February 25, 2008

Mr. Christopher M. Crane
President and Chief Nuclear Officer
Exelon Nuclear
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: EMERGENCY ACTION LEVEL REVISIONS FOR ZION NUCLEAR POWER STATION (TAC NOS. J00327 AND J00328)

Dear Mr. Crane:

By letter dated May 25, 2007, Exelon Generation Company, LLC, requested Nuclear Regulatory Commission (NRC) approval for changes to the emergency action levels (EALs) for Zion Nuclear Power Station Units 1 and 2 (Zion).

The requested changes to the Zion EALs support a conversion from their current EAL scheme to a scheme based on Nuclear Energy Institute's (NEI's) 99-01, "Methodology for Development of Emergency Action Levels", Revision 4, January 2003, in accordance with Regulatory Issue Summary 2003-18, including Supplements 1 and 2, "Use of NEI 99-01, Methodology for Development of Emergency Action Levels." Zion currently uses a hybrid mix of EAL methodologies based on NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants" and NUMARC/NESP-007, Revision 2, "Methodology for Development of Emergency Action Levels".

The NRC staff has completed a technical and regulatory review of the proposed EAL changes and supporting documentation. We have concluded that incorporation of the proposed changes does not decrease the effectiveness of the applicable Emergency Plans and that the plans, as changed, continue to meet the standards of Title 10 of the *Code of Federal Regulations* , Part 50, Section 50.47, "Emergency plans," paragraph (b) and the requirements of Appendix E to Part 50, "Emergency Planning and Preparedness for Production and Utilization Facilities." The basis for our conclusion is contained in the enclosed safety evaluation.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

If you have any questions, please contact me at 301-415-3017.

Sincerely,

/RA/

John B. Hickman, Project Manager
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket Nos. 50-295, 50-304
License Nos. DPR-39, DPR-48

Enclosure:
Safety Evaluation

cc w/encl: Zion Service List

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SAFETY EVALUATION BY THE OFFICE OF FEDERAL AND STATE MATERIALS

AND ENVIRONMENTAL MANAGEMENT PROGRAMS

RELATED TO PROPOSED REVISIONS TO THE EMERGENCY ACTION LEVELS

FOR THE ZION NUCLEAR POWER STATION DOCKET NOS. 50-295 AND 50-304

1.0 INTRODUCTION

By application letter dated May 25, 2007[1], Exelon Nuclear Generation, LLC (Exelon, the licensee), requested prior Nuclear Regulatory Commission (NRC) approval for changes to the emergency action levels (EALs) for the Zion Nuclear Power Station (Zion), Units 1 and 2.

The requested changes to the licensee's EALs supports a conversion from their current EAL methodology to a methodology based on NEI 99-01, "Methodology for Development of Emergency Action Levels," revision 4, January 2003[2], in accordance with Regulatory Issue Summary (RIS) 2003-18, including Supplements 1 & 2, "Use of NEI 99-01, Methodology for Development of Emergency Action Levels"[3]. Zion currently uses a hybrid mix of EAL methodologies based on NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants"[4] and NUMARC/NESP-007, Revision 2, "Methodology for Development of Emergency Action Levels"[5].

2.0 REGULATORY EVALUATION

The NRC staff reviewed the proposed revision against the following regulations and guidance:

2.1 Regulations

Paragraph (a)(1) to Section 50.47, "Emergency Plans," of 10 CFR Part 50 states that no operating license for a nuclear power reactor will be issued unless a finding is made by the Nuclear Regulatory Commission (NRC) that the state of onsite and offsite emergency preparedness provides reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency. Section 50.47 also establishes standards that must be met by the onsite and offsite emergency response plans 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, 50.47(b)(4),

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[1] ADAMS Accession Number ML071510308

[2] ADAMS Accession Number ML041470143

[3] ADAMS Accession Numbers ML032580518, ML041550395, and ML051450482

[4] ADAMS Accession Number ML040420012

[5] ADAMS Accession Number ML041120174

stipulates that emergency plans include a standard emergency classification and action level scheme.

Section IV.B to Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," of 10 CFR Part 50 provides that emergency plans are to include EALs, which are to be used as criteria for determining the need for notification and participation of local and State agencies and which are to be used for determining when and what type of protective measures should be considered both onsite and offsite to protect health and safety. EALs are to be based on in-plant conditions and instrumentation, and also on onsite and offsite monitoring. Section IV.B of Appendix E provides that initial EALs shall be discussed and agreed on by the applicant and State and local authorities and be approved by NRC, and reviewed annually thereafter with State and local authorities. In addition, Section IV.B of Appendix E states that an EAL revision must be approved by the NRC before implementation if it involves: (1) the changing from an EAL scheme based on NUREG-0654/FEMA-REP-1 to a scheme based on NUMARC/NESP-007 or NEI 99-01; (2) the licensee is proposing an alternate method for complying with the regulations; or (3) the EAL revision has been evaluated by licensee as constituting a decrease in effectiveness.

2.2 Guidance

Revision 4 to Regulatory Guide (RG) 1.101, issued in July 2003[6], endorses the guidance contained in NEI 99-01 as acceptable to the NRC staff as an alternative method to that described in Appendix 1 to NUREG-0654/FEMA-REP-1, dated November 1980, and NESP-007, Revision 2, dated January 1992, for developing EALs required in Section IV of Appendix E to 10 CFR Part 50 and 10 CFR 50.47(b)(4).

RIS 2003-18, including Supplements 1 & 2, provides guidance for developing or changing a standard emergency classification and action level methodology based on NEI 99-01. In addition, this RIS provides recommendations to assist licensees, consistent with Section IV.B to Appendix E of 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 of Appendix E to 10 CFR Part 50.

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

The staff reviewed the proposed EALs against the guidance in NEI 99-01 to determine if the EALs, as proposed, meet the following guidelines:

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[6] ADAMS Accession Number ML032020276

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

The staff reviewed the proposed EALs against EALs implemented at other plants of a similar design and has determined that the proposed EALs are consistent with EALs implemented at other plants, uses objective and observable values, and is consistent with the intent of NEI 99-01.

The staff has determined that the proposed EALs are worded such that human engineering and user friendliness concerns are addressed.

The 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, follows a logical progression for multiple events, and is in accordance with the intent of NEI 99-01.

The staff reviewed the proposed EALs for technical completeness and accuracy and has determined that the proposed EALs are consistent with NEI 99-01 which was determined to be an acceptable alternative to NUREG-0654 Appendix 1 EALs.

3.1 Deviations / Differences

The licensee did not propose any deviations from the NEI 99-01 methodology, where a deviation would alter the meaning or intent, such that the classification of the event could be different from the guidance. However, the licensee did propose several differences from the NEI 99-01 methodology, where a deviation would agree in meaning or intent but may use site-specific terminology or administrative re-formatting. The differences proposed are addressed below.

Where NEI uses "Permanently Defueled Station Malfunction" as the heading for each EAL, Zion uses "Defueled Station Emergency Plan." This is a phrasing difference which does not affect the function and is acceptable.

Where NEI uses "Operating Mode Applicability: Not Applicable," Zion has deleted that subheading. As a permanently shutdown and defueled reactor, Zion has no operating modes. Therefore, to include a statement that operating mode applicability is not applicable, is unnecessary, and the deletion is acceptable.

Where NEI uses the subheading of "Example Emergency Action Levels," Zion uses "Emergency Action Level Threshold Values." This is a phrasing difference which does not affect the function and is acceptable.

Zion has added a subheading "Termination/Recovery Considerations" for clarity. This provides a heading for the section addressing de-classification, does not affect the function, and is acceptable.

Where NEI uses the acronym NOUE for the Notification of Unusual Event classification, Zion uses "Unusual Event." This is a phrasing difference which does not affect the function and is acceptable.

Zion has chosen to use a designation methodology for the EALs that is different from NEI. This is a numbering difference which does not affect the function and is acceptable.

For NEI EAL D-AU1, which Zion refers to as RU1, Zion revised the reference to release limits and durations from “>” to “≥” for consistency. This change is minor and acceptable. Zion also revised the basis statement regarding liquid effluents to reflect site specific values including the fact that the release limit is 20 times the value specified in 10 CFR 20, Appendix B, verses 2 times the limit. The actual EAL is the same as the NEI guidance, therefore the EAL is consistent and acceptable.

For NEI EAL D-HU3, which Zion refers to as HU3, Zion uses the designation RESTRICTED AREA rather than PROTECTED AREA in the NEI guidance. Zion station is in a permanently shutdown condition. In that condition the licensee has no systems, structures, or components that are required to be classified as safety-related. Therefore, the site PROTECTED AREA as defined in 10 CFR 73, which Zion refers to as the SECURITY AREA, is limited to the spent fuel pool. The site RESTRICTED AREA, as defined in 10 CFR 19 and 20, incorporates a larger area that encompasses the PROTECTED/SECURITY AREA. Therefore the use of RESTRICTED AREA at Zion more accurately reflects the intent of the NEI guidance and incorporates site specific terminology which does not affect the function and is acceptable. NEI guidance also provides for seismic instrumentation. Zion has no seismic instrumentation so this option is not included. This difference incorporates a site specific variation which does not affect the function and is acceptable.

For NEI EAL D-AA1, which Zion refers to as RA1, Zion revised the reference to release limits and durations from “>” to “≥” for consistency. This change is minor and acceptable. Zion also revised the basis statement regarding liquid effluents to reflect site specific values. The actual EAL is the same as the NEI guidance, therefore the EAL is consistent and acceptable.

For NEI EAL D-AA2, which Zion refers to as RA2, Zion did not incorporate EAL 2 which addresses areas that require continuous occupancy. Amendment nos. 183 and 170, for Units 1 and 2 respectively, eliminated the technical specification requirement for at least one person qualified to stand watch be present in the control room when nuclear fuel is stored in the spent fuel pool. As a result of this amendment, Zion station does not have any areas that require continuous occupancy within the radiologically controlled area (RCA). Zion station does have

security facilities that require continuous manning. However, these areas are outside the RCA and do not have installed radiation monitoring. Furthermore, there are no postulated accidents,

provided in Chapter 5 of the Zion Defueled Safety Analysis Report, that can lead to a dose rate in the security facility greater than 15mR/hr, which is the level specified in the NEI guidance. Therefore, this EAL is not applicable to Zion and the elimination of it from the methodology is acceptable.

For NEI EAL D-HA1, which Zion refers to as HA1, Zion eliminated reference to the control room as an area for a security event. Associated with amendments 183 and 170, it was noted that controls for spent fuel were located locally and not in the control room. Based on this, the EAL reference to a security event in the fuel building is the only area applicable to Zion and the elimination of the reference to the control room is acceptable.

4.0 CONCLUSION

The staff performed a technical and regulatory review of the proposed changes to the Zion EALs. The staff has determined, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the proposed emergency plan changes will not be inimical to the common defense and security or to the health and safety of the public.

The staff has determined that incorporation of the proposed changes does not decrease the effectiveness of the applicable Emergency Plans and the plans, as changed, continue to meet the standards of Section 50.47(b) and the requirements of Appendix E to 10 CFR Part 50.

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