

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

PROPOSED REVISIONS TO EMERGENCY ACTION LEVEL SG2.1

MONTICELLO NUCLEAR POWER STATION

NORTHERN STATES POWER COMPANY – MINNESOTA\*

DOCKET NO. 50-263

1.0 INTRODUCTION

By application dated May 9, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML081300837), and supplemented by letter dated April 28, 2009, (ADAMS Accession No. ML091190415), Nuclear Management Company, LLC\* (the licensee), requested prior Nuclear Regulatory Commission (NRC) approval for a proposed change to Emergency Action Level (EAL) SG2.1 for the Monticello Nuclear Generating Station (MNGP). The proposed change is intended to clarify the intent of this EAL SG2.1 and to preclude General Emergency declarations when plant conditions do not warrant the declaration.

2.0 REGULATORY EVALUATION

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

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 the 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:

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\*On September 22, 2008, Nuclear Management Company, LLC, transferred its operating authority to its parent, Northern States Power Company, a Minnesota corporation (NSPM). By letter dated September 3, 2008 (Accession No. ML082470648), NSPM stated that it accepts responsibility for all actions before the NRC staff which were previously initiated or addressed by Nuclear Management Company

*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 Documents

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 alternative method to develop an EAL scheme that meet the requirements of 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;
- NEI 99-01, Revision 4, "Methodology for Development of Emergency Action Levels," dated January 2003.

Regulatory Information Summary (RIS) 2005-002 discusses a decrease in effectiveness based on capability and functions and whether the capability to perform the functions that meet the

emergency preparedness regulatory requirements have been lost or degraded. RIS 2005-002 provides a table with examples of plan changes that constitute a decrease in effectiveness; however, the examples in the table were not intended to be representative of all situations. Additionally, page 4 of the RIS provides guidance for the licensee to evaluate the capability to perform the required functions and the associated time lines. The NRC staff evaluated the information provided and considered the compensatory measures described to offset any potential decrease in effectiveness.

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 No's. ML032580518, ML041550395, and ML051450482, respectively). These documents provide 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

By the two submittals referenced in Section 1.0 above, the licensee submitted the proposed change to the NRC for a technical and regulatory review prior to implementation, as required under 10 CFR 50.54(q). MNGP currently uses an EAL scheme based on NEI 99-01 Revision 4 (Reference 4). In the referenced submittals the licensee submitted the proposed EAL, its technical basis, and an explanation for any difference or deviation from NEI 99-01. The NRC staff reviewed the technical basis for the proposed EAL and the licensee's justifications.

The licensee stated that the language of the current EAL SG2.1 would require declaration of a General Emergency when MNGP is in an Anticipated Transient Without a Scram (ATWS) condition and Reactor Pressure Vessel (RPV) level was less than -149 inches. However, the licensee's Emergency Operating Procedures (EOPs) allow for a temporary reduction in RPV level and directs that RPV level be restored and maintained greater than -149 inches. The EOPs direct, under some situations, that the RPV level be restored and maintained above this level, indicating that temporary reductions below this level are acceptable in accordance with the Boiling Water Reactor Owners Group emergency operating procedural guidance. The licensee further provides that with safety relief valve actuation, this is a difficult band to maintain and as such, the EOPs permit the operators to restore and maintain RPV level above -149 inches. However, a momentary drop in RPV level below the -149 inch level in response to an ATWS would currently require declaration of a General Emergency.

The licensee further states that it believes that declaration of a General Emergency for a momentary drop in RPV level below -149 inches during an ATWS event is not in the best interest for protection of the general public due to the impact of an unwarranted General Emergency declaration. Declaration of a General Emergency requires Protective Action Recommendations to be made and administration of potassium iodide (KI) to the general public. These actions have the potential for adversely affecting the public health and safety due to the impact of evacuations and the potential for allergic reactions to KI. Therefore, General Emergency declarations for the above condition should be avoided.

During its review, the NRC staff asked the licensee to consider using the wording from NEI 99-01 Revision 5 (Reference 3) for this EAL. In response, the licensee proposed to revise the language from the following wording:

Indication(s) exist that automatic and manual scram were NOT successful in reducing power to LESS THAN 3%

**AND**

Either of the following: (a or b)

- a. Indication(s) exist that the core cooling is extremely challenged as indicated by RPV level less than -149 in.

**OR**

- b. Indication(s) exists that heat removal is extremely challenged as indicated by Torus temperature and RPV pressure cannot be maintained LESS THAN Heat Capacity Limit (C.5-1200 fig. M, SPDS 78)

to the following language:

- a. An automatic scram (trip) failed to shutdown the reactor.

**AND**

- b. Indication(s) exist that all manual scram actions were NOT successful in reducing power to LESS THAN 3%.

**AND**

- c. EITHER of the following exist or have occurred due to continued power generation:
- RPV level cannot be restored and maintained GREATER THAN OR EQUAL TO -149 inches
  - Indication(s) exists that heat removal is extremely challenged as indicated by Torus temperature and RPV pressure cannot be maintained LESS THAN Heat Capacity Limit (C.5-1200 fig. M, SPDS 78)

The NRC staff reviewed the proposed EAL against the guidance in NEI 99-01 to determine if it meet the guidelines in that document. The following NEI 99-01 guidelines were considered in the NRC staff's 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 EAL SG2.1 and has determined that it is consistent with EALs implemented at plants similar in design, that it uses objective and observable values, and that it is consistent with the intent of NEI 99-01.

The NRC staff reviewed the proposed EAL to determine if it is worded in a manner that addresses human engineering and user-friendliness concerns. Based on this review, the NRC staff determined that the proposed EAL meets the guidelines in NEI 99-01 in this area.

The NRC staff reviewed the proposed EAL set (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 EAL is in accordance with the intent of NEI 99-01 in this area.

The NRC staff also reviewed the proposed EAL for technical completeness and accuracy. The NRC staff has determined that the proposed EAL is 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 EAL, the NRC staff concludes that this EAL meets the guidelines in NEI 99-01 for all of the areas listed above in this section. Therefore, the NRC staff further concludes that the proposed EALs meets NEI 99-01, which is an acceptable alternative 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 change to Monticello EAL SG2.1. The NRC staff determined that the proposed changes meet the guidelines in NEI 99-01, which is an acceptable alternative for development of an EAL scheme that meets the regulatory requirements. Based on this, the NRC staff determined that incorporation of the proposed change to SG2.1 would not decrease the effectiveness of the MNGP Emergency Plan and the plan as changed will continue to meet the standards cited in Section 2.0 above. In light of the above, no NRC approval is necessary.

## 5.0 REFERENCES

1. Letter from NMC to the NRC, "Revision to Emergency Action Level SG2.1," dated May 9, 2008, (ADAMS Accession No. ML081300837).
2. Letter from NSPM to the NRC, "Response to NRC Requests for Additional Information for a Proposed Revision to Emergency Action Level SG2.1," dated April 28, 2009 (ADAMS Accession No. ML091190415).
3. NEI 99-01, Revision 5, "Methodology for Development of Emergency Action Levels," February 2008 (ADAMS Accession No. ML080450149).
4. NEI 99-01, Revision 4, "Methodology for Development of Emergency Action Levels," January 2003 (ADAMS Accession No. ML041470143).
5. 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 No's. ML032580518, ML041550395, and ML051450482).
6. Regulatory Guide 1.101, Revision 4, "Emergency Planning and Preparedness for Nuclear Power Reactors," dated July 2003 (ADAMS Accession No. ML032020276).
7. NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," (ADAMS Accession No. ML040420012).
8. 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).

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