



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

March 27, 2001

Mr. Mark Reddemann
Site Vice President
Kewaunee and Point Beach Nuclear Plants
Nuclear Management Company, LLC
6610 Nuclear Road
Two Rivers, WI 54241

SUBJECT: KEWAUNEE NUCLEAR POWER PLANT - ISSUANCE OF AMENDMENT
(TAC NO. MB1131)

Dear Mr. Reddemann:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 153 to Facility Operating License No. DPR-43 for the Kewaunee Nuclear Power Plant. This amendment revises the Technical Specifications in response to your application dated February 5, 2001.

The amendment revises the Kewaunee Nuclear Power Plant (KNPP) Technical Specifications (TSs) 3.1.d.2 to reduce the maximum allowable leakage of primary system reactor coolant to the secondary system from 500 gallons per day (gpd) through any one steam generator to 150 gpd through any one steam generator. In addition, the amendment removes reference to the voltage based repair criteria.

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

Sincerely,

John G. Lamb, 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. 153 to
License No. DPR-43
2. Safety Evaluation

cc w/encls: See next page

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

NUCLEAR MANAGEMENT COMPANY, LLC

DOCKET NO. 50-305

KEWAUNEE NUCLEAR POWER PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 153
License No. DPR-43

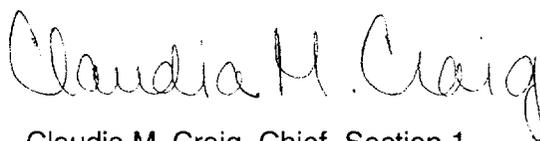
1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Nuclear Management Company, LLC (the licensee) dated February 5, 2001, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's 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. 153, 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 the date of its issuance, and is to be implemented within 30 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Claudia M. Craig, 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: March 27, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 153

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 3.1-9
TS B 3.1-11
TS B 3.1-12

INSERT

TS 3.1-9
TS B 3.1.-11
TS B 3.1.-12

d. Leakage of Reactor Coolant

1. Any Reactor Coolant System leakage indication in excess of 1 gpm shall be the subject of an investigation and evaluation initiated within 4 hours of the indication. Any indicated leak shall be considered to be a real leak until it is determined that no unsafe condition exists. If the Reactor Coolant System leakage exceeds 1 gpm and the source of leakage is not identified within 12 hours, the reactor shall be placed in the HOT SHUTDOWN condition utilizing normal operating procedures. If the source of leakage exceeds 1 gpm and is not identified within 48 hours, the reactor shall be placed in the COLD SHUTDOWN condition utilizing normal operating procedures.
2. Reactor coolant-to-secondary leakage through the steam generator tubes shall be limited to 150 gallons per day through any one steam generator. With tube leakage greater than the above limit, reduce the leakage rate within 4 hours or be in COLD SHUTDOWN within the next 36 hours.
3. If the sources of leakage other than that in 3.1.d.2 have been identified and it is evaluated that continued operation is safe, operation of the reactor with a total Reactor Coolant System leakage rate not exceeding 10 gpm shall be permitted. If leakage exceeds 10 gpm, the reactor shall be placed in the HOT SHUTDOWN condition within 12 hours utilizing normal operating procedures. If the leakage exceeds 10 gpm for 24 hours, the reactor shall be placed in the COLD SHUTDOWN condition utilizing normal operating procedures.
4. If any reactor coolant leakage exists through a non-isolable fault in a Reactor Coolant System component (exterior wall of the reactor vessel, piping, valve body, relief valve leaks, pressurizer, steam generator head, or pump seal leakoff), the reactor shall be shut down; and cooldown to the COLD SHUTDOWN condition shall be initiated within 24 hours of detection.
5. When the reactor is critical and above 2% power, two reactor coolant leak detection systems of different operating principles shall be in operation with one of the two systems sensitive to radioactivity. Either system may be out of operation for up to 12 hours provided at least one system is operable.

Leakage directly into the containment indicates the possibility of a breach in the coolant envelope. The limitation of 1 gpm for an unidentified source of leakage is sufficiently above the minimum detectable leak rate to provide a reliable indication of leakage, and is well below the capacity of one charging pump (60 gpm).

Twelve (12) hours of operation before placing the reactor in the HOT SHUTDOWN condition are required to provide adequate time for determining whether the leak is into the containment or into one of the closed systems and to identify the leakage source.

TS 3.1.d.2

Limiting the leakage through any single steam generator to 150 gpd ensures that tube integrity is maintained during a design basis main steam line break or loss-of-coolant accident. Remaining within this leakage rate provides reasonable assurance that no single tube-flaw will sufficiently enlarge to create a steam generator tube rupture as a result of stresses caused by a LOCA or a main steam line break accident within the time allowed for detection of the accident condition and resulting commencement of plant shutdown. This operational leakage rate is less than the condition assumed in design basis safety analyses and conforms to industry standards established by the Nuclear Energy Institute through its NEI 97-06, "Generic Steam Generator Program Guidelines."

TS 3.1.d.3

When the source of leakage has been identified, the situation can be evaluated to determine if operation can safely continue. This evaluation will be performed by the plant operating staff and will be documented in writing and approved by either the Plant Manager or his designated alternate. Under these conditions, an allowable Reactor Coolant System leak rate of 10 gpm has been established. This explained leak rate of 10 gpm is within the capacity of one charging pump as well as being equal to the capacity of the Steam Generator Blowdown Treatment System.

TS 3.1.d.4

The provision pertaining to a non-isolable fault in a Reactor Coolant System component is not intended to cover steam generator tube leaks, valve bonnets, packings, instrument fittings, or similar primary system boundaries not indicative of major component exterior wall leakage.

TS 3.1.d.5

If leakage is to the containment, it may be identified by one or more of the following methods:

- A. The containment air particulate monitor is sensitive to low leak rates. The rates of reactor coolant leakage to which the instrument is sensitive are dependent upon the presence of corrosion product activity.

- B. The containment radiogas monitor is less sensitive and is used as a backup to the air particulate monitor. The sensitivity range of the instrument is approximately 2 gpm to > 10 gpm.
- C. Humidity detection provides a backup to A. and B. The sensitivity range of the instrumentation is from approximately 2 gpm to 10 gpm.
- D. A leakage detection system is provided which determines leakage losses from all water and steam systems within the containment. This system collects and measures moisture condensed from the containment atmosphere by fancoils of the Containment Air Cooling System and thus provides a dependable and accurate means of measuring integrated total leakage, including leaks from the cooling coils themselves which are part of the containment boundary. The fancoil units drain to the containment sump, and all leakage collected by the containment sump will be pumped to the waste holdup tank. Pump running time will be monitored in the control room to indicate the quantity of leakage accumulated.

If leakage is to another closed system, it will be detected by the area and process radiation monitors and/or inventory control.

Maximum Reactor Coolant Oxygen, Chloride and Fluoride Concentration (TS 3.1.e)

By maintaining the oxygen, chloride and fluoride concentrations in the reactor coolant below the limits as specified in TS 3.1.e.1 and TS 3.1.e.4, the integrity of the Reactor Coolant System is assured under all operating conditions.⁽¹⁷⁾

If these limits are exceeded, measures can be taken to correct the condition, e.g., replacement of ion exchange resin or adjustment of the hydrogen concentration in the volume control tank.⁽¹⁸⁾ Because of the time-dependent nature of any adverse effects arising from oxygen, chloride, and fluoride concentration in excess of the limits, it is unnecessary to shut down immediately since the condition can be corrected. Thus, the time periods for corrective action to restore concentrations within the limits have been established. If the corrective action has not been effective at the end of the time period, reactor cooldown will be initiated and corrective action will continue.

The effects of contaminants in the reactor coolant are temperature dependent. The reactor may be restarted and operation resumed if the maximum concentration of any of the contaminants did not exceed the permitted transient values; otherwise a safety review by the Plant Operations Review Committee is required before startup.

⁽¹⁷⁾USAR Section 4.2

⁽¹⁸⁾USAR Section 9.2



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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 153 TO FACILITY OPERATING LICENSE NO. DPR-43

NUCLEAR MANAGEMENT COMPANY, LLC

KEWAUNEE NUCLEAR POWER PLANT

DOCKET NO. 50-305

1.0 INTRODUCTION

By letter dated February 5, 2001, Nuclear Management Company, LLC (the licensee) submitted a proposed amendment to the Kewaunee Nuclear Power Plant (KNPP) Technical Specifications (TSs) to revise TS 3.1.d.2 to reduce the maximum allowable leakage of primary system reactor coolant to the secondary system from 500 gallons per day (gpd) through any one steam generator to 150 gpd through any one steam generator. In addition, the proposed amendment removes reference to the voltage based repair criteria.

2.0 BACKGROUND

The steam generator (SG) tubes in the KNPP have a number of important safety functions. These tubes are an integral part of the reactor coolant pressure boundary role and, as such, are relied upon to maintain the primary system's pressure and inventory. As part of the reactor coolant pressure boundary, the SG tubes are unique in that they are also relied upon as a heat transfer surface between the primary and secondary systems such that residual heat can be removed from the primary system. Also, as part of the reactor coolant pressure boundary, the SG tubes are relied upon to isolate the radioactive fission products in the primary coolant from the secondary system. In addition, the SG tubes are relied upon to maintain their integrity, as necessary, to be consistent with the containment objectives of preventing uncontrolled fission product release under conditions resulting from core damage severe accidents.

Primary-to-secondary leakage monitoring is an important defense-in-depth measure that assists the licensee in monitoring its overall SG tube integrity during operation. Primary-to-secondary leakage monitoring gives licensee operators information needed to safely respond to situations in which SG tube integrity becomes impaired and significant leakage or tube failure occurs. The licensee TSs include a requirement to shut down when the KNPP exceeds an established threshold of primary-to-secondary leakage. Therefore, limiting conditions for operation (LCO) play a significant role in assuring safe operation. The KNPP TS 3.1.d for leakage of reactor coolant establishes one of these LCOs. The KNPP TS 3.1.d.2 states the following:

"Reactor coolant-to-secondary leakage through the steam generator tubes shall be limited to 500 gallons per day through any one steam generator except when the tube support plate, voltage-based repair criteria is applied. Primary to secondary leakage is

limited to 150 gallons per day through any one steam generator when the tube support plate voltage-based repair criteria is applied. With tube leakage greater than the above limit, reduce the leakage rate within 4 hours or be in COLD SHUTDOWN within the next 36 hours.”

3.0 EVALUATION

3.1 Licensee Proposed TS 3.1.d.2 Change

The licensee proposed to change the KNPP TS 3.1.d.2 from the above to the following:

“Reactor coolant-to-secondary leakage through the steam generator tubes shall be limited to 150 gallons per day through any one steam generator. With tube leakage greater than the above limit, reduce the leakage rate within 4 hours or be in COLD SHUTDOWN within the next 36 hours.”

3.2 Regulatory Requirements

Several General Design Criteria (GDC) in Appendix A to 10 CFR Part 50 are applicable to the integrity of SG tubes: 1, 2, 4, 14, 15, 30, and 32. Of particular interest is GDC 14. GDC 14 states that the reactor coolant pressure boundary shall be designed, fabricated, erected, and tested so as to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture.

3.3 Nuclear Regulatory Commission (NRC) Primary-to-Secondary Leakage Rate Recommendations

NUREG-1431, “Standard Technical Specifications for Westinghouse Plants,” recommends 500 gpd primary to secondary leakage through any one SG in LCO 3.4.13.e. Generic Letter (GL) 95-05, “Voltage-Based Repair Criteria for Westinghouse Steam Generator Tubes Affected by Outside Diameter Stress Corrosion Cracking,” recommends that the operational leakage limit should be reduced in the TSs to 150 gpd through each SG.

3.4 Industry Primary-to-Secondary Leakage Rate Recommendations

Electric Power Research Institute (EPRI) TR-104788, “PWR Primary-to-Secondary Leak Guidelines,” recommends the primary-to secondary maximum leak rate of 150 gpd through one SG. Nuclear Energy Institute (NEI) 97-06, “Steam Generator Program Guidelines,” recommends that the operational leakage performance criteria is to ensure that the operational primary-to-secondary leakage limit for any one SG does not exceed 150 gpd.

3.5 NRC Safety Evaluation Dated April 17, 1995

The NRC staff wrote a safety evaluation dated April 17, 1995, regarding Amendment 118 for the KNPP to allow the application of a voltage-based repair limit for the SG tube support plate intersections experiencing outside diameter stress corrosion cracking. Amendment 118 reduced the allowed primary-to-secondary operational leakage from any one SG from 500 gpd to 150 gpd when the tube support plate voltage-based repair criteria is applied. Regarding normal operational leakage, the NRC staff stated the following:

“Development of the 150 gpd per steam generator leakage limit has utilized the extensive industry database regarding burst pressure as a function of crack length and leakage during normal operation. Based on leakage evaluated at the lower 95 percent confidence interval for a given crack size, the 150 gpd limit would be exceeded before the crack length reaches the critical crack length for [Main Steam Line Break] MSLB pressures. Based on nominal, the best estimate leakage rates, the 150 gpd limit would be exceeded before the crack length reaches the critical crack length corresponding to a burst pressure of three times normal operating pressure.”

3.6 NRC Evaluation

Amendment 118 dated April 17, 1995, requires 150 gpd primary-to-secondary leakage limit through any one SG when the tube support plate, voltage-based repair criteria is applied. The licensee’s current TS states: “Reactor coolant-to-secondary leakage through the steam generator tubes shall be limited to 500 gallons per day through any one steam generator except when the tube support plate, voltage-based repair criteria is applied. Primary to secondary leakage is limited to 150 gallons per day through any one steam generator when the tube support plate voltage-based repair criteria is applied. With tube leakage greater than the above limit, reduce the leakage rate within 4 hours or be in COLD SHUTDOWN within the next 36 hours.” The TS change to primary-to-secondary leakage accompanying Amendment 118 was written to allow the licensee to retain a 500 gpd limit until it started to use the voltage-based repair criteria. Since the licensee has been using the voltage-based repair criteria for several years, the licensee uses the more restrictive primary-to-secondary leakage limit of 150 gallons per day through any one steam generator.

The licensee proposed change TS 3.1.d.2 to read the following: “Reactor coolant-to-secondary leakage through the steam generator tubes shall be limited to 150 gallons per day through any one steam generator. With tube leakage greater than the above limit, reduce the leakage rate within 4 hours or be in COLD SHUTDOWN within the next 36 hours.”

The licensee proposed TS 3.1.d.2 change of 150 gpd primary-to-secondary leakage limit through any one SG is more restrictive than NUREG-1431 LCO 3.4.13.e of 500 gpd primary-to-secondary leakage limit through any one SG. The licensee proposed TS 3.1.d.2 change of 150 gpd primary-to-secondary leakage limit through any one SG is consistent with GL 95-05, EPRI TR-104788, NEI 97-06, and in effect, Amendment 118 dated April 17, 1995. Therefore, the NRC staff finds the licensee proposed TS 3.1.d.2 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

The 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 effluents 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 the amendment involves no significant hazards consideration and there has been no public comment on such finding (66 FR 11062). 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 for the above items.

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 Contributor: J. Lamb

Date: March 27, 2001