November 2, 2012

Ms. Susan Perkins-Grew
Director, Emergency Preparedness
Nuclear Energy Institute
1776 I Street, NW, Suite 400
Washington, DC 20006-3708

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION REVIEW OF THE PROPOSED REVISION 6 TO THE NUCLEAR ENERGY INSTITUTE (NEI) NEI 99-01, "DEVELOPMENT OF EMERGENCY ACTION LEVELS FOR NON-PASSIVE REACTORS," DATED SEPTEMBER 2012

Dear Ms. Perkins-Grew:

My staff has performed a review of the proposed Revision 6 of NEI 99-01 dated September 2012 (ADAMS Accession No. ML113270260) and has identified comments that need to be addressed by the NEI Emergency Action Level (EAL) Task Force before further staff consideration for endorsement. Please coordinate with my Lead Technical Reviewer, Don A. Johnson (301-415-4040 or don.johnson@nrc.gov), for resolution of these few remaining issues.

Sincerely,

/RA/

Joseph D. Anderson, Chief
Operating Reactor Licensing and Outreach Branch
Division of Preparedness and Response
Office of Nuclear Security and Incident Response

Enclosures:
1. NRC Staff Questions and Comments
2. Figure 9-F-4 Consideration
3. Emergency Classification Level Attribute Language

Ms. Susan Perkins-Grew
Director, Emergency Preparedness
Nuclear Energy Institute
1776 I Street, NW, Suite 400
Washington, DC 20006-3708

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION REVIEW OF THE PROPOSED REVISION 6 TO THE NUCLEAR ENERGY INSTITUTE (NEI) NEI 99-01, "DEVELOPMENT OF EMERGENCY ACTION LEVELS FOR NON-PASSIVE REACTORS," DATED SEPTEMBER 2012

Dear Ms. Perkins-Grew:

My staff has performed a review of the proposed Revision 6 of NEI 99-01 dated September 2012 (ADAMS Accession No. ML113270260) and has identified comments that need to be addressed by the NEI Emergency Action Level (EAL) Task Force before further staff consideration for endorsement. Please coordinate with my Lead Technical Reviewer, Don A. Johnson (301-415-4040 or don.johnson@nrc.gov), for resolution of these few remaining issues.

Sincerely,

/RA/

Joseph D. Anderson, Chief
Operating Reactor Licensing and Outreach Branch
Division of Preparedness and Response
Office of Nuclear Security and Incident Response

Enclosures:
1. NRC Staff Questions and Comments
2. Figure 9-F-4 Consideration
3. Emergency Classification Level Attribute Language

Distribution:
DPR Reading File D. Johnson, NSIR M. Norris, NSIR J. Anderson, NSIR

ADAMS Accession Number: ML12305A548

OFFICE	NSIR:DPR	TL:NSIR:DPR	ADMIN:NSIR	BC:NSIR:DPR
NAME	DJohnson	MNorris	STucker	JAnderson
DATE	11/01/12	11/01/12	11/01/12	11/02/12

OFFICIAL RECORD COPY

Enclosure 1

NRC Staff Questions and Comments

Based on the staff's technical review of the generic emergency action level (EAL) scheme development guidance provided in Revision 6 to Nuclear Energy Institute (NEI) 99-01 (dated September 2012), the following comments should be considered for incorporation in support of proposed endorsement.

1. Section 5.1, 3rd Paragraph: Please add a sentence that reinforces the staff's expectation that classification assessments are to be timely.
2. Section 4.3: Please add the following paragraph: "*Instrumentation referenced in EAL statements should include that described in the emergency plan section that addresses 10 CFR 50.47(b)(8) and (9) and/or Chapter 7 of the FSAR. Instrumentation used for EALs need not be safety-related, covered by a technical specification or ODCM/RETS control, nor powered from emergency power. However, EAL developers should strive to incorporate instrumentation that is reliable and routinely maintained by site processes*."
3. Section 4.6: Please add the following paragraph: "*The basis should not contain information that modifies the outcome of the IC and or EALs to which it applies. Such information should be presented in the IC or EALs. The basis information should only clarify and inform the classification decision*."
4. EAL CA6/SA10:
    a. The staff recommends adding a bulleted list of specific hazards to be addressed by this EAL, as well as guidance for site-specific hazards that a licensee may need to consider in the development of their EALs (seiche for example).
    b. The staff recommends revising the safety system language such that an event the potentially impacts the ability of a safety system to perform its intended function, for the current operating mode, is classified.
5. Fission Barrier Matrix:
    a. Pressurized water reactor (PWR)-reactor coolant system (RCS) Loss 1A and Potential Loss 1A: Please add the term UNISOLABLE to INTERFACING SYSTEM.
    b. PWR Containment Barrier Loss 4A.1: Please add the following to the developer notes: "*A failed feedwater line to a steam generator inside containment, in conjunction with a FAULTED steam generator, would also create an UNISOLABLE pathway since the steam generator would be dry*."
    c. Please add a bullet to the developer notes of Section 9 as follows: "*References to "RCS Leakage" used in this recognition category are not restricted to the technical specification definition, but include any loss of RCS mass to any location–inside containment, to the secondary-side (i.e., steam generator tube leakage), to UNISOLABLE interfacing systems, or outside of containment*."

d. The staff considers the 2nd and 3rd bullets from NEI 99-01 Revision 5, to be important, and therefore recommends inclusion into NEI 99-01 Revision 6.

e. The staff recommends adding language to Note #4 stating that the staff considers the development of the table to be important for use and to aid in consistency throughout the industry.

f. Please consider adding the drawing in Enclosure 2 to Figure 9-F-4.

6. EAL HU2: The staff recommends two distinct approaches to this EAL.

a. Approach #1, which is the staff's preference, is for licensees that have an alarm in the Control Room at the operating basis earthquake (OBE) level. In this case, the only EAL is the occurrence of this alarm.

b. Approach #2 is for licensees that do not have an alarm in the Control Room at the OBE level. In this case, the EAL will need to be a combination of feeling the ground motion and confirming an earthquake occurred.

7. EAL HU3:

a. The staff recommends removing the 'technological hazard" language from the Initiating Condition (IC) and limiting this EAL to natural hazards only. The staff recommends the IC be "Natural Hazards."

b. The staff recommends placing the EAL thresholds related to internal/external flooding back to this EAL.

c. The staff requires more information to support how the distinction between an explosion at the Unusual Event and Alert levels are made, and what the resultant plant impact is for explosions that only result in an Unusual Event as proposed. If this EAL is maintained, the staff recommends making it a stand-alone EAL.

d. The staff requires more information to support how the distinction between turbine failure at the Unusual Event level and turbine failure at the Alert level is made, and what the resultant plant impact is for turbine failures that only result in an Unusual Event as proposed.

e. The staff recommends adding language to EAL #4 for when the event impedes movement within the protected area.

f. EAL HU3.5: Please add the following paragraph to the basis, and consider the development of EAL language (or a note) that informs this EAL: "*This EAL is not intended apply to routine impediments such as fog, snow, ice, or vehicle breakdowns or accidents, but rather the more significant conditions such as Hurricane Andrew strike on Turkey Point in 1992, the flooding around the Cooper Station during the Midwest floods of 1993, or the flooding around the Ft. Calhoun Station in 2011."*

8. EAL HU4:

a. The staff recommends changing "field verification" to "field verified" in the third bullet for EAL 1.

b. The staff considers the limitation of the areas of consideration for the single fire alarm, in EAL 2, to be the same as EAL 1. Please explain how this consideration is made for EAL 2 or revise accordingly.

c. While the staff recognizes the bases information clarifies the areas of consideration for EALs 3 and 4, please add language to these EALs so that decision-makers can readily classify these events appropriately.

d. The staff does not consider the information in the developer notes related to Appendix R to be developer notes but rather information that must be in the basis information to aid in clarifying the intent and background of this EAL.

e. EAL HU4.1: Please add the following to the basis: "*The verification and validation actions are taken to confirm an initial alarm, indication, or report. Accordingly, the classification clock starts at the time that the initial alarm, indication, or report was received, and not the time that the verification was completed. Similarly, the fire duration also starts at the time that the initial alarm, indication or report was received.*"

f. EAL HU4.2: Please add the following to the basis: "*The verification and validation actions are taken to confirm an initial alarm, indication, or report. Accordingly, the fire duration starts at the time that the initial alarm, indication or report was received, and not the time that the verification was completed."*

9. EAL HA5: The staff recommends making sure that consideration of the Control Room as an area of concern is made during the development of this EAL. More robust guidance, both boiling water reactor (BWR) and PWR specific, for how to consider/evaluate the Control Room, should be added to the developer notes.

10. EAL SU2/SA2: The staff recommends addressing whether or not process and radiological effluent monitoring were considered in the development of this EAL. Of particular note is the logical progression from the NUREG-0654 EAL to the proposed NEI 99-01 Revision 6 EAL. The staff acknowledges that the basis for this EAL has evolved to where it is based upon the difficulties the Control Room will have in managing the plant when safety system indications are unavailable, but the staff requires justification as to why process and/or radiological effluent monitoring are not addressed.

11. EAL SU3: The staff recommends that the developer note for EAL 2 acknowledge that licensee Technical Specifications may have multiple values and that the EAL should address each one.

12. EAL SU5: The staff recommends removal of the 4th paragraph of the Basis. Several reactor protection system (RPS) designs use the manual trip/scram button as an input into the RPS, and therefore, a failure to trip/scram using the pushbutton would constitute classification via this EAL.

13. EAL SA5: The staff recommends returning the basis information related to how a successful shutdown using non-reactor control console (RCC) sources still warrants classification due to the gross failure of the reactor protection system (RPS).

14. EAL AU1: Please revise note #4 to "*Developers should keep in mind the requirements of 10 CFR 50.54(q), the guidance in INPO 10-007, and the radiation monitors identified in the emergency plan section that shows compliance with 10 CFR 47(b)(8) and (9) when considering the addition of other effluent monitors*."

15. EALs AA1/AS1/AG1: Please revise the fourth bullet to "*The pre-calculated effluent monitor values presented in EAL #1 should be used for emergency classification*

assessments until results from dose assessment performed using actual meteorology are available."

16. EALs CU2 and SA1: The staff questions the addition of the sentence in the basis that states "*To align with industry standards and NRC regulatory guides, the EALs and Basis should reflect that each offsite power circuit constitutes a single power source*," and *requires* additional justification as to why it was added, or remove the sentence.

17. EAL SU4: Please add the following to the basis, and delete the 2nd paragraph: "*These thresholds focus on the loss of mass from the RCS and are applicable to unidentified and pressure boundary leakage, as well as identified leakage. They are also applicable to leakage through an UNISOLABLE interfacing system. The RCS mass loss may be into any location – inside containment, to the secondary-side (i.e., steam generator tube leakage (PWR)) or outside of containment*."

18. Appendix B – Definitions

    a. Visible Damage: The staff recommends returning this definition to that used in NEI 99-01 Revision 5 with the possible exemption of heat deformation and paint blistering, as justified.

19. Attributes:

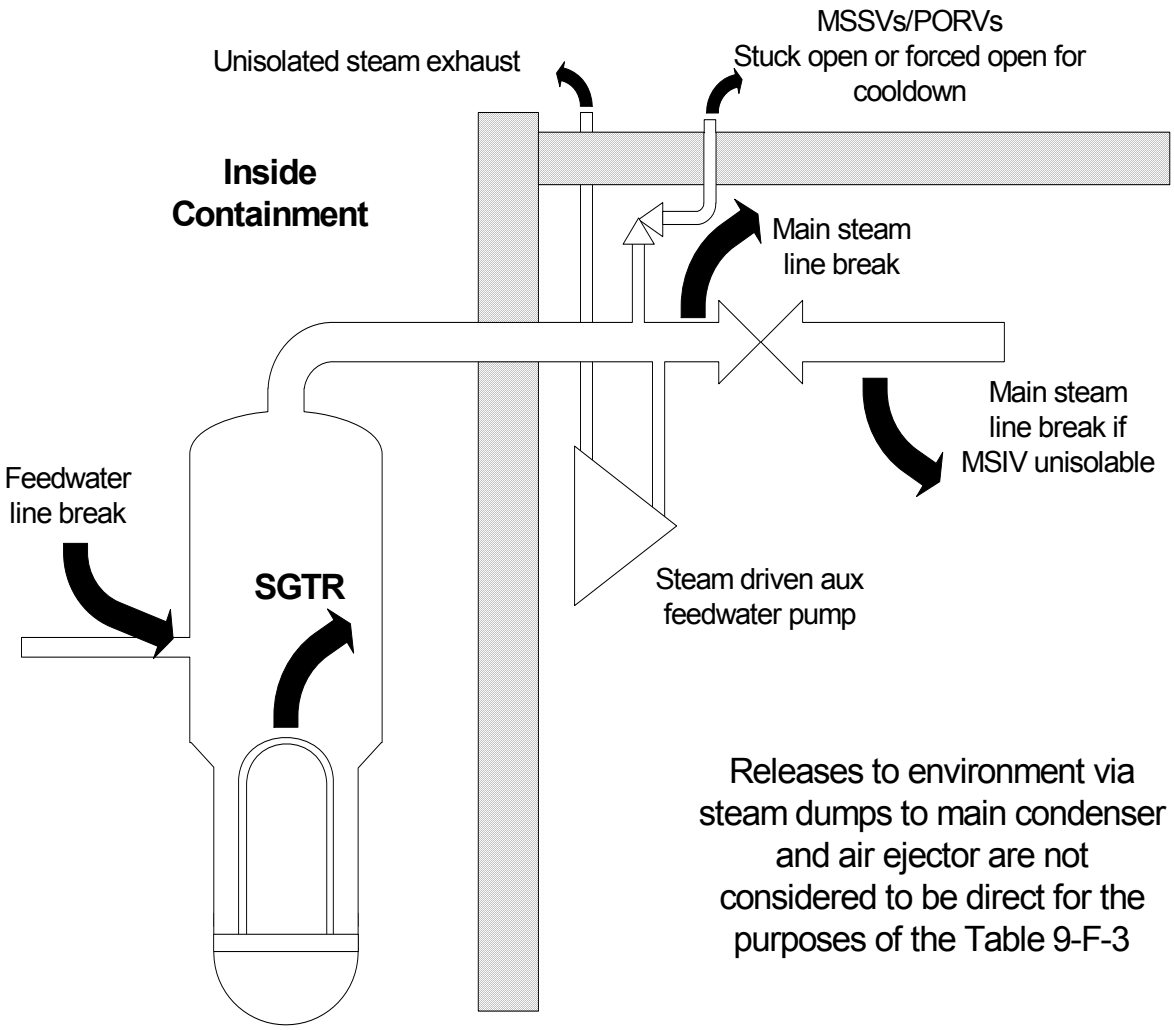
    a. The staff recommends adding language related to how the attributes are to be used. The use of this term is considered to be at the discretion of individual licensees and is not a requirement of the NRC. In addition, if a licensee chooses to use the attributes, the document must be very clear that at no time does the staff consider the listed attributes to be all-inclusive or entirely accurate for each EAL, nor does the attributes supersede the definitions of each classification level. As a result, the use of attributes when justifying revisions to the EALs is unacceptable.

    b. Please revise the definition of each attribute, in Section 3.1 as provided in Enclosure 3.

20. Change Summary: The staff noted that the change summary did not align with the actual document in many areas. The staff recommends revising this section to align with the final proposed document.

Enclosure 2

Figure 9-F-4 Consideration



A feedwater line break inside containment would blowdown the steam generator and provide a path for the containment atmosphere to be released via the FAULTED steam generator (SG).

If the main condenser is unavailable (e.g., loss of offsite AC power) plant cooldown would be affected by dumping steam to the atmosphere. Although this is directed by procedures, it creates a bypass of containment when occurring in conjunction with a steam generator tube rupture (SGTR) or a feedwater line break.

Enclosure 3

Emergency Classification Level Attribute Language

Notification of Unusual Event (NOUE)

A Notification of Unusual Event involves:

Events in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. No releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs.

This includes but is not limited to:

(A) A precursor to a more significant event or condition (e.g., inability to meet certain requirements in Technical Specifications or operating procedures, an event or SECURITY CONDITION that poses a threat to plant personnel or equipment, etc.).

(B) A minor loss of control of radioactive materials or the ability to control radiation levels within the plant.

(C) A consequence otherwise significant enough to warrant notification to local, State and Federal authorities.

Alert

An Alert involves:

Events in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. Any releases are expected to be limited to small fractions of the EPA PAG exposure levels.

This includes but is not limited to:

(A) A loss or potential loss of either the fuel clad or Reactor Coolant System (RCS) fission product barrier.

(B) An event or condition that significantly reduces the margin to a loss or potential loss of the fuel clad or RCS fission product barrier.

(C) A significant loss of control of radioactive materials resulting in an inability to control radiation levels within the plant, or a release of radioactive materials to the environment that could result in doses greater than 1% of an EPA PAG at or beyond the site boundary.

(D) A HOSTILE ACTION occurring within the OWNER CONTROLLED AREA, including those directed at an Independent Spent Fuel Storage Installation (ISFSI).

Site Area Emergency

A Site Area Emergency involves:

Events in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; 1) toward site personnel or equipment that could lead to the likely failure of or; 2) that prevent effective access to, equipment needed for the protection of the public. Any releases are not expected to result in exposure levels which exceed EPA PAG exposure levels beyond the site boundary.

This includes but is not limited to:

(A) A loss or potential loss of any two fission product barriers - fuel clad, RCS and/or containment.

(B) A precursor event or condition that may lead to the loss or potential loss of multiple fission product barriers within a relatively short period of time. Precursor events and conditions of this type include those that challenge the monitoring and/or control of multiple safety systems.

(C) A release of radioactive materials to the environment that could result in doses greater than 10% of an EPA PAG at or beyond the site boundary.

(D) A HOSTILE ACTION occurring within the plant PROTECTED AREA.

General Emergency

A General Emergency involves:

Events in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA PAG exposure levels offsite for more than the immediate site area.

This includes but is not limited to:

(A) Loss of any two fission product barriers AND loss or potential loss of the third barrier - fuel clad, RCS and/or containment.

(B) A precursor event or condition that, unmitigated, may lead to a loss of all three fission product barriers. Precursor events and conditions of this type include those that lead directly to core damage and loss of containment integrity.

(C) A release of radioactive materials to the environment that could result in doses greater than an EPA PAG at or beyond the site boundary.

(D) A HOSTILE ACTION resulting in the loss of key safety functions (reactivity control, core cooling/RPV water level or RCS heat removal) or damage to spent fuel.