SAE based on EAL 6.1.4, depending on plant operating mode.

Specific RAI #20
The NUMARC example SU7-1 states:

"1. Either of the following conditions..."

The licensee equivalent EAL for loss of DC power, Unusual Event, 6.2.1 stated:

"< 105 vdc bus voltage..."

The NUMARC criteria specifies that the loss of DC voltage is unplanned. This EAL applies to cold shutdown and refueling, and planned work that de-energizes the DC buses should not trigger a declaration.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria or provide technical justification for the deviation.

Response to Specific RAI #20
Both DC buses would never be de-energized for any planned activity unless the reactor was defueled.

Specific RAI # 21
The NUMARC example SA1-1 states:

"1. The following conditions exist:..."

The licensee equivalent EAL for Loss of AC Power Sources, Alert, 6.1.2 stated:

"Loss of all safeguards bus..."

The NUMARC criteria specifies a site specific list of transformers and generators. The licensee did not provide a site specific list in this EAL, but did specify the site specific power requirements in the PEG.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria or provide technical justification for the deviation.

Response to Specific RAI #21
The concern of NUMARC IC SA1 and this EAL is the loss of ability to provide AC power to the safeguards busses and their vital loads. A condition can exist where the supply transformers and/or emergency diesel generators are available but a fault on the bus precludes powering vital loads. Therefore it is more appropriate and inclusive to define the EAL by the inability to power the safeguards buses rather than the loss of the power sources.

Specific RAI #22
The NUMARC example SA2-1 states:

(Site-specific) indication(s) exist that indicate..."

Licensee equivalent Initiating Condition in the PEG stated:

"SA2 Failure of Reactor Protection..."

The licensee equivalent EAL, CSFST status, 1.1.1 Alert stated:

"ORANGE or RED path F-0.1..."

The licensee Initiating Condition and EAL deviated from the NUMARC criteria. NUMARC bases the Alert on the failure of the automatic protection system to respond to the established setpoint. The licensee added the additional, inappropriate condition that a manual scram was also ineffective, which should escalate the event to a SAE. The licensee's technical basis

states, This EAL addresses any manual trip or automatic trip signal followed by manual trip which fails to shut down the reactor to an extent requiring emergency boration. The licensee identified this difference as a deviation in the PEG but did not provide justification for the deviation in the technical bases.

The licensee should revise that EAL to achieve consistency with the NUMARC criteria or provide technical justification for the deviation. For additional guidance on this IC the licensee should reference the "Questions and Answers" on NUMARC/NESP-007, published in June 1993.

Response to Specific RAI #22

As stated in the PEG: "This IC and resulting EAL have been specifically modified to more accurately define the condition described by the generic bases as applied to pressurized water reactors. The failure of automatic initiation of a reactor trip followed by successful manual initiation actions which can be rapidly taken at the reactor control console does not pose a potential loss of either fuel clad or RCS boundaries. It is the continued criticality under conditions requiring a reactor scram which poses the potential threat to RSC or fuel clad integrity. If an ORANGE path exists on F-0.1, CRITICALITY after immediate attempts to trip the reactor have been taken, there has been a failure to shut down the reactor, but without substantial heat generation. If a RED path exists on F-0.1, CRITICALITY after immediate attempts to trip the reactor have been taken, there has been a failure to shut down the reactor, with substantial heat generation. Either of these conditions may represent a potential loss of the fuel clad boundary, and thus warrant a declaration of ALERT. A manual trip is any set of actions by the reactor operator(s) at the reactor control console which causes control rods to be rapidly inserted into the core and brings the reactor subcritical (e. g., reactor trip button). It is important to note that the failure of the reactor protection system to initiate an automatic trip does not infer actual or potential failures of other systems nor is it, in and of itself, a precursor to fission product barrier degradation. The RPS serves no other safety function but to initiate reactor trips. Therefore, once the reactor has been successfully tripped, failures in the RPS system can have no plant safety impact. If immediate manual actions to trip the reactor are successful following recognition of an automatic trip failure, there is no threat to either plant safety or fission product barrier integrity related to the automatic trip failure. This deviation is consistent with the philosophy of making accurate vs. conservative classifications."

It is also important to note the response to NUMARC/NESP-007 "Questions & Answers" General question #9:

Q: If, after the fact, it is discovered that an event has occurred that caused an EAL to be reached without adverse consequences, should a classification declaration be made?

A: If an emergency condition no longer exists, there is no reason to declare an emergency. The NRC shall be notified after discovery within 1 hour, meeting 10CFR50.72 reporting criteria...."

The NUMARC EAL SA2, as written, would not have to be declared, based on this criteria, absent exceeding another fuel clad or RCS barrier breach EAL.

Given that the NUMARC/NESP-007 EAL SA2 represents neither fission product barrier loss or potential loss nor involve actual or potential substantial degradation of the level of safety of the plant, it is inappropriate to declare an Alert classification.

Specific RAI #23
The NUMARC example SA3-1 states:

"1. The following conditions exist..."

The licensee equivalent EAL for system failures, Alert, 7.2.4 stated:

"Reactor coolant temperature..."

The licensee EAL did not include the required technical specification functions to maintain cold shutdown and did not include the anticipatory philosophy related to an uncontrolled temperature rise. The licensee justified the omission of these attributes in the Technical Basis document with the statement: "A reactor coolant..." Without the anticipatory declaration that would occur with the loss of shutdown functions or uncontrolled rise in temperature, the EAL is inadequate. Therefore, the licensee should modify the EAL to achieve consistency with the NUMARC criteria, or provide additional justification for the deviation.

Response to Specific RAI #23
The Ginna Technical Specifications do not specify required functions to maintain cold shutdown. EAL 7.2.4 is derived from IC SA3 which states: "Inability to Maintain Plant in Cold Shutdown." The anticipatory criteria is provided in the use of the term "cannot be maintained." The definition section of the Technical Bases Document defines the term as follows: "The value of the identified parameter(s) is not able to be kept above /below specified limits. This determination includes making an evaluation that considers both current and future system performance in relation to the current value and trend of the parameter(s). Neither implies that the parameter must actually exceed the limit before the action is taken nor that the action must be taken before the limit is reached." NUMARC/NESP-007 "Questions and Answers" published in June 1993 defines the term 'function' as : "The action which a system, subsystem or component is designed to perform." The evaluation of both current and future system performance (function) is inherent in this definition of "cannot be maintained."

Specific RAI #24
The NUMARC example SS1-1 states:

"1 Loss of all offsite and onsite AC..."

The licensee equivalent EAL for Loss of AC Power Sources, SAE, 6.1.4 stated:

"Loss of all safeguards..."

The NUMARC criteria specifies a site specific list of transformers and generators. The licensee omitted a site specific list of transformers and generators. The licensee omitted a site specific list in the EAL, but did specify the site specific power requirements in the PEG.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria or provide justification for the deviation.

Response to Specific RAI #24
Refer to Response to Specific RAI #21

Specific RAI #25
The NUMARC example SS2-1 states:

"1. (Site-specific) indication exist that..."

The licensee equivalent EAL, CSFST status, 1.1.2 stated:

"RED path F-0.1 ..."

The Subcriticality Red Path is entered based upon failure of power range indication to decrease below 5% following a reactor trip. This condition by itself would be an adequate EAL except the licensee has added other conditions that were inconsistent with the NUMARC criteria. Therefore, the licensee should revise this EAL to achieve consistency with the NUMARC criteria, or provide adequate justification for the deviation.

Response to Specific RAI #25
As stated in the PEG: "CSFST Subcriticality - RED path is entered based on failure of power range indication to decrease below 5% following a reactor trip. This portion of the EAL addresses any manual trip or automatic trip signal followed by a manual trip which fails to shut down the reactor to an extent that the reactor is producing more heat load for which the safety systems were designed. This condition indicates failure of both the automatic and manual protection systems to trip the reactor in conjunction with a failure of alternate boration systems to reduce reactor power below decay heat levels. The combination of failure of both front line and backup protection systems to function in response to a plant transient, along with the continued production of heat poses a direct threat to fuel clad and RCS

integrity and thus warrants declaration of a Site Area Emergency. 15 minutes is specified to allow time for emergency boration to be effective and provides a discriminator between SA2.1 and SS2.1. The classification should be made as soon as it is apparent that emergency boration is not or will not be effective in reducing reactor power below 5%."

It is the failure of both primary and backup means of reactor shutdown systems which represents an event which involves actual or likely major failures of plant functions needed for the protection of the public.

Specific RAI # 26
The NUMARC example for SS4-1 states:

"1. Complete loss of any..."

The licensee equivalent EAL, RCS Leakage 1.3.1, for SAE stated:

"RED path in F-0.3, HEAT SINK"

The NUMARC criteria specifies complete loss of functions required for hot shutdown, including the ultimate heat sink and reactivity control. The licensee EAL did not address the loss of functions required for hot shutdown. Entry into CSFST Red Path did not provide the anticipatory declaration that loss of functions would.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria, or provide adequate justification for the deviation. The licensee should also provide information on their disposition of the function of core cooling in relation to this IC.

Response to Specific RAI #26
Ginna Technical Specifications Section 1.2 defines hot shutdown as: Reactivity $\Delta k/k\% \leq -1$ and Tavg ≥ 540 °F. Since the hot shutdown mode has no upper defining limit for coolant temperature, the ability to achieve and maintain hot shutdown is only a function of reactivity control. EAL 1.1.2 addresses loss of reactivity control. The NUMARC/NESP-007 basis for SS4, while not supporting the IC or example EAL, does state that the EAL is intended addresses loss of functions, including ultimate heat sink. No reference to core cooling is made. However, EAL 1.2.1 and EAL 3.1.3 provide for the declaration of a Site Area Emergency under conditions which loss of functions threaten core cooling. It is also important to differentiate between function and operability of components or equipment which support a function. NUMARC/NESP-007 "Questions and Answers" published in June 1993 defines 'function' as: "The action which a system, subsystem or component is designed to perform. Safety functions, as applied to PWRs are reactivity control, RCS inventory control and secondary heat removal." NUMARC/NESP-007 Section 3.9 states "There are diverse and redundant plant systems to support each CSF. By monitoring the CSFs instead of the individual system component status, the impact of multiple events is

inherently addressed, e.g., the number of operable components available to maintain the function." Since it would be impossible to define all possible losses of system component operability under which loss of function may occur, consistent with Section 3.9 of NUMARC/NESP-007, the loss of function is defined by CSF status. For secondary heat removal, that CSF is RED path heat sink. The Technical bases document has been revised to reflect that EALs 1.1.2, 1.2.1 and 3.1.3 also serve to support IC SS4.

Specific RAI #27
The NUMARC example SS5-1 states:

"OPERABILITY MODE APPLICABILITY: Cold Shutdown..."

The licensee equivalent EAL, RCS Leakage 3.1.3 for SAE stated:

"RVLIS cannot be maintained..."

The NUMARC criteria specifies evaluation of decay heat removal for this event since the criteria applies for the shutdown condition. The licensee did not include this criteria in the EAL since the EAL was intended to apply to all operating modes. However, the EAL was self-contradictory in the mode applicability cannot be ALL...With the reactor vessel head removed. Therefore, the licensee should revise this EAL to achieve consistency with the NUMARC criteria and clarity of meaning, or provide adequate justification for the deviation.

Response to Specific RAI #27
The NUMARC IC from which EAL 3.1.3 is derived is NUMARC IC SS5: "Loss of Water Level in the Reactor Vessel That Has or Will Uncover Fuel in the Reactor Vessel." There are numerous conditions which can lead to a loss of RCS inventory to the extent resulting in core uncovery while in cold shutdown or refuel modes. The one addressed in the generic bases for PWRs is "sequences such as prolonged boiling following loss of decay heat removal." Loss of inventory can also occur as a result of drain down events. The concern of this IC and EAL is uncovery of the fuel, regardless of the cause. Therefore the criteria regarding loss of decay heat removal serves no function. The EAL wording provides for the anticipatory criteria. The mode applicability was expanded to include the inability to maintain RVLIS above top of fuel consistent with use of RVLIS level as a RCS barrier loss indicator. Refer to Response to Specific RAI #9. The EAL does not imply that the reactor vessel head can be removed while in hot condition. Since this configuration would never occur under hot conditions, that portion of the EAL based on visual observation would not apply or be evaluated.

Specific RAI #28
The NUMARC example SS6-1 states:

"1. The following conditions exist:..."

The licensee equivalent EAL for Equipment Failures, SAE, 7.3.4 stated:

"Loss of annunciators or indications..."

The NUMARC criteria specifies that Compensatory non-alarming indications are unavailable. Although the PEG reflected a "modified" EAL of ~~Compensatory non-alarming indications~~ PPCS and SAS are unavailable, this specificity was lost in the translation to the Technical Bases and the EAL Categories. (Based upon limited information available, the reviewer had to assume the PPCS and SAS were not located on the panels of Table 7.3). No justification was provided in the technical bases for the omission. Therefore, the licensee should revise this EAL to achieve consistency with the NUMARC criteria and clarity of meaning, or provide adequate justification for the deviation.

Response to Specific RAI #28
Items (b.) and (c.) of this EAL in the Ginna PEG were combined into a single statement "Complete loss of ability to monitor all critical safety function status." As stated in the RAI, PPCS and SAS are compensatory non-alarming indications. If either of these sources are functional, critical safety function monitoring is available.

Specific RAI #29
The NUMARC example SG1-1 states:

"Prolonged loss of all offsite and onsite..."

The licensee equivalent EAL for Loss of AC Power Sources, GE, 6.1.5 stated:

"Loss of all safeguard bus AC..."

NUMARC employs the wording that Restoration... ...is NOT likely. The licensee used the wording "Power cannot be restored...". The NUMARC "not likely" implies that as soon as it is known that power will not be restored the threshold has been exceeded, whereas the licensee "cannot": implies that power restoration must be a "known" quantity before a licensee declaration. The NUMARC intent is that the condition is met as soon as it is known that power restoration is not likely within the specific time limit. Further, the licensee did not employ the concept of IMMINENT referred to in NUMARC Table 4 and discussed in the NUMARC based information for this Initiating Condition.

The NUMARC criteria specifies a site specific list of transformers and generators. The licensee did not provide a site specific list in this EAL although site specific power requirements were specified in the PEG.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria and clarity of meaning, or provide adequate justification for the deviation.

Response to Specific RAI #29
The wording "is not likely" has been added to EAL 6.1.5 regarding restoration of safeguard bus power.

The wording has been revised to reflect the wording: "Actual or imminent entry into ORANGE or RED path on F-0.2 Core Cooling."

The concern of NUMARC IC SG1 and this EAL is the loss of ability to provide AC power to the safeguards buses and their vital loads. A condition can exist where the supply transformers and/or emergency diesel generators are available but a fault on the bus precludes powering vital loads. Therefore it is more appropriate and inclusive to define the EAL by the inability to power the safeguards buses rather than the loss of the power sources

Specific RAI #30
The NUMARC examples SG2-1 and -2 state:

> "1. (Site-specific) indications exist that automatic..."

The equivalent licensee EAL was found in Category 1.0, CSFST Status, 1.3.2 General Emergency, which stated:

> "RED path in F-0.3, HEAT SINK..."

The NUMARC logic of core cooling OR heat removal was omitted from the licensees EALs (and the Technical Bases Document) notwithstanding that the logic was included in the PEG.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria, or provide adequate justification for the deviation.

Response to Specific RAI #30
EAL 1.3.2 has been revised to include the core cooling OR heat removal logic by inclusion of RED path core cooling in combination with RED path Subcriticality. EAL 1.3.2 has been moved to the Subcriticality sub-category since this is the common condition in combination with either core cooling or heat sink. The EAL has been renumbered to 1.1.3.

Specific RAI #31
The NUMARC example HU1-3 states:

"Assessment by the control room..."

The licensee equivalent EAL for Hazards, Unusual Event, 8.4.3 stated:

"Assessment by Control Room personnel..."

The NUMARC criteria is unrestricted with the modifying verbiage "precluding access to a plant vital area, Table 8.3." The licensee restricts the declaration to natural events that preclude access to vital areas without justification in the technical bases.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria, or provide adequate justification in the technical bases.

Response to Specific RAI #31
EAL 8.4.3 has been deleted. The example EAL from which it was derived, HU1-3 and its generic bases provides no specific guidance for declaration beyond that which the IC provides. Therefore this EAL has been subsumed into the "Other" category EAL 9.1.1. The section 8.4 EAL have been renumbered appropriately.

Specific RAI #32
The NUMARC example HU4-1 and -2 states:

"1. Bomb device discovered within plant..."

The licensee equivalent EAL for hazards, Unusual Event, 8.1.1 stated:

"Bomb device or other..."

The NUMARC criteria suggests that other security events which may potentially impact plant safety should be the subject of a declaration, however the additional EAL was omitted from the licensee's EAL category. The Technical Bases Document stated, "This EAL is based on the REGNPS Security Contingency Plan. Security events which do not represent at least a potential degradation in the level of safety of the plant are reported under 10CFR73.71 or in some cases under 10CFR50.72" As written, the EAL did not permit an emergency declaration for other security events that may represent a potential degradation of safety which is inconsistent with the NUMARC criteria. This discussion is also applicable to the Alert and SAE EALs but will not be repeated.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria, or provide adequate justification for the deviation.

Response to Specific RAI #32
EAL 8.1.1 has been revised to include any security event which represents a potential degradation in the level of safety of the plant.

EAL 8.1.2 has been revised to include any security event which represents an actual substantial degradation of the level of safety of the plant.

EAL 8.1.3 has been revised to include any security event which represents actual or likely failures of plant systems needed to protect the public.

Specific RAI #33
The NUMARC example HA1-3 states:

"3. Report of any visible structural..."

The licensee equivalent EAL for Hazards, Alert, 8.4.7 stated:

"Assessment by Control Room personnel that..."

The NUMARC criteria does not limit the threshold of declaration to "resulted in damage to equipment needed for safe plant operation." The intent of the NUMARC EAL is that if visible structural damage has occurred to the building, the event was significant and has a high potential for damage to equipment needed for safe plant operation. The licensee's Technical Bases document recognized this potential with the following: "This EAL addresses events that..." However, this recognition did not carry through to the plant EAL. Anticipating the potential damage, the declaration should be made based upon visible structural damage, not "Assessment.... damage to equipment needed ... safe plant operation."

The licensee should revise this EAL to achieve consistency with the NUMARC criteria, or provide adequate justification for the deviation.

Response to Specific RAI #33
EAL 8.4.7 (renumbered to 8.4.6) has been revised to reflect either a report of visible structural damage to structures or assessment of actual damage to equipment needed for safe plant operation.

Specific RAI #34
The NUMARC example HA2-1 states:

1. The following condition exists:..."

The licensee equivalent EAL for Hazards, Alert, 8.2.2 stated:

"Fire or explosion in any plant area,..."

The NUMARC criteria includes the condition that "Affected system parameter indications show degraded performance." The licensee EAL did not clearly convey this NUMARC criteria.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria or technically justify the deviation.

Response to Specific RAI #34
EAL 8.2.2 has been revised to reflect either degraded system performance or report of visible damage to systems needed for safe plant operations.

Specific RAI #35
The NUMARC examples HA3-1 and 2 state:

"1. Report or detection of toxic gases..."

The licensee equivalent EAL for Hazards, Alert, 8.3.5 stated:

"Report or detection of toxic..."

The licensee did not provide or reference measurable criteria to the emergency director for establishing concentrations that affect safe operation of the plant. Without such information readily available, classification would be difficult.

The licensee should provide measurable criteria to the classifier to determine when life threatening and flammable concentration thresholds have been exceeded.

Response to Specific RAI #35
Toxic or flammable gases do not in themselves pose any threat to the safe operation of the plant but may preclude access to areas necessary for safe operation of the plant. Therefore the concern of this EAL are concentrations which are either life threatening or preclude access to areas needed for safe plant operation. No specific thresholds have been defined since specific thresholds are dependent upon the type of toxic or flammable gas involved as well as the amount and type of personal protective equipment available to those individuals requiring access. Therefore, the determination as to whether concentrations are sufficient to be life threatening or preclude access to areas required for safe operation is left to the judgment of the user. Where specific criteria are available to the user it is expected that criteria would be considered in this evaluation.

Specific RAI #36
The NUMARC example HA5-1 states:

"Entry into (site-specific) procedure..."

The licensee equivalent EAL for Equipment Failures, Alert, 7.2.3 stated:

"Control Room evacuation"

The NUMARC criteria specifically initiates the declaration at the time of entry into the control room evacuation procedure. The licensee's EAL was not specific about the time of declaration and did not identify the procedure upon which declaration would be based.

The licensee should revise the EAL to achieve consistency with the NUMARC criteria or provide technical justification for the deviation.

Response to Specific RAI #36
EAL 7.2.3 has been revised to specify entry into AP-CR.1 "Control Room Inaccessibility" which provides guidance for control room evacuation.

Specific RAI #37
The NUMARC example HS2-1 states:

"1. The following conditions exist:..."

The NUMARC Basis information goes on to state: "(Site-specific) time for transfer based..."

The equivalent licensee EAL, 7.2.5, SAE stated:

"Control Room evacuation..."

The licensee Technical Bases Document stated: "The time interval for transfer is based..."

If the reviewer understands the licensee's basis information correctly, the basis information states that under worst case conditions it could take up to 20 minutes to regain control of safety systems from remote shutdown facilities. This says nothing about whether core uncovering and/or core damage could occur during the transfer period. The intent of the NUMARC guidance is that a declaration of SAE should be made after the time elapses where safety systems may be "unattended", and not incur uncovering and/or damage. The licensee basis information did not indicate this unattended time, and the deviation of 20 minutes from the maximum criteria of 15 minutes was not adequately justified.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria or provide technical justification for the deviation.

Response to Specific RAI #37
The technical bases of EAL 7.2.5 has been revised to define how the 20 minutes relates to the referenced "unattended time." The design criteria for the remote shutdown equipment specifies that control of safety systems must be able to be achieved without resulting in core uncovery or core damage. The Appendix R analysis says that 20 minutes is the maximum time for which control of plant safety systems should occur under worst case conditions. Therefore, 20 minutes is within the design criteria of the remote shutdown equipment.

Specific RAI #38
The NUMARC examples HG1-1 and -2 states:

> "1. Loss of physical control of the control room..."

The licensee equivalent EAL for Hazards, GE 8.1.4 stated:

> Security event which result in:..."

The NUMARC criteria utilized OR logic for the EALs whereas the licensee utilized AND logic. The inconsistency with the NUMARC criteria was not justified in the Technical Bases Document.

The licensee should revise this EAL to achieve consistency with the NUMARC criteria or provide technical justification for the deviation

Response to Specific RAI #38
EAL 8.1.4 has been revised to reflect an 'OR' logic.