



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

PRESSURIZER PRESSURE - SHUTDOWN COOLING SYSTEM INTERLOCKS

NORTHEAST NUCLEAR ENERGY COMPANY

MILLSTONE NUCLEAR POWER STATION, UNIT NO. 2

DOCKET NO. 50-336

1.0 INTRODUCTION

By letter dated April 29, 1998, the Northeast Nuclear Energy Company (NNECO/the licensee) proposed a license amendment to allow changes to the description of the Millstone Nuclear Power Station, Unit No. 2 (MNPS2) Final Safety Analysis Report (FSAR). The licensee determined that the requested changes constitute an unreviewed safety question (USQ) as defined in Title 10 of the Code of Federal Regulations (10 CFR) Section 50.59.

The proposed changes would delete the diversity requirement in FSAR, Section 4.3.8.2.3, "Pressurizer Pressure," for PT-103 and PT-103-1, which are the two low-range pressurizer pressure transmitters. The licensee proposes to replace PT-103 and PT-103-1 with transmitters that are more accurate in a post-accident environment to provide assurance that entry into shutdown cooling in a post-accident environment is not compromised and to provide relief for the reactor coolant system (RCS) pressure/temperature curves. The licensee further indicates that only a single model series of Rosemount transmitters meet the revised design requirements.

This request results from the licensee's determination that the existing low-range pressurizer pressure transmitters in the shutdown cooling (SDC) system interlocks are susceptible to high inaccuracies during harsh environment conditions following a loss-of-coolant accident or a main steamline break inside the containment. The replacement of these transmitters will result in the elimination of transmitter diversity as described in the MNPS2 FSAR, Section 4.3.8.2.3, "Pressurizer Pressure." The licensee has determined that this deviation involves a USQ, as defined in 10 CFR 50.59. Therefore, in accordance with 10 CFR 50.59(c), the licensee requests that the staff review and approve this change to the FSAR through an amendment to Facility Operating License DPR-65, pursuant to 10 CFR 50.90.

2.0 EVALUATION

The NRC's Branch Technical Position HICB-1, "Guidance on Isolation of Low-Pressure Systems From the High-Pressure Reactor Coolant System," states in part, that where both valves in a high/low pressure system interface are motor-operated, the valves should have independent and diverse interlocks to prevent both from opening unless the primary system pressure is below the subsystem design pressure. In the MNPS2 FSAR, credit is presently taken for diversity achieved through the use of diverse pressure transmitters in each of the two channels for the motor-operated valves that isolate the low-pressure SDC system from the high-pressure RCS.

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Enclosure

The licensee indicates that replacement of the low-range pressurizer pressure transmitters is necessary to provide sufficient accuracy so that entry into SDC in a post-accident environment is not compromised. To resolve the problem, the existing transmitters, PT-103 and PT-103-1, will be replaced with transmitters that exhibit greater accuracy in post-accident environments. Of the qualified transmitters available, only one model series manufactured by Rosemount exhibits a post-accident accuracy that meets the revised design requirements. Therefore, both PT-103 and PT-103-1 must be replaced with identical Rosemount, Model 1154, Series H transmitters. As previously noted, the replacement would eliminate the transmitter diversity presently credited in the FSAR and the licensee has determined that the change is a USQ as defined in 10 CFR 50.59. Thus, the licensee has requested that the NRC staff review and approve the change prior to implementation.

The NRC staff has reviewed the diversity aspect of the licensee's submittal and finds that the design change proposed by NNECO is similar to the change implemented by Southern California Edison Company (Edison) for the same problem at San Onofre Nuclear Generating Station (SONGS), Units 2 and 3. Edison had similarly submitted a request to the staff for approval of the design before its implementation. However, in a phone conference held on January 11, 1995, Edison informed the staff that one valve in each SDC system flow path has power removed whenever primary plant pressure is greater than the SDC design pressure. These valves have power removed to prevent inadvertent opening caused by failures that could defeat the keylock feature or other safety interlocks. On the basis of this discussion, it was agreed that having power removed from one valve in each SDC flow path meets the staff's diversity criteria for assurance that the high/low pressure interface would not be inappropriately opened. (See letter from Walter C. Marsh, Southern California Edison Company, to U.S. Nuclear Regulatory Commission, dated March 28, 1995.)

On the basis of that agreement, Edison performed a 10 CFR 50.59 evaluation for the proposed design change. The evaluation supported replacing the existing low-range pressurizer pressure transmitters at SONGS, Units 2 and 3, with an improved model supplied by one manufacturer and providing a diverse means of assuring SDC system isolation by the removal of motive power from one of the motor-operated valves in each SDC system flow path when RCS pressure is greater than SDC system design pressure.

The design for MNPS2 is similar to that at SONGS in that one valve in the SDC system flow path has power removed whenever RCS pressure exceeds the SDC system design pressure. This design change was implemented by NNECO in 1983 to improve operator control over one of the SDC suction valves and to prevent inadvertent or unauthorized operation of that valve. The design change included the installation of a manual power disconnect switch in the control room. When open, this switch removes power to one of the two motor-operated valves. This switch is maintained open in accordance with operating procedures whenever the pressure of the RCS exceeds 265 psia, in order to better preclude the possibility of connecting the high-pressure system to the low-pressure system. An annunciator is provided to warn the operator whenever the manual power disconnect switch is closed.

Thus, the NRC staff finds that the existing design at MNPS2 provides a diverse means of assuring SDC system isolation by the removal of motive power from one of the motor-operated valves whenever the RCS pressure exceeds the SDC system design pressure.

3.0 CONCLUSION

The NRC staff has reviewed NNECO's submittal and finds that NNECO had not considered the diversity provided by the switch in the control room that removes power to one of the two motor-operated valves in the SDC system flow path in its evaluation of the high/low pressure interface design. The NRC staff has determined that the licensee should perform a new safety evaluation under the provisions of 10 CFR 50.59 to determine if a USQ exists with this design consideration included. Depending on its findings, NNECO may be able to withdraw the April 29, 1998, amendment application and proceed to change the MNPS2 licensing basis and associated FSAR revision under the provisions of 10 CFR 50.59. If NNECO determines that a USQ still exists, it may supplement the current application by providing the results of the new safety evaluation to support a license amendment.

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