

September 24, 2004

Mr. Thomas Coutu
Site Vice President
Kewaunee Nuclear Power Plant
Nuclear Management Company, LLC
N490 Highway 42
Kewaunee, WI 54216-9511

SUBJECT: KEWAUNEE NUCLEAR POWER PLANT - ISSUANCE OF AMENDMENT
RE: TURBINE BUILDING SERVICE WATER HEADER ISOLATION
(TAC NO. MB9944)

Dear Mr. Coutu:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 177 to Facility Operating License No. DPR-43 for the Kewaunee Nuclear Power Plant. This amendment revises the Technical Specifications (TSs) in response to your application dated July 7, 2003, as supplemented March 17, May 18, and August 18, 2004.

The amendment revises TS Section 3.3.e, "Service Water System," to add requirements for the turbine building service water header isolation logic.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next regular biweekly *Federal Register* notice.

Sincerely,

/RA/

Carl F. Lyon, Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-305

Enclosures: 1. Amendment No. 177 to License No. DPR-43
2. Safety Evaluation

cc w/encls: See next page

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Kewaunee Nuclear Power Plant

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NUCLEAR MANAGEMENT COMPANY, LLC

DOCKET NO. 50-305

KEWAUNEE NUCLEAR POWER PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 177
License No. DPR-43

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Nuclear Management Company, LLC (NMC), dated July 7, 2003, as supplemented March 17, May 18, and August 18, 2004, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-43 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 177, are hereby incorporated in the license. The licensees shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

L. Raghavan, Chief, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical
Specifications

Date of Issuance: September 24, 2004

ATTACHMENT TO LICENSE AMENDMENT NO. 177

FACILITY OPERATING LICENSE NO. DPR-43

DOCKET NO. 50-305

Replace the following pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

TS 3.3-7
TS Table 4.1-1 (Page 7 of 7)

INSERT

TS 3.3-7
TS Table 4.1-1 (Page 7 of 7)

The following marked-up TS Bases page is provided for information only.

TS B3.3-4

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATING TO AMENDMENT NO. 177 TO FACILITY OPERATING LICENSE NO. DPR-43

NUCLEAR MANAGEMENT COMPANY, LLC

KEWAUNEE NUCLEAR POWER PLANT

DOCKET NO. 50-305

1.0 INTRODUCTION

By application to the U.S. Nuclear Regulatory Commission (NRC) July 7, 2003 (ADAMS Accession No. ML031980490), as supplemented by letters dated March 17 (ML040850547), May 18, 2004 (ML041480158), and August 18, 2004 (ML042390460), Nuclear Management Company, LLC (NMC, or the licensee) requested changes to Technical Specification (TS) 3.3.e, "Service Water System," for the Kewaunee Nuclear Power Plant (Kewaunee). The proposed changes include operability requirements for the non-essential service water (SW) header isolation valves, the associated valve isolation logic, and surveillance requirements.

The licensee stated that its analysis demonstrated that SW flow to the non-safety related turbine building SW header might be exceeded under some postulated accident conditions, and the subsequent decrease of SW flow to the safety-related components could impact the ability to remove design-basis heat loads from safety-related components. As provided in the original SW system design, however, operators had the ability to isolate the turbine building SW supply through remote manually controlled isolation valves SW-4A or 4B. The proposed changes to the TSs establish operability requirements for the turbine building service water header isolation valves and the associated isolation logic which will automatically close the isolation valves upon receipt of a safety injection signal concurrent with a low-pressure signal in the respective SW header. The licensee also proposes to add a surveillance requirement to ensure that design capabilities are maintained and tested.

The supplements, dated March 17, May 18, and August 18, 2004, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on August 5, 2003 (68 FR 46244).

Specifically, the proposed changes would add TS Section 3.3.e.1.A.3, as follows.

A. TWO service water trains are OPERABLE with each train consisting of:

...

3. An OPERABLE turbine building service water header isolation valve and associated isolation logic capable of closing the header isolation valve, or a closed and deactivated turbine building service water header isolation valve.

The proposed changes also add a surveillance requirement to Table TS 4.1-1 to calibrate and test the SW turbine header isolation logic trip each refueling cycle.

2.0 REGULATORY EVALUATION

The regulatory requirements on which the NRC staff based its review of the licensee's proposed changes to the TSs are in Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a(h), "Protection and safety systems." Specifically, 10 CFR 50.55a(h)(2) provides requirements for protection systems for nuclear power plants and references Institute of Electrical and Electronics Engineers (IEEE) Standard 279, "Criteria for Protection Systems for Nuclear Power Generating Stations," as an optional standard. IEEE 279-1968 is the licensing basis for Kewaunee protection systems.

The staff also considered (1) NRC standard practice with respect to Allowed Outage Times (AOTs) for TS LCOs, as reflected in NUREG-1431, "Standard Technical Specifications Westinghouse Plants," and (2) the current plant licensing basis as reflected in Section 9.6.2 of the Kewaunee Updated Safety Analysis Report (USAR), "Service Water System." USAR Section 9.6.2 states that "automatic isolation actuates on a train basis to maintain cooling as long as possible to the non-safety features equipment."

3.0 TECHNICAL EVALUATION

3.1 Background

The SW System at Kewaunee was designed to provide redundant cooling water supplies to the following safety-related components: the containment fan coil units, diesel generators, air compressors, component cooling heat exchangers, safety injection pump stuffing boxes and/or coolers, and control room air conditioners. Cooling water for some non-essential and non-redundant coolers and equipment is also supplied from the SW headers. The original design includes the provision for remote manual isolation of non-essential loads following an accident. Two electric motor-driven SW pumps are connected to a SW Header A and two are connected to SW Header B. The headers are connected by normally-open valves SW-3A and 3B. A safety injection signal or a SW low-pressure signal will close redundant valves SW-3A and 3B. Once this occurs, the SW headers will become independent and redundant. Two of the SW pumps serving one header receive power from one 4160V safety-feature bus, and the other two SW pumps serving the other header receive power from a separate safety-feature bus. Each header has an isolation valve (SW-4A or 4B) to isolate SW to non-essential turbine building loads. Only one header is connected to the turbine building non-essential components at a time. Both headers need to have protection against excess turbine building SW header pressure demand, because it cannot be predicted which header would be aligned to the non-essential loads at the start of an accident.

While conducting SW system testing during the 2001 refueling outage, the licensee discovered the potential for higher-than-expected non-safety related turbine building SW demand during

some postulated accident conditions. The increased turbine building SW flow, and subsequent decreased safety-related SW flow, could impact the ability of the safety-related SW flow to remove the design basis heat loads from safety-related components. The original design of the SW system provided for remote manual operation of isolation valves from the control room, which could be used to isolate the SW flow to the non-safety related turbine building components. However, the licensee determined that automatic isolation was necessary to assure adequate SW flow to safety-related components under postulated accident conditions.

The licensee initiated Design Change Request (DCR)-3338 under 10 CFR 50.59 to install actuation circuitry to automatically close the turbine building non-essential SW supply by actuating the respective isolation valve SW-4A or SW-4B upon initiation of a safety injection signal concurrent with a low SW header pressure.

3.2 Evaluation

The licensee proposes to add TS 3.3.e.1.A.3 to establish operability requirements for the non-essential turbine building service water header isolation valves and associated valve isolation logic, as well as surveillance requirements to ensure that design basis capabilities are maintained.

The automatic isolation of SW to non-essential load design provides independent and redundant closure signals to the SW-4 valves: A-train to SW-4A and B-train to SW-4B. The closure signals are developed from the safety injection sequence signal coincident with low SW header pressure on the corresponding A-train and B-train SW headers. The signal for SW isolation logic is at step 9 of the safety injection sequence. Step 9 is a later point in the safety injection sequence than the automatic start of both SW pumps. This is an appropriate step in the safety injection sequence because of the time necessary to establish header pressures with both pumps running on the respective header. Using low header pressure as the coincident signal is appropriate because it indicates that SW supply to the safety-related loads will not be adequate unless the SW supply to the non-essential load is isolated.

The licensee stated that it performed single-failure analysis for the control circuit to assess the impact of a failure on the safety-related portion of the service water system. The turbine building header can only be selected to one engineered safeguards header of service water at a time. Each safeguards service water header is capable of handling 100 percent of the post accident SW cooling needs. Since there can only be one safeguards header selected at any one time to provide turbine building header flow, there is no single failure that can cause both trains of engineered safeguards service water to be inoperable. Therefore, the design meets the single-failure criterion at the system level.

The staff evaluated the licensee's proposed changes using IEEE 279-1968, which is part of the licensing basis for Kewaunee. DCR-3338 does not provide for a new plant protection system. Instead, it uses the output from an existing protection system (safety injection actuation) in conjunction with low SW header pressure, to automatically isolate the non-safeguards SW header to assure that the safeguards SW flow and pressure assumed in the licensee's accident analysis is provided for engineered safeguards SW loads. Since the isolation function is necessary to mitigate a design basis accident, the design of the isolation logic is required to meet the protection system design criteria required by 10 CFR 50.55a(h), which for Kewaunee is IEEE 279. In Enclosures 3, 4, and 5 to its letter dated March 17, 2004 (ML040850547), the

licensee addressed how DCR-3338 conformed to the 21 requirements of Section 4, "Requirements," of IEEE 279-1968. The NRC staff reviewed DCR-3338 and the licensee's assessment and, based on the licensee's assessment, has determined that DCR-3338 conforms to IEEE 279-1968.

The addition of TS 3.3.e.1.A.3 will ensure the SW system is capable of supplying cooling water flow to the required safety-related components, under all conditions, by automatically isolating SW flow to the turbine building when necessary during a design-basis accident. The operators currently have the ability to isolate the turbine building service water supply through manual remote actuation of the non-essential service water header isolation valves, SW-4A and 4B. This change to the TS will establish requirements for automatically closing the turbine building non-essential SW supply valves upon receipt of a safety injection signal coincident with a low-pressure signal in the respective non-essential SW header. Operability requirements that are specified in TS 3.3.e.1.A.3 maintain the functional capability of the SW system commensurate with the AOTs already established in the Kewaunee TSs for the SW system, consistent with NRC policy as reflected in the Westinghouse Standard Technical Specifications. The operability of valves SW-4A and 4B is assured by existing TS 4.2, "ASME Code Class In-Service Inspection and Testing."

The licensee proposes to require calibration and testing of the SW turbine header isolation logic trip (SW 4A/B) each refueling cycle. The surveillance requirements are included as item no. 45 to Table TS 4.1-1, "Minimum Frequencies for Checks, Calibrations and Test of Instrument Channels." The calibration and testing is consistent with that of other safety significant systems, such as the auxiliary feedwater pump low discharge pressure trip system and other safety injection system actuation circuit tests. Therefore, the NRC staff finds that the proposed TS change is acceptable.

The proposed addition of TS 3.3.e.1.A.3 is consistent with the Kewaunee licensing basis as discussed in USAR Section 9.6.2, maintains AOTs that are commensurate with NRC policy, and satisfies 10 CFR 50.55a(h) requirements. Therefore, the NRC staff finds that the proposed TS changes are acceptable.

The licensee proposed changes to the TS Bases consistent with the proposed changes to the TSs. The NRC staff has no objections to the proposed changes to the TS Bases.

3.3 Conclusion

The NRC staff concludes, based on the evaluation discussed above, that the addition of TS 3.3.e.1.A.3 will ensure that the SW system is capable of supplying required safety-related components under all conditions, by automatically isolating SW flow to the turbine building when necessary in accordance with the plant licensing basis. Therefore, the staff finds the proposed TS changes to be acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Wisconsin State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes a surveillance requirement. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that this amendment involves no significant hazards consideration and there has been no public comment on such finding (68 FR 46244). Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

6.0 CONCLUSION

The NRC staff has concluded, 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 issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: R. Reyes-Maldonado
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Date: September 24, 2004