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SUBJECT: Responds to GL 93-04, "Rod Control Sys Failure & Withdrawal of Rod Control Cluster Assemblies." Concludes that licensing basis satisfied for GDC 25.

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September 20, 1993

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 22555

Ladies/Gentlemen:

Docket No. 50-305
Operating License No. DPR-43
Kewaunee Nuclear Power Plant
Response to Generic Letter 93-04

References:
1) Generic Letter 93-04, "Rod Control System Failure and Withdrawal of Rod Control Cluster Assemblies," dated June 21, 1993

2) Letter from Mr. Ashok C. Thadani (NRC) to Mr. Roger Newton (WOG) dated July 26, 1993

3) Letter from C.R. Steinhardt (WPSC) to Document Control Desk (NRC) dated August 5, 1993

4) WCAP-13803, Rev. 1 (Proprietary), "Generic Assessment of Asymmetric Rod Control Assembly Withdrawal," dated August 1993

Pursuant to the requirements of 10CFR 50.54 (f), the NRC issued Generic Letter 93-04 (Reference 1). The generic letter requires that, within 45 days from the date of the generic letter, each addressee provide an assessment of whether or not the licensing basis for each facility is still satisfied with regard to the requirements for system response to a single failure in the Rod Control System (GDC 25 or equivalent). If the assessment (Required Response 1.(a)) indicates that the licensing basis is not satisfied, then the licensee must describe compensatory short-term actions consistent with the guidelines contained in the generic letter, and within 90 days provide a plan and schedule for long-term resolution (Required Response 1. (b) and 2). Subsequent correspondence between the Westinghouse Owners Group (WOG) and the NRC resulted in schedular relief for Required Response 1.(a) (Reference 2).

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In Reference 3, Wisconsin Public Service Corporation (WPSC) submitted a summary of compensatory short-term actions for Kewaunee, consistent with the guidelines of References 1 and 2. This submittal also provided a summary of the generic safety analysis program conducted by the WOG and an assessment of its applicability to Kewaunee. WPSC committed to complete Kewaunee specific DNBR calculations and submit the conclusions to the NRC by September 20, 1993. The results of this calculation are contained in the attachment 1.

Attachment 2 provides the response for item 1.(a) as it applies to Kewaunee. The attached response concludes that the licensing basis is satisfied for GDC 25 (or equivalent) and discusses possible long-term considerations to further clarify this issue. The safety assessment that was provided in Reference 3 that there is no safety significance for any asymmetric RCCA withdrawal by using three-dimensional safety analysis.

If you have any questions or need further information, please contact a member of my staff.

Sincerely,

Clark R. Steinhardt
Senior Vice President - Nuclear Power

SLB/cjt

Attach.

cc - US NRC Region III
US NRC Senior Resident Inspector

lic\nrc\36.wp

Subscribed and Sworn to
Before Me This 20th Day
of September 1993

Notary Public, State of Wisconsin

My Commission Expires:
June 18, 1995

ATTACHMENT 1

To

Response to Generic Letter 93-04

Letter from C. R. Steinhardt (WPSC)

To

Document Control Desk (NRC)

Dated

September 20, 1993

Conclusion of Kewaunee Specific DNBR Calculation

In the 45 day response to the GL, (Reference 3), WPSC committed to perform a plant specific DNBR evaluation for the Kewaunee plant. This was performed because the plant specific analysis done under the generic program assumed Westinghouse OFA type fuel whereas Kewaunee currently uses fuel supplied by Siemens Power Corporation.

The calculations were performed in accordance with the methodology outlined in the WCAP (Reference 4) for non-Westinghouse fuel. These calculations used the identified limiting asymmetric rod withdrawal statepoints provided by the generic Westinghouse analysis, approved DNBR calculation methods for the Kewaunee plant, and the specific characteristics of Siemens fuel.

As anticipated, the Kewaunee specific calculations confirm that the DNB design basis is met for the asymmetric rod withdrawal event using the 3-dimensional transient results. The plant specific calculations for Kewaunee result in a substantially larger DNBR margin than calculated by the generic WOG program.

ATTACHMENT 2

To

Response to Generic Letter 93-04

Letter from C. R. Steinhardt (WPSC)

To

Document Control Desk (NRC)

Dated

September 20, 1993

Assessment of Licensing Basis Compliance

The purpose of this response is to provide an assessment of whether or not the licensing basis for Kewaunee is still satisfied with regard to the requirements for system response to a single failure in the rod control system and to provide supporting discussion for this assessment in light of the information generated as a result of the Salem event (Required Response 1.(a)).

The Westinghouse Owners Group (WOG) has undertaken the following initiatives to support the response to NRC Generic Letter 93-04: conducting Rod Control System testing in the Salem training center, examining the existing Rod Control System Failure Modes and Effects Analysis (FMEA), analyzing the worst-case asymmetric RCCA withdrawal combinations with three-dimensional analytical methods, and performing an equipment survey of Westinghouse plants to determine the frequency and significance of control system circuit card failures.

After this extensive investigation, the WOG has concluded that GDC 25 continues to be met, but also recognizes that there are questions as to the interpretation of not only the intent of GDC 25 but also the appropriate definition of the specified acceptable fuel design limit as well.

Based on previous communications, the NRC has conservatively interpreted the GDC 25 fuel design limit to be the DNB design basis. The WOG believes that this is a conservative definition if applied to all events. The equipment survey conducted by the WOG demonstrated that the failure rate of card failures that could result in the movement of less than a whole group is on the order of 4 E-8 / critical reactor hours. This would indicate that the likelihood of a Salem-type event is extremely remote. With this in mind, the WOG would propose that a Condition III (or IV) specified acceptable fuel design limit would be applicable.

Based on the WOG's understanding of GDC 25, the purpose of this criterion is to ensure that the appropriate limits (commensurate with the probability of occurrence) are not violated for a "worst-case" stand-alone single failure. The test program conducted at the Salem training center demonstrated that all the rods within a given group would receive the same signals. The corrupted current orders generated by the logic cabinet failures at Salem were transmitted identically to all 8 RCCA's in Shutdown Bank A. The fact that only one RCCA withdrew in the plant was due to a second unrelated effect. Had all the rods in SBA responded, as predicted in the existing FMEA, all the rods would have withdrawn uniformly and have been enveloped by the existing Updated Safety Analyses Report accident analyses. In addition, existing rod motion surveillance requirements would detect the type of rod motion failure observed at Salem. Thus, the requirement that <u>one</u> single failure not result in a specified acceptable fuel design limit being exceeded, in this case the DNB design basis, would remain satisfied.

Assessment of the Safety Significance of Potential Asymmetric Rod Motion in the rod Control System

Westinghouse has also performed a safety analysis using three-dimensional safety analysis techniques to assist the WOG in its determination of the safety significance of an uncontrolled asymmetric rod withdrawal. WCAP-13803, Revision 1 documented the safety analysis program and concluded that the generic analysis and their plant-specific application demonstrated the DNB does not occur for a worst-case asymmetric rod withdrawal for all affected Westinghouse plants. As such, the analysis program concluded that there is no safety significance for affected Westinghouse plants for a Salem-type rod withdrawal.

WPSC letter to NRC dated August 5, 1993 (Reference 3) provided WPSC's 45 day response to the Generic Letter as it applies to Kewaunee. The response provided a summary of the results of the generic safety analysis program conducted by the Westinghouse Owners Group and an assessment of its applicability to Kewaunee. (Refer to Attachment 1.)

Long-Term Considerations

As the above assessment indicates, the licensing basis for Kewaunee is currently satisfied. However, based on the WOG program results WPSC is taking additional measures.

WPSC will implement a new current order surveillance (such as current order traces from each group following each refueling outage) to enhance the detectability of an uncontrolled asymmetric rod withdrawal.

Additionally, WPSC is evaluating the possibility of making Rod Control System logic cabinet changes (current order timing adjustment). The WPSC's decision will be based on the successful demonstration of the timing adjustments at other operating plants and receipt of the official technical bulletin from Westinghouse. WPSC feels additional time to evaluate the basis for making the current order timing changes and potential negative consequences is justified since the technical information was just received from Westinghouse and the success of the modifications has yet to be demonstrated.