

DECEMBER 20 1979

Docket Nos. 50-315  
and 50-316

Mr. John Dolan, Vice President  
Indiana and Michigan Electric Company  
Post Office Box 18  
Bowling Green Station  
New York, New York 10004

REGULATORY DOCKET FILE COPY

Dear Mr. Dolan:

The Commission has issued the enclosed Amendment No. 35 to Facility Operating License No. DPR-58 and Amendment No. 16 to Facility Operating License No. DPR-74 for the Donald C. Cook Nuclear Plant, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications in response to your application transmitted by letter dated August 9, 1979, as supplemented December 7, 1979.

These amendments provide for the addition of a safety-related DC battery system to upgrade the turbine driven train of the auxiliary feedwater system, the upgrading of the Technical Specifications for existing safety-related batteries and the removal of a Unit 2 license condition which has been satisfied by elimination of AC dependency in the turbine driven train of the Unit 2 auxiliary feedwater system.

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

Original Signed By

A. Schwencer, Chief  
Operating Reactors Branch #1  
Division of Operating Reactors

Enclosures:

1. Amendment No. 35 to DPR-58
2. Amendment No. 16 to DPR-74
3. Safety Evaluation
4. Notice of Issuance

cc: w/enclosures  
See next page

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|         |  |  |  |  |  |  |  |  |  |
|---------|--|--|--|--|--|--|--|--|--|
| OFFICE  |  |  |  |  |  |  |  |  |  |
| SURNAME |  |  |  |  |  |  |  |  |  |
| DATE    |  |  |  |  |  |  |  |  |  |

Distribution

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and 50-316

|              |                |
|--------------|----------------|
| NRC PDR (2)  | B. Jones (8)   |
| Local PDR    | B. Scharf (10) |
| NRR Rdg      | D. Brinkman    |
| ORBI Rdg     | B. Harless     |
| D. Eisenhut  | C. Miles       |
| B. Grimes    | R. Diggs       |
| W. Gammill   | H. Denton      |
| D. Brinkman  | ACRS (16)      |
| C. Parrish   | TERA           |
| D. Wigginton | NSIC           |
| OELD         |                |
| R. Vollmer   |                |

*12/20/79 3:30 PM  
Called AEP (Castro) to advise amendment issued today - signed by H. Schwencer - required for plant startup 12/24/79 -  
S. Reeves  
Project Manager*

|                     |               |                                              |           |                                      |            |                                                    |  |
|---------------------|---------------|----------------------------------------------|-----------|--------------------------------------|------------|----------------------------------------------------|--|
| TACS<br>12023/13024 |               | BIO Task Gr<br>R Matthews<br>PRM<br>12/11/79 |           | BIO Task Gr<br>T Novack<br>JMY 12/11 |            | No legal objection<br>OELD<br>R. BLACK<br>12/13/79 |  |
| OFFICE              | DOR:ORBI      | DOR:ORBI                                     | DOR:STSG  | B&O TASK GRP                         | DOR:AD:ORP | DOR:ORBI                                           |  |
| SURNAME             | DWigginton:jb | CSParrish                                    | DBrinkman | Booyce                               | WPGammill  | ASchwencer                                         |  |
| DATE                | 12/11/79      | 12/ /79                                      | 12/12/79  | 12/11/79                             | 12/12/79   | 12/12/79                                           |  |



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

December 20, 1979

Docket Nos. 50-315  
and 50-316

Mr. John Dolan, Vice President  
Indiana and Michigan Electric Company  
Post Office Box 18  
Bowling Green Station  
New York, New York 10004

Dear Mr. Dolan:

The Commission has issued the enclosed Amendment No. 35 to Facility Operating License No. DPR-58 and Amendment No. 16 to Facility Operating License No. DPR-74 for the Donald C. Cook Nuclear Plant, Unit Nos. 1 and 2, respectively. The amendments consist of changes to the Technical Specifications in response to your application transmitted by letter dated August 9, 1979, as supplemented December 7, 1979.

These amendments provide for the addition of a safety-related DC battery system to upgrade the turbine driven train of the auxiliary feedwater system, the upgrading of the Technical Specifications for existing safety-related batteries and the removal of a Unit 2 license condition which has been satisfied by elimination of AC dependency in the turbine driven train of the Unit 2 auxiliary feedwater system.

Copies of the Safety Evaluation and the Notice of Issuance are also enclosed.

Sincerely,

A handwritten signature in cursive script, appearing to read "A. Schwencer", is written over the typed name.

A. Schwencer, Chief  
Operating Reactors Branch #1  
Division of Operating Reactors

Enclosures:

1. Amendment No. 35 to DPR-58
2. Amendment No. 16 to DPR-74
3. Safety Evaluation
4. Notice of Issuance

cc: w/enclosures  
See next page

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046

Mr. John Dolan  
Indiana and Michigan Electric Company

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December 20, 1979

cc: Mr. Robert W. Jurgensen  
Chief Nuclear Engineer  
American Electric Power  
Service Corporation  
2 Broadway  
New York, New York 10004

Gerald Charnoff, Esquire  
Shaw, Pittman, Potts and Trowbridge  
1800 M Street, N.W.  
Washington, D. C. 20036

Citizens for a Better Environment  
59 East Van Buren Street  
Chicago, Illinois 60605

Maude Preston Palenske Memorial  
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St. Joseph, Michigan 49085

Mr. D. Shaller, Plant Manager  
Donald C. Cook Nuclear Plant  
P. O. Box 458  
Bridgman, Michigan 49106

Mr. Robert Masse  
Donald C. Cook Nuclear Plant  
P. O. Box 458  
Bridgman, Michigan 29160

Mr. Wade Schuler, Supervisor  
Lake Township  
Baroda, Michigan 49101

Mr. William R. Rustem (2)  
Office of the Governor  
Room 1 - Capitol Building  
Lansing, Michigan 48913

Honorable James Bemeneck, Mayor  
City of Bridgman, Michigan 49106

Director, Technical Assessment Division  
Office of Radiation Programs (AW-459)  
U. S. Environmental Protection Agency  
Crystal Mall #2  
Arlington, Virginia 20460

U. S. Environmental Protection Agency  
Federal Activities Branch  
Region V Office  
ATTN: EIS COORDINATOR  
230 South Dearborn Street  
Chicago, Illinois 60604

Maurice S. Reizen, M.D.  
Director  
Department of Public Health  
P. O. Box 30035  
Lansing, Michigan 48909



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

INDIANA AND MICHIGAN ELECTRIC COMPANY

DOCKET NO. 50-315

DONALD C. COOK NUCLEAR PLANT UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 35  
License No. DPR-58

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Indiana and Michigan Electric Company (the licensee) dated August 9, 1979 as supplemented December 7, 1979, 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.

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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. 35, 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 the date of elimination of Unit 1 AC dependency in the turbine driven pump train of the auxiliary feedwater system but no later than startup following the next Unit 1 refueling outage.

FOR THE NUCLEAR REGULATORY COMMISSION



A. Schwencer, Chief  
Operating Reactors Branch #1  
Division of Operating Reactors

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: December 20, 1979

ATTACHMENT TO LICENSE AMENDMENT NO. 35

FACILITY OPERATING LICENSE NO. DPR-58

DOCKET NO. 50-315

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided for document completeness.

Pages

VIII

3/4 8-13 (added)

3/4 8-14 (added)

3/4 8-15 (added)

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## ELECTRICAL POWER SYSTEMS

### D.C. DISTRIBUTION - OPERATING - TRAIN N BATTERY SYSTEM

#### LIMITING CONDITION FOR OPERATION

3.8.2.5 The following D.C. bus train shall be energized and OPERABLE with tie breakers between bus trains open:

TRAIN N consisting of 250-volt D.C. bus N, 250-volt D.C. battery bank N, and a full capacity charger.

APPLICABILITY: MODES 1, 2 and 3.

#### ACTION:

With the Train N battery system inoperable, declare the turbine driven Auxiliary Feedwater Pump inoperable and follow the ACTION statement of Specification 3.7.1.2.

#### SURVEILLANCE REQUIREMENTS

4.8.2.5.1 The D.C. bus train N shall be determined OPERABLE and energized with tie breakers open at least once per 7 days by verifying correct breaker alignment and indicated power availability.

4.8.2.5.2 The 250-volt battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

1. The electrolyte level of each pilot cell is between the minimum and maximum level indication marks,

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

2. The pilot cell specific gravity, corrected to 77°F and full electrolyte level is  $\geq 1.200$ .
3. The pilot cell voltage is  $\geq 2.10$  volts, and
4. The overall battery voltage is  $\geq 250$  volts.
- b. At least once per 92 days by verifying that:
  1. The voltage of each connected cell is  $\geq 2.10$  volts under float charge and has not decreased more than 0.05 volts from the value observed during the original acceptance test, and
  2. The specific gravity, corrected to 77°F, of each connected cell is  $\geq 1.200$  and has not decreased more than 0.03 from the value observed during the previous test, and
  3. The electrolyte level of each connected cell is between the minimum and maximum level indication marks.
- c. At least once per 18 months by verifying that:
  1. The cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration.
  2. The cell-to-cell and terminal connections are clean, tight, free of corrosion and coated with anti-corrosion material,
  3. The battery charger will supply at least 10 amperes at  $\geq 250$  volts for at least 4 hours.
- d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status the emergency loads for the specified times of Table 4.8-2 with the battery charger disconnected. The battery terminal voltage shall be maintained  $\geq 210$  volts throughout the entire test.
- e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test shall be performed subsequent to the satisfactory completion of the required battery service test.

TABLE 4.8-2  
BATTERY EMERGENCY LOADS

| <u>"N" Battery Loads</u>                | <u>Minimum Time</u> |
|-----------------------------------------|---------------------|
| Auxiliary feedwater turbine control bus | 4 hours             |
| FMO-211 valve                           | *                   |
| FMO-221 "                               | *                   |
| FMO-231 "                               | *                   |
| FMO-241 "                               | *                   |
| TDTV "                                  | *                   |

\*Valves will be operated through the following sequence:

1. Beginning of test: open valves
  2. Five minutes after the beginning of the test: close the valves.
  3. Ten minutes after the beginning of the test: reopen the valves.
  4. Four hours after the beginning of the test: close the valves.
- End of the test.

### 3/4.8 ELECTRICAL POWER SYSTEMS

#### BASES

The OPERABILITY of the A.C. and D.C power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety related equipment required for 1) the safe shutdown of the facility and 2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criteria 17 of Appendix "A" to 10 CFR 50.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least one of each of the onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite A.C. source.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during shutdown and refueling ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the facility status.

The train N station battery system provides an independent 250 volt DC power supply for power and control of the turbine driven auxiliary feedwater pump train. The limiting conditions of operation for the train N battery are consistent with the requirements of the auxiliary feedwater system. The surveillance requirements for the train N battery system are consistent with the requirements of the AB and CD station batteries. Standby circuits provide the capability to connect the train N battery system to the AB or CD station battery trains. The train N battery loads are derived from equipment in the turbine driven auxiliary feedwater pump train and battery sizing is consistent with the functional requirements of these components.



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

INDIANA AND MICHIGAN ELECTRIC COMPANY

DOCKET NO. 50-316

DONALD C. COOK NUCLEAR PLANT UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 16  
License No. DPR-74

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Indiana and Michigan Electric Company (the licensee) dated August 9, 1979 as supplemented December 7, 1979, 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. 16, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. In addition, License Condition 2.C.(3)(k) is hereby deleted.
4. This license amendment is effective as of the date of its issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



A. Schwencer, Chief  
Operating Reactors Branch #1  
Division of Operating Reactors

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: December 20, 1979

ATTACHMENT TO LICENSE AMENDMENT NO. 16

FACILITY OPERATING LICENSE NO. DPR-74

DOCKET NO. 50-316

Replace the following pages of the Appendix "A" Technical Specifications with the enclosed pages. Revised pages are identified by Amendment number and contain vertical lines indicating the area of change. The corresponding overleaf pages are also provided for document completeness.

Pages

VIII

3/4 8-12 (added)

3/4 8-13 (added)

3/4 8-14 (added)

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### LIMITING CONDITIONS FOR OPERATION AND SURVEILLANCE REQUIREMENTS

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## ELECTRICAL POWER SYSTEMS

### D.C. DISTRIBUTION - SHUTDOWN

#### LIMITING CONDITION FOR OPERATION

---

3.8.2.4 As a minimum, the following D.C. electrical equipment and bus shall be energized and OPERABLE:

1 - 250 volt D.C. bus, and

1 - 250 volt battery bank and charger associated with the above D.C. bus.

APPLICABILITY: MODES 5 and 6.

#### ACTION:

With less than the above complement of D.C. equipment and bus OPERABLE, establish CONTAINMENT INTEGRITY within 8 hours.

#### SURVEILLANCE REQUIREMENTS

---

4.8.2.4.1 The above required 250 volt D.C. bus shall be determined OPERABLE and energized at least once per 7 days by verifying correct breaker alignment and indicated power availability.

4.8.2.4.2 The above required 250 volt battery bank and charger shall be demonstrated OPERABLE per Surveillance Requirement 4.8.2.3.2.

## ELECTRICAL POWER SYSTEMS

### D.C. DISTRIBUTION - OPERATING - TRAIN N BATTERY SYSTEM

#### LIMITING CONDITION FOR OPERATION

3.8.2.5 The following D.C. bus train shall be energized and OPERABLE with tie breakers between bus trains open:

TRAIN N consisting of 250 volt D.C. bus No. N, 250 volt D.C. battery bank No. N and a full capacity charger.

APPLICABILITY: MODES 1, 2 and 3.

#### ACTION:

With the Train N battery system inoperable, declare the turbine driven Auxiliary Feedwater Pump inoperable and follow the ACTION statement of Specification 3.7.1.2.

#### SURVEILLANCE REQUIREMENTS

4.8.2.5.1 The D.C. bus train N shall be determined OPERABLE and energized with tie breakers open at least once per 7 days by verifying correct breaker alignment and indicated power availability.

4.8.2.5.2 The 250 volt battery bank and charger shall be demonstrated OPERABLE:

a. At least once per 7 days by verifying that:

1. The electrolyte level of each pilot cell is between the minimum and maximum level indication marks,

## ELECTRICAL POWER SYSTEMS

### SURVEILLANCE REQUIREMENTS (Continued)

2. The pilot cell specific gravity, corrected to 77°F and full electrolyte level, is  $\geq 1.200$ ,
  3. The pilot cell voltage is  $\geq 2.10$  volts, and
  4. The overall battery voltage is  $\geq 250$  volts.
- b. At least once per 92 days by verifying that:
1. The voltage of each connected cell is  $\geq 2.10$  volts under float charge and has not decreased more than 0.05 volts from the value observed during the original acceptance test,
  2. The specific gravity, corrected to 77°F and full electrolyte level, of each connected cell is  $\geq 1.200$  and has not decreased more than 0.03 from the value observed during the previous test, and
  3. The electrolyte level of each connected cell is between the minimum and maximum level indication marks.
- c. At least once per 18 months by verifying that:
1. The cells, cell plates and battery racks show no visual indication of physical damage or abnormal deterioration.
  2. The cell-to-cell and terminal connections are clean, tight, and coated with anti-corrosion material.
  3. The battery charger will supply at least 10 amperes at  $\geq 250$  volts for at least 4 hours.
- d. At least once per 18 months, during shutdown, by verifying that the battery capacity is adequate to supply and maintain in OPERABLE status the emergency loads for the specified times of Table 4.8-2 with the battery charger disconnected. The battery terminal voltage shall be maintained  $\geq 210$  volts throughout the entire test.
- e. At least once per 60 months, during shutdown, by verifying that the battery capacity is at least 80% of the manufacturer's rating when subjected to a performance discharge test. This performance discharge test shall be performed subsequent to the satisfactory completion of the required battery service test.

TABLE 4.8-2  
BATTERY EMERGENCY LOADS

| <u>"N" Battery Loads</u>                | <u>Minimum Time</u> |
|-----------------------------------------|---------------------|
| Auxiliary feedwater turbine control bus | 4 hours             |
| FMO-211 valve                           | *                   |
| FMO-221 "                               | *                   |
| FMO-231 "                               | *                   |
| FMO-241 "                               | *                   |
| TDTV "                                  | *                   |

\*Valves will be operated through the following sequence:

1. Beginning of test: open valves
  2. Five minutes after the beginning of the test: close the valves.
  3. Ten minutes after the beginning of the test: reopen the valves.
  4. Four hours after the beginning of the test: close the valves.
- End of the test.

### 3/4.8 ELECTRICAL POWER SYSTEMS

#### BASES

The OPERABILITY of the A.C. and D.C. power sources and associated distribution systems during operation ensures that sufficient power will be available to supply the safety related equipment required for 1) the safe shutdown of the facility and 2) the mitigation and control of accident conditions within the facility. The minimum specified independent and redundant A.C. and D.C. power sources and distribution systems satisfy the requirements of General Design Criteria 17 of Appendix "A" to 10 CFR 50.

The ACTION requirements specified for the levels of degradation of the power sources provide restriction upon continued facility operation commensurate with the level of degradation. The OPERABILITY of the power sources are consistent with the initial condition assumptions of the accident analyses and are based upon maintaining at least one redundant set of onsite A.C. and D.C. power sources and associated distribution systems OPERABLE during accident conditions coincident with an assumed loss of offsite power and single failure of the other onsite A.C. source.

The OPERABILITY of the minimum specified A.C. and D.C. power sources and associated distribution systems during shutdown and refueling ensures that 1) the facility can be maintained in the shutdown or refueling condition for extended time periods and 2) sufficient instrumentation and control capability is available for monitoring and maintaining the facility status.

The Surveillance Requirements for demonstrating the OPERABILITY of the diesel generators are in accordance with the recommendations of Regulatory Guides 1.9 "Selection of Diesel Generator Set Capacity for Standby Power Supplies", March 10, 1971, and 1.108 "Periodic Testing of Diesel Generator Units Used as Onsite Electric Power Systems at Nuclear Power Plants", Revision 1, August 1977.

The train N station battery system provides an independent 250 volt DC power supply for power and control of the turbine driven auxiliary feedwater pump train. The limiting conditions of operation for the train N battery are consistent with the requirements of the auxiliary feedwater system. The surveillance requirements for the train N battery system are consistent with the requirements of the AB and CD station batteries. Standby circuits provide the capability to connect the train N battery system to the AB or CD station battery trains. The train N battery loads are derived from equipment in the turbine driven auxiliary feedwater pump train and battery sizing is consistent with the functional requirements of these components.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 35 TO FACILITY OPERATING LICENSE NO. DPR-58  
AND AMENDMENT NO. 16 TO FACILITY OPERATING LICENSE NO. DPR-74  
INDIANA AND MICHIGAN ELECTRIC COMPANY  
DONALD C. COOK NUCLEAR PLANT UNIT NOS. 1 AND 2  
DOCKET NOS. 50-315 AND 50-316

Introduction

By letter dated August 9, 1979, Indiana and Michigan Electric Company (the licensee) submitted proposed Technical Specification changes for the Donald C. Cook Nuclear Plant, Unit Nos. 1 and 2. The proposed changes would (1) add a motor driven auxiliary feedwater (AFW) pump to each unit to enhance the availability of Units 1 and 2 by eliminating shared equipment dependency, (2) add an additional DC battery system; and (3) eliminate dependency on alternating current in the turbine drive auxiliary feedwater train.

The Unit 2 Facility Operating License No. DPR-74 contains a license condition, 2.C.(3)(k), which requires the conversion of the AC electrical dependency to DC before return to power following the first refueling outage. Unit 2 is currently in the first refueling outage and since the addition of the motor driven auxiliary feedwater pumps has not progressed as originally scheduled, this safety evaluation addresses only the proposed changes of AC to DC. The evaluation has been done specifically for Unit 2, however, the information provided by the licensee is for both Units 1 and 2. Because these units are essentially identical and the proposed changes and commitments apply equally to Units 1 and 2, this evaluation and the resulting conclusions and Technical Specifications are for Units 1 and 2.

Existing Turbine Driven Auxiliary Feedwater Train - Unit 2

The turbine driven auxiliary feedwater (TDAFW) pump is connected to all four steam generators in Unit 2. Steam is supplied redundantly from Steam Generator Nos. 2 and 3 and taken upstream of the main steam isolation valves. The steam supply isolation valves to the TDAFW pump are MCM 221 and MCM 231; (refer to Figure 1). These 4-inch motor operated gate valves are normally open, allowing steam pressure to be available up to the trip and throttle (T&T) valve. The motor operated steam isolation valves MCM-221 and 231 can be opened or closed from the control room and on loss of power they fail as-is.

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The T&T valve is normally closed and opens automatically when the TDAFW pump receives a start signal, however, it is AC powered and fails as-is. Auxiliary feedwater is supplied to the four steam generators through 4-inch motor operated valves (MOV), FMO-211, 221, 231, and 241. These globe type MOVs are normally open, but each may be closed by the control room operator in the event of a feedwater or steam line break at the steam generator it feeds. Each MOV can be throttled to regulate steam generator level. In the event of a steam line break and rapid depressurization of a steam generator, or upon detection of a high flow at the TDAFW pump, these MOVs are automatically driven to an intermediate position to prevent pump runout. On loss of power, these MOVs fail as-is.

The TDAFW pumps and associated valves are presently powered from the Class IE AC power system train B. Upon loss of all AC both onsite and offsite the AFWs could not perform its intended function. Therefore, the staff has found it necessary and the licensee has committed to eliminate dependence of the TDAFW pump train upon alternating current by converting to a direct current source of power.

#### Description of Design Modification

At the present time, Unit 2 has two safety-related station batteries. However, when the additional motor driven auxiliary feedwater (MDAFW) pump (proposed for future installation by the licensee) is installed, the use of either of these batteries for the TDAFW pump train will not be possible. At that time, each of the two MDAFW pumps will be served by its own ESF electrical train and associated station battery. Hence, the licensee has installed a third station battery, designated as train "N". This new train "N" station battery is considered to be part of the ESF system.

The turbine driven auxiliary feed pump control bus and associated MOV motors will be powered from the "N" train battery. The following is a list of loads on the "N" train: valve - FMO - 211, 221, 231 and 241 (1.6 Hp) each; the trip and throttle valve (0.33 Hp); test valve - FRV - 256; emergency leak off valve - FRV - 258; AFW Turbine Auto Start; AFW turbine trip; and the overspeed monitor.

Two battery chargers are connected to the "N" train battery bus. When AC power is available, each charger has sufficient capacity to supply all steady state "N" train loads and recharge the battery from full discharge (1.75 volts per cell) to full charge in 24 hours. Only one of the chargers will be in service at any one time. The battery is capable of serving all of the electrical needs of the TDAFW pump train for at least four hours upon loss of all AC power.

### Evaluation

We have reviewed the information provided by the licensee concerning the change of the TDAFW pump train from AC to DC power. This included information provided in Amendment No. 84 (also provided in a letter dated August 9, 1979) which provided a brief description of the proposed modification, additional documentation by the licensee in response to our requests for additional information, and functional logic diagrams. Our evaluation is presented below.

The two new battery chargers would be powered from separate and independent Class IE power buses. As originally proposed, either charger could have been connected to the "N" train battery under normal conditions. During our review we identified the potential for unacceptable parallel operation of both chargers which could connect redundant safety load groups in violation of Regulatory Guide 1.5. We required that at least one interlock (mechanical or electrical) be provided to prevent an operator error that would parallel these chargers. The licensee modified its design to incorporate an acceptable electrical interlock which will prevent this potential problem.

Likewise, during our review we identified another potential for paralleling two standby circuits from the existing station batteries (AB and CD) in violation of Regulatory Guide 1.6. We required that at least one interlock be provided to prevent operator error from tying these batteries together. To meet our requirement, the licensee disabled the backup feeders from the AB and CD batteries (by disconnecting and insulating the ends of the interconnecting cables). These cables were disconnected at the "N" train distribution cabinet and at the distribution cabinets for the AB and CD batteries.

With the incorporation of these modifications we conclude that the design of the TDAFW pump train complies with the provisions of Regulatory Guide 1.6.

The electrical equipment to be installed for the "N" train is qualified in accordance with IEEE 323-1971. This includes the battery, battery chargers, distribution cabinets, and valve control centers. The installation also meets the provisions of Regulatory Guide 1.75 with the exception of the annunciation circuits which are non Class IE.

The "N" train batteries for each unit will each be housed in a new room. Each room will be fully enclosed by two hour fire rated barriers with 1-1/2 hour rated (Class B) doors and ventilation dampers. In addition, the licensee will provide automatic fire detection and manual fire suppression equipment. Also the ventilation system is designed to maintain hydrogen concentration well below 2 volume percent and alarms in the control room are provided to annunciate if either redundant ventilation fan fails.

The licensee has performed a fire hazards analysis for the new battery being installed in each unit. In this analysis, the licensee concludes that no unacceptable safety-related consequences would result from a postulated fire in these rooms. This conclusion is based primarily on containing the fire within the room and because of the separation, diversity and redundancy in the auxiliary feedwater system. We agree with this evaluation and find that the fire protection meets the requirements of Appendix A to Branch Technical Position APCSB 9.5-1.

#### Technical Specifications

The changes to the Technical Specifications proposed by the licensee on August 9, 1979 for the addition of the "N" train batteries are consistent with the current Technical Specifications for Units 1 and 2. However, the action statement for the "N" train batteries is being revised to refer to the operability of the unit's turbine driven auxiliary feedwater pump. With the "N" train battery inoperable, the related TDAFW pump is to be declared inoperable and the TDAFW pump Action Statement would apply.

The changes to the Unit 2 Technical Specifications should be effective immediately to satisfy license condition 2.C.(3)(k) which requires elimination of AC dependency in the TDAFW pump train during the first refueling outage.

Similar changes to the Unit 1 Technical Specifications should be made effective as soon as the licensee can complete the modifications described above. The licensee has committed to completing these modifications before returning to power from the next refueling outage of Unit 1. Therefore, we find that these changes for the Unit 1 Technical Specifications should be made effective no later than during the next Unit 1 refueling outage or sooner if at all possible.

#### Summary

Based on the information presented in FSAR Amendment No. 84 and the additional information requested we have concluded that:

- (1) The design bases information provided gives reasonable assurance that the new DC train can be satisfactorily implemented into the existing AFWS.
- (2) The "N" battery train is physically and electrically independent from the other ESF electrical trains.

- (3) The conversion of the TDAFW pump train from AC to DC meets the Commission's requirements and is acceptable.
- (4) The "N" battery train is capable of serving the TDAFW pump train for at least four hours without either charger in operation. This feature satisfies the staff position that at least one AFW flow path and associated instrumentation and controls be capable of being operated without AC power for at least two hours.
- (5) The fire protection for the rooms containing the "N" battery train meets the requirements of Appendix A to Branch Technical Position APCSB 9.5-1.

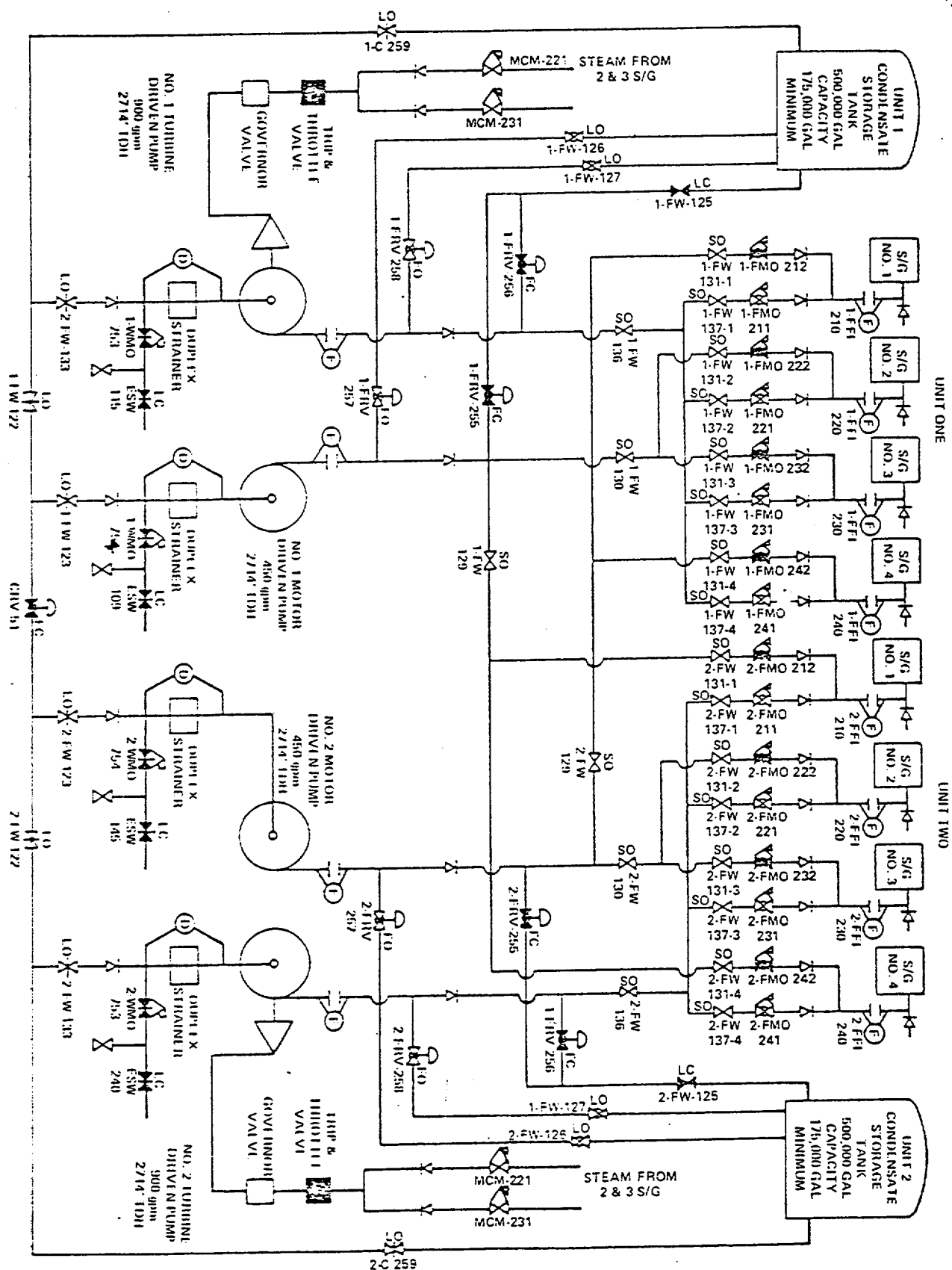
#### Environmental Consideration

We have determined that the amendments do not authorize a change in effluent types or total amounts nor an increase in power level and will not result in any significant environmental impact. Having made this determination, we have further concluded that the amendments involve an action which is insignificant from the standpoint of environmental impact and, pursuant to 10 CFR §51.5(d)(4), that an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with the issuance of these amendments.

#### Conclusion














We have concluded based on the considerations discussed above, that: (1) because the amendments do not involve a significant increase in the probability or consequences of accidents previously considered and do not involve a significant decrease in a safety margin, the amendments do not involve a significant hazards consideration, (2) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public.

Date: December 20, 1979



Auxiliary Feedwater System  
D.C. Cook  
Figure 1 (Sheet 1 of 2)

LEGEND:

-  = MOTOR OPERATED GLOBE VALVE – OPEN
-  = MOTOR OPERATED GLOBE VALVE – CLOSED
-  = MOTOR OPERATED BUTTERFLY VALVE – OPEN
-  = MOTOR OPERATED BUTTERFLY VALVE – CLOSED
-  = MOTOR OPERATED GATE VALVE – OPEN
-  = MOTOR OPERATED GATE VALVE – CLOSED
-  = MANUAL GATE VALVE – OPEN
-  = MANUAL GATE VALVE – CLOSED
-  = MANUAL GLOBE VALVE – OPEN
-  = MANUAL GLOBE VALVE – CLOSED
-  = MANUAL BUTTERFLY VALVE – OPEN
-  = MANUAL BUTTERFLY VALVE – CLOSED
-  = CHECK VALVE
- FO = FAILS OPEN
- FC = FAILS CLOSED
- LO = LOCKED OPEN (LOCK AND KEY)
- LC = LOCKED CLOSED (LOCK AND KEY)
- SO = SEALED OPEN (DETENT)

UNITED STATES NUCLEAR REGULATORY COMMISSIONDOCKET NOS. 50-315 AND 50-316INDIANA AND MICHIGAN ELECTRIC COMPANYNOTICE OF ISSUANCE OF AMENDMENT TO FACILITY  
OPERATING LICENSE

The U. S. Nuclear Regulatory Commission (the Commission) has issued Amendment No. 35 to Facility Operating License No. DPR-58, and Amendment No. 16 to Facility Operating License No. DPR-74 issued to Indiana and Michigan Electric Company (the licensee), which revised Technical Specifications for operation of Donald C. Cook Nuclear Plant, Unit Nos. 1 and 2 (the facilities) located in Berrien County, Michigan. The Unit No. 2 amendment is effective as of the date of issuance. The amendment for Unit 1 is effective on the date of elimination of AC dependency in the turbine driven pump train of the auxiliary feedwater system, but no later than the startup date following the next Unit No. 1 refueling outage.

These amendments provide for the addition of a safety-related DC battery system to upgrade the turbine driven train of the auxiliary feedwater system, the upgrading of the Technical Specifications for existing safety-related batteries and the removal of a Unit 2 license condition which has been satisfied by elimination of AC dependency in the turbine driven train of the Unit 2 auxiliary feedwater system.

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- 2 -

The application for the amendments complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations. The Commission has made appropriate findings as required by the Act and the Commission's rules and regulations in 10 CFR Chapter I, which are set forth in the license amendments. Prior public notice of these amendments was not required since the amendments do not involve a significant hazards consideration.

The Commission has determined that the issuance of these amendments will not result in any significant environmental impact and that pursuant to 10 CFR §51.5(d)(4) an environmental impact statement or negative declaration and environmental impact appraisal need not be prepared in connection with issuance of these amendments.

For further details with respect to this action, see (1) the application for amendments dated August 9, 1979 as supplemented December 7, 1979 (2) Amendment Nos. 35 and 16 to License Nos. DPR-58 and DPR-74, and (3) the Commission's related Safety Evaluation. All of these items are available for public inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D.C. and at

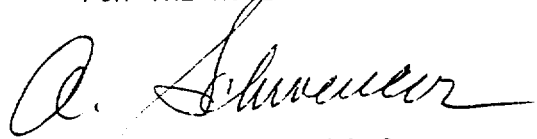


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the Maude Reston Palenske Memorial Library, 500 Market Street, St. Joseph, Michigan 49085. A copy of items (2) and (3) may be obtained upon request addressed to the U. S. Nuclear Regulatory Commission, Washington, D.C. 20555, Attention: Director, Division of Operating Reactors.

Dated at Bethesda, Maryland, this 20th day of December, 1979.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in cursive script, appearing to read "A. Schwencer".

A. Schwencer, Chief  
Operating Reactors Branch #1  
Division of Operating Reactors