



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

July 30, 2009

Mr. Kevin R. Bronson  
Site Vice President  
Entergy Nuclear Operations, Inc.  
Pilgrim Nuclear Power Station  
600 Rocky Hill Road  
Plymouth, MA 02360-5508

SUBJECT: PILGRIM NUCLEAR POWER STATION - SAFETY EVALUATION FOR  
EMERGENCY ACTION LEVELS (TAC NO. ME0101)

Dear Mr. Bronson:

By application dated October 17, 2008, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML083120381), as supplemented by letters dated June 1, 2009, and July 1, 2009, (ADAMS Accession Nos. ML091630097 and ML091890934, respectively), Entergy Nuclear Operations, Inc. (the licensee), requested prior U.S. Nuclear Regulatory Commission (NRC) approval for proposed changes to the emergency action levels (EALs) for the Pilgrim Nuclear Power Station (Pilgrim).

The requested changes to the licensee's EALs support a conversion from the current EAL scheme to a scheme based on Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels" (Revision 5, February 2008). Pilgrim currently uses an EAL scheme based on NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants."

The NRC staff performed a review of the proposed changes to Pilgrim's EALs as directed by Appendix E to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50. The NRC staff determined that incorporation of the proposed changes meets the standards in 10 CFR 50.47(b) and the requirements of Appendix E to 10 CFR Part 50, and provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. Therefore, the NRC staff concludes that the licensee's proposed changes to the EALs for Pilgrim, as outlined in its application dated October 17, 2008, as supplemented by letters dated June 1, 2009, and July 1, 2009, are acceptable.

K. R. Bronson

- 2 -

The licensee will implement the EALs as approved by the NRC (i.e., as provided in EAL Technical Bases Document referenced by the licensee's letter dated July 1, 2009), which includes the implementation of the Emergency Action Level Design Basis Document. If the licensee changes the EALs as approved by the enclosed Safety Evaluation via 10 CFR 50.54(q) prior to implementation, the licensee shall ensure that the changes are provided to the NRC during the next Emergency Preparedness baseline inspection.

Sincerely,

A handwritten signature in black ink, appearing to read "Eric J. Leeds". The signature is fluid and cursive, with the first name "Eric" and last name "Leeds" clearly distinguishable.

Eric J. Leeds, Director  
Office of Nuclear Reactor Regulation

Docket No. 50-293

Enclosure:  
As stated

cc: ListServ



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

PROPOSED REVISIONS TO EMERGENCY ACTION LEVELS

ENTERGY NUCLEAR OPERATIONS, INC.

PILGRIM NUCLEAR POWER STATION

DOCKET NO. 50-293

1.0 INTRODUCTION

By application dated October 17, 2008, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML083120381), as supplemented by letters dated June 1, 2009, and July 1, 2009, (ADAMS Accession Nos. ML091630097 and ML091890934, respectively), Entergy Nuclear Operations, Inc. (the licensee), requested prior U.S. Nuclear Regulatory Commission (NRC) approval for proposed changes to the emergency action levels (EALs) for the Pilgrim Nuclear Power Station (Pilgrim).

The requested changes to the licensee's EALs support a conversion from the current EAL scheme to a scheme based on Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels" (Revision 5, February 2008). Pilgrim currently uses an EAL scheme based on NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants."

2.0 REGULATORY EVALUATION

The NRC staff reviewed the proposed revision against the following regulations and guidance described below.

2.1 Regulations

Section 47 of Part 50, "Domestic Licensing of Production and Utilization Facilities," in Title 10 of the *Code of Federal Regulations* (10 CFR) sets forth emergency plan requirements for nuclear power plant facilities. Paragraph 50.47(a)(1)(i) states in part "... no initial operating license for a nuclear power reactor will be issued unless a finding is made by the NRC that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency." Paragraph 50.47(b) establishes the standards that the on-site and off-site emergency response plans must meet for NRC staff to make a positive finding that there is reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. One of these standards, 10 CFR 50.47(b)(4), stipulates that emergency plans include a standard emergency classification and action level scheme.

Section IV.B of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, states, in part, "The means to be used for determining the magnitude of, and for continually assessing the impact of, the release of radioactive materials shall be described, including emergency action levels that are to be used as criteria for determining the need for notification and participation of local and State agencies, the Commission, and other Federal agencies, and the emergency action levels that are to be used for determining when and what type of protective measures should be considered within and outside the site boundary to protect health and safety. The emergency action levels shall be based on in-plant conditions and instrumentation in addition to onsite and offsite monitoring. These initial emergency action levels shall be discussed and agreed on by the applicant or licensee and state and local governmental authorities, and approved by the NRC. Thereafter, emergency action levels shall be reviewed with the State and local governmental authorities on an annual basis. A revision to an emergency action level must be approved by the NRC before implementation if:

- (1) The licensee is changing from one emergency action level scheme to another emergency action level scheme (e.g., a change from an emergency action level scheme based on NUREG-0654 to a scheme based upon NUMARC/NESP-007 or NEI-99-01);
- (2) The licensee is proposing an alternate method for complying with the regulations; or,
- (3) The emergency action level revision decreases the effectiveness of the emergency plan."

## 2.2 Guidance

A revision to an entire EAL scheme, from NUREG-0654 to another NRC-endorsed EAL scheme, must be submitted for prior NRC approval as specified in Section IV.B. of Appendix E to 10 CFR Part 50. The Statement of Considerations for the final rule amending the NRC's regulations relating to NRC approval of EAL changes, dated January 26, 2005, stated in part, "The Commission believes a licensee's proposal to convert from one EAL scheme (e.g., NUREG-0654-based) to another EAL Scheme (NUMARC/NESP-007 or NEI 99-01 based) ... is of sufficient significance to require prior NRC review and approval. NRC review and approval for such major changes in EAL methodology is necessary to ensure that there is reasonable assurance that the final EAL change will provide an acceptable level of safety." Regulatory Guide 1.101, Revisions 3 and 4, "Emergency Planning and Preparedness for Nuclear Power Reactor," endorsed NUMARC/NESP-007 and NEI 99-01 EAL guidance respectively, as acceptable alternatives to the guidance provided in NUREG-0654 for development of EALs to comply with 10 CFR 50.47 and Appendix E to 10 CFR Part 50. A change in an EAL scheme to incorporate the improvements provided in NUMARC/NESP-007 or NEI 99-01 would not decrease the overall effectiveness of the emergency plan, but due to the potential safety significance of the change, needs prior NRC review and approval.

The NRC staff, in a letter dated February 22, 2008, from Christopher Miller to Alan Nelson (ADAMS Accession No. ML080430535), concluded the guidance contained in NEI 99-01, Revision 5, "Methodology for Development of Emergency Action Levels," dated February 2008 (ADAMS Accession No. ML080450149), is an acceptable method to develop an EAL scheme that meet the requirements of in Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4).

The following are also acceptable methods to the NRC staff for developing EALs that meet the requirements of in Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4):

- Appendix 1 to NUREG-0654/FEMA-REP-1, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," dated November 1980;
- NUMARC/NESP-007, Revision 2, "Methodology for Development of Emergency Action Levels," dated January 1992;
- NEI 99-01, Revision 4, "Methodology for Development of Emergency Action Levels," dated January 2003.

Guidance is also provided in Regulatory Issue Summary (RIS) 2003-18, with Supplements 1 and 2, "Use of NEI 99-01, Methodology for Development of Emergency Action Levels" (ADAMS Accession Nos. ML032580518, ML041550395, and ML051450482, respectively). This provides guidance for developing or changing a standard emergency classification and action level scheme. In addition, this RIS provides recommendations to assist licensees, consistent with Section IV.B of Appendix E to 10 CFR Part 50, in determining whether to seek prior NRC approval of deviations from the guidance.

### 3.0 TECHNICAL EVALUATION

The proposed changes were submitted to the NRC for a technical and regulatory review prior to implementation by the licensee, as required under Section IV.B.(1) of Appendix E to 10 CFR Part 50.

This evaluation is based on a revision to EALs provided in the licensee's application letter and supplemented by the licensee's responses to the NRC's requests for additional information.

Pilgrim currently utilizes an EAL scheme based on NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants." The licensee is converting to an EAL scheme based on NEI 99-01, Revision 5, dated February 2008. Henceforth, NEI 99-01, Revision 5, dated February 2008 will be referred to as NEI 99-01.

In its application and supplemental letters, the licensee submitted the proposed EALs for Pilgrim, their technical basis, a comparison matrix, the EAL numbering scheme, and an explanation for any difference or deviation from NEI 99-01. The comparison matrix provided a cross reference relating the proposed EAL scheme to the EALs in NEI 99-01. The NRC staff has reviewed the technical basis for the proposed EALs, the differences or deviations from NEI 99-01, and the licensee's justifications.

Therefore, the NRC staff reviewed the proposed EALs against the guidance in NEI 99-01 to determine if the EALs for Pilgrim, as provided in its application and supplemental letters, meet the guidelines in that document. The following NEI 99-01 guidelines were considered in the staff review:

- Consistency (i.e., the EALs would lead to similar decisions under similar circumstances at different plants)
- Human engineering and user friendliness
- Potential for classification upgrade only when there is an increasing threat to public health and safety
- Ease of upgrading and downgrading
- Thoroughness in addressing and disposing of the issues of completeness and accuracy raised regarding Appendix 1 to NUREG-0654
- Technical completeness for each classification level
- Logical progression in classification for multiple events
- Objective, observable values

The NRC staff reviewed the proposed EALs and has determined that the proposed EALs are consistent with EALs implemented at similar designed plants, use objective and observable values, and are consistent with the intent of NEI 99-01.

The NRC staff reviewed the proposed EALs to determine if the proposed EALs are worded in a manner that addresses human engineering and user friendliness concerns. The proposed EALs use procedure language, including specific tag numbers for instrument readings and alarms; use flow charts, critical safety function status trees, check lists, and combinations of the above. Based on this review, the staff has determined that the proposed EALs meet the guidelines in NEI 99-01 in this area.

The NRC staff reviewed the proposed EAL sets (a group of EALs within a category related to a common concern, i.e., the Unusual Event, Alert, Site Area Emergency, and General Emergency related to a failure of the plant to shutdown via an automatic scram would be considered an EAL set), and has determined that classification upgrades are based upon an increasing threat to public health and safety, can effectively support upgrading and downgrading, and follow a logical progression for multiple events. Based on this review, the NRC staff concludes that the EALs are in accordance with the intent of NEI 99-01 in these areas.

The NRC staff also reviewed the proposed EALs for technical completeness and accuracy for each classification level. The proposed EALs are based on risk assessment to set the boundaries of the emergency classification levels and assure that all EALs that trigger that emergency classification are in the same range of relative risk. Precursor conditions of more serious emergencies also represent a potential risk to the public and are appropriately classified. The staff has determined that the proposed EALs are consistent with NEI 99-01, which has been determined to be an acceptable alternative to EALs based on NUREG-0654, Appendix 1.

Based on its review of the proposed EALs, the NRC staff concludes that these EALs meet the guidelines in NEI 99-01 for all of the areas listed above in this section. Therefore, based on this, the staff further concludes that the proposed EALs meet NEI 99-01, which is an acceptable method to the regulatory requirements listed in Section 2.0 of this safety evaluation.

#### 4.0 CONCLUSION

The NRC staff performed a technical and regulatory review of the proposed changes to the Pilgrim EALs. The staff has determined that the proposed changes meet the guidelines in NEI 99-01, which is an acceptable method for the development of an EAL scheme that meets the regulatory requirements. Based on this, the staff concludes that the proposed EALs meet the standards in 10 CFR 50.47(b) and the requirements in Appendix E to 10 CFR Part 50 and provide reasonable assurance that the licensee will take adequate protective measures in a radiological emergency. Therefore, based on this conclusion, the NRC staff determined that the proposed EAL changes are acceptable.

Principal Contributor: D. Johnson

Date: July 30, 2009

K. R. Bronson

- 2 -

The licensee will implement the EALs as approved by the NRC (i.e., as provided in EAL Technical Bases Document referenced by the licensee's letter dated July 1, 2009), which includes the implementation of the Emergency Action Level Design Basis Document. If the licensee changes the EALs as approved by the enclosed Safety Evaluation via 10 CFR 50.54(q) prior to implementation, the licensee shall ensure that the changes are provided to the NRC during the next Emergency Preparedness baseline inspection.

Sincerely,

*/RA/*

Eric J. Leeds, Director  
Office of Nuclear Reactor Regulation

Docket No. 50-293

Enclosure:  
As stated

cc: ListServ

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\* SE input memo

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