BOSTON EDISON COMPANY
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WILLIAM D. HARRINGTON
SENIOR VICE PRESIDENT
NUCLEAR

Proposed
Change 85-01
BECo 85-022

February 1, 1985

Mr. Domenic B. Vassallo, Chief
Operating Reactors Branch #2
Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D. C. 20555

License DPR-35
Docket 50-293

Proposed Technical Specification Change
Tables 3.1.1 and 3.2.A

Dear Sir:

Pursuant to 10 CFR 50.90, Boston Edison Company hereby proposes the attached modification to Appendix A of Operating License No. DPR-35. This modification adds a note to Tables 3.1.1 and 3.2.A concerning the Main Steam Line High Radiation instrument setpoint. It is proposed to address the expected increase in main steam line radiation associated with injecting hydrogen as a mitigator of intergranular stress corrosion cracking of stainless steel piping.

Should you wish further information concerning this proposal, please contact us.

Very truly yours,

WD Harrington

Attachment

Three signed originals and 37 copies

cc: See next page

Commonwealth of Massachusetts)
County of Suffolk )

Then personally appeared before me W. D. Harrington, who, being duly sworn, did state that he is Senior Vice President - Nuclear of the Boston Edison Company, the applicant herein, and that he is duly authorized to execute and file the submittal contained herein in the name and on behalf of the Boston Edison Company and that the statements in said submittal are true to the best of his knowledge and belief.

My Commission expires: October 21, 1988

Peter M Kahler
Notary Public



Rec'd w/check #150.00
#390095

A001
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ADD: NRR/CHEB

cc: Mr. Robert Hallisey, Director
Radiation Control Program
Mass. Dept. of Public Health
150 Tremont Street F-7
Boston, MA 02111

PMK/kmc

Proposed Change

Reference is made to Pilgrim Operating License No. DPR-35, Appendix A, pages 27, 29, 45 and 46. Page 27 contains Table 3.1.1, "Reactor Protection System (SCRAM) Instrumentation Requirement," and page 29 provides notes associated with that table. Page 45 contains Table 3.2.A, "Instrumentation That Initiates Primary Containment Isolation", and Page 29 provides notes associated with that table.

Currently, Table 3.1.1 states that the main steam line high radiation trip level setting is "$\leq$ 7x Normal Full Power Background." This applies to Refuel, Startup, Hot Standby and Run modes.

The desired amendment would add a note reference, (18), immediately following the trip level setting and next to the "x" in the "Run" column of the table. Note (18) is a new note added to Table 3.1.1 notes found on page 29, and shall state:

> Within 24 hours prior to the planned start of hydrogen injection with the reactor power at greater than 20% rated power, the normal full power radiation background level and associated trip setpoints may be changed based on a calculated value of the radiation level expected during the injection of hydrogen. The background radiation level and associated trip setpoints may be adjusted based on either calculations or measurements of actual radiation levels resulting from hydrogen injection. The background radiation level shall be determined and associated trip setpoints shall be set within 24 hours of re-establishing normal radiation levels after completion of hydrogen injection, or prior to withdrawing control rods at reactor power levels below 20% rated power.

Table 3.2.A includes the main steam line high radiation instrumentation. The proposed change adds the identical wording of the note described above to Page 46 as note (9), and places a (9) on Page 45 next to High Radiation Main Steam Line Tunnel.

Reason for Change

This amendment is proposed to permit changes in the normal full power background trip level setting for the Main Steam Line High Radiation scram and isolation setpoints to allow hydrogen injection as an IGSCC mitigating activity.

The purpose of hydrogen injection is to allow Boston Edison to evaluate the feasibility and efficacy of hydrogen water chemistry as a mitigator of intergranular stress corrosion cracking (IGSCC) of stainless steel BWR piping, and employ it should the evaluation demonstrate its usefulness as a mitigator. This technique consists of adding hydrogen to the primary coolant to lower the free oxygen concentration by suppressing radiolysis of water. By reducing free oxygen, one of the three necessary causative agents of IGSCC is eliminated. Testing at Pilgrim will be predicated upon experience gained from the hydrogen water chemistry programs developed and conducted by General Electric at their San Jose facilities, and at the Dresden-2 Unit of Commonwealth Edison Company. Permanent implementation will be based on plant specific data.

In sum, the purpose of employing hydrogen water chemistry is to effect the following benefits:

1) The elimination or reduction of IGSCC concerns.

2) The elimination of the costly replacement or repair of IGSCC, as well as the lost plant availability associated with such activities.

3) The reduction of radiation exposure to personnel engaged in pipe crack repairs and non-destructive examinations which stem from IGSCC.

The following data is to be provided by initial implementation:

1. The relationship of hydrogen level to oxygen level in the primary coolant system.

2. The identification of changes to plant chemistry, ion transport, conductivity, and reduction potential.

3. The determination of general in-plant and site boundary radiation increases due to increased N-16 activity.

4. The determination of specific locations where additional shielding may be required to support continued use of hydrogen injection.

5. The assessment of offgas system performance with hydrogen injection.

6. The adequacy of injection locations.

7. The adequacy of sampling equipment and procedural requirements.

8. The effectiveness of the hydrogen addition system to control free oxygen levels.

9. The evaluation of a permanent hydrogen injection installation.

When hydrogen is injected for oxygen suppression, nitrogen (N-16) carry-over increases in the main steam, which increases radiation in areas where main steam is found. The increased carry-over and radiation is caused by a conversion of N-16 from a soluble to a volatile form in the reactor.

The requested revision of Tables 3.1.1 and 3.2.A, and the addition of notes (18) and (9) permit an increase in the Main Steam Line High Radiation scram and isolation setpoints to allow operation with the expected higher radiation levels resulting from hydrogen injection. The main steam high radiation setpoint will remain at "$\leq$7 Normal Full Power Background"; however, because of increased N-16 in the steam, the background radiation level used to determine the high radiation setpoint will be increased prior to injection in accordance with a calculated background level value. The license amendment would permit the full load background radiation level to be adjusted during early implementation to correct for uncertainties in the initial calculated value. Pre-injection setpoints will be restored following the conclusion of injection, or when power is decreased to below 20% power. Hydrogen injection will not be performed with the reactor less than 20% power.

Boston Edison, with the aid and cooperation of General Electric, is planning to conduct hydrogen injection at Pilgrim during a 3 to 4 day period in March, 1985. Should this initial injection demonstrate the efficacy of further injection, Boston Edison will resume injection consistent with the data gleaned from the initial injection. We cannot commence prior to the approval of this proposed amendment by NRC.

Safety Considerations

At the maximum planned hydrogen injection rate, initially to be approximately 18 SCFM, experience indicates an expected increase of approximately 3 to 8 times the normal main steam line background radiation level. The only event which takes credit for the main steam line high radiation (MSLRM) trip is the design basis control rod drop accident (CRDA). As stated in Section 14.7.1.2 of the Pilgrim FSAR, a CRDA is only of concern below 10% of rated power. Since the Main Steam Line Radiation Monitor (MSLRM) setpoint will be adjusted at power levels above 20% power, the FSAR analysis and the design function of the MSLRM trip will remain valid. An increase in the MSLRM setpoint will not impact any other FSAR Chapter 14 accident or transient analysis since no credit is taken for MSLRM trips. Therefore, this proposed technical specification change will not reduce plant safety margins. In addition, the effect of hydrogen injection on the gaseous effluent release rate is expected to be insignificant because of the short decay time for N-16.

Boston Edison will maintain radiation protection/ALARA practices and procedures during injection. Initially, injection is being conducted, in part, to determine area radiation levels, which will, in turn, be used to determine shielding or procedural adjustments to minimize personnel exposure when hydrogen injection is employed.

This proposed change has been reviewed and approved by the Operations Review Committee (ORC), and reviewed by the Boston Edison Nuclear Safety Review and Audit Committee (NSRAC).

Significant Hazards Considerations

The Commission has provided guidance concerning the application of the standards for determining whether license amendments involve no significant hazards considerations by providing certain examples (48 FR 14870). Example (vi) of actions involving no significant hazards consideration is a change which may reduce in some way a safety margin, but where the results of the change are clearly within all acceptable criteria. The change proposed by this applications fits this example because it would permit the normal full power background level, associated with the Main Steam High Radiation scram and isolation setpoints, to be increased only so as to compensate for the anticipated increase in the main steam radiation levels during hydrogen injection. The capability to monitor for fuel failures, which is the mission of the MSLR trip setpoint, is maintained by: (1) the continued operability of the main steam radiation monitors, which provide signals to the reactor protection system and primary containment isolation system; (2) routine radiation surveys; (3) the performance of primary coolant water analyses; and (4) the continued operability of the Steam Jet-Air Ejector Off-Gas Radiation Monitor.

Although the potential for error exists whenever instrument setpoints are adjusted, the resulting increase in the probability or consequences of accidents previously evaluated is considered insignificant because of Boston Edison's existing quality assurance program and operating procedures as applied to instrument adjustments.

If, due to a recirculation pump trip or other unanticipated power reduction event, the reactor drops below 20% rated power without setpoint readjustment, control rod withdrawal is prohibited until the necessary setpoint readjustment is made. This ensures that fuel failures of the type concerning the MSLRM are unlikely.

Radiation protection practices will be performed during initial hydrogen injection based upon a pre-injection radiation (ALARA) review. During initial injection, special radiation level surveys will be performed and protective actions will be taken, as appropriate, to control all onsite personnel exposure. As data is gathered and assessed, steps will be taken to make permanent those changes to plant design and procedures deemed appropriate to minimize personnel exposure during the injection of hydrogen. Changes in gaseous effluent release rates for hydrogen injection are expected to be negligible due to the short decay times for N-16.

Based on the diverse means for maintaining the ability to detect fuel failures, on the protection of primary coolant system piping promised by implementing hydrogen water chemistry, on the efficacy of existing programs and procedures to assure accurate instrument setpoint adjustment, on both routine and exceptional ALARA actions to be taken prior to and during injection, on the ability of existing technical specifications to ensure that inimical control rod movement cannot occur below 20% power, and on the insignificant effect of increased N-16 activity on gaseous effluent release rates, Boston Edison concludes that the proposed amendment will not significantly increases the probability or consequences of accidents previously considered, will not create the possibility of a new or different accident from any previously evaluated, and will not significantly reduce a safety margin. Therefore, Boston Edison proposes to the NRC that it should make a determination that the proposed amendment does not involve significant hazards considerations.

Schedule of Change

This change will become effective upon Boston Edison's receipt of approval by the NRC. It is our intention to begin injection in March, 1985. We request that NRC act expeditiously on this change to allow the fulfillment of that schedule, which is determined, in part, by the availability of General Electric personnel.

Fee Determination

Pursuant to 10CFR 170.12 (c), an application fee of $150.00 is included with this proposed amendment.