

NORTHEAST UTILITIES



THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
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September 30, 1988

Docket No. 50-336

B13032

Re: 10CFR50.90

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

Gentlemen:

Millstone Nuclear Power Station, Unit No. 2
Proposer Changes to Technical Specifications
Primary-to-Secondary Steam Generator Leakage Limit

Pursuant to 10CFR50.90, Northeast Nuclear Energy Company (NNECO) hereby proposes to amend its Operating license No. DPR-65 by incorporating the attached changes into the Technical Specifications for Millstone Unit No. 2.

Background

During January 1987 Millstone Unit No. 2 was shut down to locate and repair a 0.15 gpm primary-to-secondary leak which had developed in one steam generator (SG). The leak was located in tube line 25, row 19, in the hot leg side of SG #1. Bobbin coil eddy-current test (ECT) inspection of this tube showed a large volume indication at the top of the tube sheet. Further inspection using a rotating pancake coil (RPC) probe revealed that the large volume indication was circumferentially oriented and extended approximately 220 degrees around the tube. The ECT indications were interpreted as a possible circumferential crack which was through-wall over at least a portion of the 220-degree circumferential extent.

Assessments of the safety significance of the leaking tube were performed and concluded that operation of the SG continued to be safe provided that structural limits could be met for a circumferentially oriented crack. Based on calculations which concluded that a circumferential crack of the size which would allow 0.15 gpm primary-to-secondary leakage was structurally acceptable, an administrative reduction of the allowable leakage from 0.5 to 0.15 gpm per SG was adopted.

A meeting with the NRC Staff was held on March 5, 1987 in Bethesda, Maryland, to discuss events leading up to, and actions taken as a result of, the steam generator primary-to-secondary leak at Millstone Unit No. 2. NNECO informed the Staff that an administrative leakage limit of 0.15 gpm per steam generator had been established to ensure that acceptable structural margins would be maintained, and that a license amendment request would be submitted to the NRC Staff to change the Technical Specifications for Millstone Unit No. 2.

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In a letter dated March 16, 1987,⁽¹⁾ the NRC Staff concurred with NNECO's evaluation that the structural integrity of the steam generator tubes appeared adequate for the present. This conclusion was based upon NNECO's commitment to observe the administrative primary-to-secondary leakage limit, through any one steam generator, of 0.15 gpm until a formal technical specification change could be issued by the NRC Staff. This administrative limit was formalized as a change to the Millstone Unit No. 2 Technical Specifications by issuance of License Amendment No. 121 on November 13, 1987.⁽²⁾

During the January 1988 Millstone Unit No. 2 refueling outage, tube line 25, row 19, in the hot leg side of SG #1 was removed for destructive examination. The observed circumferential crack was larger than the size which had been previously measured. Based on a more complete understanding of the cracking phenomena, the structural implications of circumferential cracks were reevaluated and a new, lower, primary-to-secondary leakage limit of 0.10 gpm was administratively implemented prior to start-up from the 1988 refueling outage. This leakage limit was implemented to better assure that any flaw of the type discovered in the leaking tube will be repaired before the structural margin or accident condition leakage becomes unacceptable. Accordingly, this proposed change formalizes that administrative limit.

Description of Change

NNECO proposes to change Limiting Condition for Operation (LCO) 3.4.6.2(c) on page 3/4 4-9 from 0.15 to 0.10 gpm for any one steam generator. For consistency, NNECO would also change the Bases for the Reactor Coolant System Leakage Section 3/4.4.6 on page B 3/4 4-3 from 0.15 to 0.10 gpm. The 0.10 gpm limit assures that the structural integrity of the tube will be adequately maintained even in the presence of a circumferentially oriented crack leaking at the allowable limit.

The proposed change will also modify the requirements to perform eddy current examinations when the unit is shut down to repair primary-to-secondary leakage. The change will limit the required examinations to those necessary to locate the leakage, investigate the cause and define appropriate corrective measures. Prior to restart, an evaluation will be performed to assure that structural integrity is adequate.

Section 4.4.5.1.3(c)(1) would be changed to eliminate the requirement for unscheduled eddy current inspections in the case of primary-to-secondary tube leaks in excess of the limits of Section 3.4.6.2; and a new Section

(1) A. C. Thadani letter to E. J. Mroccka, "Steam Generator Tube Leakage at Millstone Unit No. 2," dated March 16, 1987.

(2) D. H. Jaffe letter to E. J. Mroccka, "Issuance of Amendment," dated November 13, 1987.

(4.4.5.1.3(d)) would be added to specify the examinations and evaluations conducted in the event of primary-to-secondary leakage and to supersede the requirements of Section 4.4.5.1.2. For consistency, NNECO would also change the Bases for the Steam Generator Section 3/4.4.5 on page B 3/4 4-2a.

NNECO is not proposing a change to the limit of 1 gpm total primary-to-secondary leakage through both SGs contained in Technical Specification 3.4.6.2(c). Although, with the proposed limit of 0.10 gpm leakage per SG the 1 gpm total leakage would never conceivably be reached, the 1 gpm limit was established for radiological considerations following design-basis events at Millstone Unit No. 2. Since there have been no changes to the radiological considerations, NNECO believes it is prudent to leave this limit as it currently exists.

Safety Assessment

The development of cracks in SG tubes is not a significant safety concern provided appropriate leakage limits are utilized. Physical examinations of tube line 25, row 19, and our technical evaluations have demonstrated that if a circumferential crack were to develop, the crack would penetrate through-wall and leak prior to reaching a condition which would burst the tube. The change in the leakage limit from 0.15 to 0.10 gpm is based on new understanding of the defect.

The existing Technical Specification requires a random sample examination of the tube population in the event measured primary-to-secondary tube leakage exceeds the allowable. The proposed change to the requirement for eddy current examinations would redirect the scope of examinations to those necessary to locate the leakage, investigate the cause, and define appropriate corrective measures. Prior to restart, an evaluation to assure adequate structural integrity would be required. In contrast, the existing Technical Specification requires examinations which target the general level of structural integrity and does not address the specific cause of leakage or its effect on structural integrity.

In light of the above, NNECO considers the proposed change to be safer and more practical than the existing Technical Specification requirement. The existing program could possibly miss a local problem, in that it does not require an investigation of cause, or a reassessment of structural integrity. In addition, the proposed changes are more conservative in that an inspection is required regardless of whether the leakage limits are exceeded prior to shutdown of the unit to repair primary-to-secondary leakage.

Significant Hazards Consideration

NNECO has reviewed the attached proposed changes in accordance with 10CFR50.92 and has concluded that they do not involve a significant hazards consideration in that these changes would not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated. The proposed change would reduce the primary-to-secondary leakage limit from 0.15 gpm in any one steam generator to 0.10 gpm. This will reduce the probability of occurrence of tube ruptures since the allowable leakage has been reduced. Consequences of the analyzed accidents are not increased since the reduced allowable leakage limit will ensure that the total accident condition leakage will remain below the 1 gpm limit.

The change to modify eddy-current inspection requirements formalizes the existing practices at the unit in the event the unit is shut down prior to the leak exceeding the Technical Specification limits. Adequately fulfilling the proposed requirements to locate the leak, regardless of size, investigate the cause, and identify appropriate corrective actions increases the probability that highly localized problems, as well as widespread problems, will be identified. The addition of the requirement to evaluate the structural integrity prior to restart of the unit will increase the probability that all items of safety significance have been adequately addressed and will increase the overall safety of the unit.

2. Create the possibility of a new or different kind of accident from any previously analyzed. The proposed change lowers an existing leakage limit. The reduction in the leakage limit clearly does not create the possibility of a new accident since no physical change has occurred. The more restrictive limit helps ensure an adequate margin of safety for the failure of an SG tube, an analyzed accident.

Since the proposed change in eddy-current inspection requirements does not alter the way the plant is operated, the potential for an unanalyzed accident is not created and no new failure modes are introduced.

3. Involve a significant reduction in a margin of safety. The reduction in the leakage limit increases margins of safety. Further, structural integrity margins are retained at acceptable levels in accordance with Regulatory Guide 1.121. The proposed change to eddy-current inspection requirements is more conservative in that an inspection is required regardless of whether the leakage limits are exceeded prior to shutdown of the unit to repair primary-to-secondary leakage.

The Commission has provided guidance concerning the application of the standards in 10CFR50.92 by providing certain examples (51 FR 7750, March 6, 1986). Example (ii) most closely resembles this change; i.e., "a change that constitutes an additional limitation, restriction, or control not presently included in the technical specifications, e.g., a more stringent surveillance requirement," because the allowable leakage is reduced and proposed post-leakage requirements focus the inspection examinations to more closely relate them to the cause of the leakage.

The Millstone Unit No. 2 Nuclear Review Board has reviewed and approved the attached proposed changes and has concurred with the above determinations.

