



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
ON REVISED EMERGENCY ACTION LEVELS FOR
DETROIT EDISON
FERMI 2
DOCKET NO. 50-341

1.0 INTRODUCTION

By letter dated April 10, 1995, as supplemented by letters dated November 3, and December 14, 1995, Detroit Edison (the licensee) proposed changes to the Fermi 2 emergency action levels (EALs) to implement the NUMARC/NESP-007 EAL methodology. Specifically, the licensee provided Revision 13 to the Radiological Emergency Response Preparedness Plan (Section D, Emergency Classification System), draft Revision 23 to EP-101, "Classification of Emergencies," and Revisions 0 and 1 to the Fermi 2 Emergency Action Level (EAL) Technical Basis Document that describe how the proposed EALs incorporated the guidance in NUMARC/NESP-007, "Methodology for Development of Emergency Action Levels," Revision 2, January 1992. The NRC has endorsed NUMARC/NESP-007 as an acceptable method by which licensees may develop site-specific emergency classification schemes.

2.0 BACKGROUND

The proposed revision to the Fermi 2 emergency action levels (EALs) was reviewed against the requirements in 10 CFR 50.47 (b)(4) and Appendix E to 10 CFR Part 50.

Section 50.47 (b)(4) specifies that onsite emergency plans must meet the following standard: "A standard classification and action level scheme, the bases of which include facility system and effluent parameters, is in use by the nuclear facility licensee..."

Appendix E (IV)(C) specifies that "emergency action levels (based not only on onsite and offsite radiation monitoring information but also on readings from a number of sensors that indicate a potential emergency, such as pressure in containment and response of the Emergency Core Cooling System) for notification of offsite agencies shall be described....The emergency classes defined shall include (1) notification of unusual events, (2) alert, (3) site area emergency, and (4) general emergency."

ENCLOSURE

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In Revision 3 to Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactors," the NRC endorsed NUMARC/NESP-007, Revision 2, "Methodology for Development of Emergency Action Levels," as an acceptable method for licensees to meet the requirements of 10 CFR 50.47 (b)(4) and Appendix E to 10 CFR Part 50. The staff relied upon the guidance in NUMARC/NESP-007 as the basis for its review of the Fermi 2 EAL changes.

3.0 EVALUATION

The licensee documented the emergency classification system in Table D-1 of the Fermi Radiological Emergency Response Preparedness Plan and in Enclosures A and B to EPIP-101, "Classification of Emergencies." The classification system follows the NUMARC guidance. First presented were the initiating conditions (IC) and emergency action levels (EALs) for the Abnormal Rad Levels/Radiological Effluent recognition category. Second, were the ICs and EALs for Fission Product Barrier Degradation. Third, were the ICs and EALs for Hazards and Other Conditions Affecting Plant Safety. Fourth were the ICs and EALs for the System Malfunction category.

A technical basis for the revision of the emergency classification system, "Emergency Action Level (EAL) Technical Basis Document," was provided as an enclosure. The Technical Basis Document included justifications of deviations from the generic guidance. Detroit Edison has reviewed the emergency classification structure with its offsite authorities and received the concurrence of each. Concurrence letters from the State of Michigan, Monroe County and Wayne County were provided in the licensee's April 10, 1995, submittal package.

A majority of the proposed EALs conform closely to the guidance; however, several of the licensee's proposed EALs either depart from the example EALs in NUMARC/NESP-007 or include site-specific thresholds. Review of the licensee's justification for these variations, as discussed below, found the variations to be acceptable.

- A. An NUMARC example EAL for IC AU1 (and ICs AA1, AS1, and AG1) addresses a valid reading on a perimeter radiation monitoring system. Fermi 2 does not have a telemetered monitoring system and therefore does not have a corresponding EAL. This deviation is acceptable.
- B. An NUMARC example EAL for IC AU2 addresses uncontrolled water level decrease in the spent fuel pool and fuel transfer canal. Fermi 2 does not have a separate fuel transfer canal and therefore that aspect of the EAL was not addressed. In addition, example EAL for IC AU2 addresses (Site-specific) radiation reading for irradiated spent fuel in dry storage. Fermi 2 does not have onsite dry storage and therefore does not have a corresponding EAL. These deviations are acceptable.
- C. NUMARC example EAL AA2-3 addresses water level less than (site-specific) feet in the Reactor Refueling Cavity that will result in Irradiated Fuel Uncovering. In the Fermi technical basis document, the licensee states

that unless refueling floor radiation levels are high enough to require immediate evacuation from the refuel floor on a water level decrease, the Refueling Bridge Operator would place the fuel bundle in a safe condition (i.e., back into position in the reactor vessel or into a refuel pool storage location) and stop operation until level is restored. Therefore, the condition where fuel is removed from the vessel but not stored in the fuel pool is covered in EALs 1 and 2 and Fermi 2 has no EAL corresponding to NUMARC EAL AA2-3. This deviation is acceptable.

- D. NUMARC example EAL HU4-1 discusses a bomb device discovered within the plant Protected Area and outside the plant Vital Area. Fermi 2 considers the discovery of an explosive device within the Protected Area to be a "security event within the plant Protected Area" and classifies this event as an Alert under IC HA4, "Security Event in a Plant Protected Area." This deviation is acceptable.
- E. The NUMARC example EAL for the loss of the fuel clad barrier includes the condition "Other (site-specific) indications." The licensee included the following EAL as a site-specific indication of the loss of the fuel clad barrier.

- Determination of release of at least 5% of the gap activity from the fuel

The addition of this EAL meets the intent of the NUMARC guidance and is therefore acceptable.

- F. The NUMARC example EAL for the loss of the reactor coolant system (RCS) barrier includes the condition "(site-specific) indication of Main Steamline Break." The licensee removed this EAL from the fission product barrier matrix and added it as an Alert level EAL under the system malfunction category of EALs. The removal of the main steam line break as an indication of the loss of RCS is acceptable because if the main steam line isolates the RCS barrier is not lost. In addition, if the Main Steamline does not isolate, an EAL "Unisolable primary system leakage" is included as an EAL for the potential loss of the RCS barrier. The addition of an Alert level EAL under the system malfunction category for the main steam line break is warranted because of the probable release of radioactive material from the puff release associated with this malfunction. This deviation is acceptable.
- G. NUMARC ICs HU1 and HA1 for natural and destructive phenomena include the EAL, "site-specific occurrences." The licensee added the following site-specific occurrence EALs.

HU1 (Unusual Event classification level)

- Sustained wind speeds greater than 75 mph as measured at the 10M or 60M elevations on the meteorological tower

- External flooding indicated by wave crests exceeding the top of the shore barrier
- Internal flooding in the Auxiliary Building, Reactor Building, or RHR Complex that has the potential to affect the operation of safe shutdown equipment

HA1 (Alert classification level)

- High winds greater than 90 mph as measured at the 10 M or 60 M elevations on the meteorological tower
- Flooding from internal or external sources that has affected the operation of safe shutdown equipment in the Reactor Building, Auxiliary Building or RHR Complex

These site-specific EALs meet the intent of the NUMARC guidance and therefore are acceptable.

- H. NUMARC ICs HU4, HA4, and HS4 for security events include the EAL, "other security events as determined from (site-specific) Safeguards Contingency Plan." The licensee added the following site-specific EALs.

HU4 (Unusual Event classification level)

- Attempted unauthorized entry into the protected area
- Attempted sabotage within the protected area
- Internal disturbance within the protected area not brought under immediate control or presenting an unknown threat

HA4 (Alert classification level)

- Confirmed act of sabotage within the plant protected area

HS1 (Site Area Emergency classification level)

- Explosive device discovered in a plant vital area
- Confirmed act of sabotage within a plant vital area

These site-specific EALs meet the intent of the NUMARC guidance and therefore are acceptable.

- I. NUMARC IC SS4 defines an initiating condition for a complete loss of function needed to achieve or maintain hot shutdown. For BWRs, however, technical specifications define hot shutdown as placement of the reactor

mode switch in the "Shutdown" position and do not consider RCS temperature. To meet the intent of IC SS4, the licensee developed a site-specific EAL which addressed loss of cooling capability during hot shutdown. The EAL threshold value is:

Any combination of events which would require the plant to be shutdown from normal operating pressure and temperature,

and

Torus water temperature and RPV pressure which cannot be kept below the Heat Capacity Limit (HCL)

The threshold is indicative of a loss of available heat sink to reject decay and sensible heat in a shutdown condition. The EAL defines an event where a major function needed for the protection of the public (heat sink) has failed and thus warrants the declaration of a Site Area Emergency. The staff finds the licensee's approach acceptable in meeting the intent of the NUMARC IC.

- J. The NUMARC BWR EAL Fission Product Barrier Reference Table states that an event is classified as a Site Area Emergency when the following combination of lost or potentially lost barriers exist.

Loss of BOTH Fuel Clad and RCB

OR

Potential Loss of BOTH Fuel Clad and RCB

OR

Potential Loss of EITHER Fuel Clad OR RCB, and Loss of ANY Additional Barrier

The Fermi 2 EAL scheme states that an event is classified as a Site Area Emergency when the following conditions exist:

Loss or Potential Loss of Any Two Barriers

The licensee justifies the modification of the NUMARC Site Area Emergency classification criteria based on human factors considerations and the assertion that any loss or potential loss of two fission product barriers satisfies the definition of a Site Area Emergency.

The potential loss of the containment barrier coupled with the potential loss of the RCS or fuel clad is specifically excluded from the combination of lost or potentially lost barriers which constitute a Site Area Emergency under the NUMARC guidance. However, the indication (thresholds) for the potential loss of the containment barrier provided in the NUMARC guidance (i.e., drywell pressure at design pressure, hydrogen concentration, containment radiation levels, and reactor vessel level) are, of themselves, indications of the loss of fuel clad or RCS