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HINTZ, D. C. Wisconsin Public Service Corp.
RECIP. NAME RECIPIENT AFFILIATION
LEAR, G. E. PWR Project Directorate 1

SUBJECT: Forwards addl info re util Part 21 rept concerning environ qualification of internal wiring of Limitorque valve actuators at facility, per 850210 request.

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NRC-86-17

WISCONSIN PUBLIC SERVICE CORPORATION
P.O. Box 19002, Green Bay, WI 54307-9002

February 18, 1986

Director of Nuclear Reactor Regulation
Attention: Mr. G. E. Lear, PWR Project Directorate-1
Operating Reactors Branch No. 1
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
TAC #60362
Request for Additional Information Regarding WPSC's 10 CFR, Part 21 Report on Limitorque Valve Actuators

References: 1) Letter to D. C. Hintz of WPSC from M. B. Fairtile of the NRC dated February 10, 1986

2) Letter to the Director of the Office of Inspection and Enforcement of the NRC from D. C. Hintz of WPSC dated December 20, 1985

3) Letter to C. W. Giesler of WPSC from S. A. Varga of the NRC dated September 11, 1984

Reference 1 requested additional information concerning the 10 CFR, Part 21 report filed by Wisconsin Public Service Corporation (WPSC) regarding the environmental qualification of the internal wiring of Limitorque valve actuators installed at the Kewaunee Nuclear Power Plant (KNPP). This information was requested within five working days from the receipt of this request (February 10, 1986). The requested information is provided in the attachment to this letter.

Sincerely yours,

D. C. Hintz
Manager - Nuclear Power

JGT/jms

Attach.

cc - Mr. Robert Nelson, US NRC

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Attachment

To

Letter to Mr. G. E. Lear of the NRC from Mr. D. C. Hintz of WPSC

Dated February 18, 1986

Request for Additional Information Regarding WPSC's 10 CFR, Part 21

Report on Limitorque Valve Actuators

Request for Additional Information Regarding WPSC's 10 CFR, Part 21 Report on Limitorque Valve Actuators

Reference 1 requested additional information concerning the 10 CFR, Part 21 report filed by Wisconsin Public Service Corporation (WPSC) regarding the environmental qualification of the internal wiring of Limitorque valve actuators installed at the Kewaunee Nuclear Power Plant (KNPP). This attachment provides the requested information.

In your letter of February 10, 1986 (Reference 1), you requested that we confirm that we have performed and have available for inspection certain analyses for the subject valve actuators. WPSC has performed and documented in Reference 2 an evaluation of the significance of and the corrective actions for the generic concern, which included a description of the circumstances of discovery. A presentation summarizing the results of this evaluation was given at NRC Region III Headquarters on December 20, 1985. Additional supporting analyses were performed and are available for inspection at WPSC.

A summary of WPSC's classification (i.e., Categories H1, H2, H3, M and N) of the 68 valve actuators in question was also provided in Reference 1. One correction should be made to this summary in that one actuator (32088, CC-600) which was previously classified as Category H3 was reclassified to Category N, as noted in Reference 2. This results in the following revised summary:

15 actuators in a mild environment and classified as M.

8 actuators not required to mitigate an accident and classified as N.

22 actuators that complete their safety function prior to exposure to a harsh environment and are classified as H3.

23 actuators that must complete their safety function in a harsh environment and are classified H1 and H2.

68 actuators total

It should be noted that WPSC considers only the 23 actuators that must complete their safety function in a harsh post-accident environment (i.e., Categories H1 and H2) within the scope of 10 CFR 50.49.

In order to obtain staff concurrence with this classification of the valve actuators the NRC requested that we confirm the following.

1) NRC Concern:

> For the 15 actuators classified as M, confirmation that the environment that this equipment is required to operate in will at no time be significantly more severe than the environment that would occur during normal plant operation, including anticipated operational occurrences, and that the radiation environment is $\leq 10^4$ RADS total integrated dose (TID). If any actuator in this group might experience $\geq 10^4$ RADS TID, identify the actuator, the system it is in and provide justification for the "mild" classification.

WPSC Response:

Although these actuators have a total integrated dose (i.e., 40 year normal plus post-accident dose) less than or equal to 1E4 Rads, WPSC would classify this type of equipment as being in a mild post-accident radiation environment had its total integrated dose been less than or equal to 1E5 Rads and consider it exempt from demonstration of its radiation withstand capabilities by testing and/or analysis. This position is supported by research conducted by the Electric Power Research Institute (EPRI) and endorsed by the Atomic Industrial Forum (AIF). It was also included as part of WPSC's Environmental Qualification Program which was reviewed by the NRC for compliance with the requirements of 10 CFR 50.49 and approved in Reference 3.

WPSC confirms that the post-accident environment that the 15 actuators classified as Category M are required to operate in is at no time significantly more severe than the environment that would occur during normal plant operation, including anticipated operational occurrences. WPSC also confirms that the

radiation environment for these actuators results in a total integrated dose less than or equal to 1E4 Rads.

2) NRC Concern:

For the 8 actuators classified as N and the 23 actuators classified as H1 and H2, confirmation that a failure mode and effects analysis has been performed; that the analysis included consideration of a spectrum of pipe breaks, and whether there was a potential need for the equipment later in an event or during recovery operations. The licensee should also confirm that the results of the analysis established that failure of that equipment would not be detrimental to plant safety or mislead the operator.

WPSC Response:

A failure mode and effects analysis has been performed for Limitorque actuators. This analysis concludes that in the remote possibility that the wires located in Limitorque actuators should fail due to radiation exposure from any postulated pipe break, the actuators could still be operated for at least one additional cycle. Having this capability ensures that the valves can be placed into their safety related position should the wires fail. The analysis also confirmed that such wire failures would not cause valve position changes to occur and furthermore, that other pieces of equipment would not be affected.

Finally, to address the concern of the possibility of improper valve position indication, an operational review was performed by the QA Typing Committee. This review was performed on a valve by valve basis considering the valve function, operating procedures, additional control room indication and operator training. From this review it was determined that failure of the equipment would not be detrimental to plant safety or mislead the operator.

3) NRC Concern:

For the 22 actuators classified as H3, confirmation for each piece of equipment, that documented justification exists for a time margin less than one hour in accordance with the recommendation of Reg. Guide 1.89 including: (1) consideration of a spectrum of breaks; (2) potential need for the equipment later in an event or during recovery operations; (3) a determination that failure of the equipment after performance of its safety function will not be detrimental to plant safety or mislead the operator; and (4) a deter-

mination that the margin applied to minimum operability time is conservative.

WPSC Response:

A review of the operational times for each of the 22 actuators was performed. From this review all 22 actuators were confirmed to have an operational time of less than one hour. According to Regulatory Guide 1.89, documented justification is required for equipment when a time margin of less than one hour is considered. For 20 of these actuators sufficient documented justification exists for reclassifying them to H3 and thereby excluding them from further consideration. The documented justification includes (but is not limited to) the concerns of total integrated dose (TID) for the worst case source term, the operational time requirements from the Design Basis LOCA and the potential need for these actuators later in the event or during recovery operations. The margin applied to minimum operability time was conservative based on the dose rate applied. Lastly, failure of the equipment after performance of its safety function would not be detrimental to plant safety or mislead the operator. Therefore, based upon the documented justification these 20 actuators were reclassified from H1 to H3.

A documentation review for the remaining two (2) valves (SI 351A and SI 351B) revealed that these recirculation valves, changed from H1 to H3 in reference 2, should have in fact remained H1. This is due to a postulated scenario in which recirculation is established in one train, thus providing a significant source term dose on the redundant train actuator. The source term dose received by the redundant train actuator (resulting from recirculation in the other train) could cause it to receive a TID equivalent to a harsh radiation environment prior to it being aligned for recirculation. Each independent train is capable of providing 100% of the required recirculation flow, however, this reclassifi-

cation was considered necessary in order to maintain the capability to sustain a single active failure after one train is on recirculation. This additional analysis has been resubmitted back to the QA Typing Committee where the classification was restored to H1.

Finally, the conclusions of the analysis presented in reference 2, are not altered by this change.