February 3, 1992

Docket No. 50-255

Mr. Gerald B. Slade
Plant General Manager
Palisades Plant
Consumers Power Company
27780 Blue Star Memorial Highway
Covert, Michigan 49043

Dear Mr. Slade:

SUBJECT: PALISADES PLANT - AMENDMENT NO. 141 TO FACILITY OPERATING LICENSE NO. DPR-20 (TAC NO. M77853)

The Commission has issued the enclosed Amendment No. 141 to Facility Operating License No. DPR-20 for the Palisades Plant. This amendment consists of changes to the Technical Specifications in response to your application dated October 22, 1990.

This amendment revises the augmented inservice inspection program for steam generators that is currently described in Technical Specification 4.14. This change to the Technical Specification Surveillance Program deletes requirements that were applicable to the old steam generators and updates the inservice inspection program to be consistent with the program described in the Standard Technical Specifications.

A copy of our Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Original signed by

Brian Holian, Project Manager
Project Directorate III-1
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 141 DPR-20
2. Safety Evaluation

cc w/enclosures:
See next page ***SEE PREVIOS CONCURRENCE***

OFC	:LA:PDIII-1	:PE:PDIII-1**	:PM:PDIII-1**	:OGC**	:D:PDIII-1:
NAME	:MShuttleworth	:MGamberoni:jkd	:BHolian	:	:LMarsh :
DATE	: 1/13/92	:01/17/92	:01/17/92	:01/22/92	: 2/3 /92

OFFICIAL RECORD COPY Document Name: M77853.pal - dy's c:

DFO1

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

February 3, 1992

Docket No. 50-255

Mr. Gerald B. Slade
Plant General Manager
Palisades Plant
Consumers Power Company
27780 Blue Star Memorial Highway
Covert, Michigan 49043

Dear Mr. Slade:

SUBJECT: PALISADES PLANT - AMENDMENT NO. 141 TO FACILITY OPERATING LICENSE NO. DPR-20 (TAC NO. M77853)

The Commission has issued the enclosed Amendment No. 141 to Facility Operating License No. DPR-20 for the Palisades Plant. This amendment consists of changes to the Technical Specifications in response to your application dated October 22, 1990.

This amendment revises the augmented inservice inspection program for steam generators that is currently described in Technical Specification 4.14. This change to the Technical Specification Surveillance Program deletes requirements that were applicable to the old steam generators and updates the inservice inspection program to be consistent with the program described in the Standard Technical Specifications.

A copy of our Safety Evaluation is also enclosed. The notice of issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

Brian Holian, Project Manager
Project Directorate III-1
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Enclosures:
1. Amendment No. 141 DPR-20
2. Safety Evaluation

cc w/enclosures:
See next page

cc:

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

Mr. Thomas A. McNish, Secretary
Consumers Power Company
212 West Michigan Avenue
Jackson, Michigan 49201

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

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

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

Mr. Patrick M. Donnelly
Director, Safety and Licensing
Palisades Plant
27780 Blue Star Memorial Hwy.
Covert, Michigan 49043

Resident Inspector
c/o U.S. Nuclear Regulatory Commission
Palisades Plant
27782 Blue Star Memorial Hwy.
Covert, Michigan 49043

Nuclear Facilities and Environmental
Monitor Section Office
Division of Radiological Health
Department of Public Health
3423 N. Logan Street
P. O. Box 30195
Lansing, Michigan 30195

Gerald Charnoff, P.C.
Shaw, Pittman, Potts &
Trowbridge
2300 N. Street, N.W.
Washington, D.C. 20037

Mr. David L. Brannen
Vice President
Palisades Generating Company
c/o Bechtel Power Corporation
15740 Shady Grove Road
Gaithersburg, Maryland 20877

Roy W. Jones
Manager, Strategic Program
Development
Westinghouse Electric Corporation
4350 Northern Pike
Monroeville, Pennslyvania 15146

DATED: February 3, 1992

AMENDMENT NO. 141 TO FACILITY OPERATING LICENSE NO. DPR-20-PALISADES

Docket File
NRC & Local PDRs
PDIII-1 Reading
Palisades Plant File
B. Boger
J. Zwolinski
L. Marsh
M. Shuttleworth
B. Holian OGC-WF
M. Gamberoni
D. Hagan, 3302 MNBB
G. Hill (4), P-137
Wanda Jones, MNBB-7103
C. Grimes, 11/F/23
H. Conrad 7/D/4
ACRS (10)
GPA/PA
OC/LFMB
W. Shafer, R-III

cc: Plant Service list

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

CONSUMERS POWER COMPANY

DOCKET NO. 50-255

PALISADES PLANT

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 141
License No. DPR-20

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

   A. The application for amendment by Consumers Power Company (the licensee) dated October 22, 1990, 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:

Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 141 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

L. B. Marsh, Director
Project Directorate III-1
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Technical
Specifications

Date of Issuance: February 3, 1992

ATTACHMENT TO LICENSE AMENDMENT NO. 141

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 the amendment number and contain marginal lines indicating the area of change.

REMOVE	INSERT
4-66	4-66
4-67	4-67
4-68	4-68
4-68a	4-69
4-68b	4-69a
4-68c	4-69b
4-68d	4-69c
4-69	-

4.14 AUGMENTED INSERVICE INSPECTION PROGRAM FOR STEAM GENERATORS

4.14.1 Each steam generator shall be demonstrated OPERABLE by performance of the following augmented inservice inspection program and the requirements of Specification 4.0.5.

4.14.2 Steam Generator Sample Selection and Inspection - Each steam generator shall be determined OPERABLE during shutdown by selecting and inspecting at least the minimum number of steam generators specified in Table 4.14-1.

4.14.3 Steam Generator Tube Sample Selection and Inspection - The steam generator tube minimum sample size, inspection result classification, and the corresponding action required shall be as specified in Table 4.14-2. The inservice inspection of steam generator tubes shall be performed at the frequencies specified in Specification 4.14.4 and the inspected tubes shall be verified acceptable per the acceptance criteria of Specification 4.14.5. The tubes selected for each inservice inspection shall include at least 3% of the total number of tubes in all steam generators; the tubes selected for these inspections shall be selected on a random basis except:

a. Where experience in similar plants with similar water chemistry indicates critical areas to be inspected, then at least 50% of the tubes inspected shall be from these critical areas.

b. The first sample of tubes selected for each inservice inspection (subsequent to the preservice inspection) of each steam generator shall include:

1. All nonplugged tubes that previously had detectable wall penetrations greater than 20%.

2. Tubes in those areas where experience has indicated potential problems.

3. A tube inspection (pursuant to Specification 4.14.5.a.8) shall be performed on each selected tube. If any selected tube does not permit the passage of the eddy current probe for a tube inspection, this shall be recorded and an adjacent tube shall be selected and subjected to a tube inspection.

c. The tubes selected as the second and third samples (if required by Table 4.14-2) during each inservice inspection may be subjected to a partial tube inspection provided:

1. The tubes selected for these samples include the tubes from those areas of the tube sheet array where tubes with imperfections were previously found.

2. The inspections include those portions of the tubes where imperfections were previously found.

The results of each sample inspection shall be classified into one of the following three categories:

Category	Inspection Results
C-1	Less than 5% of the total tubes inspected are degraded tubes and none of the inspected tubes are defective.
C-2	One or more tubes, but not more than 1% of the total tubes inspected are defective, or between 5% and 10% of the total tubes inspected are degraded tubes.
C-3	More than 10% of the total tubes inspected are degraded tubes or more than 1% of the inspected tubes are defective.

Note: In all inspections, previously degraded tubes must exhibit significant (greater than 10%) further wall penetrations to be included in the above percentage calculations.

4.14.4 Inspection Frequencies - The above required inservice inspection of steam generator tubes shall be performed at the following frequencies:

a. The first inservice inspection shall be performed after 6 Effective Full Power Months but within 24 calendar months of inaugural criticality for the steam generators. Subsequent inservice inspections shall be performed at intervals of not less than 12 nor more than 24 calendar months after the previous inspection. If two consecutive inspections following service under AVT conditions, not including the preservice inspection, result in all inspections results falling into the C-1 category or if two consecutive inspections demonstrate that previously observed degradation has not continued and no additional degradation has occurred, the inspection interval may be extended to a maximum of once per 40 months.

b. If the results of the inservice inspection of a steam generator conducted in accordance with Table 4.14-2 at 40 month intervals fall into Category C-3, the inspection frequency shall be increased to at least once per 20 months.

4.14 AUGMENTED INSERVICE INSPECTION PROGRAM FOR STEAM GENERATORS (Cont'd)

The increase in inspection frequency shall apply until the subsequent inspections satisfy the criteria of Specification 4.14.4.a; the interval may then be extended to a maximum of once per 40 months.

c. Additional, unscheduled inservice inspections shall be performed on each steam generator in accordance with the first sample inspection specified in Table 4.14-2 during the shutdown subsequent to any of the following conditions:

1. Primary-to-secondary tube leaks (not including leaks originating from tube-to-tube sheet welds) in excess of the limits of Specification 3.1.5.

2. A seismic occurrence greater than the Operating Basis Earthquake.

3. A loss-of-coolant accident resulting in initiation of flow of the engineered safeguards.

4. A main steam line or main feedwater line break.

4.14.5 Acceptance Criteria

a. As used in this Specification

1. Imperfection means an exception to the dimensions, finish or contour of a tube from that required fabrication drawings or specifications. Eddy-current testing indications below 20% of the nominal tube wall thickness, if detectable, may be considered as imperfections.

2. Degradation means a service-induced cracking, wastage, wear or general corrosion occurring on either inside or outside of a tube.

3. Degraded Tube means a tube containing imperfections greater than or equal to 20% of the nominal wall thickness caused by degradation.

4. % Degradation means the percentage of the tube wall thickness affected or removed by degradation.

5. Defect means an imperfection of such severity that it exceeds the plugging limit. A tube containing a defect is defective.

6. Plugging Limit means the imperfection depth at or beyond which the tube shall be removed from service and is equal to 40% of the nominal tube wall thickness.

4.14 AUGMENTED INSERVICE INSPECTION PROGRAM FOR STEAM GENERATORS (Cont'd)

7. Unserviceable described the condition of a tube if it leaks or contains a defect large enough to affect its structural integrity in the event of an Operating Basis Earthquake, a loss-of-coolant accident, or a steam line or feedwater line break as specified in 4.14.4.c, above.

8. Tube Inspection means an inspection of the steam generator tube from the point of entry (hot leg side) completely around the U-bend to the top support of the cold leg.

9. Preservice Inspection means an inspection of the full length of each tube in steam generator performed by eddy current techniques prior to service to establish a baseline condition of the tubing. This inspection shall be performed after the shop hydrostatic test and prior to initial POWER OPERATION using the equipment and techniques expected to be used during subsequent inservice inspections.

b. The steam generator shall be determined OPERABLE after completing the corresponding actions (plug all tubes exceeding the plugging limit and all tubes containing through-wall cracks) required by Table 4.14-2.

4.14.6 Reports

a. Within 15 days following the completion of each inservice inspection of steam generator tubes, the number of tubes plugged in each steam generator shall be reported to the Commission in a Special Report pursuant to Specification 6.9.3.3b.

b. The complete results of the steam generator tube inservice inspection shall be submitted to the Commission in a Special Report pursuant to Specification 6.9.3.3b within 12 months following completion of the inspection. This Special Report shall include:

1. Number and extent of tubes inspected.

2. Location and percent of wall-thickness penetration for each indication of an imperfection.

3. Identification of tubes plugged

c. Results of steam generator tube inspections that fall into Category C-3 shall require 24 hour verbal notification to the NRC prior to resumption of plant operation. A written followup within the next 30 days shall provide a description of investigations and corrective measures taken to prevent recurrence.

Table 4.14-1

MINIMUM NUMBER OF STEAM GENERATORS TO BE
INSPECTED DURING INSERVICE INSPECTION

Preservice Inspection	Yes
No. of Steam Generators per Unit	Two
First Inservice Inspection	One
Second & Subsequent Inservice Inspections	One[1]

Table Notation:

1. The inservice inspection may be limited to one steam generator on a rotating schedule encompassing 6% of the tubes if the results of previous inspections indicate that all steam generators are performing in a like manner. Note that under some circumstances, the operating conditions in one or more steam generators may be found to be more severe than those in other steam generators. Under such circumstances the sample sequence shall be modified to inspect the most severe conditions.

TABLE 4.14-2
STEAM GENERATOR TUBE INSPECTION

1ST SAMPLE INSPECTION			2ND SAMPLE INSPECTION		3RD SAMPLE INSPECTION	
Sample Size	Result	Action Required	Result	Action Required	Result	Action Required
A minimum of S Tubes per S.G.	C-1	None	N/A	N/A	N/A	N/A
	C-2	Plug defective tubes and inspect additional 2S tubes in this S.G.	C-1	None	N/A	N/A
			C-2	Plug defective tubes and inspect additional 4S tubes in this S.G.	C-1	None
					C-2	Plug defective tubes
					C-3	Perform action for C-3 result of first Sample
			C-3	Perform action for C-3 result of first Sample	N/A	N/A
	C-3	Inspect all tubes in this S.G., plug defective tubes and inspect 2S tubes in each other S.G. 24 hour verbal notification to NRC with written follow up within next 30 days	All other S.G.s are C-1	None	N/A	N/A
			Some S.G.s C-2 but no additional S.G. are C-3	Perform action for C-2 result of second sample	N/A	N/A
			Additional S.G. is C-3	Inspect all tubes each S.G. and plug defective tubes.	N/A	N/A

$S = 3\frac{N}{n}\%$ Where N is the number of steam generators in the unit, and n is the number of steam generators inspected during an inspection

Basis (cont'd)

The Surveillance Requirements for inspection of the steam generator tubes ensure that the structural integrity of this portion of the PCS will be maintained. The program for inservice inspection of steam generator tubes is based on a modification of Regulatory Guide 1.83, Revision 1. Inservice inspection of steam generator tubing is essential in order to maintain surveillance of the conditions of the tubes in the event that there is evidence of mechanical damage or progressive degradation due to design, manufacturing errors, or inservice conditions that lead to corrosion.

Inservice inspection of steam generator tubing also provides a means of characterizing the nature and cause of any tube degradation so that corrective measures can be taken.

The plant is expected to be operated in a manner such that the secondary coolant will be maintained within those chemistry limits found to result in negligible corrosion of the steam generator tubes. If the secondary coolant chemistry is not maintained within these limits, localized corrosion may likely result in stress corrosion cracking. The extent of cracking during plant operation would be limited by the limitation of steam generator tube leakage limit between the primary coolant system and the secondary coolant system that is stated in Technical Specifications 3.1.5. Cracks having a primary-to-secondary leakage less than this limit during operation will have an adequate margin of safety to withstand the loads imposed during normal operation and by postulated accidents. Operating experience has demonstrated that primary-to-secondary leakage in excess of the limits stated in Technical Specification 3.1.5 can readily be detected by radiation monitors of steam generator blowdown or condenser off-gas. Leakage in excess of this limit will require plant shutdown and an unscheduled inspection, during which the leaking tubes will be located and plugged.

Waste-type defects are unlikely with proper chemistry treatment of the secondary coolant. However, even if a defect should develop in service, it will be found during scheduled inservice steam generator tube examinations. Plugging will be required for all tubes with imperfections exceeding the plugging limit of 40% of the tube nominal wall thickness (ASME B&PV Code, Section XI, IWB 3521). Steam generator tube inspections of operating plants have demonstrated the capability to reliably detect degradation that has penetrated 20% of the original tube wall thickness.

Whenever the results of any steam generator tubing inservice inspection fall into category C-3, these results will be promptly reported to the Commission prior the resumption of plant operation. Such cases will be considered by the Commission on a case-by-case basis and may result in a requirement for analysis, laboratory examinations, tests, additional eddy-current inspection, and revision of the Technical Specifications, if necessary.

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 141 TO FACILITY OPERATING LICENSE NO. DPR-20

CONSUMERS POWER COMPANY

PALISADES PLANT

DOCKET NO. 50-255

1.0 INTRODUCTION

By letter dated October 22, 1990, Consumers Power Company submitted a request for change to Palisades Technical Specification 4.14, "Augmented Inservice Inspection Program for Steam Generators." Under the proposed change, the existing Technical Specification (TS) program for augmented inservice inspection of the steam generators will be replaced with an inservice inspection program that is consistent with the inspection program described in the Standard Technical Specifications (STS). With the replacement of the original steam generators and approval of this change to the TS, all previous commitments and requirements pertaining to inspection of the original steam generators will be annulled.

2.0 DISCUSSION

The proposed TS change would revise the augmented inservice inspection program for steam generators that is currently described in Technical Specification 4.14. Under the proposed change, the existing TS program for inservice inspection of steam generators will be replaced with an inservice inspection program that is consistent with the program described in the STS.

Inservice inspection of primary coolant system components, including steam generator tubes, is necessary to ensure that design basis assumptions are maintained. Steam generator tube inspections also provide periodic surveillance of steam generator tube condition in order to detect mechanical damage or progressive degradation caused by corrosion. The proposed inservice inspection program for steam generators is based Regulatory Guide 1.83, Revision 1, "Inservice Inspection of Pressurized Water Reactor Steam Generator Tubes" and satisfies these objectives.

3.0 Evaluation

The existing augmented inservice inspection program for steam generators includes the following: (1) non-destructive examination of a sample of steam generator tubes on a schedular basis, (2) emphasis on tubes that are located in areas where experience has indicated that flaw initiation is most probable,

(3) increased monitoring of tubes that were previously identified as degraded, (4) increased tube sample size and inspection frequency following evidence of excess tube degradation, and (5) repair and plugging criteria for degraded and defective tubes.

These same requirements from the existing steam generator inspection program are embodied in the STS program for augmented inservice inspection of steam generators, and are also reflected in the inservice inspection program proposed. In addition to the previously mentioned program attributes, both the existing and proposed inservice inspection programs contain provisions for reporting the results of inspection activities to the Commission.

A difference between the existing and proposed programs is the imperfection depth at or beyond which a steam generator tube will be considered defective. Under the proposed TS, a steam generator tube will be considered unacceptable if an indication penetrates 40% or more of the nominal tube wall thickness.

The existing specification has a separate criteria for tubes that contain multiple indications. However, neither the STS inspection program nor the proposed inspection program contain a separate criteria for tubes with multiple indications. The existing criteria for tubes with multiple indications was developed specifically for the original Palisades steam generators at a time when operational degradation of the steam generator tubes was unpredictable and aggressive due to previous chemistry practices. The repair criteria reflects previously observed operational degradation rates, as well as the relatively high level of instrument uncertainty that was inherent in eddy current testing (ECT) devices which were available at the time the specification was written.

Early ECT devices often provided ambiguous representations of tube wall condition, including indeterminate evidence of multiple tube wall indications. ECT devices are now able to depict tube wall conditions with significantly greater accuracy. Additionally, the licensee utilizes secondary water chemistry that has been demonstrated to minimize operational tube degradation, and has recently the steam generators.

The proposed change to Technical Specification 4.14 will result in an acceptance criteria that is as conservative as those described in the existing program for steam generator tubes that do not exhibit multiple indications. Because of differences in nominal tube wall thickness between the original and replacement steam generators, the proposed 40% acceptance criteria will result in a dimensionally larger thickness of un-degraded tube wall.

The proposed specification also clarifies the method used to satisfy the requirement that hydrostatic testing be performed prior to preservice ECT examination of the steam generator tubes.

The same principal provisions from the existing inservice inspection program are also reflected in the proposed inservice inspection program. Therefore, the reliability and integrity of those provisions of the primary coolant boundary associated with the steam generator tubes will not be reduced.

Additionally, the proposed inspection program will direct tube repairs under conditions that are no less conservative than those stated in the existing specification.

The margin of safety associated with the structural integrity of those portions of the primary coolant system that are associated with the steam generator tubes will be maintained following implementation of the proposed change through use of TS limits on primary-to-secondary leakage and the inservice inspection program.

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 State official had no comments.

5.0 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 a change in a surveillance requirement. 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 this amendment involves no significant hazards consideration and there has been no public comment on such finding (FR). Accordingly, this 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 this amendment.

6.0 CONCLUSION

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

Principal Contributor: H. F. Conrad

Date: February 3, 1992