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

November 6, 2009

Mr. Benjamin Waldrep, Vice President
Brunswick Steam Electric Plant
Carolina Power & Light Company
Post Office Box 10429
Southport, North Carolina 28461

SUBJECT: BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2 – REVISION TO EMERGENCY ACTION LEVELS (TAC NOS. ME0117 AND ME0118)

Dear Mr. Waldrep:

By letter dated November 14, 2008, and supplemented by letters dated December 19, 2008, June 25 and August 24, 2009, Carolina Power & Light Company (the licensee) requested the U.S. Nuclear Regulatory Commission (NRC) approval for proposed changes to the emergency action levels (EALs) for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2.

The requested changes to the licensee's EALs support a conversion from the current EAL scheme to one based on Nuclear Energy Institute 99-01, "Methodology for Development of Emergency Action Levels," Revision 5, February 2008. The BSEP 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 the BSEP Units 1 and 2 EALs as directed by Section IV.B.(1) of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," 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 measure 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 BSEP, as outlined in the above-mentioned application and supplemental letters (References 1 through 4 of the enclosed safety evaluation), are acceptable.

It is expected that the licensee implements the EALs as found acceptable by the NRC, which is provided in Enclosure 2 of the licensee's letter dated August 24, 2009, and includes the implementation of the Emergency Action Level Technical Basis Document. If the licensee changes the EALs 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,

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation

Docket Nos. 50-325 and 50-324

Enclosure:
Safety Evaluation

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

CAROLINA POWER & LIGHT COMPANY

BRUNSWICK STEAM ELECTRIC PLANT, UNITS 1 AND 2

DOCKET NOS. 50-325 AND 50-324

1.0 INTRODUCTION

By letter dated November 14, 2008, (Reference 1), and supplemented by letters dated December 19, 2008, June 25 and August 24, 2009 (References 2, 3 and 4), Carolina Power & Light Company (the licensee) requested the U.S. Nuclear Regulatory Commission (NRC or Commission) approval for proposed changes to the emergency action levels (EALs) for the Brunswick Steam Electric Plant (BSEP), Units 1 and 2.

The requested changes to the licensee's EALs support a conversion from the current EAL scheme to one based on Nuclear Energy Institute (NEI) 99-01, "Methodology for Development of Emergency Action Levels," Revision 5, February 2008 (Reference 5); henceforth referred to as NEI 99-01. BSEP 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" (Reference 6).

2.0 REGULATORY EVALUATION

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

2.1 Regulations

Section 47, "Emergency Plans," 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) of 10 CFR states, in part, that "... 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." Section 50.47(b) establishes the standards that the onsite and offsite 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.

Enclosure

Section IV.B of Appendix E, "Emergency Planning and Preparedness for Production and Utilization Facilities," to 10 CFR Part 50, states, in part, that:

> 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 [Methodology for Development of Emergency Action Levels] 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

Regulatory Guide 1.101, "Emergency Planning and Preparedness for Nuclear Power Reactor," Revision 3 (Reference 7) and Revision 4 (Reference 8), endorsed NUMARC/NESP-007 and NEI 99-01 Revision 4 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, Revision 4 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, of NEI, (Reference 9), concluded that the guidance contained in NEI 99-01 is an acceptable method to develop an EAL scheme to 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 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; and

- 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," (Reference 10). 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

In its application and supplemental letters, the licensee submitted the proposed EALs for the BSEP, the 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 evaluation of the proposed changes.

The following NEI 99-01 guidelines were considered in the NRC 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; and

- objective, observable values.

The NRC staff reviewed the proposed EALs, and has determined that the proposed EALs are consistent with EALs implemented at similarly designed plants. In addition, these EALs use objective and observable values, and are consistent with the guidance in NEI 99-01 in these areas.

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 are consistent with the guidance in NEI 99-01 in these areas.

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 consistent with the guidance in 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 NRC staff has determined that the proposed EALs are consistent with the guidance in NEI 99-01 in these areas.

Based on its review of the proposed EALs, the NRC staff concludes that these EALs are consistent with the guidance in NEI 99-01 for all of the areas listed above in this section.

4.0 CONCLUSION

The NRC staff performed a technical and regulatory review of the proposed changes to the BSEP EALs. The NRC 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 determines that the proposed EAL changes are acceptable.

5.0 REFERENCES

1. Letter from Progress Energy to the NRC, "Conversion of Emergency Action Levels Based on NEI 99-01 Revision 5," dated November 14, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML083250250).

2. Letter from Progress Energy to the NRC, "Additional Information for the Conversion of Emergency Action Levels Based on NEI 99-01 Revision 5," dated December 19, 2008 (ADAMS Accession No. ML083650140).

3. Letter from Progress Energy to the NRC, "Response to a Request for Additional Information Related to the NRC Approval of Proposed Brunswick Nuclear Power Station Upgraded Emergency Action Levels Using NEI 99-01 Revision 5 Methodology," dated June 25, 2009 (ADAMS Accession No. ML091800439).

4. Letter from Progress Energy to the NRC, "Response to a Request for Additional Information Related to the NRC Approval of Proposed Brunswick Nuclear Power Station Upgraded Emergency Action Levels Using NEI 99-01 Revision 5 Methodology," dated August 24, 2009 (ADAMS Accession No. ML092430300).

5. NEI 99-01, Revision 5, "Methodology for Development of Emergency Action Levels," February 2008 (ADAMS Accession No. ML080450149).

6. NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," (ADAMS Accession No. ML040420012).

7. Regulatory Guide 1.101, Revision 3, "Emergency Planning and Preparedness for Nuclear Power Reactors," dated August 1992 (ADAMS Accession No. ML003740302).

8. Regulatory Guide 1.101, Revision 4, "Emergency Planning and Preparedness for Nuclear Power Reactors," dated July 2003 (ADAMS Accession No. ML032020276).

9. Letter from Christopher Miller, NRC to Alan Nelson, NEI, "US Nuclear Regulatory Commission Review and Endorsement of NEI 99-01, Revision 5, Dated February 2008," dated February 22, 2008 (ADAMS Accession No. ML080430535).

10. Regulatory Issue Summary 2003-18, with Supplements 1 and 2, "Use of NEI 99-01, Methodology for Development of Emergency Action Levels," January 2003 (ADAMS Accession Nos. ML032580518, ML041550395, and ML051450482).

Principal Contributor: Don Johnson

Date: November 6, 2009

It is expected that the licensee implements the EALs as found acceptable by the NRC, which is provided in Enclosure 2 of the licensee's letter dated August 24, 2009, and includes the implementation of the Emergency Action Level Technical Basis Document. If the licensee changes the EALs 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 Nos. 50-325 and 50-324

Enclosure:
Safety Evaluation

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