



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

SUPPLEMENTAL SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO STATION BLACKOUT RULE (10 CFR 50.63)

COMMONWEALTH EDISON COMPANY

LASALLE COUNTY STATION, UNITS 1 AND 2

DOCKET NOS. 50-373 AND 50-374

1.0 INTRODUCTION

The NRC staff's Safety Evaluation (SE) pertaining to Commonwealth Edison Company's (CECo, the licensee) initial responses to the Station Blackout (SBO) Rule (10 CFR 50.63) was transmitted to the licensee by letter dated March 6, 1992. The staff found the licensee's proposed method of coping with an SBO for the LaSalle County Station to be conforming contingent upon the satisfactory resolution of the recommendations presented in the SE. The licensee responded to the staff's SE, and specifically to the recommendations, by letter from J. M. Shields, Commonwealth Edison Company, to the Document Control Desk, U.S. Nuclear Regulatory Commission, dated May 15, 1992.

2.0 EVALUATION

The licensee's responses to each of the staff's recommendations are evaluated below.

2.1 Effects of Loss of Ventilation (SE Section 2.3.4)

SE Recommendation: In the original temperature transient analyses for the initial room temperatures, the licensee used 75°F for the auxiliary electric equipment rooms (AEER) and 73°F for the control room. The peak calculated temperatures for these rooms were 117°F and 98.1°F, respectively. In the SE, the staff concluded that the effects of loss of ventilation in these rooms during an SBO event had been properly evaluated. However, the staff recommended that the licensee establish an administrative procedure to ensure that the AEER temperature and the control room temperature during normal power operation will not exceed the assumed initial temperatures used in the transient analyses for an SBO event. In addition, the staff recommended that the licensee verify that the drywell temperature will not exceed the temperature profile used for equipment qualification (EQ).

Licensee Response: In its response, the licensee indicated that a revision had been made to the AEER and the control room temperature transient analyses based on additional and more conservative input parameters. The licensee used 90°F as the initial temperature and calculated a maximum peak temperature of 119.7°F for the AEER and 116°F for the control room. The licensee further indicated that the Center Desk Shift Surveillance LOS-AA-S2 which monitors

area temperatures in accordance with Technical Specification 3/4.7.7 will be revised to maintain the AEER and the control room temperature to be below or equal to 90°F. If this limit is exceeded, appropriate action will be taken to investigate the problem and resolve it in a timely manner. In addition, the procedure will be revised to open control room and AEER panel doors following an SBO event.

With regard to the effects of loss of ventilation in the drywell, the licensee indicated that the calculated maximum drywell temperature during a 4-hour SBO event is 251°F. The equipment required for an SBO event is designed and qualified to operate at 320°F which will envelop the SBO conditions.

Staff Evaluation: Based on its review, the staff finds the licensee's response acceptable and, therefore, considers the SE issue related to the effects of loss of ventilation in the AEER, the control room, and drywell during an SBO event at the LaSalle plant resolved.

Note: Subsequent to issuing the SE, the NRC staff has clarified its position with respect to the assumed initial temperatures used in the heat-up evaluations during an SBO. The staff position is that the licensee should document the basis and justification for the assumed initial temperatures used in heat-up analysis for the control room and identified dominant areas of concern. The basis and justification should be included in the documentation that is to be maintained by the licensee in support of the SBO submittals. If non-conservative initial temperatures are assumed, then administrative procedures or other controls should be established to maintain temperatures consistent with the initial temperatures used in the heat-up analyses. However, if conservative initial temperatures (in this case, 90°F is conservative) are used, then administrative procedures or other controls for the initial temperature are not necessary but can be established.

2.2 Reactor Coolant Inventory (SE Section 2.3.6)

SE Recommendations: (1) The licensee needs to provide an analysis that shows that the core remains covered. If the core is briefly uncovered, the analysis needs to specify the duration of core uncover. (2) The licensee also needs to verify that the suppression pool temperatures are within the acceptable range for the operation of reactor core isolation cooling (RCIC) and high-pressure core spray (HPCS) equipment. (3) In addition, the licensee needs to verify that, following restoration of AC power, recovery from these elevated suppression pool temperatures is possible and does not impact the ability to run the reactor heat removal system in the suppression pool cooling mode without cavitating or damaging the pumps.

Licensee Response: In the response, the licensee stated that the lowest reactor vessel level of approximately -130", using RCIC during an SBO event, does not result in core uncover since the top of active fuel (TAF) is -161" per the LaSalle Technical Specification Bases Figure B3/4.3-1.

The licensee further stated that the maximum 4-hour and 15-minute suppression pool temperature is 234.1°F when using the HPCS system and 217.1°F when using the RCIC system for decay heat removal and reactor coolant inventory, as stated in the Suppression Pool Temperature Transient calculation 3C7-0390-001, Revision 1. The qualified temperature rating for the RCIC pump material is 221°F and for the HPCS material is 300°F per calculation CQD-055096, Revision 0. Thus, the maximum suppression pool temperatures have no adverse effect on the RCIC and HPCS material.

The licensee also stated that when HPCS or RCIC is taking suction from the suppression pool, the suppression pool temperature affects the pump's Net Positive Suction Head Available (NPSH_A). An evaluation of the suppression pool during an SBO and until pool cooling becomes available shows that the NPSH_A for the HPCS or RCIC pump exceeds the Net Positive Suction Head Requirements (NPSH_R). The following table summarizes these results as stated in calculation ATD-C117, Revision 0:

Pump	NPSH _R	NPSH _A
RCIC	15 ft	22.6 ft
HPCS	1.5 ft	16.5 ft

The RCIC turbine backpressure was determined based on worst-case suppression pool water levels, suppression chamber pressure, and RCIC turbine exhaust flow following the SBO. The calculated maximum RCIC turbine backpressure is 23.1 psig at 4 hours following an SBO and is 24.5 psig at 4-hours and 15-minutes following an SBO. These pressures are below the RCIC turbine backpressure trip setpoint of 25 psig (see calculation ATD-0117, Revision 0).

The licensee indicated that the maximum suppression pool temperature when utilizing HPCS for decay heat removal and reactor inventory control is 234.2°F. The residual heat removal (RHR) materials are unaffected since their qualified temperature rating is 300°F (calculation CQD-055096, Revision 0). An evaluation of the suppression pool up until the time suppression pool cooling becomes available shows that the NPSH_A for the RHR pumps is 16.2 feet while the NPSH_R is 11.5 feet. Thus, the NPSH_A exceeds the NPSH_R (see calculation ATD-0117, Revision 0).

Staff Evaluation: Based on its review, the staff finds the above licensee's response acceptable and considers this SE issue related to the Reactor Coolant Inventory resolved.

2.3 Proposed Modifications (SE Section 2.5)

SE Recommendation: The licensee should include a full description including the nature and objectives of the proposed modifications and include these in the documentation that is to be retained by the licensee in support of the SBO submittals.

Licensee Response: In response to the above concern, the licensee provided a table referencing the modification number and the SBO load calculations associated with the replacement batteries. The licensee also stated that a full description of the nature and objectives of the modifications can be found in these documents.

Staff Evaluation: The staff accepts the licensee's statement and finds the SE issue resolved.

3.0 SUMMARY AND CONCLUSION

The NRC staff's Safety Evaluation (SE) pertaining to the licensee's initial responses to the Station Blackout (SBO) Rule (10 CFR 50.63) was transmitted to the licensee by letter dated March 6, 1992. The staff found the licensee's proposed method of coping with an SBO for the LaSalle County Station to be conforming contingent upon the satisfactory resolution of the recommendations presented in the SE. The licensee's responses to each of the staff's recommendations have been evaluated in this Supplemental Safety Evaluation and found to be acceptable.

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Dated: July 17, 1992