



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

October 20, 2000

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, UNITS 1 AND 2 - ISSUANCE OF  
AMENDMENTS (TAC NOS. MA9872 AND MA9873)

Dear Mr. Powers:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 246 to Facility Operating License No. DPR-58 and Amendment No. 227 to Facility Operating License No. DPR-74 for the Donald C. Cook Nuclear Plant, Units 1 and 2. The amendments consist of changes to the Technical Specifications in response to your application dated September 1, 2000.

The amendments clarify Technical Specification (TS) 3/4.4.4, "Pressurizer," to reflect the current power supply to the pressurizer heaters and require two operable trains of pressurizer heaters during Modes 1, 2, and 3. In addition, the amendments revise the Bases for TS 3/4.4.4 to reflect these changes and clarify the purpose of the pressurizer heaters. This action closes restart action matrix item 8.3.

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 Nos. 50-315 and 50-316

Enclosures: 1. Amendment No. 246 to DPR-58  
2. Amendment No. 227 to DPR-74  
3. Safety Evaluation

cc w/encls: See next page

NRR-058

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October 20, 2000

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Indiana Michigan Power Company  
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Buchanan, MI 49107

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**/RA/**

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Office of Nuclear Reactor Regulation

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Donald C. Cook Nuclear Plant, Units 1 and 2

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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. 246  
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 September 1, 2000, 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.

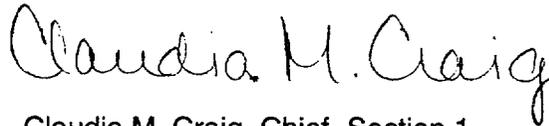
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DFR-58 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 246 , 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 45 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: October 20, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 246

TO FACILITY OPERATING LICENSE NO. DPR-58

DOCKET NO. 50-315

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

3/4 4-6  
B 3/4 4-2

INSERT

3/4 4-6  
B 3/4 4-2

3/4 **LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS**  
3/4.4 **REACTOR COOLANT SYSTEM**

---

PRESSURIZER

LIMITING CONDITION FOR OPERATION

- 3.4.4 The pressurizer shall be OPERABLE with a water volume less than or equal to 92% of span and two trains of pressurizer heaters with the capacity of each train greater than or equal to 150 kW.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

- a. With the pressurizer inoperable due to an inoperable train of pressurizer heaters, either restore the inoperable train within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 12 hours.
- b. With the pressurizer otherwise inoperable, be in at least HOT SHUTDOWN with the reactor trip breakers open within 12 hours.

SURVEILLANCE REQUIREMENTS

- 4.4.4.1 The pressurizer water volume shall be determined to be within its limits at least once per 12 hours.
- 4.4.4.2 The pressurizer heaters shall be demonstrated OPERABLE at least once per 18 months by energizing the required capacity of heaters in each train.

3/4 BASES  
3/4.4 REACTOR COOLANT SYSTEM

---

3/4.4.2 and 3/4.4.3 SAFETY VALVES

The pressurizer code safety valves operate to prevent the RCS from being pressurized above its Safety Limit of 2735 psig. Each safety valve is designed to relieve 420,000 lbs per hour of saturated steam at the valve set point. The relief capacity of a single safety valve is adequate to relieve any overpressure condition which could occur during shutdown. In the event that no safety valves are OPERABLE, an operating RHR loop, connected to the RCS, provides overpressure relief capability and will prevent RCS overpressurization.

During operation, all pressurizer code safety valves must be OPERABLE to prevent the RCS from being pressurized above its safety limit of 2735 psig. The combined relief capacity of all of these valves is greater than the maximum surge rate resulting from a complete loss of load assuming no reactor trip until the first Reactor Protective System trip set point is reached (i.e., no credit is taken for a direct reactor trip on the loss of load) and also assuming no operation of the power operated relief valves or steam dump valves.

Demonstration of the safety valves' lift settings will occur only during shutdown and will be performed in accordance with the provisions of Section XI of the ASME Boiler and Pressure Code.

3/4.4.4 PRESSURIZER

A steam bubble in the pressurizer ensures that the RCS is not a hydraulically solid system and is capable of accommodating pressure surges during operation. The steam bubble also protects the pressurizer code safety valves and power operated relief valves against water relief. The power operated relief valves and steam bubble function to relieve RCS pressure during all design transients up to and including the design step load decrease with steam dump. Operation of the power operated relief valves minimizes the undesirable opening of the spring-loaded pressurizer code safety valves. The requirements for pressurizer heaters apply to the pressurizer backup heaters as they are the only heaters that can be controlled from both the control room and the hot standby panel to perform their required function. The requirement to verify the capacity of each train of pressurizer heaters provides assurance that these heaters can be energized during a loss of offsite power condition to provide adequate subcooling margin in the reactor coolant system to maintain natural circulation conditions at HOT STANDBY.



UNITED STATES  
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WASHINGTON, D.C. 20555-0001

INDIANA MICHIGAN POWER COMPANY

DOCKET NO. 50-316

DONALD C. COOK NUCLEAR PLANT, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 227  
License No. DPR-74

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 September 1, 2000, 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.

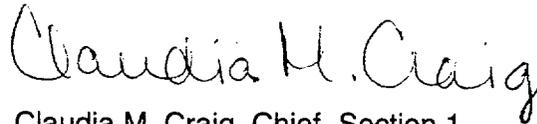
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Facility Operating License No. DPR-74 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 227 , 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 45 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: October 20, 2000

ATTACHMENT TO LICENSE AMENDMENT NO. 227

FACILITY OPERATING LICENSE NO. DPR-74

DOCKET NO. 50-316

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

3/4 4-6  
B 3/4 4-2

INSERT

3/4 4-6  
B 3/4 4-2

3/4 **LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS**  
3/4.4 **REACTOR COOLANT SYSTEM**

---

PRESSURIZER

LIMITING CONDITION FOR OPERATION

3.4.4 The pressurizer shall be OPERABLE with a water volume less than or equal to 92% of span and two trains of pressurizer heaters with the capacity of each train greater than or equal to 150 kW.

APPLICABILITY: MODES 1, 2, and 3.

ACTION:

- a. With the pressurizer inoperable due to an inoperable train of pressurizer heaters, either restore the inoperable train within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 12 hours.
- b. With the pressurizer otherwise inoperable, be in at least HOT SHUTDOWN with the reactor trip breakers open within 12 hours.

SURVEILLANCE REQUIREMENTS

4.4.4.1 The pressurizer water volume shall be determined to be within its limit at least once per 12 hours.

4.4.4.2 The pressurizer heaters shall be demonstrated OPERABLE at least once per 18 months by energizing the required capacity of heaters in each train.

**3/4 BASES**  
**3/4.4 REACTOR COOLANT SYSTEM**

---

3/4.4.2 and 3/4.4.3 SAFETY VALVES

The pressurizer code safety valves operate to prevent the RCS from being pressurized above its Safety Limit of 2735 psig. Each safety valve is designed to relieve 420,000 lbs per hour of saturated steam at the valve setpoint. The relief capacity of a single safety valve is adequate to relieve any overpressure condition which could occur during shutdown. In the event that no safety valves are OPERABLE in MODES 4 and 5, an operating RHR loop, connected to the RCS, provides overpressure relief capability. Additionally, if no safety valves are OPERABLE, then all Safety Injection pumps and all but one charging pump will be rendered inoperable to preclude overpressurization due to an inadvertent increase in the RCS inventory.

During operation, all pressurizer code safety valves must be OPERABLE to prevent the RCS from being pressurized above its safety limit of 2735 psig. The combined relief capacity of all of these valves is greater than the maximum surge rate resulting from a complete loss of load assuming no reactor trip until the first Reactor Protective System trip set point is reached (i.e., no credit is taken for a direct reactor trip on the loss of load) and also assuming no operation of the power operated relief valves or steam dump valves.

Demonstration of the safety valves' lift settings will occur only during shutdown and will be performed in accordance with the provisions of Section XI of the ASME Boiler and Pressure Code.

3/4.4.4 PRESSURIZER

A steam bubble in the pressurizer ensures that the RCS is not a hydraulically solid system and is capable of accommodating pressure surges during operation. The steam bubble also protects the pressurizer code safety valves and power operated relief valves against water relief. The power operated relief valves and steam bubble function to relieve RCS pressure during all design transients up to and including the design step load decrease with steam dump. Operation of the power operated relief valves minimizes the undesirable opening of the spring-loaded pressurizer code safety valves. The requirements for pressurizer heaters apply to the pressurizer backup heaters as they are the only heaters that can be controlled from both the control room and the hot standby panel to perform their required function. The requirement to verify the capacity of each train of pressurizer heaters provides assurance that these heaters can be energized during a loss of offsite power condition to provide adequate subcooling margin in the reactor coolant system to maintain natural circulation conditions at HOT STANDBY.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 246 TO FACILITY OPERATING LICENSE NO. DPR-58  
AND AMENDMENT NO. 227 TO FACILITY OPERATING LICENSE NO. DPR-74  
INDIANA MICHIGAN POWER COMPANY  
DONALD C. COOK NUCLEAR PLANT, UNITS 1 AND 2  
DOCKET NOS. 50-315 AND 50-316

1.0 INTRODUCTION

By application dated September 1, 2000, the Indiana Michigan Power Company (the licensee) requested amendments to the Technical Specifications (TSs) for the Donald C. Cook Nuclear Plant (D. C. Cook), Units 1 and 2. The proposed amendments would clarify TS 3/4.4.4, "Pressurizer," to reflect the current power supply to the pressurizer heaters and require two operable trains of pressurizer heaters during Modes 1, 2, and 3. In addition, the proposed amendments would revise the Bases for TS 3/4.4.4 to reflect these changes and to clarify the purpose of the pressurizer heaters.

2.0 BACKGROUND

The pressurizer heaters are electrical immersion heaters, located in the lower section of the pressurizer vessel. The purpose of the pressurizer heaters is to keep the water in the pressurizer at saturation temperature and maintain a constant operating pressure. A minimum required available capacity of pressurizer heaters ensures that the Reactor Coolant System (RCS) pressure can be maintained. The capability to maintain and control system pressure is important for maintaining subcooled conditions in the RCS and ensuring the capability to remove core decay heat by either forced or natural circulation of reactor coolant. Unless adequate heater capacity is available, the hot, high pressure condition cannot be maintained indefinitely and still provide the required subcooling margin in the primary system. Inability to control the system pressure and maintain subcooling under conditions of natural circulation flow in the primary system could lead to a loss of single phase natural circulation and decreased capability to remove core decay heat.

After the Three Mile Island (TMI) accident, NUREG-0578, "TMI-2 Lessons Learned Category A Items," Section 2.1.1, "Emergency Power Supply Requirements for the Pressurizer Heaters, Power-Operated Relief and Block Valves, and Pressurizer Level Indicators in PWR's," recommended that licensees provide redundant emergency power for the minimum number of pressurizer heaters necessary to maintain natural circulation conditions in the event of a loss of offsite power. Westinghouse put together a TMI Owners' Group. Westinghouse conservatively

calculated that the minimum block of heaters to be powered from each safety train is 150 kW. D. C. Cook, as part of the Owners' Group, adopted the 150 kW value and stated that to the Nuclear Regulatory Commission (NRC) staff in the D. C. Cook response to NUREG-0578 dated October 24, 1979.

The D.C. Cook pressurizer heaters were originally powered from non-safety related buses. The design was modified to power the pressurizer heaters from Class 1E buses. The 480 volt systems for each unit are divided into two bus sections (11PHA and 11PHC in Unit 1, and 21PHA and 21PHC in Unit 2) and are used to provide power to the pressurizer heater system. Buses 11PHA and 11PHC are fed from two 4160/480V, 1000 KVA transformers (TR11PHA and TR11PHC, respectively). These transformers are fed from 4160 volt buses T11A and T11D respectively. Buses 21PHA and 21PHC are fed from two 4160/480V, 1000 KVA transformers (TR21PHA and TR21PHC, respectively). These transformers are fed from 4160 volt buses T21A and T21D respectively.

Currently, TS 3/4.4.4 requires at least 150 kW of pressurizer heaters. This is verified by TS surveillance requirement (SR) 4.4.4.2, which requires that the emergency power supply for the pressurizer heaters be demonstrated operable at least once per 18 months by transferring power from the normal to the emergency power supply and energizing the required capacity of heaters. Since the pressurizer heaters are powered from Class 1E buses, the SR to transfer from the normal to the emergency power supply is no longer necessary. This is the reason for the proposed amendment change.

### 3.0 EVALUATION

The licensee proposed the following changes:

- (1) Remove the requirement from TS SR 4.4.4.2 to transfer power from the normal to the emergency power supply.
- (2) Expand TS 3.4.4 to require two operable, 150 kW trains of pressurizer heaters during Modes 1, 2, and 3 and an allowed outage time (AOT) of 72 hours if one train is inoperable.
- (3) Test both trains of heaters under TS SR 4.4.4.2.
- (4) Revise the Bases for TS 3/4.4.4 to reflect the above changes and clarify that the pressurizer backup heaters provide assurance there is adequate subcooling margin in the RCS to maintain natural circulation conditions at hot standby (Mode 3).
- (5) Make the following administrative format changes:
  - (a) Change the format of the action statement to separate it into two parts and label them as a and b.
  - (b) Reformat the headers 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.
  - (c) Reformat the footers for Unit 2 pages to include "COOK NUCLEAR PLANT - UNIT 2" 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.
  - (d) Delete the full height double lines on the right side of Page B 3/4 4-2.
  - (e) Delete full width double line separating the header from the page text on Page 3/4 4-2.

- (f) Fully justify the text and change the font.

The following are the evaluations of the licensee proposed changes above:

- (1) D.C. Cook's current TS 3/4.4.4 requires at least 150 kW of pressurizer heaters. This is verified by TS SR 4.4.4.2, which requires that the emergency power supply for the pressurizer heaters be demonstrated operable at least once per 18 months by transferring power from the normal to the emergency power supply and energizing the required capacity of heaters.

NUREG-0578, "TMI-2 Lessons Learned Category A Items", Section 2.1.1, "Emergency Power Supply Requirements for the Pressurizer Heaters, Power-Operated Relief and Block Valves, and Pressurizer Level Indicators in PWR's," recommended that licensees provide redundant emergency power for the minimum number of pressurizer heaters necessary to maintain natural circulation conditions in the event of a loss of offsite power.

NUREG-0737, "A Clarification of TMI Action Plan Requirements," Item II.E.3.1, "Emergency Power Supply for Pressurizer Heaters," stated the following position:

The pressurizer heater power supply design shall provide the capability to supply, from either the offsite power source or the emergency power source (when offsite power is not available), a predetermined number of pressurizer heaters and associated controls necessary to establish and maintain natural circulation at hot standby conditions. The required heaters and their controls shall be connected to the emergency buses in a manner that will provide redundant power supply capability. Redundant heater capacity must be provided, and each redundant heater or group of heaters should have access to only one Class 1E division power supply.

The D. C. Cook pressurizer heaters were originally powered from non-safety related buses. The design was modified to power the pressurizer heaters from Class 1E buses. Therefore, the current D. C. Cook configuration conforms to NUREG-0578 Section 2.1.1 and NUREG-0737 Item II.E.3.1 since the pressurizer heaters are permanently attached to Class 1E supplied power.

The Class 1E emergency buses receive normal power from the unit generators and emergency power from the emergency diesel generators (EDGs). When the normal power supply is lost, the EDGs automatically supply power to the bus. In the current TSs, SR4.8.1.1.2.e.4 requires the licensee to verify the ability to transfer the emergency busses from the normal power supply to the emergency power supply. Therefore, the staff concludes that it is not necessary to transfer the power supply during operability tests of the pressurizer heaters required in TSs SR 4.4.4.2, and the proposed TSs SR 4.4.4.2 is acceptable.

- (2) D. C. Cook's current TS requires at least 150 kW of pressurizer heaters. NUREG-1431, "Standard Technical Specifications for Westinghouse Plants," specifies two groups of pressurizer heaters operable with the capacity of each group greater than or equal to

150 kW with an AOT of 72 hours. D. C. Cook proposed to expand TS 3.4.4 to require two operable 150 kW trains of pressurizer heaters during Modes 1, 2, and 3 and an AOT of 72 hours is added when one train is inoperable. The licensee chose to change the standard TS wording from group to train due to plant-specific operator terminologies. The 72-hour AOT is consistent with the current TS and NUREG-1431. The licensee's proposed change is consistent with the standard TS for Westinghouse plants and meets the recommendation for redundant heater capacity specified in NUREG-0737. Based on the above, the staff finds this proposed change acceptable.

- (3) D. C. Cook's current TS requires testing of 150 kW of pressurizer heaters at least once per 18 months. The standard TS for Westinghouse plants specifies verification that the capacity of each required group of pressurizer heaters is greater than or equal to 150 kW on an 18 month frequency. D. C. Cook proposed to test both trains of heaters under TS SR 4.4.4.2 at least once per 18 months. The licensee proposed change is consistent with the standard TS for Westinghouse plants and meets the requirement for redundant heater capacity specified in NUREG-0578 and NUREG-0737 and Show Cause Order dated January 2, 1980. Therefore, the staff finds this proposed change acceptable.
- (4) D. C. Cook's proposed change to the bases incorporated the proposed changes to TS 3/4.4.4. The proposed change to the bases of TS 3/4.4.4 clarifies the purpose of the pressurizer heaters minimum capacity for each train to provide adequate subcooling margin in the RCS to maintain natural circulation conditions at hot standby (Mode 3) during a loss of offsite power condition. Also, the licensee's proposed change adds information stating that the requirements apply to the pressurizer backup heaters since the backup heaters can be controlled from both the control room and the hot standby panel. The licensee's proposed change is consistent with the standard TS for Westinghouse plants. The staff does not object to the licensee's proposed changes.
- (5) The licensee proposed administrative changes are format changes intended to make the TS easier to read and understand. The licensee proposed administrative changes result in no substantive changes; therefore, the staff finds the proposed changes acceptable.

#### 4.0 STATE CONSULTATION

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

#### 5.0 ENVIRONMENTAL CONSIDERATION

These amendments change 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 staff has determined that the amendments involve 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 amendments involve no significant hazards consideration and there has been no public comment on such finding (65 FR 56952). Accordingly, the amendments meet 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 amendments.

## 6.0 CONCLUSION

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

Principal Contributor: John G. Lamb

Date: October 20, 2000