



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 97 TO FACILITY OPERATING LICENSE NO. NPF-37,  
AMENDMENT NO. 97 TO FACILITY OPERATING LICENSE NO. NPF-66,  
AMENDMENT NO. 88 TO FACILITY OPERATING LICENSE NO. NPF-72,  
AND AMENDMENT NO. 88 TO FACILITY OPERATING LICENSE NO. NPF-77  
COMMONWEALTH EDISON COMPANY  
BYRON STATION, UNIT NOS. 1 AND 2  
BRAIDWOOD STATION, UNIT NOS. 1 AND 2  
DOCKET NOS. STN 50-454, STN 50-455, STN 50-456 AND STN 50-457

1.0 INTRODUCTION

By application dated January 30, 1997, as supplemented by letter dated December 9, 1997, Commonwealth Edison Company (ComEd) the licensee for Byron and Braidwood Stations, requested changes to the Technical Specifications (TS) for the Byron and Braidwood facilities. Additional information that did not change the initial proposed no significant hazards consideration determination was provided by letters dated May 23, August 8, 1997, and January 7, 1998. The proposed changes would reflect the higher loss-of-coolant accident (LOCA) peak containment pressure calculation due to steam generator (SG) replacements and would also implement TS administrative improvements having no technical significance. ComEd will be replacing the original Westinghouse D4 SG in the Byron and Braidwood #1 units with Babcock & Wilcox International (BWI) SG. The SG replacements are a 10 CFR 50.59 modification that will increase the reactor coolant system (RCS) volume and secondary side pressure. This results in a greater steam mass and energy release in the event of a LOCA. The greater mass and energy release, in turn, results in an increase of the calculated peak containment internal pressure (Pa) related to the design basis LOCA. Since Pa is specified in the TS, changes are needed to increase the test pressure for the #1 units. The TS changes for the #2 units are necessary because common TS pages are used for Units 1 and 2.

2.0 AFFECTED TECHNICAL SPECIFICATIONS

The following changes are proposed:

TS 1.20.a defines Pa and specifies the current value as 44.4 psig. This TS would be changed to indicate that Pa will be 47.8 psig for Unit 1 after Cycle 8.

TS 4.6.1.3 would be changed to specify air lock door seal maximum leakage limits solely in terms of percentage of maximum allowable primary containment leakage rate (La) rather than in terms of both percentage of La and in standard cubic feet per hour (SCFH).

TS 4.6.1.7.3 & 4 would be revised to specify that the containment purge supply and exhaust isolation valve resilient seal test pressure is "Pa" rather than "Pa, 44.4 psig."

TS BASES 3/4.6.1.4 and 3/4.6.1.6 would be revised in several places to substitute the term Pa for "44.4 psig."

The above changes are due to the increase in calculated peak accident pressure from 44.4 psig to 47.8 psig. By (a) stating the exact value of Pa in one place only (i.e., the TS Definitions section) and using the term "Pa" alone elsewhere, and (b) stating specified leakage limits in terms of percentage of La, the TS are simplified so as to minimize the number of TS pages affected by differences among units.

Also:

TS 5.4.2.2 would be revised to indicate a corrected value of 12,340 cubic feet for the RCS volume and that for each Unit 1, the RCS volume of 12,340 cubic feet is increased by an additional 1,280 cubic feet as a result of SG replacement.

This change would reflect the effects of SG replacement on the RCS volume.

### 3.0 EVALUATION

To support the increased RCS volume, the licensee has performed an evaluation of all accident analyses documented in the Updated Final Safety Analysis Report (UFSAR) to determine the effect of an increase in RCS volume on the consequences of the accidents analyzed. The results of the licensee's evaluation concluded that the increased RCS volume will not result in a reduction of the safety margin.

In the licensee's evaluation performed to determine the effect of the increased RCS volume on the peak containment pressure following a large break loss of coolant accident (LBLOCA), the calculation indicated that the increased RCS volume could cause the peak containment pressure to increase to 47.8 psig. However, the licensee states that this increased peak pressure is still below the containment design pressure of 50.0 psig.

Pa is defined in Appendix J as:

Pa (p.s.i.g.) means the calculated peak containment internal pressure related to the design basis accident and specified either in the technical specification or associated bases.

The design basis accident for calculation of Pa is the postulated LOCA case which produces the highest containment peak internal pressure considering the complete spectrum of primary coolant piping system break sizes, break locations, single-failures and initial operating conditions. A new maximum peak accident pressure was calculated by applying the incremental effects of the larger SG to the Final Safety Analysis Report (FSAR) mass and energy release analysis. The licensee increased the blowdown phase data by 54,256 lbm and 33.084E+07 BTU to account for the mass and energy added by the additional RCS fluid inventory of the replacement SG. For the reflood and post-reflood phases of a LOCA, the enthalpy of the fluid discharged from a break after passing through a SG would be higher with the replacement SG due to the higher secondary side temperature. To account for this effect, the licensee increased the enthalpy of



the fluid discharge during reflood and post-reflood by 3.0 BTU/lbm. The 3 BTU/lbm value corresponds to an increase in secondary side T(sat) of 5.6 degrees Fahrenheit. Also, the SG depressurization time was increased to allow for dissipation of the additional stored energy in the larger metal mass and secondary side water inventory of the replacement SG's. The revised mass and energy data were input into a new CONTEMPT-B&W containment model which had been previously benchmarked against the original licensing model using the original mass and energy data. The licensee's analytical methodology is sufficiently accurate and conservative for the purpose of calculating a new containment leakage rate test pressure. The licensee calculated the new Pa to be 47.8 psig. With regard to the qualification of equipment, the licensee determined that the revised temperature profile for the large break LOCA with the replacement steam generators is bounded by the equipment qualification envelope currently used to qualify equipment at the Byron and Braidwood Stations.

#### 4.0 SUMMARY

The staff reviewed the licensee's submittals and methodology for calculation of the new containment peak accident (LOCA) pressure and found it acceptable. The proposed amendment will revise the containment test pressure "Pa" specification to conform with the new value. This is consistent with Appendix J to 10 CFR, Part 50 which requires that the LOCA peak accident pressure be identified in the TSs or TS Bases. The recalculated value of Pa remains bounded by the containment design pressure thereby maintaining containment structural margins and is acceptable. The other TS changes are of an editorial nature and are acceptable on the basis that the increased RCS volume will not result in a reduction of the margin of safety.

#### 5.0 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.

#### 6.0 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 and change surveillance requirements. 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 (62 FR 19826 and 62 FR 66699). 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.

## 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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Date: January 22, 1998