

June 21, 2005

Mr. Michael G. Gaffney
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 EMERGENCY
AMENDMENT REGARDING CONTAINMENT SPRAY FLOW PATH
(TAC NO. MC7335)

Dear Mr. Gaffney:

The Commission has issued the enclosed Amendment No. 184 to Facility Operating License No. DPR-43 for the Kewaunee Nuclear Power Plant. The amendment consists of changes to the Technical Specifications (TSs) in response to your application dated June 16, 2005, as supplemented June 19, 2005. This request was treated as an emergency amendment in accordance with Title 10 of the *Code of Federal Regulations* Section 50.91(a)(5).

The amendment revises the TSs to remove the requirement to have a containment spray pump suction flow path from the containment sump.

A copy of our related safety evaluation is enclosed. A Notice of Issuance will be included in the Commission's next 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. 184 to DPR-43
2. Safety Evaluation

cc w/encls: See next page

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Package Accession Number: ML051710039

Amendment Accession Number: ML051710030

**Previously concurred

TS Accession Number: ML

*email dated 6/20

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Kewaunee Nuclear Power Plant

cc:

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NUCLEAR MANAGEMENT COMPANY, LLC

DOCKET NO. 50-305

KEWAUNEE NUCLEAR POWER PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 184
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 June 16, 2005, as supplemented June 19, 2005, 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. 184, are hereby incorporated in the license. The licensee 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 immediately.

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: June 21, 2005

ATTACHMENT TO LICENSE AMENDMENT NO. 184

FACILITY OPERATING LICENSE NO. DPR-43

DOCKET NO. 50-305

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

REMOVE

TS 3.3-4

INSERT

TS 3.3-4

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 184 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 or the Commission) dated June 16, 2005 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML051680198), as supplemented June 19, 2005, the Nuclear Management Company, LLC (NMC, or the licensee) requested an amendment to the Operating License for the Kewaunee Nuclear Power Plant (KNPP). The proposed change would revise the Technical Specifications (TSs) to remove the requirement to have a containment spray (CS) pump suction flow path from the containment sump.

Since the licensee determined that resolution of this issue is preventing resumption of plant operations, the licensee requested that the proposed amendment be processed as an emergency amendment as discussed in Section 4.0 of this safety evaluation (SE).

Currently, TS 3.3.c.1.A.1 requires:

1. Two containment spray trains are OPERABLE with each train comprised of:
...
 - (ii) An OPERABLE flow path consisting of all valves and piping associated with the above train of components and required to function during accident conditions. This flow path shall be capable of taking suction from the Refueling Water Storage Tank [RWST] and from the containment sump.

Specifically, the proposed change would revise TS 3.3.c.1.A.1(ii) to read:

- (ii) An OPERABLE flow path consisting of all valves and piping associated with the above train of components and required to function during accident conditions. This flow path shall be capable of taking suction from the Refueling Water Storage Tank.

2.0 REGULATORY EVALUATION

TS 3.3.c.1, "Containment Spray and Containment Fancoil Units," establishes the operability requirements for the CS trains, including the requirement to have an operable flow path capable of taking suction from the RWST and from the containment sump.

The design-basis for the CS system is described primarily in KNPP Updated Safety Analysis Report (USAR) Section 6.4, "Containment Vessel Internal Spray System," and Section 14.3, "Reactor Coolant System Piping Ruptures (Loss of Coolant Accident [LOCA])."

3.0 TECHNICAL EVALUATION

As described in the USAR, Section 6.4.1, the primary purpose of the CS system is to spray cool water into the containment atmosphere in the event of a design basis accident (DBA) to ensure containment pressure does not exceed its design value and to remove airborne fission products (iodine) from the containment atmosphere. This protection is provided for all pipe break sizes up to and including the hypothetical instantaneous circumferential rupture of a reactor coolant system (RCS) pipe or a main steamline inside containment. Concentrated sodium hydroxide is added to the CS for the purposes of (1) pH control to preclude the possibility of stress corrosion cracking of the austenitic stainless steel components in containment and (2) some removal of iodine in elemental and particulate forms from the containment atmosphere for radiological concerns.

During the injection phase of a LOCA, the CS pumps take suction from the RWST and discharge through the spray ring headers inside containment to reduce containment pressure. During this phase, the residual heat removal (RHR) pumps provide low-head safety injection (LHSI) from the RWST to the RCS.

Following the injection phase, after the RWST is empty, the RHR system is placed in the recirculation mode and the RHR pumps, RHR heat exchangers, and CS pumps are placed in series operation. In this mode, the RHR pumps provide long-term core cooling by taking suction from the containment sump and recirculating the water through the RHR heat exchangers back to the core. In this mode, the RHR system may supply the suction of the CS pumps through cross-connect valves RHR-400A/B, which are on the downstream side of the RHR heat exchangers. Thus, the CS pumps may take suction from the downstream side of the RHR heat exchangers and discharge through the spray ring headers inside containment.

However, the licensee determined that, without the ability to limit LHSI flow from the RHR pump following a large-break LOCA (LBLOCA), a runout condition on the RHR pump might occur if run concurrently with CS system in the recirculation mode. This condition would occur only if the ability to throttle the injection flow were lost due to failure of the Class II (non-safety related) control system to the RHR heat exchanger flow control valves RHR-8A/B.

The licensee states that, although the CS system is not required in the recirculation mode, the TS requirement that it must be available, coupled with the fact that it is potentially detrimental to the LOCA accident response, imposes an operability challenge to the RHR pumps. Procedure changes would remove the potential detrimental scenario regarding the CS pumps, but currently such changes are not consistent with the existing verbiage in TS 3.3.c.1.A.1(ii). The licensee proposes to remove the TS requirement to have an available flow path to the CS

suction from the containment sump in order to be consistent with the current LBLOCA design-basis stated in the USAR and to remove the potential for placing the RHR pumps in a runout condition.

Since the sodium hydroxide solution flows to the CS pump suction immediately upon actuation of the CS system, the safety functions of concern are containment integrity (pressure control) and fission product (iodine in elemental and particulate forms) removal from the containment atmosphere for radiological concerns. The NRC staff reviewed the need for CS operation during the recirculation mode, when it could be aligned to take suction from the containment sump. The limiting DBAs relative to containment integrity are the LOCA and steamline break. The NRC reviewed these DBAs in the SE for Amendment No. 172 (stretch power uprate), dated February 27, 2004. No credit was taken for operation of CS during the recirculation phase. The licensee stated in its June 16, 2005, application that analysis has determined that the CS system is not needed for pressure or temperature control after the RHR suction has been switched to the containment sump. The NRC staff performed an independent verification of the radiological consequences of a LOCA in its SEs supporting Amendment No. 166 (implementation of alternate source term), dated March 17, 2003, and Amendment No. 172. No credit was taken for fission product removal by CS during the recirculation phase in the NRC staff's evaluation. The licensee stated in its June 16, 2005, application that operation of the CS system while taking suction from the containment sump is not credited in the licensee's safety analyses.

In its June 16, 2005, application, the licensee provided its evaluation of the proposed change compared to the four TS criteria of Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(c)(2)(ii) and concluded that a limiting condition for operation for the CS train suction path from the containment sump does not need to be established to meet the criteria. In summary, the licensee concluded that Criterion 1 (10 CFR 50.36(c)(2)(ii)(A)) does not apply, since the CS system does not detect degradation of the reactor coolant boundary. Criterion 2 (10 CFR 50.36(c)(2)(ii)(B)) does not apply, since the CS system is not a process variable, design feature, or operating restriction that is an initial condition of a DBA or transient condition that either assumes the failure of or presents a challenge to fission product barrier integrity. Criterion 3 (10 CFR 50.36(c)(2)(ii)(C)) does not apply, since the CS system flow path from the containment sump is not part of the primary success path for a DBA or transient. Criterion 4 (10 CFR 50.36(c)(2)(ii)(D)) does not apply, since the CS system flow path from the containment sump has not been shown by operating experience or probabilistic risk assessment to be significant to public health and safety. The NRC staff reviewed the licensee's evaluation and concurs that the proposed change complies with the requirements of 10 CFR 50.36(c)(2)(ii).

Because (1) operation of the CS while taking suction from the containment sump is not credited in the safety analyses described in the USAR, (2) the proposed change complies with the criteria of 10 CFR 50.36(c)(2)(ii), and (3) the proposed change removes a potential for rendering the RHR pumps inoperable, the NRC staff finds the change acceptable.

4.0 EMERGENCY CIRCUMSTANCES

The NRC's regulations at 10 CFR 50.91(a)(5) contain provisions for issuance of an amendment where the Commission finds that emergency circumstances exist, in that a licensee and the Commission must act quickly and that time does not permit the Commission to publish a *Federal Register* notice allowing 30 days for prior public comment. The emergency exists in

this case in that the proposed amendment is needed to allow the licensee to resume operation. The NRC staff has determined that the licensee used its best efforts to make a timely application and that the licensee could not reasonably have foreseen the problem that led to this license amendment request.

In its June 19, 2005, supplemental letter, the licensee stated why the emergency situation occurred and why the situation could not be avoided.

The current TS requires a CS pump suction flow path from the containment sump for system operability. By design, this flow path is through the RHR pumps which provide suction flow to the CS pumps during the post-LOCA recirculation phase.

The licensee stated that it has recognized since early operation of the plant that operation of the CS pumps while taking suction from the RHR pumps could potentially cause an RHR pump runout condition that could result in damage to the RHR pumps. The licensee addressed the potential for RHR pump runout under these postulated conditions by including procedure steps to address the condition in the procedure for manual switching to the recirculation mode.

The licensee stated that it did not recognize until May 2005 that non-safety related flow control valves could not be credited to prevent RHR pump runout if the CS system is operated during the post-LOCA recirculation phase. This condition would occur if the ability to throttle the RHR injection flow with the RHR heat exchanger flow control valves (RHR-8A/B) was lost. The RHR-8A/B valves have a non-safety related (Class II) control system and are designed to fail open. Equipment with non-safety related components should not be credited to assure operability of safety-related (Class I) engineered safety feature (ESF) components.

The licensee stated that it promptly initiated resolution of this issue through engineering evaluations and review of the CS system design-basis. As discussed in the licensee's June 16, 2005, application, these evaluations and reviews established that CS is not credited during the post-LOCA recirculation phase of accident recovery. Since CS is not credited during the recirculation phase, NMC originally concluded that administrative control of the CS pumps provided a satisfactory solution.

Following discussions with the NRC staff in June 2005, NMC determined that administrative controls will protect the RHR pumps from runout, but the plant would not be in compliance with TS 3.3.c.1A.1(ii) (i.e., capable of taking a suction from the containment sump). On June 10, 2005, NMC identified three actions that could resolve the issue: (1) demonstrate by engineering evaluation that the RHR pump will not runout with RHR-8A/B failed open with CS taking suction from RHR, (2) implement a modification to upgrade the RHR-8A/B valve controls, or (3) remove the operability requirement for a containment sump flow path from TS 3.3.c.1A.1(ii).

The licensee could not provide a satisfactory evaluation that the RHR pump would not runout and determined that a modification to the RHR flow control valve controls would require at least eight weeks.

The licensee stated that the proposed change is the only remaining issue preventing plant startup. Therefore, the licensee requested that the June 16, 2005, amendment request be considered on an emergency basis to allow resumption of operation.

Accordingly, the Commission has determined that emergency circumstances exist pursuant to 10 CFR 50.91(a)(5) and could not have been avoided, that the submittal of information was timely, and that the licensee did not create the emergency condition.

5.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission's regulation at 10 CFR 50.92(c) states that the Commission may make a final determination that a license amendment involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not: (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) result in a significant reduction in a margin of safety. The NRC staff has made a final determination that no significant hazards consideration is involved for the proposed amendment and that the amendment should be issued as allowed by the criteria contained in 10 CFR 50.91. The NRC staff's final determination is presented below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed amendment does not involve a significant increase in the probability of an accident previously evaluated. The proposed change is associated with the CS system, which is not an initiator of any accident previously evaluated.

The proposed amendment does not involve a significant increase in the consequences of an accident previously evaluated. The mitigation functions assumed in the DBA analyses will continue to be performed.

Therefore, operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of any accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

No system modifications or new systems are associated with the proposed amendment. Therefore, no new failure modes or effects are introduced. The removal of the requirement to have a CS flow path from the containment sump during containment sump recirculation is consistent with the approved accident analysis. Therefore, the possibility that a new or different kind of accident would be created either with the CS system or the related RHR system does not exist.

Therefore, operation of the facility in accordance with the proposed amendment does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

The proposed amendment does not alter the intended functions of the CS system as defined in the current approved accident analysis. The margins associated with the

evaluation of the radiological consequences of the LBLOCA are unchanged since the proposed change is consistent with the approved analysis assumptions.

Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

6.0 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.

7.0 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. 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 made a final finding that the amendment involves no significant hazards consideration. Accordingly, the 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 the amendment.

8.0 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 the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: F. Lyon

Date: June 21, 2005