

FEB 6 1975

Docket No. 50-255

Consumers Power Company
ATTN: Mr. R. C. Youngdahl
Senior Vice President
212 West Michigan Avenue
Jackson, Michigan 49201

Gentlemen:

On December 13, 1974, you submitted a request for amendment to Provisional Operating License No. DPR-20 for the Palisades Plant which, in effect, would substitute a 500-tube inspection in the "A" steam generator for the more extensive tube inspection in both steam generators required by your license. The 500-tube inspection was conducted in the period December 13-15, 1974, and you forwarded the results to us with your letter of January 3, 1975.

The results of this inspection were statistically evaluated by you in support of your conclusion that wastage had not progressed in the Palisades steam generators. Nevertheless, these results showed that 27 tubes of the limited sample taken were indicating tube wall thinning in excess of 50% of the original wall thickness.

Since the plant was still in the cold shutdown condition for the tube inspection, we advised you by telephone on January 10, 1975, that we were concerned from a safety standpoint about resuming operation with tubes with wastage of 50% or more in service, and that further tube inspections might be required.

On January 21, 1975, we met with you at your request to discuss these concerns prior to taking action on your request for amendment dated December 13, 1974. At this meeting, we had the benefit of further information, including the actual tube data, which you had furnished the day before at our request. No conclusions were reached at this meeting pending further evaluation of the additional information furnished. Nevertheless, we advised you at this time that the results of our review might not be favorable.

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On January 28, 1975, we completed our review, and you were notified by telephone of our conclusions that prior to resuming plant operation (1) further tube inspections would be required and (2) tubes with confirmed wastage of 50% or more must be plugged. The plant at that time was being maintained in a shutdown condition, and you advised us that the plant would remain shutdown pending resolution of this matter.

At a meeting on January 29, 1975, we informed you that we were prepared to issue an Order requiring the plant to remain shutdown pending further inspections, corrective action, and evaluation of the results thereon. We discussed an alternative course of action whereby our requirements might be documented instead by an exchange of correspondence. However, on January 31, 1975, you notified us that you preferred to receive an Order.

Enclosed is an Order for Modification of License relating to this matter.

Sincerely,

Original signed by
R. A. Purple

Robert A. Purple, Chief
Operating Reactors Branch #1
Division of Reactor Licensing

Enclosure:
Order for Modification of
License

cc w/enclosure:
Myron M. Cherry, Esquire
Suite 4501
One IBM Plaza
Chicago, Illinois 60611

Mr. John D. Beck (2 cys)
Division of Intergovernmental
Relations
Executive Office of the Governor
Lewis Cass Building, 2nd Floor
Lansing, Michigan 48913

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cc: H. I. Miller, Esquire
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Lansing, Michigan 48913

Gatter

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of
CONSUMERS POWER COMPANY
(Palisades Plant)

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Docket No. 50-255

ORDER FOR MODIFICATION OF LICENSE

I.

Consumers Power Company (the Licensee) is the holder of Provisional Operating License No. DPR-20, which authorizes operation of the Palisades Plant (the facility) at power levels up to 2,200 megawatts thermal. The facility is located in Covert Township, Van Buren County, Michigan.

II.

The facility is a pressurized water reactor which consists of a two loop system using two steam generators designated as "A" and "B". The facility commenced commercial operation on December 22, 1971, and, during the course of operation since that time, the tubes within

both steam generators have experienced localized corrosion of the wastage type and intergranular cracking. The cause of this steam generator tubing corrosion is attributed to phosphate treatment of the water chemistry in the secondary coolant system.

It should be noted by way of background that on January 15, 1973, after approximately one year of intermittent operation of the facility, the first leak in the facility's steam generator tubes developed. Eddy current inspection detected wall thinning in the tubes of both steam generators in the U-bend area. All tubes in the first eleven rows from the divider plates were plugged, and the facility returned to service early in March 1973, after which it operated at essentially 100% rated power. On August 11, 1973, the facility was shutdown because of steam generator tube leakage in excess of the limits established by the license technical specifications. Eddy current measurements performed during September 1973 showed measurable wall thinning on nearly half the tubes in each of the two steam generators. The inservice inspection and evaluation continued through April 1974, and all tubes with eddy current indications of 60% or more wall thinning were plugged. During a pre-operational hydrostatic test early in May 1974, leaks developed in

two tubes at a pressure differential of 200 psi. Reinspections of the steam generators showed that a number of tubes had developed a new type of degradation called "intergranular attack" during the nine-month period of shutdown. Thereafter, the Licensee plugged all tubes suspected of intergranular attack.

By September 1974, the Licensee had plugged all steam generator tubes which either were the subject of intergranular attack or exhibited eddy current indications of wall thinning of 50%* or more. In addition, the Licensee proposed to avoid further corrosion effects by changing from a phosphate water chemistry regime to an all volatile water chemistry treatment of the secondary coolant system. Based on the then AEC Regulatory Staff's (hereinafter referred to as the "NRC Staff") Safety Evaluation Reports dated August 30, 1974, and November 27, 1974, resumed operation of the facility was authorized. Specifically, (i) the facility could be operated at first only at limited power levels consistent with the requirements of a program designed to flush residual phosphates from the secondary coolant system, and then at power levels up to 100% of rated power subject to the limiting of the maximum operating transient differential pressure across the steam generator

* By September 1974, the plugging criterion had been revised from 60 to 50%.

tubes to 1530 psi; and (ii) because of the possibility of the recurrence of further corrosion, the facility would be subject to a further steam generator tube inspection at the end of ninety effective full-power days or six calendar months from the date of resumption of criticality -- September 5, 1974 -- whichever occurs first. Based on the foregoing, the NRC Staff determined that, taking into account the number of tubes plugged, the steam generators met the requirements for reactor system performance, and that steam generator tube integrity could be maintained with adequate margins of safety during normal operation or under postulated accident conditions. Accordingly, on August 30, 1974, and November 27, 1974, Provisional Operating License No. DPR-20 was amended by Amendments Nos. 10 and 11 to reflect the foregoing requirements.

In December 1974, the Licensee, on its own initiative, conducted an eddy current inspection of steam generator tubes in the "A" steam generator. On January 3, 1975, the Licensee reported the results of this inspection. The Licensee tested a sample of 569 tubes selected with emphasis upon tubes which had eddy current indications of at least 40% wall thinning in previous tests. Within the inspection sample, 27 tubes had eddy current indications of corrosion exceeding

50%. Of the 27 tubes, one tube had indications exceeding 70% (which the Licensee has since plugged); three tubes, from 60 to 70%; and 23 tubes, from 50 to 60%. These test results suggest (i) the possibility of continuing corrosion, and (ii) that there may exist, within the facility's steam generators, a number of tubes with wall thinning significantly in excess of the limit established by the tube plugging criterion upon which the basis for operation of the facility has been authorized under Amendments Nos. 10 and 11, and that, therefore, such thinning could represent a significant reduction in the margins of safety needed to protect the health and safety of the public.

Although the facility is otherwise ready to resume operation, the Licensee has maintained the facility in a shutdown condition since the December 1974 inspection was performed. Under the present operating license, absent further action by the NRC Staff, the Licensee could return the facility to full power operation in its present condition until March 5, 1975, without any further inspections.*

* As indicated supra, Amendments Nos. 10 and 11 require a further steam generator tube inspection after ninety effective full-power days or six calendar months, whichever occurs first. The six-month period expires first, and it occurs on March 5, 1975.

III.

In view of the foregoing, the Acting Director, Office of Nuclear Reactor Regulation, finds that the additional license provisions set forth in Part IV below are required, and that the public health, safety or interest require that these conditions be made immediately effective upon issuance.

IV.

Accordingly, pursuant to the Atomic Energy Act of 1954, as amended, and the Commission's Rules and Regulations in 10 CFR Parts 2 and 50, IT IS ORDERED THAT:

1. The Provisional Operating License No. DPR-20 is amended by the addition of paragraphs 4.14.4 and 4.14.5 to the Technical Specifications as follows:

4.14.4 The Licensee shall conduct prior to further reactor operation the following steam generator in-service

inspection program:

- A. Inspect all steam generator tubes in both steam generators which previously had defect indications (not including plugged tubes) of greater than 20% wall penetration in the manner prescribed by Regulatory Guide 1.83 (issued June 1974), as that guide applies to inspections after the baseline inspection. All tubes with indications of 50% or more wall thinning shall be plugged; or in the alternative,
- B. Conduct additional statistical inspections as follows:
 1. With respect to each steam generator "A" tube with December 1974 test indications of 50% or more wall thinning, either plug such tube or re-evaluate by the following procedure:
 - (a) eddy current test such tube to obtain at least 2 additional readings.
 - (b) average the 2 or more additional readings with the December 1974 reading.
 - (c) if the average indicated wall thinning is 50% or more, plug the tube.

2. If the results of B.1 above require plugging one or more tubes (in addition to the one tube already plugged since the December 1974 inspection), an additional 3% of the total tubes in steam generator "A" shall be inspected, concentrating on those areas of the tube sheet array where tubes with defects were previously found. All tubes with indications of 50% or more wall thinning shall be plugged.
3. Continue the sampling procedure of B.2 above until a sampling results in no tubes found that require plugging, or all tubes have been inspected.
4. Irrespective of the results of the inspection in B.1 through B.3 above, sample 3% of the total tubes in steam generator "B", concentrating on those areas of the tube sheet array where tubes with defects were previously found. Acceptance, plugging and further sampling criteria shall be the same as described above for steam generator "A".

C. The results of the above-described inspection and tube plugging program, and a proposal for the conduct of future operations, including a recommended schedule for the next steam generator tube inspection shall be submitted to the NRC Staff for review and approval by letter prior to further operation.

4.14.5 Any steam generator tubes with eddy current indications of 50% or more wall thinning shall be removed from service by plugging. Such indications may be confirmed by averaging during a given inspection, but such average shall be based on not less than three readings, in which case an average indication of 50% or more wall thinning shall result in tube plugging.

2. This Order is effective immediately upon issuance.
3. Within thirty (30) days of the date of issuance of this Order, the Licensee may file a request for a hearing with respect to this Order. Within the same thirty (30) day period, any other person whose interest may be affected

may file a request for a hearing with respect to this Order. If a request for a hearing is filed within the prescribed time herein, the Commission will issue a notice of hearing or such other order as may be appropriate. A request for a hearing must be filed with the Office of the Secretary, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, Attention: Docketing and Service Section. A copy of the request for a hearing should also be sent to the Chief Hearing Counsel, Office of the Executive Legal Director, U. S. Nuclear Regulatory Commission, Washington, D. C. 20555, and to R. Rex Renfrow, III, Esquire, Isham, Lincoln & Beale, One First National Plaza, Chicago, Illinois 60670, attorney for the Licensee.

A petition for leave to intervene must be accompanied by a supporting affidavit which identifies the specific aspect or aspects of this Order as to which intervention is desired and specifies with particularity the facts on which the petitioner relies as to both his interest and his contentions with regard to each aspect on which intervention is requested. Petitions stating contentions relating only to matters outside the Commission's jurisdiction will be denied.

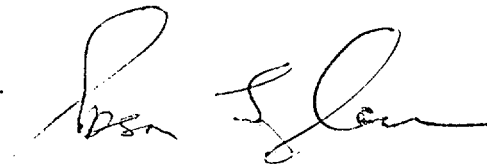
All requests for a hearing and petitions for leave to intervene will be acted upon by the Commission or an Atomic Safety and Licensing Board designated by the Commission or by the Chairman of the Atomic Safety and Licensing Board Panel.

In the event that a hearing is held and a petitioner is permitted to intervene, that petitioner becomes a party to the proceeding and has a right to participate fully in the conduct of the hearing. For example, the petitioner may present evidence and examine and cross-examine witnesses.

For further details with respect to this action, see (1) Provisional Operating License No. DPR-20, as amended, (2) the Licensee's inspection report dated January 3, 1975, (3) the Commission's Safety Evaluation Report dated August 30, 1974, issued in connection with Amendment No. 10 to the operating license dated August 30, 1974, which was issued in response to the Licensee's application for amendment dated August 20, 1974, and its letter to the Directorate of Licensing dated August 28, 1974, requesting interim Technical Specifications, and (4) the Commission's Safety Evaluation Report dated November 27, 1974, issued in

connection with Amendment No. 11 to the operating license dated November 27, 1974, which was issued in response to the Licensee's August 20, 1974, application for amendment as supplemented November 7, 1974. All of the above documents are available for inspection at the Commission's Public Document Room, 1717 H Street, N.W., Washington, D. C. and at the Kalamazoo Public Library, 315 South Rose Street, Kalamazoo, Michigan 49006.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in black ink, appearing to read "Edson G. Case". The signature is fluid and cursive, with a large initial "E" and "G".

Edson G. Case, Acting Director
Office of Nuclear Reactor Regulation

Order dated and issued at
Bethesda, Maryland, this
6th day of February, 1975.