

NEI 99-01
Rev. 4
(NUMARC/NESP-007)

Methodology for Development of Emergency Action Levels

September 2002

FOREWORD

Revision 4 to NUMARC/NESP-007 presents the methodology for development of emergency action levels as an alternative to NRC/FEMA guidelines contained in Appendix 1 of NUREG-0654/FEMA-REP-1, Rev. 2 "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," October 1980 and 10 CFR 50.47 (a)(4). Revision 4 (NEI 99-01) enhances Revision 3 (NEI 97-03) by consolidating the system malfunction initiating conditions and example emergency action levels which address conditions that may be postulated to occur at nuclear power plants during plant shutdown conditions (Recognition Category C). Also included are initiating conditions and example emergency action levels that fully address conditions that may be postulated to occur at permanently Defueled Stations (Recognition Category D) and Independent Spent Fuel Storage Installations (Recognition Category E).

Recognition Category C, D, and E initiating conditions and associated emergency action levels were written so that they could be implemented by both NUMARC/NESP-007 and NUREG-0654/FEMA-REP-1 users. As described in Appendix B, the industry anticipates that the NRC will provide written position so that NUREG-0654/FEMA-REP-1 users may implement Recognition Category C, D, and E even though they may have chosen to not fully implement the NUMARC/NESP-007 methodology.

Revision 4 was originally submitted to NRC for review and endorsement in August of 2000. Endorsement was delayed due to concerns related to Recognition Category D and E.

Revision 4 was resubmitted to NRC in September of 2002 with request for endorsement per Regulatory Guide 1.101 regardless of Recognition Category D and E. Changes to the September 2002 submittal of Revision 4 are limited as described below:

- Modifies HU4 to incorporate post September 11 security EAL changes based on the October 6, 2001 Safeguards Advisory Notice and the NRC's November 6, 2001 Information Assessment Team Recommended Actions in Response to a Site-specific Credible Threat at a Nuclear Power Plant. These security EAL changes were endorsed by letter from NRR to NEI dated February 4, 2002.
- Modifies EAL 1 associated with HU3 and HA4 to more closely describe the IC based on operating experience.

HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

HU3

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Release of Toxic or Flammable Gases Deemed Detrimental to Normal Operation of the Plant.

Operating Mode Applicability: All

Example Emergency Action Levels: (1 or 2)

1. Report or detection of toxic or flammable gases that have or could enter normally occupied areas of the site in amounts that can affect NORMAL PLANT OPERATIONS.
2. Report by Local, County or State Officials for evacuation or sheltering of site personnel based on an offsite event.

Basis:

This IC is based on the existence of uncontrolled releases of toxic or flammable gas that may enter the site boundary and affect normal plant operations. It is intended that releases of toxic or flammable gases are of sufficient quantity, and the release point of such gases is such that normal plant operations would be affected. This would preclude small or incidental releases, or releases that do not impact structures needed for plant operation. The EALs are intended to not require significant assessment or quantification. The IC assumes an uncontrolled process that has the potential to affect plant operations, or personnel safety.

Escalation of this EAL is via HA3, which involves a quantified release of toxic or flammable gas affecting VITAL AREAS.

HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

HU4

Initiating Condition – NOTIFICATION OF UNUSUAL EVENT

Confirmed Security Event Which Indicates a Potential Degradation in the Level of Safety of the Plant.

Operating Mode Applicability: All

Example Emergency Action Levels:

1. Security events as determined from (site-specific) Safeguards Contingency Plan and reported by the (site-specific) security shift supervision
2. A credible site specific security threat notification.

Basis:

Reference is made to (site-specific) security shift supervision because these individuals are the designated personnel on-site qualified and trained to confirm that a security event is occurring or has occurred. Training on security event classification confirmation is closely controlled due to the strict secrecy controls placed on the plant Safeguards Contingency Plan.

This EAL 1 is based on (site-specific) Site Security Plans. Security events which do not represent a potential degradation in the level of safety of the plant, are reported under 10 CFR 73.71 or in some cases under 10 CFR 50.72. Examples of security events that indicate Potential Degradation in the Level of Safety of the Plant are provided below for consideration.

Consideration should be given to the following types of events when evaluating an event against the criteria of the site specific Security Contingency Plan: SABOTAGE, HOSTAGE / EXTORTION, CIVIL DISTURBANCE, and STRIKE ACTION.

INTRUSION into the plant PROTECTED AREA by a HOSTILE FORCE would result in EAL escalation to an ALERT.

The intent of EAL 2 is to ensure that appropriate notifications for the security threat are made in a timely manner. Only the plant to which the specific threat is made need declare the Notification of an Unusual Event.

The determination of "credible" is made through use of information found in the (site-specific) Safeguards Contingency Plan.

A higher initial classification could be made based upon the nature and timing of the threat and potential consequences. The licensee shall consider upgrading the emergency response status and emergency classification in accordance with the [site security specific] Safeguards Contingency Plan and Emergency Plans.

HAZARDS AND OTHER CONDITIONS
AFFECTING PLANT SAFETY

HA3

Initiating Condition – ALERT

Release of Toxic or Flammable Gases Within or Contiguous to a VITAL AREA Which Jeopardizes Operation of Systems Required to Establish or Maintain Safe Shutdown.

Operating Mode Applicability: All

Example Emergency Action Levels: (1 or 2)

1. Report or detection of toxic gases within or contiguous to a VITAL AREA; in concentrations that may be unsafe to plant personnel AND personnel are NOT able to access the area for the safe operation of the plant.
2. Report or detection of gases in concentration greater than the LOWER FLAMMABILITY LIMIT within or contiguous to a VITAL AREA .

Basis:

This IC is based on gases that affect the safe operation of the plant. This IC applies to buildings and areas contiguous to plant VITAL AREAs or other significant buildings or areas (i.e., service water pump house). The intent of this IC is not to include buildings (e.g., warehouses) or other areas that are not contiguous or immediately adjacent to plant VITAL AREAs. It is appropriate that increased monitoring be done to ascertain whether consequential damage has occurred. Escalation to a higher emergency class, if appropriate, will be based on System Malfunction, Fission Product Barrier Degradation, Abnormal Rad Levels / Radioactive Effluent, or Emergency Director Judgment ICs.

EAL #1 is met if measurement of toxic gas concentration results in an atmosphere that is IDLH within a VITAL AREA or any area or building contiguous to VITAL AREA. Exposure to an IDLH atmosphere will result in immediate harm to unprotected personnel, and would preclude access to any such affected areas. Areas that require only temporary access that can be supported by the use of respiratory protection should not be considered as exceeding this threshold.

EAL #2 is met when the flammable gas concentration in a VITAL AREA or any building or area contiguous to a VITAL AREA exceed the LOWER FLAMMABILITY LIMIT. Flammable gasses, such as hydrogen and acetylene, are routinely used to maintain plant systems (hydrogen) or to repair equipment/components (acetylene - used in welding). This EAL addresses concentrations at which gases can ignite/support combustion. An uncontrolled release of flammable gasses within a facility structure has the potential to affect safe operation of the plant by limiting either operator or equipment operations due to the potential for ignition and resulting equipment damage/personnel injury. Once it has been determined that an uncontrolled release is occurring, then sampling must be done to determine if the concentration of the released gas is within this range.