



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

May 3, 2001

Mr. Nathan L. Haskell, Director  
Licensing and Performance Assessment  
Palisades Plant  
27780 Blue Star Memorial Highway  
Covert, MI 49043

SUBJECT: PALISADES PLANT - ISSUANCE OF AMENDMENT RE: TECHNICAL SPECIFICATIONS TASK FORCE CHANGE NO. 325, STRUCTURE OF THE LIMITING CONDITIONS FOR OPERATION OF THE EMERGENCY CORE COOLING SYSTEM (TAC NO. MB0870)

Dear Mr. Haskell:

The Commission has issued the enclosed Amendment No. 198 to Facility Operating License No. DPR-20 for the Palisades Plant. The amendment consists of changes to the Technical Specifications in response to a portion of your application dated December 7, 2000.

The amendment changes Technical Specification (TS) 3.5.2 in accordance with changes to the "Standard Technical Specifications, Combustion Engineering Plants," NUREG 1432, Revision 1, made by the Nuclear Energy Institute Technical Specifications Task Force change number 325, Revision 0, addressing changes to the structure of the TS Limiting Conditions for Operation for the Emergency Core Cooling System in the Palisades TS.

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

Sincerely,

Handwritten signature of Claudia M. Craig for.

Darl S. Hood, Senior Project Manager, Section 1  
Project Directorate III  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-255

Enclosures: 1. Amendment No. 198 to DPR-20  
2. Safety Evaluation

cc w/encl: See next page

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/RA by C. Craig for/  
Darl S. Hood, Senior Project Manager, Section 1  
Project Directorate III  
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Palisades Plant

cc:

Mr. John Paul Cowan  
Site Vice President  
Palisades Plant  
27780 Blue Star Memorial Highway  
Covert, MI 49043

Mr. Robert A. Fenech, Senior Vice President  
Nuclear, Fossil, and Hydro Operations  
Consumers Energy Company  
212 West Michigan Avenue  
Jackson, MI 49201

Arunas T. Udrys, Esquire  
Consumers Energy Company  
212 West Michigan Avenue  
Jackson, MI 49201

Regional Administrator, Region III  
U.S. Nuclear Regulatory Commission  
801 Warrenville Road  
Lisle, IL 60532-4351

Jerry Sarno, Supervisor  
Covert Township  
P. O. Box 35  
Covert, MI 49043

Office of the Governor  
P. O. Box 30013  
Lansing, MI 48909

U.S. Nuclear Regulatory Commission  
Resident Inspector's Office  
Palisades Plant  
27782 Blue Star Memorial Highway  
Covert, MI 49043

Drinking Water and Radiological  
Protection Division  
Michigan Department of  
Environmental Quality  
3423 N. Martin Luther King Jr Blvd  
P. O. Box 30630 CPH Mailroom  
Lansing, MI 48909-8130

Michigan Department of Attorney General  
Special Litigation Division  
630 Law Building  
P.O. Box 30212  
Lansing, MI 48909



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

CONSUMERS ENERGY COMPANY

DOCKET NO. 50-255

PALISADES PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 198  
License No. DPR-20

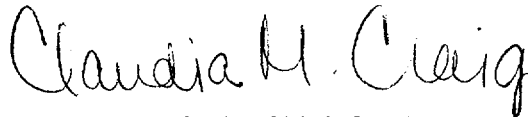
1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Consumers Energy Company (the licensee) dated December 7, 2000, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules 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;
  - 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 the license amendment and Paragraph 2.C.(2) of Facility Operating License No. DPR-20 is hereby amended to read as follows:

The Technical Specifications contained in Appendix A, as revised through Amendment No. 198 , and the Environmental Protection Plan contained in Appendix B are hereby incorporated in the license. Consumers Energy Company shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of issuance and shall be implemented within 90 days.

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: May 3, 2001

ATTACHMENT TO LICENSE AMENDMENT NO. 198

FACILITY OPERATING LICENSE NO. DPR-20

DOCKET NO. 50-255

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

3.5.2-1  
B 3.5.2-6  
B 3.5.2-7  
B 3.5.2-8  
B 3.5.2-9  
B 3.5.2-10  
B 3.5.2-11  
B 3.5.2-12

INSERT

3.5.2-1  
B 3.5.2-6  
B 3.5.2-7  
B 3.5.2-8  
B 3.5.2-9  
B 3.5.2-10  
B 3.5.2-11  
B 3.5.2-12

3.5 EMERGENCY CORE COOLING SYSTEMS (ECCS)

3.5.2 ECCS - Operating

LCO 3.5.2 Two ECCS trains shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,  
MODE 3 with Primary Coolant System (PCS) temperature  $\geq 325^{\circ}\text{F}$ .

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One LPSI subsystem inoperable.	A.1 Restore LPSI subsystem to OPERABLE status.	7 days
B. One or more ECCS trains inoperable for reasons other than Condition A.	B.1 Restore train(s) to OPERABLE status.	72 hours
C. Required Action and associated Completion Time of Condition A or B not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Reduce PCS temperature to $< 325^{\circ}\text{F}$ .	6 hours  24 hours
D. Less than 100% of the required ECCS flow available.	D.1 Enter LCO 3.0.3.	Immediately

BASES

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APPLICABILITY

In MODES 1 and 2, and in MODE 3 with PCS temperature  $\geq 325^{\circ}\text{F}$ , the ECCS OPERABILITY requirements for the limiting Design Basis Accident (DBA) large break LOCA are based on full power operation. Although reduced power would not require the same level of performance, the accident analysis does not provide for reduced cooling requirements in the lower MODES. The HPSI pump performance is based on the small break LOCA, which establishes the pump performance curve and has less dependence on power. The requirements of MODE 2 and MODE 3 with PCS temperature  $\geq 325^{\circ}\text{F}$ , are bounded by the MODE 1 analysis.

The ECCS functional requirements of MODE 3, with PCS temperature  $< 325^{\circ}\text{F}$ , and MODE 4 are described in LCO 3.5.3, "ECCS - Shutdown."

In MODES 5 and 6, plant conditions are such that the probability of an event requiring ECCS injection is extremely low. Core cooling requirements in MODE 5 are addressed by LCO 3.4.7, "PCS Loops - MODE 5, Loops Filled," and LCO 3.4.8, "PCS Loops - MODE 5, Loops Not Filled." MODE 6 core cooling requirements are addressed by LCO 3.9.4, "Shutdown Cooling (SDC) and Coolant Circulation - High Water Level," and LCO 3.9.5, "Shutdown Cooling (SDC) and Coolant Circulation - Low Water Level."

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ACTIONS

A.1

Condition A is applicable whenever one LPSI subsystem is inoperable. With one LPSI subsystem inoperable, action must be taken to restore OPERABLE status within 7 days. In this condition, the remaining OPERABLE ECCS train is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure to the remaining LPSI subsystem could result in loss of ECCS function. The 7 day Completion Time is reasonable to perform corrective maintenance on the inoperable LPSI subsystem. While mechanical system LCOs typically provide a 72 hour Completion Time, this 7 day Completion Time is based on the findings of the deterministic and probabilistic analysis in Reference 5. Reference 5 concluded that extending the Completion Time to 7 days for an inoperable LPSI subsystem provides plant operational flexibility while simultaneously reducing overall plant risk. This is because the risks incurred by having the LPSI subsystem unavailable for a longer time at power will be substantially offset by the benefits associated with avoiding unnecessary plant transitions and by reducing risk during plant shutdown operations.



BASES

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ACTIONS  
(continued)

B.1

Condition B is applicable whenever one or more ECCS trains is inoperable for reasons other than one inoperable LPSI subsystem. Action B.1 requires restoration of both ECCS trains, (HPSI and LPSI) to OPERABLE status within 72 hours. The 72 hour Completion Time is based on an NRC study (Ref. 3), assuming that at least 100% of the required ECCS flow (that assumed in the safety analyses) is available. If less than 100% of the required ECCS flow is available, Condition D must also be entered.

Mechanical system LCOs typically provide a 72 hour Completion Time under conditions when a required system can perform its required safety function, but may not be able to do so assuming an additional failure. When operating in accordance with the Required Actions of an LCO Condition, it is not necessary to be able to cope with an additional single failure.

The ECCS can provide one hundred percent of the required ECCS flow following the occurrence of any single active failure. Therefore, the ECCS function can be met during conditions when those components which could be deactivated by a single active failure are known to be inoperable. Under that condition, however, the ability to provide the function after the occurrence of an additional failure cannot be guaranteed. Therefore, continued operation with one or more trains inoperable is allowed only for a limited time.

C.1 and C.2

Condition C is applicable when the Required Actions of Condition A or B cannot be completed within the required Completion Time. Either Condition A or B is applicable whenever one or more ECCS trains is inoperable. Therefore, when Condition C is applicable, either Condition A or B is also applicable. Being in Conditions A or B, and Condition C concurrently maintains both Completion Time clocks for instances where equipment repair allows exit from Condition C while the plant is still within the applicable conditions of the LCO.

If the inoperable ECCS trains cannot be restored to OPERABLE status within the required Completion Times of Condition A and B, the plant must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and PCS temperature reduce to < 325°F within 24 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power in an orderly manner and without challenging plant systems.

BASES

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ACTIONS  
(continued)

D.1

Condition D is applicable with one or more trains inoperable when there is less than 100% of the required ECCS flow available. Either Condition A or B is applicable whenever one or more ECCS trains is inoperable. Therefore, when this Condition is applicable, either Condition A or B is also applicable. Being in Conditions A or B, and Condition D concurrently maintains both Completion Time clocks for instances where equipment repair allows exit from Condition D (and LCO 3.0.3) while the plant is still within the applicable conditions of the LCO.

One hundred percent of the required ECCS flow can be provided by one OPERABLE HPSI subsystem and one OPERABLE LPSI subsystem. The required LPSI flow (that assumed in the safety analyses) is available if there is an OPERABLE LPSI flow path from the SIRWT to any two PCS loops. Shutdown cooling flow control valve, CV-3006 must be full open. The required HPSI flow (that assumed in the safety analyses) is available if there is an OPERABLE HPSI flow path from the SIRWT to each PCS loop (having less than all four PCS loop flowpaths may be acceptable if verified against current safety analyses). A Containment Spray Pump and a sub-cooled suction valve must be available to support each OPERABLE HPSI pump. In each case, an OPERABLE flow path must include an OPERABLE pump and OPERABLE loop injection valves.

Reference 4 describes situations in which one component, such as the shutdown cooling flow control valve, CV-3006, can disable both ECCS trains. With one or more components inoperable, such that 100% of the required ECCS flow (that assumed in the safety analyses) is not available, the facility is in a condition outside the accident safety analyses.

With less than 100% of the required ECCS flow available, the plant is in a condition outside the assumptions of the safety analyses. Therefore, LCO 3.0.3 must be entered immediately.

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.5.2.1

Verification of proper valve position ensures that the flow path from the ECCS pumps to the PCS is maintained. CV-3027 and CV-3056 are stop valves in the minimum recirculation flow path for the ECCS pumps. If either of these valves were closed when the PCS pressure was above the shutoff head of the ECCS pumps, the pumps could be damaged by running with insufficient flow and thus render both ECCS trains inoperable.

Placing HS-3027A and HS-3027B for CV-3027, and HS-3056A and HS-3056B for CV-3056, in the open position ensures that the valves cannot be inadvertently misaligned or change position as the result of an active failure. These valves are of the type described in Reference 4, which can disable the function of both ECCS trains and invalidate the accident analysis. CV-3027 and CV-3056 are capable of being closed from the control room since the SIRWT must be isolated from the containment during the recirculation phase of a LOCA. A 12 hour Frequency is considered reasonable in view of other administrative controls ensuring that a mispositioned valve is an unlikely possibility.

SR 3.5.2.2

Verifying the correct alignment for manual, power operated, and automatic valves in the ECCS flow paths provides assurance that the proper flow paths will exist for ECCS operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. A valve that receives an actuation signal is allowed to be in a nonaccident position provided the valve automatically repositions within the proper stroke time. This Surveillance does not require any testing or valve manipulation. Rather, it involves verification that those valves capable of being mispositioned are in the correct position.

The 31 day Frequency is appropriate because the valves are operated under procedural control and an improper valve position would only affect a single train. This Frequency has been shown to be acceptable through operating experience.

BASES

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SURVEILLANCE  
REQUIREMENTS  
(Continued)

SR 3.5.2.3

SR 3.5.2.3 verifies CV-3006 is in the open position and that its air supply is isolated. CV-3006 is the shutdown cooling flow control valve located in the common LPSI flow path. The valve must be verified in the full open position to support the low pressure injection flow assumptions used in the accident analyses. The inadvertent misposition of this valve could result in a loss of low pressure injection flow and thus invalidate these flow assumptions. CV-3006 is designed to be held open by spring force and closed by air pressure. To ensure the valve cannot be inadvertently misaligned or change position as the result of a hot short in the control circuit, the air supply to CV-3006 is isolated. Isolation of the air supply to CV-3006 is acceptable since the valve does not require automatic repositioning during an accident.

The 31 day Frequency has been shown to be acceptable through operating practice and the unlikely occurrence of the air supply to CV-3006 being unisolated coincident with an inadvertent valve misalignment event or a hot short in the control circuit.

SR 3.5.2.4

Periodic surveillance testing of ECCS pumps to detect gross degradation caused by impeller damage or other hydraulic component problems is required by Section XI of the ASME Code. This type of testing may be accomplished by measuring the pump developed head at only one point of the pump characteristic curve. This verifies both that the measured performance is within an acceptable tolerance of the original pump baseline performance and that the performance at the test flow is greater than or equal to the performance assumed in the plant safety analysis. SRs are specified in the Inservice Testing Program, which encompasses Section XI of the ASME Code. Section XI of the ASME Code provides the activities and Frequencies necessary to satisfy the requirements.

SR 3.5.2.5, SR 3.5.2.6, and SR 3.5.2.7

These SRs demonstrate that each automatic ECCS valve actuates to the required position on an actual or simulated actuation signal, i.e., on an SIS or RAS, that each ECCS pump starts on receipt of an actual or simulated actuation signal, i.e., on an SIS, and that the LPSI pumps stop on receipt of an actual or simulated actuation signal, i.e., on an RAS. This Surveillance is not required for valves that are locked, sealed, or otherwise secured in the required position under administrative controls.

BASES

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SURVEILLANCE  
REQUIREMENTS

SR 3.5.2.5, SR 3.5.2.6, and SR 3.5.2.7 (continued)

The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a plant outage and the potential for unplanned transients if the Surveillances were performed with the reactor at power. The 18 month Frequency is also acceptable based on consideration of the design reliability of the equipment and operating experience. The actuation logic is tested as part of the Engineered Safety Feature (ESF) testing, and equipment performance is monitored as part of the Inservice Testing Program.

SR 3.5.2.8

The HPSI Hot Leg Injection motor operated valves and the LPSI loop injection valves have position switches which are set at other than the full open position. This surveillance verifies that these position switches are set properly.

The HPSI Hot leg injection valves are manually opened during the post-LOCA long term cooling phase to admit HPSI injection flow to the PCS hot leg. The open position limit switch on each HPSI hot leg isolation valves is set to establish a predetermined flow split between the HPSI injection entering the PCS hot leg and cold legs.

The LPSI loop injection MOVs open automatically on a SIS signal. The open position limit switch on each LPSI loop injection valve is set to establish the maximum possible flow through that valve. The design of these valves is such that excessive turbulence is developed in the valve body when the valve disk is at the full open position. Stopping the valve travel at slightly less than full open reduces the turbulence and results in increased flow. Verifying that the position stops are properly set ensures that a single low pressure safety injection subsystem is capable of delivering the flow rate required in the safety analysis.

The 18 month Frequency is based on the same factors as those stated above for SR 3.5.2.5, SR 3.5.2.6, and SR 3.5.2.7.

SR 3.5.2.9

Periodic inspection of the containment sump ensures that it is unrestricted and stays in proper operating condition. The 18 month Frequency is based on the need to perform this Surveillance under outage conditions. This Frequency is sufficient to detect abnormal degradation and is confirmed by operating experience.

BASES

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REFERENCES

1. FSAR, Section 5.1
  2. FSAR, Section 14.17
  3. NRC Memorandum to V. Stello, Jr., from R. L. Baer, "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975
  4. IE Information Notice No. 87-01, January 6, 1987
  5. CE-NPSD-994, "CEOG Joint Applications Report for Safety Injection Tank AOT/STI Extension," May 1995
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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 198 TO FACILITY OPERATING LICENSE NO. DPR-20  
CONSUMERS ENERGY COMPANY  
PALISADES PLANT  
DOCKET NO. 50-255

1.0 INTRODUCTION

By application dated December 7, 2000, the Consumers Energy Company (the licensee) requested an amendment to the Operating License, to change the Technical Specifications (TS) for the Palisades Plant. The proposed amendment would change the TS in accordance with changes to the "Standard Technical Specifications, Combustion Engineering Plants," NUREG-1432, Revision 1, made by the Nuclear Energy Institute Technical Specifications Task Force change number 325, Revision 0 (TSTF-325R0) addressing changes to the structure of the TS Limiting Condition for Operation (LCO) for the Emergency Core Cooling System (ECCS).

The following changes to the Palisades TS are proposed in accordance with TSTF-325R0:

TS 3.5.2, "ECCS - Operating."

1. The second part of the Condition B description, "At least 100 percent of the required ECCS flow available," would be deleted.
2. The wording of Condition C would be revised to limit its application to Conditions A or B.
3. The deleted wording from Condition B would be made into a new condition, Condition D, which would read: "Less than 100 percent of the required ECCS flow available." Required Action D.1, "Enter LCO 3.0.3," and its completion time, "Immediately," would also be added.

The licensee's application for amendment forwarded associated changes to the TS Bases.

The licensee's application also proposed (1) changes to additional systems similar to the changes in TSTF-325R0, and (2) additional changes based upon TSTFs other than TSTF-325R0. The Nuclear Regulatory Commission (NRC) staff will address those changes by separate correspondence.

## 2.0 BACKGROUND

When the licensee converted the Palisades TS to the improved technical specification (ITS), it adopted action requirements for the ECCS based on TS 3.5.2, "Emergency Core Cooling Systems - Operating," of NUREG-1432, Revision 1 (STS). The action requirements permit continued operation for the specified completion time (72 hours) in the event components from both "trains" of the system were inoperable provided at least one train's capability remained operable using the remaining operable components. In TS 3.5.2, such ECCS inoperable situations are addressed with the following condition statement:

One or more trains of ECCS inoperable for reasons other than Condition A.

### AND

At least 100 percent of the ECCS flow equivalent to a single OPERABLE ECCS train available.

This approach could lead to problems in actual use due to the strict logic rules of standard TS. Stating the condition in this way allows inoperabilities to be present in both trains, as long as 100 percent equivalent ECCS flow is available. If a situation were to subsequently occur which resulted in less than 100 percent equivalent ECCS flow, LCO 3.0.3 would require an immediate plant shutdown. However, with less than 100 percent equivalent ECCS flow operable, the above stated conditions would no longer exist, and by the completion time rules of TS Section 1.3, "Completion Time," the condition and required actions would be exited, and its 72-hour completion time clock reset. If flow is then restored, reentry into the condition would incorrectly result in an additional 72 hours completion time, without ever having returned a train to operable status. This is contrary to the intent of TS Section 1.3. According to TS Section 1.3, the TS should not allow exiting the condition and required actions and resetting the 72-hour completion time clock upon entering LCO 3.0.3. The condition and required actions should remain applicable until both trains of ECCS are restored to operable status or the plant is placed outside the ECCS specification's mode of applicability.

In response to this logic problem, the industry proposed a generic change, TSTF-325R0, to revise the ECCS specification's action requirements to conform to the intent of STS Section 1.3. This was accomplished by splitting the STS condition into two separate conditions, so that the required action for an inoperable train remains applicable regardless of overall remaining ECCS flow availability, and so that the completion time clock is not reset in the event flow is restored. Specifically, the split results in these two conditions:

One or more trains of ECCS inoperable for reasons other than Condition A;

And a new condition,

Less than 100 percent of the ECCS flow equivalent to a single OPERABLE ECCS train available.



Stating the original condition as two separate conditions ensures the intent of STS Section 1.3 is met. In the event the plant enters the new condition addressing low flow, entry into LCO 3.0.3 would be required. However, by TS Section 1.3, the plant would also remain in the inoperable train condition, enabling a smooth transition in the event flow capability were restored, so that the low flow condition would no longer apply and could, thus, be exited. Because this clarification of the action requirements does not change the technical basis of the specification, the NRC staff approved TSTF-325R0.

### 3.0 EVALUATION

In view of the above clarification achieved by TSTF-325R0, the Palisades licensee proposed to adopt similar TS changes by revising Palisades TS 3.5.2, "ECCS - Operating," by splitting Condition B into two conditions: (1) Revised Condition B would address the condition of one or more trains of ECCS inoperable for reasons other than Condition A; and (2) New Condition D would address the condition of less than 100 percent of the required ECCS flow available.

In the first condition stated above, the required actions allow 72 hours to restore the inoperable trains to operable status before requiring a plant shutdown (in accordance with Required Action C for TS 3.5.2). In the second condition stated above, the actions require immediately entering LCO 3.0.3. These action requirements are technically identical to the existing action requirements.

The proposed revision to the format of the existing action requirements is an administrative change because it does not alter the existing restrictions on plant operation, but only clarifies the intent of the existing action requirements, making them consistent with the completion time rules of Palisades TS 1.3, "Completion Time." Therefore, because these changes are purely administrative and do not change the technical basis of these specifications, they are acceptable. The licensee has also forwarded conforming changes for the TS Bases. The NRC staff does not object to the licensee's changes to the TS Bases.

### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Michigan State official was notified of the proposed issuance of the amendment. The Michigan 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 7675). 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 Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: C. Harbuck

Date: May 3, 2001