

May 15, 1998

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

SUBJECT: PALISADES PLANT - ISSUANCE OF AMENDMENT RE: PRIMARY COOLANT PUMP FLYWHEEL INSPECTION TECHNICAL SPECIFICATIONS (TAC NO. M94567)

Dear Mr. Haskell:

The Commission has issued the enclosed Amendment No. 182 to Facility Operating License No. DPR-20 for the Palisades Plant. The amendment consists of changes to the Technical Specifications (TS) in response to Consumers Energy Company's application dated January 18, 1996, as supplemented October 1, 1997, and January 29 and April 27, 1998.

The amendment revises the TS regarding inspection requirements for the reactor coolant pump (RCP) flywheels. The submittal is related to the ABB Combustion Engineering report SIR-94-080, "Relaxation of Reactor Coolant Pump Flywheel Inspection Requirements," approved by the staff, with certain conditions, on May 21, 1997. The RCP flywheels' inspection intervals have been changed in accordance with the conclusions of the staff safety evaluation (SE) related to SIR-94-080.

The proposed change to TS 6.5.6 regarding application to the flywheel testing program of the Surveillance Requirement 4.0.2 allowance for surveillance interval extension of up to 25% was not adequately justified and has been denied. The basis for this finding is documented in the enclosed SE. A copy of the Notice of Partial Denial of Amendment to be published in the *Federal Register* is enclosed.

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,

ORIGINAL SIGNED BY:

Robert G. Schaaf, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

11
DFU

9805290274 980515
PDR ADOCK 05000255
P PDR

Docket No. 50-255

- Enclosures: 1. Amendment No. 182 to DPR-20
2. Safety Evaluation
3. Notice of Partial Denial

cc w/encl: See next page
DISTRIBUTION: See attached page
*SEE PREVIOUS CONCURRENCE

NRC FILE CENTER COPY

DOCUMENT NAME: G:\WPDOCS\PALISADE\PAL94567.AMD **No major changes made to SE.

To receive a copy of this document, indicate in the box: "C" = Copy without attachment/enclosure "E" = Copy with attachment/enclosure "N" = No copy

OFFICE	PM:PD31	E	LA:PD31	E	SC:EMCB**	OGC*	D:PD31
NAME	RGSchaaf:db		CJamerson		KWichman	RBachman	CACarpente
DATE	5/15/98		5/15/98		SE dtd 5/7/98	5/14/98	5/15/98

OFFICIAL RECORD COPY

DATED: May 15, 1998

AMENDMENT NO. 182 TO FACILITY OPERATING LICENSE NO. DPR-20 - PALISADES

Docket File (50-255)

PUBLIC

PDIII-1 Reading

E. Adensam (EGA1)

C. Jamerson

R. Schaaf

OGC

G. Hill (2)

W. Beckner

S. Sheng

ACRS

B. Burgess, RIII

SEDB (TLH3)

Mr. Nathan L. Haskell
Consumers Energy Company

Palisades Plant

cc:

Mr. Thomas J. Palmisano
Site Vice President
Palisades Plant
27780 Blue Star Memorial Highway
Covert, Michigan 49043

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

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

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, Michigan 48909-8130

M. I. Miller, Esquire
Sidley & Austin
54th Floor
One First National Plaza
Chicago, Illinois 60603

Gerald Charnoff, Esquire
Shaw, Pittman, Potts and Trowbridge
2300 N Street, N. W.
Washington DC 20037

Mr. Thomas A. McNish
Vice President & Secretary
Consumers Energy Company
212 West Michigan Avenue
Jackson, Michigan 49201

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

Judd L. Bacon, Esquire
Consumers Energy Company
212 West Michigan Avenue
Jackson, Michigan 49201

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

Jerry Sarno
Township Supervisor
Covert Township
36197 M-140 Highway
Covert, Michigan 49043

Office of the Governor
Room 1 - Capitol Building
Lansing, Michigan 48913



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. 182
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 January 18, 1996, as supplemented October 1, 1997, and January 29 and April 27, 1998, 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. 182, 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.

FOR THE NUCLEAR REGULATORY COMMISSION

Robert G. Schaaf, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation

9805290278 980515
PDR ADOCK 05000255
P PDR

Attachment: Changes to the Technical
Specifications

Date of Issuance: May 15, 1998

ATTACHMENT TO LICENSE AMENDMENT NO. 182

FACILITY OPERATING LICENSE NO. DPR-20

DOCKET NO. 50-255

Revise Appendix A Technical Specifications by removing the pages identified below and inserting the attached pages. The revised pages are identified by amendment number and contain vertical lines indicating the areas of change.

REMOVE

6-8

INSERT

6-8

6.5.5 Reserved

6.5.6 Primary Coolant Pump Flywheel Surveillance Program

Surveillance of the primary coolant pump flywheels shall consist of a 100% volumetric inspection of the upper flywheels each 10 years.

6.5.7 Inservice Inspection and Testing Program

This program provides controls for inservice inspection and testing of ASME Code Class 1, 2, and 3 components including applicable supports. The program shall include the following:

- a. Testing frequencies specified in Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda (B&PV Code) as follows:

<u>B&PV Code terminology for inservice testing activities</u>	<u>Required interval for performing inservice testing activities</u>
Weekly	≤ 7 days
Monthly	≤ 31 days
Quarterly or every 3 months	≤ 92 days
Semiannually or every 6 months	≤ 184 days
Every 9 months	≤ 276 days
Yearly or annually	≤ 366 days
Biennially or every 2 years	≤ 731 days

- b. The provisions of Surveillance Requirement 4.0.2 are applicable to the above required intervals for performing inservice testing activities;
- c. The provisions of Surveillance Requirement 4.0.3 are applicable to inservice testing activities; and
- d. Nothing in the B&PV Code shall be construed to supersede the requirements of any Technical Specification.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 182 TO FACILITY OPERATING LICENSE NO. DPR-20

CONSUMERS ENERGY COMPANY

PALISADES PLANT

DOCKET NO. 50-255

1.0 INTRODUCTION

By letter dated January 18, 1996, as supplemented by letters dated October 1, 1997, and January 29, and April 27, 1998, Consumers Energy Company (the licensee) requested an amendment to the Technical Specifications (TS) appended to Facility Operating License No. DPR-20 for the Palisades Plant. The proposed amendment would revise the TS regarding inspection requirements for the reactor coolant pump (RCP) flywheels and allow the application of Surveillance Requirement 4.0.2, which permits extension of surveillance intervals by up to 25%, to the flywheel inspection program. The submittal is related to the ABB Combustion Engineering report SIR-94-080, "Relaxation of Reactor Coolant Pump Flywheel Inspection Requirements," which was approved by the staff, with certain conditions, on May 21, 1997. The licensee proposed to change the RCP flywheels' inspection intervals in accordance with the conclusion of the safety evaluation (SE) related to SIR-94-080.

The January 29 and April 27, 1998, letters provided additional clarifying information that was within the scope of the original *Federal Register* notice and did not change the staff's initial proposed no significant hazards considerations determination.

2.0 EVALUATION

The function of the RCP in the reactor coolant system (RCS) of a pressurized-water reactor (PWR) plant is to maintain an adequate cooling flow rate by circulating a large volume of primary coolant water at high temperature and pressure through the RCS. A concern regarding overspeed of the RCP and its potential for failure led to the issuance of Regulatory Guide (RG) 1.14 in 1971. Since then, most licensees for PWR plants, with very few exceptions, have adopted the guidelines of RG 1.14 to conduct their RCP flywheel examinations. These requirements are normally specified in the individual plant's TS as is the case for Palisades.

In the May 21, 1997, SE related to ABB Combustion Engineering report SIR-94-080, the staff concluded, "(1) all flywheels meet the proposed nonductile fracture criteria, and will have adequate fracture toughness during their service periods, and (2) all flywheels except those for Waterford 3 satisfy the excessive deformation criterion of RG 1.14." This conclusion was based on the fracture toughness (K_{Ic}) values reported in SIR-94-080 for all participating plants, including Palisades. In the SE related to SIR-94-080, the staff required applicants wishing to

reference the report to support flywheel inspection interval extensions to verify the reference temperature, RT_{NDT} , and to justify the use of the K_{Ic} versus $(T-RT_{NDT})$ curve in Appendix A of Section XI of the American Society of Mechanical Engineers (ASME) Code for flywheels made of materials other than SA 533 B and SA 508.

2.1 Licensee's Evaluation

The licensee indicated in the submittal that Palisades RCP flywheels were made from ASTM A-108 (SAE 1017) low carbon steel, and the nil ductility transition (NDT) temperature for this material is 40 °F with an average Charpy V-notch (CVN) energy of 100 ft-lb at 70 °F. Using the ASME Code, the licensee concluded that the RT_{NDT} for its flywheel material may be conservatively considered as 40 °F, the same as the NDT.

The licensee does not have plant-specific test data to establish the appropriate K_{Ic} value for its flywheel material. Nor does it have flywheels made from either SA 533 B or SA 508 material so that it can use the K_{Ic} versus $(T-RT_{NDT})$ curve in Appendix A directly. To overcome this, the licensee used the Appendix A curve for K_{Ic} determination, but introduced a factor of 0.75 to cover any uncertainty on the fracture toughness. Using an operating temperature, T , of 100 °F, an RT_{NDT} of 40 °F, and an uncertainty factor of 0.75, the licensee determined the K_{Ic} value to be 85.5 ksi(in)^½. This fracture toughness is employed in the subsequent fracture mechanics analysis. The allowable flaw size is then determined by intersecting this fracture toughness with the applied stress curve plotted as a function of flaw depth. The applied stress represents the combined shrink-fit and centrifugal stresses multiplied by a safety factor of 2.5, as approved in the SE related to SIR-94-080. The critical flaw size calculated by the licensee is 1.52 inches, which provides a large margin when compared to the postulated crack size of 0.343 inch from the SE related to SIR-94-080 based on an initial flaw size of 0.33 inch and a crack growth of 0.013 inch after 10 years of operation of the flywheel. Consequently, the licensee concluded that the inspection interval for Palisades' flywheels can be extended to 10 years.

2.2 Staff's Evaluation

According to the ASME Code, if the NDT, which can be estimated by the drop-weight test, is 40 °F, then the RT_{NDT} is also 40 °F, provided that the Charpy energy at 100 °F (40 °F+60 °F) exceeds 50 ft-lb and the lateral expansion exceeds 35 mils. Since the Palisades flywheel material has an average Charpy energy of 100 ft-lb at 70 °F, it would have a Charpy energy far exceeding 50 ft-lb at a temperature higher than 70 °F. Because of this large margin, the material is also very likely to meet the lateral expansion threshold of 35 mils. Hence, the staff accepts the RT_{NDT} of 40 °F for the Palisades flywheel material.

The licensee applied the Appendix A curve to estimate the K_{Ic} value for its flywheels. To cover the uncertainty involved in applying a curve based on SA 533 B and SA 508 vessel material data to the Palisades flywheel material of SAE 1017 low carbon steel, the licensee applied a factor of 0.75 to reduce the K_{Ic} value to 85.5 ksi(in)^½. The rest of the licensee's approach is in accordance with the flaw evaluation procedure in Section XI of the ASME Code. The staff concludes that in addition to the uncertainty factor of 0.75, there is margin associated with the fact that the calculated flaw size after 10 years of operation (0.343 inch) is far less than the critical flaw size (1.52 inches).

To further evaluate the K_{Ic} value of $85.5 \text{ ksi}(\text{in})^{1/2}$, the staff conducted a literature search. Page 175 of the book, Linear Elastic Fracture Mechanics, by D. Broek, indicates that the K_{Ic} for the low strength carbon steel is greater than $200 \text{ ksi}(\text{in})^{1/2}$. Page 877 of the American Society for Metals (ASM) Handbook, Fatigue and Fracture, by S. Lampman, et al., indicates that the Mean-minus-2-sigma K_{Ic} for 1018 steel is $215 \text{ ksi}(\text{in})^{1/2}$. The staff did not find the K_{Ic} value for the 1017 steel. However, considering that both 1017 and 1018 materials have the same carbon, sulfur, and phosphorus contents (manganese content is 0.4% for 1017 and 0.8% for 1018), and their K_{Ic} values may not be significantly different, the staff accepts the K_{Ic} value of $85.5 \text{ ksi}(\text{in})^{1/2}$.

The staff has reviewed the licensee's request and has determined that the analysis in the submittal meets the intent of the ABB Combustion Engineering topical report SIR-94-080, and the combined margin is adequate to cover the uncertainty in applying the Appendix A K_{Ic} curve. Hence, the staff accepts the licensee's proposed change to implement 10-year inspection intervals for the RCP flywheels.

2.3 Related Proposed Changes

The licensee proposed to delete the footnote appended to TS 6.5.6a. regarding deferral of the flywheel inspections during the refueling outage at the end of cycle 12. This refueling outage was completed in December 1996; therefore, the footnote is no longer applicable. This change is acceptable to the staff.

The licensee proposed to add paragraph b. to TS 6.5.6, to apply the provisions of Surveillance Requirement 4.0.2, which permits extension of surveillance intervals by up to 25%, to the flywheel inspection program. However, this proposed change would allow the licensee to extend the flywheel inspection interval to as long as 12.5 years, which is not in accordance with the staff's conclusion in the SE related to SIR-94-080, and the licensee's submittal did not include sufficient information for the staff to evaluate the proposed change. Consequently, this proposed change is denied.

3.0 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.

4.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. The 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 (62 FR 59915). 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.

5.0 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: S. Sheng

Date: May 15, 1998

UNITED STATES NUCLEAR REGULATORY COMMISSION**PALISADES NUCLEAR PLANT****DOCKET NO. 50-255****NOTICE OF PARTIAL DENIAL OF AMENDMENT TO FACILITY OPERATING LICENSE
AND OPPORTUNITY FOR HEARING**

The U.S. Nuclear Regulatory Commission (the Commission) has denied a portion of a request by Consumers Energy Company (the licensee) for an amendment to Facility Operating License No. DPR-20 issued to the licensee for operation of the Palisades Nuclear Plant, located in Van Buren County, Michigan. Notice of Consideration of Issuance of this amendment was published in the FEDERAL REGISTER on November 5, 1997 (62 FR 59915).

The purpose of the licensee's amendment request was to revise the Technical Specifications regarding inspection requirements for the reactor coolant pump (RCP) flywheels. As part of its request, the licensee proposed to revise Technical Specification 6.5.6 to apply the provisions of Surveillance Requirement 4.0.2, which permits extension of surveillance intervals by up to 25%, to the flywheel inspection program. The licensee's submittal did not include sufficient information for the staff to evaluate this proposed change.

The NRC staff has concluded that a portion of the licensee's request cannot be granted. The licensee was notified of the Commission's denial of the proposed change by a letter dated May 15, 1998.

By June 22, 1998, the licensee may demand a hearing with respect to the denial described above. Any person whose interest may be affected by this proceeding may file a written petition for leave to intervene.

A request for hearing or petition for leave to intervene must be filed with the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attention: Rulemakings and Adjudications Staff, or may be delivered to the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC, by the above date.

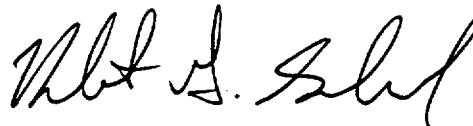
A copy of any petitions should also be sent to the Office of the General Counsel, U.S. Nuclear Regulatory Commission, Washington, DC 20555, and to Judd L. Bacon, Esquire, Consumers Energy Company, 212 West Michigan Avenue, Jackson, Michigan 49201, attorney for the licensee.

For further details with respect to this action, see (1) the application for amendment dated January 18, 1996, as supplemented by letters dated October 1, 1997, and January 29, and April 27, 1998, and (2) the Commission's letter to the licensee dated May 15, 1998.

These documents are available for public inspection at the Commission's Public Document Room, the Gelman Building, 2120 L Street, NW., Washington, DC, and at the local public document room located at the Van Wylen Library, Hope College, Holland, Michigan 49423.

Dated at Rockville, Maryland, this 15th day of May 1998.

For the Nuclear Regulatory Commission



Robert G. Schaaf, Project Manager
Project Directorate III-1
Division of Reactor Projects - III/IV
Office of Nuclear Reactor Regulation