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July 16, 1984
EF2 - 69,179

Director of Nuclear Reactor Regulation
Attention: Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Reference: 1. Fermi 2
NRC Docket No. 50-341
2. NRC Letter B. J. Youngblood to W. H. Jens
dated May 24, 1984

Subject: Additional Information Regarding JIO's for the Environ-
mental Qualification of Safety-Related Equipment

Dear Mr. Youngblood:

This letter provides the information requested in your letter (Reference 2) regarding our Justification for Interim Operation (JIO). Attachment 1 to this letter contains our responses to the I&C questions which comprised Enclosure 1 of your letter. Attachment 2 addresses the questions on the containment monitoring system JIO's which were raised in Enclosure 2 of your letter.

At this time, we would like to clear up a possible misunderstanding regarding the basis for justifying interim operation for the components in question. Each of the JIO's in question contains a summary of an analysis of the existing test data, material capabilities, and similarity to qualified equipment. It is our intention, consistent with 10CFR50.49 (i), to rely on these analyses as sufficient evidence that the subject components would remain operable following a postulated accident. The justification summary section of these JIO's included information from the failure effects section to augment the overall understanding of the components' role in mitigating postulated accidents. The discussion of redundant safety related equipment in this section was not intended to provide the justification for interim operation for these components. There is no case where the JIO relies on other non-qualified equipment which must function in a harsh environment.

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Mr. B. J. Youngblood

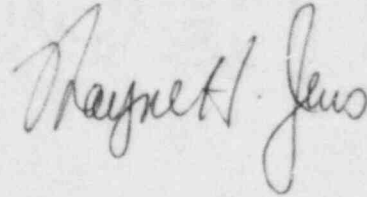
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If you have any further questions on this matter, please contact
Mr. O. K. Earle (313) 586-4211.

Sincerely,

A handwritten signature in cursive script, appearing to read "Rayne H. Jew". The signature is written in dark ink and is positioned to the right of the word "Sincerely,".

All with attachments

cc: P. M. Byron
M. D. Lynch
A. S. Masciantonio
USNRC, Document Control Desk
Washington, DC 20555

Responses to I&C Questions on Justification for Interim Operation
(Enclosure 1 of NRC letter dated May 24, 1984)

ITEM 1

You have provided on pages B21-8, 9 and 10 of your submittal, justification for interim operation (JIO) with non-qualified Rosemount transmitters. We note that these transmitters are used throughout the reactor protection system (RPS) to initiate reactor trip, containment isolation and other engineered safety features. For one of the examples cited above (i.e., reactor trip), there will be a very short time delay between the onset of harsh environmental conditions in the event of a severe accident and the reactor trip. However, this may not be the case for other engineered safety feature functions which rely on the operability of the Rosemount transmitters. Specifically, those transmitters required for the operation of the automatic depressurization system, low pressure coolant injection system and the containment spray system will have to remain operable for a considerable period of time. Accordingly, we request that you identify each case where a non-qualified Rosemount transmitter will be subjected to a harsh environment in the event of a severe accident. Additionally, confirm that the time requirements for instrument operability are enveloped by the one hour time period which you propose in your justifications. In particular, address the interlock/permissive circuits and any other circuits which do not seal in after exceeding a predetermined setpoint. Provide the numerical value of the inaccuracy of the transmitter output signal when the transmitter is subjected to harsh environmental conditions. Demonstrate how this inaccuracy has been considered in determining the instrument channel trip setpoints.

RESPONSE

Prior to issuing revision 3 of the Fermi 2 Electrical Equipment Qualification Submittal (July, 1983), a multi-phase review was performed for all of the safety related electrical equipment located in a harsh environment. This review was comprised of 3 independent evaluations and a final approval by project system engineers and nuclear operations staff with operations and safety systems experience. It resulted in the addition of new safety related equipment for revision 3, reclassification of some revision 2 equipment to NUREG-0588, Appendix E Category 2C, and the reduction in operating time requirements for some revision 2 equipment. In the course of this review, it was determined that 66 non-qualified Rosemount transmitters were required to function in a harsh environment. Of these, 56 transmitters are required to operate for 1 hour, or less, in the harsh environment. These transmitters are listed on page 140c of the action plans in Volume 1 of our submittal with a status designation "I". They are the only Rosemount transmitters for which JIO's were provided. The remaining 10 transmitters are required for long term operation in a harsh environment due to their role in containment spray, RHR and core spray injection, and reactor water level monitoring, and therefore were replaced with qualified devices.

Responses to I&C Questions on Justification for Interim Operation
(Enclosure 1 of NRC letter dated May 24, 1984)

In order to complete the JIO's, an analysis was performed for each of the 56 JIO transmitters evaluating subsequent failures. These evaluations addressed the details of the alarms, interlocks, and permissives derived from the subject transmitters, including the circuits which do not seal in. For all of these devices, an operating time of 1 hour is considered valid because their long term failures do not result in the loss of any safety function or mislead the operators. This is to be expected when one considers that most of the automatic actions (reactor scram, containment isolation, ECCS actuation, etc.) occur early in the accident chronology, with the operators taking long term action to stabilize plant conditions.

The JIO's for the 56 transmitters are based on evaluation of partial test data, material capabilities, and their similarity to qualified devices. While the existing data is not considered adequate to demonstrate complete qualification, it provides substantial evidence that the subject transmitters would function properly for the time required following a postulated accident. With regard to instrument accuracy, the test data by itself does not provide sufficient information to evaluate the post-accident accuracy of these devices. However, based on their similarity to qualified Rosemount models and their short operating times at relatively low dose rates (approximately 10^5 R/hour), their post-accident accuracy is not expected to be significantly different than that of the qualified models.

Responses to I&C Questions on Justification For Interim Operation
(Enclosure 1 of NRC letter dated May 24, 1984)

ITEM 2

On Pages E41-7, 8 and 9 of your submittal, you have provided justification for interim operation with a non-qualified General Electric flow transmitter. In the "Justification Summary" section of your submittal, you state that even if the high pressure coolant injection (HPCI) system were to fail, the reactor core could be safely cooled by other Class 1E systems. These other safety-related systems used as alternative emergency core cooling systems (ECCS) are the automatic depressurization system (ADS) and the low pressure coolant injection (LPCI) system. As discussed in Item 1 above, these systems are initiated by and include permissive/interlock circuits which depend on the operability of, non-qualified Rosemount transmitters. Accordingly, submit additional justification for relying on safety-related systems which contain environmentally unqualified components that would be required to function in a harsh environment.

RESPONSE

The criteria used to justify interim operation for the non-qualified GE HPCI flow transmitter (JIO pages E41-7, 8 and 9) are material analysis, partial test data, and similarity analysis performed by Wyle Laboratories. This analysis established the capability of the subject transmitter to operate properly in a harsh environment following a postulated accident, in accordance with the JIO criteria derived from 10CFR50.49 (i). Since the analysis provides sufficient evidence that the transmitter will function in a harsh environment, it is justified for interim operation.

The justification summary section of the JIO included information from the "equipment failure effects" section to augment the overall understanding of the essential function of the transmitter. This discussion of other safety related systems was not intended to be supplemental justification for this device. The partial test data and material analysis form the sole basis of the JIO by supplying reasonable assurance that the transmitter will function properly in a harsh environment for its required operating time. Therefore, no additional justification for other ECCS equipment is required. The JIO bases for the other safety related systems are as described in Volume III of our July 1983 submittal. They are independent of the JIO for the subject HPCI flow transmitter.

EEQ/46/5.5
6/11/84

Responses to Questions on Justification for Interim Operation
(Enclosure 1 of NRC letter dated May 24, 1984)

ITEM 3

On Pages E41-16, 17 and 18 of your submittal, you have provided justification for interim operation with a non-qualified "Square-D" pressure switch in the HPCI system. As discussed in Items 1 and 2 above, the back-up ECCS your propose to rely on if the pressure switch fails, in turn relies on non-qualified components. Accordingly, submit additional justification for relying on safety-related systems which contain environmentally unqualified components that would be required to function in a harsh environment.

RESPONSE

The criteria used to justify interim operation for the non-qualified Square D HPCI oil pressure switch (JIO pages E41-16, 17 and 18) are partial test data, similarity analysis, and material analysis performed by Wyle Laboratories. This analysis established the capability of the subject pressure switch to operate properly in a harsh environment following a postulated accident in accordance with the JIO criteria derived from 10CFR50.49 (i). Since the analysis provides sufficient evidence that the subject switch will function in a harsh environment, it is justified for interim operation.

The justification summary section of the JIO included information from the "equipment failure effects" section to augment the overall understanding of the essential function of the pressure switch. The discussion of other safety related systems was not intended to be supplemental justification for this device. The partial test data and material analysis form the sole basis of the JIO by supplying reasonable assurance that this switch will function properly in a harsh environment for its required operating time. Therefore, no additional justification for other ECCS equipment is required. The JIO bases for the other safety-related systems are as described in Volume III of our July, 1983 submittal. They are independent of the JIO for the subject oil pressure switch.

EEQ/46/5.6
6/11/84

Responses to I&C Questions on Justification for Interim Operation
(Enclosure 1 of NRC letter dated May 24, 1984)

ITEM 4

On Pages T50-5, 6 and 7 of your submittal, you have provided justification for interim operation with non-qualified ASCO solenoid valves. These solenoid valves operate post-accident monitoring instrumentation isolation valves. You state in the "Equipment Failure Effects" section of your submittal that the drywell pressure and torus level indication will be recognized by the operator as "obviously" faulty if a solenoid valve were to fail. You further state in the "Justification Summary" section of the submittal that if one solenoid valve fails, redundant instrumentation will provide equivalent data. However, you have not provided a technical basis supporting either of these two statements. If a solenoid valve were to fail causing the isolation valve to close, the reading on the instruments would be locked-in and the operator would receive conflicting information. Further, there is no evidence to support the claim that only one valve will fail and there is no basis to conclude that redundant instrumentation would be available. Accordingly, provide additional information to support your request to permit interim operation with nonqualified ASCO valves. (Refer to Item 1 of Enclosure 2.)

RESPONSE

The criteria used to justify interim operation for the non-qualified ASCO solenoid valves in the containment monitoring system (JIO pages T50-5, 6 and 7) are partial test data, similarity analysis, and materials analysis. This evaluation established the capability of the subject solenoids to operate properly in a harsh environment following a postulated accident, in accordance with the JIO criteria derived from 10CFR 50.49 (i). Since the analysis provides sufficient evidence that the subject valves will function in a harsh environment, they are justified for interim operation.

The justification summary and failure effects section of the JIO include additional information on the effects of random failures of a solenoid valve. This information was provided to augment the understanding of the essential function of these valves in the redundant divisions of the containment monitoring system. The discussion of redundancy was not intended to provide supplemental justification for these valves. The analysis and partial test data form the sole basis of the JIO by supplying adequate assurance that these valves will function properly in a harsh environment for the required post-accident period.

EEQ/46/5.7
6/11/84

Responses to Questions on Justification For Interim Operation
For the Containment Monitoring System Solenoid Valves
(Enclosure 2 of NRC letter dated May 24, 1984)

ITEM 1

In your JIO related to the ASCO solenoid used in the containment monitoring system (Page T50-5), you assume that one train of instrumentation remains functional in the event of the loss of the redundant train. However it appears we cannot preclude the failure of both trains of instrumentation due to environmental effects since neither one is qualified. It appears that a common mode failure could disable both of them. Accordingly, we request that you propose an alternative system to accomplish the safety function performed by the containment monitoring system. Alternatively, provide additional justification for this JIO. (Refer to Item 4 of Enclosure 1).

RESPONSE

The criteria used to justify interim operation for the non-qualified ASCO solenoid valves in the containment monitoring system (JIO page T50-5) are partial test data, similarity analysis, and materials analysis. This evaluation established the capability of the subject solenoids to operate properly in a harsh environment following a postulated accident, and meets the JIO criteria derived from 10CFR 50.49 (i) as discussed in Volume III of our July, 1983 submittal (Justification for Interim Operation Section, page 2, item 2).

The discussion of valve failures in the JIO provided additional information concerning random failures of the subject solenoids and was not intended to provide the basis to justify interim operation for these valves. Since the analysis established the capability of the solenoids to operate for the entire 100 day period following a postulated accident, no failures of the subject solenoids are expected to occur due to the accident induced harsh environmental conditions. Environmental effects will not cause a common mode failure of the subject solenoids.

EEQ/46/5.8
6/11/84

Responses to Questions on Justification for Interim Operation
For the Containment Monitoring System Solenoid Valves
(Enclosure 2 of NRC letter dated May 24, 1984)

ITEM 2

In our review of these solenoid valves and their associated containment isolation valves, two apparent discrepancies were noted which should be clarified. In Table 6.2-2 of the FSAR, you do not list the same valves for the torus level instrumentation penetration as those provided in this JIO (i.e., V5-2232, 2236). In addition, this JIO refers to the same set of solenoid valves with two different sets of numbers (F020 A and B, F021 A and B, F022 versus F420 A and B, F421 A and B, and F422). These apparent discrepancies should be corrected so that the JIO's and the FSAR are consistent and to assure that misunderstandings do not develop concerning the affected system.

RESPONSE

Table 6.2-2 of the FSAR lists the correct containment isolation valves for the torus level instrument penetrations. The T50 solenoid valves in the subject JIO are pilot valves for instrument line isolation, and are downstream of the containment isolation valves listed in Table 6.2-2 of the FSAR. Per the listed safety function for the JIO, containment heat removal, these valves must remain open to allow the torus level sensors to operate. They are not the valves which provide for containment isolation for this instrument line penetration.

The set of numbers F020A and B, F021A and B, and F022 (JIO page T50-6) are typographical errors (should be F420A and B, and F421A and B, and F422) which will be identified for revision to the JIO.

EEQ/46/5.9
6/11/84