



**Consumers  
Power  
Company**

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August 15, 1983

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Operating Reactor Branch No 5  
Nuclear Reactor Regulation  
US Nuclear Regulatory Commission  
Washington, DC 20555

DOCKET 50-255 - LICENSE DPR-20 -  
PALISADES PLANT - SEP TOPIC XV-2 "SPECTRUM OF STEAM PIPING FAILURES INSIDE AND  
OUTSIDE CONTAINMENT (PWR)" - REQUEST FOR TIME EXTENSION TO RESOLVE CONCERN OF  
TWO STEAM GENERATOR BLOWDOWNS INSIDE CONTAINMENT

During a review of SEP Topic XV-2 "Spectrum of Steam Piping Failures Inside and Outside Containment (PWR)," the NRC Staff became concerned that removal of core decay heat would become unreliable in the event of a main steam line break (MSLB) inside containment and a concurrent failure to close of the main steam isolation valve (MSIV) in the intact main steam (MS) line. As documented in NUREG-0820 "Integrated Plant Safety Assessment, Palisades Plant" dated October 1982, the NRC indicated that such an event would result in unreliable decay heat removal due to the blowdown of both steam generators.

In response to the Staff's concern, Consumers Power Company committed to performing appropriate modifications to make the MSIV/MS configuration single-failure proof with respect to the blowdown event. The commitment, which is also documented in NUREG-0820, presently requires that the modifications be completed by the end of the 1985 refueling outage. The purposes of this submittal are to: 1) request a time extension of one operating cycle beyond the present commitment in which to make the modifications and 2) provide the NRC with a basis for such a request.

Consumers Power Company is presently on schedule in its efforts to resolve the NRC concern via MSIV replacement by the end of the 1985 outage. We have completed a study which shows the feasibility of replacing the two existing MSIVs with new valves capable of closing under conditions of flow in either direction thereby eliminating the single-failure potential. In addition, we have begun preparing valve procurement specifications which will be completed and forwarded to prospective manufacturers on or about September 1, 1983.

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Recently, however, we have completed a preliminary probabilistic risk assessment (PRA) and cost/benefit (C/B) analysis which reveals the need to:

- a) further evaluate the safety significance of this event given the reliability of existing systems to prevent inadequate core cooling during and after the event and
- b) should plant modification prove necessary, determine the most cost-effective modification which resolves the concern.

The preliminary PRA and C/B analysis (Enclosure 1) shows that the frequency of a significant release resulting from this event is  $9.8 \times 10^{-9}$  occurrences/year and that the present course of action (ie, MSIV replacement) results in a C/B ratio of  $\$6.1 \times 10^6$ /manrem; an expenditure considerably in excess of the NRC safety goal guideline of \$1000/manrem.

Consumers Power Company met with the Staff in Bethesda on July 26, 1983 to present the results of the preliminary PRA and C/B analysis and to request that the NRC review the results and grant Consumers Power Company a time extension of one operating cycle beyond our current commitment for any necessary plant modification. This time extension, if approved, would result in:

- 1) Consumers Power Company finalizing its PRA and C/B analysis to determine more accurately the safety significance of this event as well as the most cost-effective modification (if modification is proven necessary) and submitting such analysis by September 1, 1984 and
- 2) completing any required modifications by the end of the 1986 refueling outage.

During the July 26, 1983 meeting, the Staff indicated that it would consider our request and would attempt to pass judgment on the request by September 1, 1983. However, the Staff requested that Consumers Power Company provide in this submittal certain evaluation regarding plant response during and after the event. The NRC indicated that such evaluation would assist the Staff in its consideration of the request. Specifically, the Staff requested that we provide the following:

- 1) an evaluation of the adequacy of existing operating procedures to guide operator response for this event and
- 2) an evaluation as to whether adequate heat removal through a dried-out steam generator is possible given the presence of a heat transfer barrier established by the steam that is created by the incoming auxiliary feedwater as it comes into contact with the high temperature steam generator internals.

Enclosures 2 and 3 provide our response to the requests. Enclosure 2 indicates that the immediate actions prescribed in our MSLB procedures are proper for the two steam generator blowdown event. Enclosure 3 (item 3) indicates that "steam blanketing" is not likely to be a problem given the design of the steam generator, the effectiveness of the internal separators and dryers and the low velocities of the steam which is developed by boiling of the incoming auxiliary feedwater.

Additional evaluations were requested by the Staff during an August 2, 1983 telephone conference call. These requests are itemized below. It should be noted that Enclosure 3 also responds in part to requests number 1 and 2a. Consumers Power Company will provide a detailed response to each NRC request as part of our final PRA and C/B analysis to be submitted by September 1, 1984.

Additional NRC Requests

1. Evaluate the thermal-hydraulic response of the steam generator secondary side during and after the two steam generator blowdown event.
- 2a. Determine the number of cooldown cycles that would cause the steam generator vessel, tubes or tube sheet to fail.
- 2b. Determine the number of cooldown cycles that would occur during and after the event.
3. Should it be determined that tube failure will occur, evaluate the impact on containment failure and include in the evaluation a description of the model utilized to analyze the consequences.
4. Determine the likelihood of a MSLB outside of containment and depending on the probability of such an event: a) evaluate the means by which long term cooling (LTC) would be accomplished taking into account that the spilled coolant would not be filling the sump to provide a LTC supply of water and b) provide a description of the model utilized to analyze the consequences.
5. Evaluate the effect of various MSLB sizes on the plant response.
6. Evaluate the means by which the operator would prevent excessive cooldown that could pull a void on the primary system; especially if there exists a LOCA through the steam generators.

In conclusion, this submittal represents Consumers Power Company's formal request to change its scheduled date for completing plant modifications to make the MSIV/MS configuration single-failure proof to prior to startup from the 1986 refueling outage. It is the opinion of Consumers Power Company, based on the evaluations to date of the event, that the health and safety of the public will not be jeopardized by this delay.

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Consumers Power Company also requests that the NRC pass judgment on the request for time extension and notify us of the decision by September 1, 1983 so that our efforts to procure replacement valves and meet our present commitment dates for installation are not constrained. Should our request for time extension be approved, we will submit the final PRA and C/B analysis by September 1, 1984 and will complete any required modification during the 1986 refueling outage. Should our request be denied, we will proceed with our efforts to replace the existing MSIVs on a schedule consistent with our current commitment.

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Enclosures