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NORTHEAST NUCLEAR ENERGY COMPANY

P.O. BOX 270
HARTFORD, CONNECTICUT 06101
(203) 666-6911

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Docket No. 50-336

Director of Nuclear Reactor Regulation
Attn: Mr. R. Reid, Chief
Operating Reactors Branch #4
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

References:
(1) R. Reid letter to W. G. Counsil dated December 11, 1979.
(2) W. G. Counsil letter to R. Reid dated April 27, 1979.
(3) W. G. Counsil letter to R. Reid dated January 1, 1979.
(4) Millstone Nuclear Power Station, Unit No. 2, Safety Evaluation Report, dated May 10, 1974.
(5) Millstone Nuclear Power Station, Unit No. 2, FSAR.

Gentlemen:

Millstone Nuclear Power Station, Unit No. 2
Containment Purge System
ESF Equipment/Component Design

In Reference (1), the NRC Staff requested Northeast Nuclear Energy Company (NNECO) to:

(1) Propose modifications to any bypass/override circuitry which does not satisfy the requirements of Enclosure 1 of Reference (1).

(2) Modify the Bases for Technical Specifications proposed in Reference (2), to reflect the Staff's position with respect to the requirement to maintain the purge valves closed in Modes 1 through 4.

(3) Provide information with respect to ESF equipment/component design in response to Enclosure 2 of Reference (1).

In response to these requests, the following information is provided.

In Reference (2), NNECO proposed changes to the Containment Ventilation System Technical Specifications which would require the containment purge valves to be locked closed in Modes 1 through 4. This proposal resulted from the absence of documentation indicating that the purge valves installed at Millstone Unit No. 2 would perform their design function during a postulated pressure transient

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associated with a design basis loss-of-coolant accident (LOCA). These valves are actuated by both a Containment Isolation Actuation Signal (CIAS) and a High Containment Radiation Signal. Subsequent conversations with the Staff, as documented in Reference (1), indicated that the current purge valve actuation circuitry was unacceptable and must be modified before the Reference (2) license amendment request would be issued. This is due to the fact that overriding either of the actuation signals concurrently overrides the remaining actuation signal.

As requested in Reference (1), NNECO hereby commits to electrically disconnect the CIAS circuitry from the containment purge valve actuation system. The CIAS will no longer actuate the purge valves as they are locked closed in Modes 1 through 4. The containment high radiation actuation circuitry will remain functional during all modes and will actuate the purge valves during Modes 5 and 6 when purging is authorized by current Technical Specifications. NNECO will maintain the design capability to override the high containment radiation actuation signal in accordance with the original design concept.

These circuitry modifications are scheduled to be completed during the 1980 refueling outage.

NNECO has determined that modifications to the containment ventilation system bases proposed in Reference (2), are not warranted at this time. The Reference (2) Technical Specification changes requiring the containment purge valves to remain locked closed in Modes 1 through 4 were proposed solely because these valves have not been demonstrated capable of closing during a LOCA. The containment isolation system at Millstone Unit No. 2 is an engineered safety feature and as such, the control system was designed in accordance with IEEE 279-1971. In addition, the Staff has reviewed this system pursuant to the General Design Criteria, specifically GDC 55, 56, and 57, and found that it meets the intent of the General Design Criteria, as documented in Reference (4).

NNECO has determined that the proposed Bases 3/4.6.1.7, for the Containment Ventilation System, adequately address the general requirements applicable to the Containment Ventilation System.

In response to the request for additional information as described in Enclosure 2 of Reference (1), NNECO provides the following information.

Question (1)

The design feature of cycling of the normal control switch for ESF equipment/component (e.g., isolation valve) to override a safety actuation signal to the equipment does not facilitate an acceptable degree of administrative control over the use of the override. Describe the design changes you propose to rectify this deficiency.

Response

The Engineered Safety Features (ESF) system at Millstone Unit No. 2 is designed in accordance with the requirements of IEEE-279-1971, as documented in Reference (4). The system design includes features resulting in operational flexibility during both normal and transient modes of operation, thereby enhancing the system's ability to safely mitigate abnormal or accident conditions. One such feature is the operator ability to override the safety actuation signal to each ESF component, as described in Reference (3). A manual override exists for each component which permits that component to be placed in other than its safe position or operating mode after the component has received a safeguards actuation signal and assumed its safe position or accident mode. In this situation, further automatic operation of the equipment will still occur if the actuation signal, when reset, operates again, thereby taking precedence over the manual override.

Unless an actuation signal is present, operation of the manual override will not render inoperative or bypass the safeguards response function of any component equipped with an override capability. This is a significant feature, which differentiates the override design from other designs which permit equipment bypass.

The override is accomplished through the manipulation of the equipment's control switch located on the main control board. The control switch for each component is a two position, spring return to neutral switch. The two positions of each switch correspond to the accident and non-accident position of the ESF component which the switch operates. The switch, after being cycled to its operating position will return to its neutral position through the spring loading feature. Upon receipt of a safeguards actuation signal, the ESF component will assume its safe operating position or mode. To affect an override subsequent to that condition, the operator must first cycle the component's control switch to the accident position and then to the non-accident position. Unlike other ESF designs, where the equipment can be repositioned by a single movement of the control switch to its desired position, this design promotes a double action and conscious effort on the part of the operator to affect an override, while at the same time permitting timely manipulation of ESF components which may be required to lessen the severity of an accident or mitigate a transient.

System procedures state under what conditions components in ESF systems may be overridden. Enclosure (1) of Reference (1) states that sufficient physical features should be provided to facilitate adequate administrative control. The example given in Enclosure (1) is key-lock switches. NNECO's review has determined that operations required to effect an override under the existing configuration constitute sufficient physical features. Incorporation of key-lock switches would result in the involvement of operations staff and supervisory personnel at the expense of time spent on a non-productive function, i.e., obtaining the key. If the plant configuration is one where ESF components have been actuated, optimization of operations personnel resources is essential. The trade-off associated with incorporation of key-lock switches does not warrant their installation. Significant improvements regarding shift supervision responsibilities and control room operations have occurred as a result of TMI. These actions constitute a sufficiently increased level of assurance that equipment overrides will only be affected when appropriate.

NNECO concludes that the ESF override capability at Millstone Unt No. 2 enhances the ability of the ESF system to control and mitigate the consequences of postulated transients and accidents. The design of the system and the procedures utilized for its operation provide an acceptable degree of safety. In addition, the Staff had previously reviewed and accepted this design as documented in Section 7.3 of Reference (4).

Question (2)

The fact that a safety actuation signal to ESF equipment is overridden must be "annunciated" at the system level whenever such an override is active. Valve position ("status") lights are not sufficient. Describe the design changes you propose to rectify the present deficiency.

Response

The design of the ESF system at Millstone Unit No. 2 includes a bypass safety status panel which provides a white and blue status light for each component which is automatically initiated to satisfy a safety function.

The white light indicates the availability of the control circuit and is arranged to energize whenever power to a control circuit is lost for any reason including a blown fuse, tripped or racked out circuit breaker, loss of power, or a component that is administratively bypassed for maintenance.

The blue light indicates that the component is in the position it should assume following a Safety Actuation Signal, and all blue lights should be lit upon receipt of the signal. Should an ESF component be overridden to its non-accident position, following the receipt of an actuation signal, the corresponding blue light on the bypass safety status panel will not be lit. Thus, it will be readily apparent to the operator if any of the equipment is not in the safe mode for the safety function required.

The indication provided by the bypass safety status panel is in addition to the normal component position lights located on the main control board at the control switch position.

The bypass safety status panel is designed to meet the requirements of IEEE-279-1971 and is described further in Question 7.3 of Amendments 15 and 23 to Reference (5). The acceptability of the design is documented by the Staff in Section 7.4 of Reference (4).

NNECO has determined that the level of annunciation to indicate the bypass status of ESF components is sufficient at Millstone Unit No. 2.

Question (3)

All equipment which senses plant conditions and initiates operation of ESF systems shall be designed and appropriately qualified as Class 1E equipment. Discuss the qualification of all such equipment at Millstone, Unit No. 2. Describe any changes necessary to achieve full compliance with this requirement.

All equipment which senses plant conditions and initiates operation of ESF systems is designed and qualified as Class 1E equipment at Millstone Unit No. 2. Full compliance with this requirement has been achieved.

With regard to the specific positions of Enclosure (1) of Reference (1) concerning containment isolation, Items 2, 3, and 5 have been addressed above. The remaining points are addressed below.

Position (1)

The overriding of one type of safety actuation signal (e.g., radiation) should not cause the blocking of any other type of safety actuation signal (e.g., pressure) to the isolation valves.

Response

In light of the Technical Specifications proposed in Reference (2), and NNECO's commitment to modify the circuitry associated with the purge valves, compliance with the position is assured.

Position (4)

At least two diverse signals should be provided to initiate isolation of the containment ventilation system. Specifically, containment high radiation, safety injection actuation, and/or containment high pressure should automatically initiate containment isolation.

Response

In light of the Technical Specifications proposed in Reference (2), and NNECO's commitment to modify the circuitry associated with the purge valves, compliance with the position is assured. Since the purge valves at Millstone Unit No. 2 are locked closed in Modes 1 through 4, two diverse signals are not required to actuate isolation of the containment ventilation system. In those operating modes (5 and 6), when containment purging is permitted, a high radiation actuation signal will isolate the containment ventilation system. This configuration is adequate for plant operation in Modes 5 and 6.

Position (6)

The overriding or resetting of the isolation actuation signal should not cause the automatic reopening of any isolation/purge valve.

Response

As stated in NNECO's response to the Staff regarding Item 2.1.4 of NUREG-0578, the overriding or resetting of any isolation actuation signal does not cause the automatic reopening of any isolation or purge valve.

It is emphasized that a key element of NNECO's basis for the above responses is the fact that the current design is in full conformance with current IEEE Standards, Regulatory Guides, and other relevant regulatory guidance.

Furthermore, the design has been previously reviewed and approved by the NRC Staff. It is recognized that the Staff may elect to escalate or strengthen any requirement if such action is necessary to ensure plant safety. For example, the TMI-2 accident has provided the motivation to re-review the containment isolation provisions at Millstone Unit No. 2. NNECO's review has determined that the current design conforms to the relevant requirements of NUREG-0578, and the Staff has verbally indicated their concurrence in this determination. Despite these findings, Reference (1) implies that the Millstone Unit No. 2 design must be modified. This enigma requires clarification before the appropriateness of any additional actions can be evaluated by NNECO. The Staff has developed methods, which solicit industry input, to affect changes in regulatory guidance. It is NNECO's position that such methods are appropriate in this instance.

We trust you find this information responsive, and that it satisfactorily dispositions the Reference (1) concerns. We remain available to resolve any additional questions or concerns.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

W. G. Counsil
W. G. Counsil
Vice President