



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 76 TO FACILITY OPERATING LICENSE NO. NPF-37,  
AMENDMENT NO. 76 TO FACILITY OPERATING LICENSE NO. NPF-66,  
AMENDMENT NO. 86 TO FACILITY OPERATING LICENSE NO. NPF-72,  
AND AMENDMENT NO. 86 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 letter dated May 13, 1993, as supplemented by letters dated August 11 and September 20, 1995, Commonwealth Edison Company (ComEd, the licensee) submitted proposed changes to the Byron and Braidwood Stations' Technical Specifications (TS) for the containment purge ventilation system to allow the simultaneous opening of the 8-inch miniflow purge supply and exhaust valves (mini-purge), under certain conditions, to allow the mini-purge system to be used for reasons other than containment pressure control. These reasons include the reduction of airborne radioactivity in the containment atmosphere and improved respirable air quality of the containment atmosphere prior to personnel entry into the containment. The supplemental letters provided slightly revised wording to the TSs and Bases, as suggested by the NRC staff, on control over when the valves are opened; similar to the wording in the standard improved TSs for Westinghouse plants. The revised wording does not change the objective of the initial application, the reasons for opening the valves or the time the valves may be open and does not change the staff's initial proposed no significant hazards consideration determination.

## 2.0 EVALUATION

The licensee has proposed to revise TS 3.6.1.7 to delete the limitation of no more than 1,000 hours of mini-purge operation in a calendar year. The prohibition against the concurrent opening of the mini-purge supply and exhaust lines is also proposed to be deleted. The revised TS will specify that "The 8-inch containment purge supply and exhaust isolation valves(s) shall be closed, except when the associated penetration(s) is(are) permitted to be open for PURGING or VENTING operations under administrative control."

The licensee has also proposed to revise TS 4.6.1.7.2 to replace the requirement to determine the number of hours that the mini-purge valves have been open during the calendar year with a requirement to verify the valve positions at least once per 31 days. This TS will ensure that the mini-purge supply and exhaust valves are in the correct position.

The licensee has proposed these TS changes to permit the opening of the mini-purge supply and exhaust lines concurrently, under certain conditions, to allow the mini-purge system to be effectively used for reasons other than containment pressure control. Concurrent opening of the mini-purge supply and exhaust lines will equalize the mass addition and removal from the containment atmosphere. This will allow containment pressure to remain unchanged during mini-purge system operation. Under these conditions, the mini-purge system can be used effectively for other reasons. These other reasons include reduction of airborne activity, respirable air quality considerations for personnel entry, surveillance tests that require the valve(s) to be open, and other safety-related purposes. For the mini-purge system to be effective in performing these other tasks, the supply and exhaust lines must be open concurrently.

The TS Bases were revised within the frame work of the "Marginal to Safety" program and reflect the philosophy employed in the new standard TSs. Requirements are less prescriptive by providing for administrative control of the valves by the licensee. While the licensee has more flexibility in determining the circumstances under which the valves may be opened, an analysis must be completed to assess the safety significance of any planned valve openings. Discussions of the proposed revised TS Bases were held with the licensee and agreement with the licensee was reached on the necessity for the proposed changes. By letter dated September 20, 1995, the licensee formally submitted the TS Bases changes.

The present Byron and Braidwood TS requirements are the same as those in Section 3.6.1.8 of the Westinghouse standard TSs regarding containment ventilation. The proposed TSs and Bases will be similar to surveillance requirement 3.6.3.2 on containment isolation valves in the Westinghouse Improved TSs (NUREG-1431). The present TSs are not conducive to maintaining containment pressure within a narrow range. Currently, every operation of the mini-purge system affects containment pressure due to the restrictions imposed by Specifications 3/4.6.1.7. With only one mini-purge supply or exhaust line open at one time, the mass addition or removal from the containment atmosphere causes a corresponding increase or decrease in the containment pressure. Since containment pressure must be maintained within a narrow range prescribed by Specifications 3/4.6.1.4, these restrictions effectively limit the use of the mini-purge system to containment pressure control.

As stated previously, the licensee is proposing to revise Limiting Condition for Operation (LCO) 3.6.1.7b which now states that the 8-inch containment purge supply and exhaust isolation valve(s) may be open for up to 1,000 hours during a calendar year, provided no more than one line is open at one time.

With the assistance of Westinghouse, the licensee reevaluated the possible impacts on containment and possible radiological consequences of the proposed TS changes. The reevaluations included the accidents addressed in Chapter 15.6.5 of the Updated Final Safety Analysis Report (UFSAR) such as loss-of-coolant accident (LOCA) and LOCA-related accidents, non-LOCA transients, main steamline break mass and energy releases on the containment analysis and a loss of heat sink event. The reassessment demonstrated that the proposed operation of the 8-inch containment mini-purge system will have no adverse impact upon the licensing basis analyses.

The proposed change does not affect the containment isolation function of the 8-inch containment purge system. The containment isolation signals which automatically close the 8-inch valves are not being altered by this change. The bounding condition evaluated was miniflow purge supply and exhaust lines both open at the beginning of a postulated LOCA. Under these conditions, the containment atmosphere would have a path through the 8-inch containment purge system until the containment isolation valves are closed. The containment isolation valves are closed 7 seconds into the accident (2 seconds for signal generation and 5 seconds for valve operation). The licensee states that each unit's mini-purge supply and exhaust valves are open in the range of 100-200 hours per calendar year while the unit is in MODES 1, 2, 3, and 4 for the purpose of containment pressure control. Containment pressure control will continue to be the primary reason for mini-purge system operation.

The licensee has performed plant specific radiological evaluations of the operation of the mini-purge system for the revised TS. The evaluation concludes that there is an increase in the calculated offsite dose if an accident was initiated during mini-purge system operation with the supply and exhaust lines open concurrently. This is due to an additional release pathway being open from containment. This additional pathway will be isolated by the same isolation signal and within the same time frame as the original release pathway previously analyzed by the licensee.

The licensee calculated the offsite doses (in accordance with NRC Branch Technical Position CSB 6-4 guidelines) that would result if the 8-inch containment purge system was in operation at the initiation of a large break LOCA. The large break LOCA is considered to bound other postulated accidents.

The radiological consequences of the releases through the 8-inch containment purge system at the beginning of a hypothetical LOCA are summarized below.

<u>Station</u>	<u>Site Boundary</u>	<u>Low Population Zone</u>
Byron	Thyroid Dose: 9.1 rem	0.27 rem
	Gamma Whole Body: 0.017 rem	0.0005 rem
Braidwood	Thyroid Dose: 12.3 rem	1.13 rem
	Gamma Whole Body: 0.023 rem	0.0021 rem

The doses are based on the following assumptions:

1. Primary coolant iodine concentration is at the maximum TS value of 60 uCi/g dose equivalent I-131 (pre-existing iodine spike).
2. Purge valves are isolated at 7.62 seconds into the accident.
3. Only 29 percent of the containment free volume is used as the mixing volume.
4. The flow from the containment to the atmosphere during the time the miniflow purge system is open is assumed to go through the supply and exhaust lines and is assumed to increase as a function of containment pressure during the double-ended cold leg (DECL) LOCA.
5. The coolant activity released inside containment is based on the DECL LOCA mass releases.

The above calculated doses, when added to the LOCA dose contributions from containment leakage and from leakage of recirculated ECCS solution, do not add a significant amount to the total. The largest increases are in the site boundary thyroid dose. The Byron total LOCA dose increased from 115 rem to 124 rem and the Braidwood total LOCA dose increased from 155 rem to 167 rem. The dose increases represent a small fraction of the previously calculated dose totals. The increased doses remain within the limits of 10 CFR Part 100.

Based on the above information, the analyzed consequences of postulated accidents remain within staff acceptance criteria and are, therefore, acceptable.

We have reviewed the proposed TS changes to the Byron and Braidwood containment purge ventilation system to allow the simultaneous opening of the 8-inch miniflow purge supply and exhaust valves for specific applications. We have determined that the proposed changes to the TSs are acceptable.

### 3.0 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.

### 4.0 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 a surveillance requirement. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluent 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 (58 FR 48379). 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.

#### 5.0 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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