

In the meeting held with the staff on April 30, 1997, on the preliminary results of the SG tube EC examination conducted during the present Braidwood, Unit 1, refueling outage, the licensee stated that while there was no detectable degradation (NDD) of the locked tubes or of the sleeves at the expanded joints at the SG tube/TSP intersections, 49 of the 85 locked SG tubes in the four Braidwood, Unit 1, SGs were found to have circumferential crack indications at the TTS in the roll transition zone. To resolve this issue for Braidwood, Unit 1, and restore the original design basis for the locked SG tubes, the licensee proposed in its letter dated April 29, 1997, to install Westinghouse elevated laser-welded sleeves in all 89 Braidwood, Unit 1, locked SG tubes. The staff found this proposal to install sleeves in the Braidwood, Unit 1, locked SG tubes at the TTS to be acceptable as stated in Section 3.2 of this SE.

On the basis of the acceptability of the sleeving installation discussed above, the staff finds that its prior acceptance, in the SE issued on November 9, 1995, of the licensee's structural evaluation of the installation of the 85 Braidwood, Unit 1, locked SG tubes remains applicable. Therefore, the licensee's prior structural analysis of the locked SG tube installation is acceptable for the proposed extension of the 1.0 volt and 3.0 volt IPC presently in the Braidwood, Unit 1, TSS for one additional Braidwood, Unit 1, operating cycle.

3.10 Hydrodynamic Loads on the Tube Support Plates

In Section 4.3 of the SE issued on November 9, 1995, the staff reviewed and found acceptable, the licensee's analysis of the hydrodynamic loads on the TSPs in the event of an MSLB. The staff finds that its prior conclusion in Section 4.3.5 of the SE cited above regarding the proposed values of the differential pressures across the TSPs, is still bounding. The staff does not expect the variation caused by multi-dimensional flow effects to cause this bounding TSP deflection to be exceeded as discussed below. On this basis, the staff finds that the licensee's prior estimate of the hydrodynamic loads on the TSPs under postulated accident conditions, remains acceptable for the proposed extension of the 1.0 volt and 3.0 volt IPC for one additional Braidwood, Unit 1, operating cycle.

In a meeting in mid-1996 with a subcommittee of the Advisory Committee on Reactor Safeguards (ACRS) subsequent to issuing Braidwood, Unit 1, License Amendment No. 69, some members of the ACRS Subcommittee stated a concern relating to the use of a one-dimensional code (i.e., RELAP5 MOD3) to calculate the hydrodynamic loads on the TSPs. The specific concern of these ACRS members was that the effect of a two-dimensional flow distribution above the topmost TSP would give rise to a radial variation in the hydrodynamic pressure loading on the topmost TSP.

The staff stated in response to this issue that it believed there was sufficient conservatism in each facet of the licensee's analysis of its locked SG tube proposal to amply account for the effect of any variations in TSP pressure loadings across the TSP radius. However, the staff committed to investigate this effect on the TSP displacements under postulated accident conditions. This effort is continuing.

The staff approval of the extension of the 1.0 volt and 3.0 volt IPC for one additional operating cycle at Braidwood, Unit 1, is subject to confirmation by the licensee in its forthcoming 90-Day Inspection Report that the concern of the ACRS Subcommittee members cited above, does not cause the TSP displacements under postulated accident conditions to exceed the postulated maximum displacement of 0.100 inches.

3.11 Radiological Consequences

In Section 4.6 of the SE issued in conjunction with Braidwood License Amendment No. 69 on November 9, 1995, the staff provided its evaluation of the radiological consequences of the licensee's proposal to adopt the 1.0 volt and 3.0 volt IPC. This radiological evaluation was performed using the licensee's proposal to maintain the then existing TS value of the maximum permissible primary coolant dose equivalent (DE) iodine-131 concentration of 0.35 microcuries per gram of coolant. The licensee stated that its Braidwood Station site allowable primary-to-secondary SG tube leakage from a faulted SG and the other three SGs assuming this DE iodine-131 concentration, was 26.8 gpm. This value of site specific SG leakage rate would thereby result in a 2-hour Exclusion Area Boundary (EAB) thyroid dose of about 12 rem.

In proposing to extend the applicability of the 1.0 volt and 3.0 volt IPC presently in the Braidwood, Unit 1, TSs, the licensee has not proposed to revise the present iodine-131 DE primary coolant concentration. Accordingly, the prior staff evaluation of the radiological consequences of the 1.0 volt and 3.0 volt IPC presented in Section 4.6 of the prior SE issued on November 9, 1995, remains applicable to the proposed extension of the voltage-based repair criteria. In that the estimated two-hour EAB thyroid dose of 12 rem and the relatively small whole-body radiation exposure (i.e., less than 0.3 rem) are still small fractions of the radiation exposure guideline values in 10 CFR Part 100, we find that the radiological consequences of extending the 1.0 volt and 3.0 volt IPC in the Braidwood, Unit 1, TSs for one additional operating cycle, are acceptable. This finding is based on the staff's acceptance criteria for radiation exposure of 30 rem to the thyroid and 2.5 rem for whole-body exposure as shown in Table 1 of the SE issued on August 18, 1994, for Braidwood, Unit 1.

Based on the foregoing considerations, the staff concludes that the radiological consequences outside containment for a postulated MSLB for Braidwood, Unit 1, are acceptable. This finding is based on the projected primary-to-secondary SG tube leakage not exceeding 26.8 gpm at Braidwood, Unit 1, at EOC-7. Confirmation that the regulatory requirements for allowable dose exposures are satisfied will be submitted in the forthcoming Braidwood, Unit 1, 90-Day Inspection Report.

4.0 APPROVAL OF TECHNICAL SPECIFICATION REVISION

The only substantive change proposed for TS Section 4.4.5.2 is to extend the applicability of the 1.0 volt and 3.0 volt IPC from the end of the Braidwood,

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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