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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 45 TO FACILITY OPERATING LICENSE NO. NPF-66

AND AMENDMENT NO. 34 TO FACILITY OPERATING LICENSE NO. NPF-77

COMMONWEALTH EDISON COMPANY

BYRON STATION, UNIT NO. 2

BRAIDWOOD STATION, UNIT NO. 2

DOCKET NOS. STN 50-455 AND STN 50-457

1.0 INTRODUCTION

In a submittal dated June 28, 1991, the Commonwealth Edison Company (CECo) described reactor protection system (RPS) and engineered safety features actuation system (ESFAS) trip setpoint changes resulting from lowering of the lower narrow range steam generator (SG) level instrument taps at Byron and Braidwood No. 2 Units from 438 inches above the top of the SG tubesheet to 333 inches above the tubesheet. The upper instrument tap for the Model D-5 SGs in the Byron and Braidwood No. 2 Units design remains unchanged at 566 inches above the tubesheet. With the changes, the narrow range SG level instrument taps for the No. 2 Units will be at the same levels as those in the No. 1 Units which have Model D-4 SGs.

The submittal also provided an assessment of the impact of the changes on FSAR Chapter 15 analyses, and proposed Technical Specification (TS) changes to reflect the modifications.

2.0 STAFF EVALUATION

2.1 Setpoint Changes

The Byron and Braidwood TSs express the SG water level low-low and high-high trips in terms of percent of narrow range SG water level instrument span (NRS). The increase in the narrow range instrument span alters the correlation of level expressed in inches versus level expressed in percent of span. Also included in the consideration of revised setpoints is velocity head. Velocity head effects result in indicated levels for any given power less than or equal to the actual level, with the amount of discrepancy varying directly but not proportionally with power.

The high-high and low-low SG level trip setpoints for the Byron and Braidwood No. 2 Units TSs account for the above considerations, and are based on consistency with safety analysis assumptions and with the setpoint methodology described in the Westinghouse Topical Reports WCAP-12583 and WCAP-12523.

This methodology, incorporating the above considerations, has been used in previous Byron and Braidwood applications. Since the basic methodology has not been changed for this use, we also find it applicable to Byron and Braidwood No. 2 Units for this determination of setpoints.

2.2 Chapter 15 Analyses

2.2.1 Non-LOCA Event Analyses

The submittal provided an assessment of the impact of the changes on Final Safety Analysis Report (FSAR) Chapter 15 analyses. For most Chapter 15 events, the licensee found that the calculated results for existing Byron and Braidwood Updated FSAR analyses, performed assuming Model D-4 SGs, either would be unaffected by the changes or would remain bounding versus analyses assuming the modified Model D-5 SGs and associated trip settings.

Three Chapter 15 events were reanalyzed because of the potential for adverse effect due to the changes. The events are:

a. Feedwater System Malfunction Causing an Increase in Feedwater Flow (UFSAR Section 15.1.2)

   This event was reanalyzed for both zero power and full power case conditions. The zero power case was found to be bounded by the Uncontrolled RCCA Bank Withdrawal from a Subcritical or Low Power Condition event addressed in UFSAR Section 15.4.1. For the full power case, the licensee reports that the calculated minimum departure from nucleate boiling ratio (MDNBR) remains above the safety analysis limit value throughout the transient. This assures that departure from nucleate boiling (DNB) would not be encountered and that calculated event consequences meet criteria of acceptance.

b. Feedwater System Malfunctions Causing a Reduction in Feedwater Temperature (UFSAR Section 15.1.1)

   The licensee's submittal indicates that this event is bounded by the Increase in Feedwater Flow event discussed above, and the DNB basis is met.

c. Loss of Non-Emergency AC Power to the Plant Auxiliaries/Loss of Flow (UFSAR 15.2.6/15.2.7)

   The licensee's submittal indicates that these reanalyses calculated that pressurizer overfill would not occur for these events and verified the natural circulation capability of the plants to prevent fuel or cladding damage during reactor pump coastdown.

The analyses of the above events were performed using the same methods as those for the UFSAR Chapter 15 event analyses of record. We find that these methods continue to be applicable.

2.2.2 Steam Generator Tube Rupture (SGTR)

The licensee's submittal indicated that the SGTR consequences reported in the Byron and Braidwood UFSAR will not be increased by the D-5 SG modifications. The staff concludes that the finding of acceptability for the SGTR analysis of record continues to apply.

Submittal Section 4.3.2 discusses additional SGTR analyses performed by the licensee which were submitted to the NRC for review. Because this analysis is still under review, we have not considered that analysis in our findings.

2.2.3 LOCA Analyses

The licensee's submittal indicates that LOCA analyses are not adversely affected by the changes because analysis assumptions are not changed. We find this acceptable.

3.0 TECHNICAL SPECIFICATION CHANGES

The licensee's submittal proposed changes to three TS pages to be implemented in the operating cycle after SG modification for each unit (Byron Unit 2 and Braidwood Unit 2) to reflect the setpoint modifications discussed in Section 2.1 of this report. These are:

a. TS page 2-5, Table 2.2-1, Item 13.b, SG Water Level Low-Low Reactor Coolant System (RCS) trip - Values for Total Allowance (TA), parameters not measured on a periodic basis (Z), and Sensor Error (SE) are identified as not applicable (N.A.). The new Trip Setpoint is 36.3% of NRS and the new Allowable Value is 35.4% of NRS.

b. TS page 3/4 3-25, Table 3.3-4, Item 5.b.2, SG Water Level High-High Turbine Trip and Feedwater Isolation - Values for TA, Z, and SE are increased to 18.9, 12.02, and 3.2, respectively. The new Trip Setpoint is 80.8% of NRS and the new Allowable Value is 82.8% of NRS.

c. TS page 3/4 3-26, Table 3.3-4, Item 6.c.2, SG Water Level Low-Low Start Motor-Driven Pump and Diesel-Driven Pump - The new values are the same as in a. above.

d. Because Braidwood, Unit 2, fuel cycle 3 began in November 1991, the proposed TS change and the corresponding modifications to relocate the lower sensing tap of the Unit 2 steam generator will not be effective until the start of fuel cycle 4. Therefore, for Braidwood, Unit 2, the above proposed TS changes will only be effective for cycle 4 and after. The existing TS will remain through cycle 3.

The licensee's submittal based its justification of these modified setpoints on consistency with FSAR Chapter 15 analyses assumptions as discussed in Section 2.2 of this report.

We find the licensee's submittal, describing lowered lower SG level instrumentation taps, associated trip setpoint changes, and analytical justifications, acceptable based on use of a setpoint methodology which had been previously used in an approved application, and on justifications citing applicable UFSAR analyses and reanalyses using approved methodologies.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Illinois State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (56 FR 57692). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

6.0 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.

Principal Contributor: F. Orr, SRXB

Date: February 12, 1992