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

March 29, 2001

Mr. Robert P. Powers, Senior Vice President
Indiana Michigan Power Company
Nuclear Generation Group
500 Circle Drive
Buchanan, MI 49107

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT 1 - ISSUANCE OF AMENDMENT (TAC NO. MB0908)

Dear Mr. Powers:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 252 to Facility Operating License No. DPR-58 for the Donald C. Cook Nuclear Plant, Unit 1. The amendment consists of changes to the Technical Specifications in response to your application dated January 2, 2001, as supplemented March 5, 2001.

The amendment revises Technical Specifications (TS) 3/4.6.2.2.a for the Unit 1 spray additive tank to require a contained volume between 4000 and 4600 gallons of between 30 and 34 percent by weight sodium hydroxide (NaOH) solution. In addition, the amendment makes four types of format changes to the TS pages for Unit 1.

A copy of our related safety evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

John F. Stang, Senior Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-315

Enclosures: 1. Amendment No. 252 to DPR-58
2. Safety Evaluation

cc w/encls: See next page

LTR-058

March 29, 2001

Mr. Robert P. Powers, Senior Vice President
Indiana Michigan Power Company
Nuclear Generation Group
500 Circle Drive
Buchanan, MI 49107

SUBJECT: DONALD C. COOK NUCLEAR PLANT, UNIT 2 - ISSUANCE OF AMENDMENT (TAC NO. MB0908)

Dear Mr. Powers:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 252 to Facility Operating License No. DPR-58 for the Donald C. Cook Nuclear Plant, Unit 1. The amendment consists of changes to the Technical Specifications in response to your application dated January 2, 2001, as supplemented March 5, 2001.

The amendment revises Technical Specifications (TS) 3/4.6.2.2.a for the Unit 1 spray additive tank to require a contained volume between 4000 and 4600 gallons of between 30 and 34 percent by weight sodium hydroxide (NaOH) solution. In addition, the amendment makes four types of format changes to the TS pages for Unit 1.

A copy of our related safety evaluation is also enclosed. A Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

John F. Stang, Senior Project Manager, Section 1
Project Directorate III
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-315

Enclosures: 1. Amendment No. 252 to DPR-58
2. Safety Evaluation

cc w/encls: See next page

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

INDIANA MICHIGAN POWER COMPANY

DOCKET NO. 50-315

DONALD C. COOK NUCLEAR PLANT, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 252
License No. DPR-58

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Indiana Michigan Power Company (the licensee) dated January 2, 2001, as supplemented March 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-58 is hereby amended to read as follows:

   (2) Technical Specifications

   The Technical Specifications contained in appendices A and B, as revised through Amendment No. 252, 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 within 30 days.

FOR THE NUCLEAR REGULATORY COMMISSION

Claudia M. Craig

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 29, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 252

FACILITY OPERATING LICENSE NO. DPR-58

DOCKET NO. 50-315

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	INSERT
3/4 6-12	3/4 6-12

SPRAY ADDITIVE SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.2.2 The spray additive system shall be OPERABLE with:

a. A spray additive tank containing a volume between 4000 and 4600 gallons of between 30 and 34 percent by weight NaOH solution, and

b. Two spray additive eductors each capable of adding NaOH solution from the chemical additive tank to a containment spray system pump flow.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the spray additive system inoperable, restore the system to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours; restore the spray additive system to OPERABLE status within the next 48 hours or be in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.2.2 The spray additive system shall be demonstrated OPERABLE:

a. At least once per 31 days by verifying that each valve (manual, power operated or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. At least once per 6 months by:

1. Verifying the solution level in the tank, and

2. Verifying the concentration of the NaOH solution by chemical analysis.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 252 TO FACILITY OPERATING LICENSE NO. DPR-58

INDIANA MICHIGAN POWER COMPANY

DONALD C. COOK NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-315

1.0 INTRODUCTION

By application dated January 2, 2001, as supplemented March 5, 2001, the Indiana Michigan Power Company (the licensee) requested an amendment to change Technical Specifications (TS) 3/4.6.2.2.a for the Unit 1 spray additive tank from the current requirements of a contained volume of at least 4000 gallons of not less than 30 percent by weight sodium hydroxide (NaOH) solution to the proposed requirements of a contained volume between 4000 and 4600 gallons of between 30 and 34 percent by weight NaOH solution. In addition, the amendment requested four types of format changes to the revised Unit 1 page:

(1) Reformat the header to include numbered first and second tier TS section titles and a full-width single line to separate the header section titles from the page text.

(2) Reformat the footer to include "COOK NUCLEAR PLANT-UNIT 1" on the left side of the page, "Page (page number)" center page, "AMENDMENT (past amendment numbers, with strikethrough, and ending with the current amendment number)" on the right side, and a full-width single line to separate the footer from the page text.

(3) Delete the double lines under "LIMITING CONDITION FOR OPERATION" and "SURVEILLANCE REQUIREMENTS."

(4) Fully justify the text and change the font.

By letter dated February 7, 2001, the Nuclear Regulatory Commission (NRC) staff issued a request for additional information (RAI). By letter dated March 5, 2001, the licensee responded to the RAI.

The March 5, 2001, supplemental letter, did not change the scope of the proposed action and did not change the NRC's proposed no significant hazards consideration determination.

2.0 BACKGROUND

The Spray Additive System is a subsystem of the Containment Spray System that assists in reducing the iodine fission product inventory in the containment atmosphere resulting from a design basis accident (DBA).

Radioiodine in its various forms is the fission product of primary concern in the evaluation of a DBA. It is absorbed by the spray from containment atmosphere. To enhance the iodine absorption capacity of the spray, the spray solution is adjusted to an alkaline pH that promotes iodine reduction, in which iodine is converted to nonvolatile forms. Because of its stability when exposed to radiation and elevated temperature, sodium hydroxide (NaOH) is the spray additive. The NaOH added to the spray also ensures a pH value between 7.6 to 9.5 of the solution recirculated from the containment sump. This pH band minimizes the evolution of iodine as well as the occurrence of chloride and caustic stress corrosion on mechanical systems and components.

The refueling water storage tank (RWST) supplies borated water to the containment spray system during the injection phase of operation. In the recirculation mode of operation, containment spray pump suction is transferred from the RWST to the containment sump. The containment spray system provides a spray of cold borated water mixed with NaOH from the spray additive tank into the upper regions of containment to reduce the containment pressure and temperature and to reduce fission products from the containment atmosphere during a DBA.

The Spray Additive System consists of one spray additive tank that is shared by the two trains of spray additive equipment. Each train of equipment provides a flow path from the spray additive tank to a containment spray pump and consists of an eductor for each containment spray pump, valves, instrumentation, and connection piping. Each eductor draws the NaOH spray solution from the common tank using a portion of the borated water discharged by the containment spray pump as the motive flow. The eductor mixes the NaOH solution and the borated water and discharges the mixture into the spray pump suction line. The eductors are designed to ensure that the pH of the spray mixture is between 7.6 to 9.5.

3.0 EVALUATION

3.1 Licensee Bounding Analysis

The licensee analyzed the accidents that result in containment spray system operation. The accidents analyzed were a large break loss-of-coolant accident (LOCA), a main steamline break (MSLB), and a small break LOCA. The licensee considered in the analysis six different events in the accident sequence: start of the injection phase, end of the injection phase, start of recirculation phase, spray additive tank isolation, three hours after the start of the recirculation phase, and completion of the ice melting in the ice condenser. These conditions constitute points in the accident sequence at which there can be significant changes in the parameters that affect the pH of the containment spray. The licensee analysis considered eight different single failure scenarios that were considered to be credible during the postulated sequence of events.

3.2 Acceptance Criteria

Containment sump and recirculation spray solution pH guidelines are given in:

1) Standard Review Plan (SRP) 6.1.1, "Engineered Safety Features Materials;"
2) SRP 6.1.1 Branch Technical Position MTEB 6-1; and
3) SRP 6.5.2, "Containment Spray as a Fission Product Cleanup System."

SRP 6.1.1 and SRP 6.1.1 Branch Technical Position MTEB 6-1 have a minimum pH of 7.0 as an acceptance criteria. SRP 6.5.2 has a pH above 7.0 as an acceptance criteria after mixing and dilution with the primary coolant and emergency core cooling system injection in the sump following a LOCA.

3.3 Discussion

3.3.1 Spray Additive Tank Maximum Level and Sodium Hydroxide Concentration Changes

The licensee analysis performed for the proposed Unit 1 maximum volume and NaOH concentrations for the spray additive tank verified the following:

(1) In the LOCA cases, the pH of the recirculation sump after the start of the recirculation phase is greater than or equal to 7.0.

(2) In the LOCA cases, the pH of the recirculation sump is 7.6 to 9.5 three hours after the start of the recirculation phase and thereafter.

(3) The existing minimum and proposed maximum limits for the contained volume and NaOH concentration for the spray additive tank do not result in an increase in the previously predicted hydrogen generation rates. Therefore, the current post-LOCA hydrogen generation evaluation remains valid.

(4) The pH ranges and durations determined by the containment spray and recirculation sump pH analyses fall within the values used for evaluating the environmental qualification of class 1E equipment inside containment that are required for mitigating the consequences of an accident.

The NRC staff finds the proposed changes to the licensee TSs, concerning concentration and volumes of NaOH in the spray additive tank meet the acceptance criteria given in SRP 6.1.1, SRP 6.1.1 Branch Technical Position MTEB 6-1, and SRP 6.5.2. Therefore, the NRC staff finds the proposed changes to the licensee TSs, concerning concentration and volumes of NaOH in the spray additive tank are acceptable.

In some MSLB minimum pH cases, the licensee determined that the containment spray pH will decrease below 7.0 for 25 minutes to a minimum value of 4.5 during the injection phase, because the spray additive tank is isolated before the switchover from injection to recirculation resulting in a containment spray of pure refueling water storage tank water. In these MSLB cases, the containment spray pH returns to the range of 7.0 to 10.0 when the switchover to recirculation is completed. The minimum pH range used to environmentally qualify licensee equipment for short-term exposure is 4.3 to 7.0 with a 60 minute exposure duration. This range

covers both the length of time and the lowest possible pH from the containment spray without spray additive in a postulated MSLB. The licensee determined that structures, systems, and components (SSCs) can be relied upon to perform their safety functions for this injection phase spray without additive. In addition, the licensee stated that the 25 minute duration of pH less 7.0 would not be a stress corrosion cracking concern since stress corrosion cracking would occur only after much longer exposure to these conditions. Westinghouse WCAP-7798-L, "Behavior of Austenitic Stainless Steel in Post Hypothetical Loss of Coolant Environment," stated that "No [chloride stress corrosion] cracking was observed on any of the [test] materials immediately after the 8 hours at high temperatures at any pH." In addition, WCAP-7798-L concluded that "...the test data show that for [Emergency Core Cooling] ECC solutions with no pH adjustment, containing 100 ppm [parts per million] chloride, the time to crack initiation is greater than 8 hours (the test high temperature [Design Basis Accident] DBA cycle) but is less than 3 days." Therefore, the NRC staff finds the proposed changes are acceptable since the duration is relatively short which the pH could be below 7.0 in some MSLB cases.

During recirculation, the licensee determined that the containment spray pH may be as high as 12.9 immediately after the switchover to recirculation. In these cases, the containment spray pH returns to the range of 7.0 to 10.0 when the control room operators manually isolate the spray additive tank. The expected period is 4 minutes during which the containment spray pH is 12.9 since isolation of the spray additive tank in the recirculation phase is procedurally required. The operators are trained to perform the isolation of the spray additive tank within 4 minutes of the containment spray pump restart, and the operators' ability to perform the isolation of the spray additive tank within 4 minutes of the containment spray pump restart has been validated by the licensee. The maximum pH range used to environmentally qualify licensee equipment for short-term exposure is 10.0 to 12.9 with a 10 minute exposure duration. Since the 12.9 pH for a 4 minute duration is within the environmentally qualified 10 minute exposure duration, the licensee determined that SSCs can be relied upon to perform their safety functions. The NRC staff finds this acceptable.

3.3.2 Administrative Changes

The amendment requested four types of format changes to the revised Unit 1 page:

(1) Reformat the header to include numbered first and second tier TS section titles and a full-width single line to separate the header section titles from the page text.

(2) Reformat the footer to include "COOK NUCLEAR PLANT-UNIT 1" on the left side of the page, "Page (page number)" center page, "AMENDMENT (past amendment numbers, with strikethrough, and ending with the current amendment number)" on the right side, and a full-width single line to separate the footer from the page text.

(3) Delete the double lines under "LIMITING CONDITION FOR OPERATION" and "SURVEILLANCE REQUIREMENTS."

(4) Fully justify the text and change the font.

The NRC staff reviewed these four types of format changes and the NRC staff has found that these format changes are acceptable.

4.0 STATE CONSULTATION

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

5.0 ENVIRONMENTAL CONSIDERATION

The amendment changes the requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or change the surveillance requirements. 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 NRC 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 7681). 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.

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 NRC'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: J. Lamb

Date: March 29, 2001