



# **UNITED STATES NUCLEAR REGULATORY COMMISSION**

## **OFFICE OF NUCLEAR REACTOR REGULATION EMERGENCY PREPAREDNESS AND RADIATION PROTECTION BRANCH**

**SUBJECT: EMERGENCY PREPAREDNESS POSITION (EPPOS) ON ACCEPTABLE DEVIATIONS FROM APPENDIX 1 OF NUREG-0654 BASED UPON THE STAFF'S REGULATORY ANALYSIS OF NUMARC/NESP-007, "METHODOLOGY FOR DEVELOPMENT OF EMERGENCY ACTION LEVELS"**

### **PURPOSE**

To provide guidance to the staff on the acceptability of proposed emergency action level (EAL) revisions when those revisions depart from the guidance in Appendix 1 of NUREG-0654.

### **INTRODUCTION**

Regulatory Guide 1.101, Revision 3, endorsed NUMARC/NESP-007, Revision 2, "Methodology for Development of Emergency Action Levels," as an alternative means by which licensees could meet the regulations in 10 CFR 50.47(b)(4) and Appendix E to 10 CFR Part 50. Although Regulatory Guide 1.101 admonishes the mixing of the emergency classification guidance in NUMARC/NESP-007 with that in Appendix 1 to NUREG-0654, it is recognized that licensees who continue to utilize the example initiating conditions (ICs) in Appendix 1 to NUREG-0654 as the basis for their classification scheme could benefit from the guidance in NUMARC/NESP-007. To that end, licensees could utilize the technical bases under the example emergency action levels (EALs) in NUMARC/NESP-007 to enhance and clarify some of their site-specific EALs developed from NUREG-0654. The chosen classification scheme, whether based on Appendix 1 to NUREG-0654 or NUMARC/NESP-007, must remain internally consistent.

This paper provides examples of some of the acceptable changes that licensees may make based upon the staff's current understanding of the thresholds of the four emergency classes. It should be emphasized that all EAL changes must be discussed with and agreed upon by State and local officials in accordance with Appendix E to 10 CFR Part 50.

**DELETIONS - The following ICs may be removed from a licensee's classification scheme with exceptions and conditions as noted:**

1. *Unusual Event #16: Transportation of contaminated injured individual from site to offsite hospital.*

Basis: This event does not meet the threshold of the emergency class and is not a precursor to a more serious event. The event is reportable in accordance with 10 CFR 50.72 as a non-emergency.

2. *Unusual Event #4: Abnormal coolant temperature and/or pressure or abnormal fuel temperature outside technical specifications.*

3. *Unusual Event #8 Loss of containment integrity requiring shutdown by technical specifications.*

4. *Unusual Event #9 Loss of ESF or fire protection system function requiring plant shutdown by technical specifications (e.g., because of malfunction, personnel error or procedural inadequacy).*

5. *Unusual Event #15 Other plant conditions exist that... require plant shutdown under technical specification requirements...*

Basis: Exceeding technical specification limits for the period designated in the action statement is an analyzed condition of the plant and does not, by itself, represent an emergency. If plant conditions are outside of technical specification limits and those conditions do result in a degradation in the level of plant safety, other initiating conditions would trigger an appropriate classification within an acceptable time frame. Thus, in most cases, licensees should be afforded the opportunity to return plant parameters to within the technical specification limits as directed by the action statement. When the plant cannot be brought to the required operating mode within the allowable action statement time, then declaration of an Unusual Event would be warranted. Therefore, licensees who propose to eliminate the above ICs should incorporate an IC for "inability to reach required shutdown within technical specification limits." Also, licensees must maintain or add Unusual Event ICs for coolant activity exceeding technical specifications and for RCS leakage exceeding technical specifications. These two conditions are considered to be precursors to more serious events and warrant the declaration of an Unusual Event.

6. *Unusual Event #11*      *...significant loss of assessment...all meteorological instrumentation*

Basis: Due to the shift in emphasis from classification based upon dose assessment to classification based upon plant conditions, loss of meteorological instrumentation is no longer considered to meet the threshold of an Unusual Event. For licensees who have incorporated the loss of seismic monitoring instrumentation as an Unusual Event, this EAL may also be eliminated. Standard technical specifications allow a plant's seismic monitoring system to be out of service for days. In addition, loss of this instrumentation does not represent a significant loss of assessment capability.

NOTE:            Licensees may only remove this part of IC #11. EALs should be maintained for loss of communications capability and loss of indications or alarms.

7. *Unusual Event #1*      *The emergency core cooling system (ECCS) initiated and discharged to the vessel.*

Basis: This initiating condition does not differentiate between required and inadvertent actuations of ECCS and, therefore, its disposition must be justified in two parts. First, an inadvertent discharge of ECCS to the vessel, in and of itself, does not represent an emergency condition. An event of this nature is reportable in accordance with 10 CFR 50.72. Second, for required ECCS actuations, valid ECCS signals may be indicators of an RCS barrier challenge. Challenges to the RCS barrier are adequately addressed in Appendix 1 of NUREG-0654 under the example ICs Unusual Event #5, Alert #5, and Site Area Emergency #1.

NOTE:            The licensee's classification scheme must include equivalent ICs for Unusual Event #5, Alert #5, and Site Area Emergency #1 in order for the staff to accept the elimination of this IC.

8. *Alert #9*      *Coolant pump seizure leading to fuel failure*

Basis: This IC is unnecessary because the concern is the fuel failure and not the seizure of the pump. The condition is adequately addressed under Alert #1, "Severe loss of fuel cladding."

9. *Site Area Emergency #13c*      *EPA Protective Action Guidelines are projected to be exceeded outside the site boundary*

Basis: In order to more accurately discriminate between the Site Area Emergency and General Emergency thresholds based upon projected dose, the site boundary is chosen as a line of demarcation. As stated in the definition for the Site Area Emergency class, "any releases [are] not expected to exceed EPA Protective Action

Guideline exposure levels except near site boundary." As utilized in NUMARC/NESP-007, this should be interpreted as within the site boundary. When EPA Protective Action Guidelines are projected to be exceeded outside the site boundary, a General Emergency is warranted by definition. Therefore, site-specific EALs based upon example 13c. should be classified as a General Emergency. Example 13c. should be deleted as a Site Area Emergency threshold.

**REVISIONS - The thresholds for the following ICs may be clarified:**

1. For EALs related to loss of annunciation or indication in the Control Room, licensees may use the technical bases in the following NUMARC/NESP-007 ICs to enhance their classification schemes:

*SU3 Unplanned Loss of Most or All Safety System Annunciation or Indication in the Control Room for Greater Than 15 Minutes.*

*SA4 Unplanned Loss of Most or All Safety System Annunciation or Indication in the Control Room With Either (1) a Significant Transient in Progress, or (2) Compensatory Non-Alarming Indicators are Unavailable.*

*SS6 Inability to Monitor a Significant Transient in Progress.*

NOTE: Licensees who choose to make this revision to their NUREG-0654 schemes must revise all annunciator ICs utilizing the NUMARC bases.

2. For the Site Area Emergency and General Emergency EALs based upon dose projections, licensees may use the technical bases in the following NUMARC/NESP-007 ICs to enhance their classification schemes:

*AS1 Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 100 mR Whole Body or 500 mR Child Thyroid for the Actual or Projected Duration of the Release.*

*AG1 Boundary Dose Resulting from an Actual or Imminent Release of Gaseous Radioactivity Exceeds 1000 mR Whole Body or 5000 mR Child Thyroid for the Actual or Projected Duration of the Release Using Actual Meteorology.*

The integrated dose thresholds utilized in these example ICs, versus the dose rate thresholds in Appendix 1, are more consistent with the integrated doses provided in EPA 400, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents." However, note that whole body and child thyroid doses are no longer utilized to evaluate protective actions in accordance with

EPA 400. The total effective dose equivalent (TEDE) and committed dose equivalent (CDE) to the thyroid should be applied.

### **OTHER CHANGES**

The above changes do not represent a comprehensive list of possible improvements that could be made by utilizing the technical bases in NUMARC/NESP-007. Licensees may provide to the NRC other changes that utilize NESP-007 guidance. The staff should evaluate those changes on their individual merits and their compliment to the licensee's classification scheme as a whole.