



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 44 TO FACILITY OPERATING LICENSE NO. NPF-37,
AMENDMENT NO. 44 TO FACILITY OPERATING LICENSE NO. NPF-66,
AMENDMENT NO. 33 TO FACILITY OPERATING LICENSE NO. NPF-72,
AND AMENDMENT NO. 33 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

On June 25, 1990, the staff issued Generic Letter (GL) 90-06, "Resolution of Generic Issue 70, 'Power-Operated Relief Valve and Block Valve Reliability,' and Generic Issue 94, 'Additional Low-Temperature Overpressure Protection for Light-Water Reactors,' Pursuant to 10 CFR 50.54(f)." The generic letter represented the technical resolution of the above mentioned generic issues.

Generic Issue 70, "Power-Operated Relief Valve and Block Valve Reliability," involves the evaluation of the reliability of power-operated relief valves (PORVs) and block valves and their safety significance in PWR plants. The generic letter discussed how PORVs are increasingly being relied on to perform safety-related functions and the corresponding need to improve the reliability of both PORVs and their associated block valves. Proposed staff positions and improvements to the plant's technical specifications were recommended to be implemented at all affected facilities. This issue is applicable to all Westinghouse, Babcock & Wilcox, and Combustion Engineering designed facilities with PORVs.

Generic Issue 94, "Additional Low-Temperature Overpressure Protection for Light-Water Reactors," addresses concerns with the implementation of the requirements set forth in the resolution of Unresolved Safety Issue (USI) A-26, "Reactor Vessel Pressure Transient Protection (Overpressure Protection)." The generic letter discussed the continuing occurrence of overpressure events and the need to further restrict the allowed outage time for a low-temperature overpressure protection channel in operating MODEs 4, 5, and 6. This issue is only applicable to Westinghouse and Combustion Engineering facilities.

By letter dated June 23, 1991, Commonwealth Edison Company (CECo) proposed changes to the Byron Station, Unit Nos. 1 and 2, and Braidwood Station, Unit Nos. 1 and 2, Technical Specifications in response to Generic Letter 90-06.

The August 27, 1991, submittal provided clarifying information that did not change the initial proposed no significant hazards determination.

2.1 EVALUATION FOR GENERIC ISSUE 70

The actions proposed by the NRC staff to improve the reliability of PORVs and block valves represent a substantial increase in overall protection of the public health and safety and a determination has been made that the attendant costs are justified in view of this increased protection. The technical findings and the regulatory analysis related to Generic Issue 70 are discussed in NUREG-1316, "Technical Findings and Regulatory Analysis Related to Generic Issue 70--Evaluation of Power-Operated Relief Valve and Block Valve Reliability in PWR Nuclear Power Plants."

The Technical Specification (TS) changes in response to Generic Issue 70, "Power-Operated Relief Valve and Block Valve Reliability," consist of the following changes to TS 3/4.4.4, "Relief Valves."

1. ACTION statement a. is revised to include a specific requirement to maintain power to the block valves associated with a PORV which has been isolated due to excessive seat leakage, and to terminate the cooldown sequence at MODE 4 instead of MODE 5. This is consistent with the MODEs 1-3 applicability of the specification, and avoids a potential conflict with the Cold Overpressure Protection Specification 3/4.4.9.3 which could rely on either the PORVs or residual heat removal (RHR) suction reliefs to comply with the LCO.
2. ACTION statement b. is revised to terminate the cooldown requirements at MODE 4, for the reasons noted above.
3. ACTION statement c. is modified to provide clarity and to terminate cooldown requirements at MODE 4.
4. ACTION statement d. is modified to allow a PORV to be placed in manual control if its associated block valve is inoperable. It will also require that at least one block valve be returned to operable status within 1 hour if both block valves are inoperable. The 72-hour allowed outage time for one inoperable block valve is retained. The cooldown provisions of this ACTION statement are terminated at MODE 4.
5. Surveillance Requirement 4.4.4.1 is changed to require calibration of the actuation instrumentation, limit the stroking of the PORVs to MODEs 3 or 4, and to incorporate a surveillance for the PORV control system.
6. The specification revision also incorporates an editorial change in the LCO wording and the deletion of a footnote which no longer applies.

An assessment of the proposed TS against the model TS of Generic Letter (GL) 90-06 for a Westinghouse plant with two PORV's follows.

ACTION statement a. is changed to require that power be maintained to the block valves when they are closed due to excessive PORV leakage.

ACTION statements a., b., c., and d. have been modified such that they terminate in HOT SHUTDOWN within 6 hours of the preceding action instead of terminating in COLD SHUTDOWN within 30 hours of the preceding action.

ACTION statement c. is changed to require that at least one PORV must be restored with both PORVs inoperable.

ACTION statement d. is modified to establish remedial measures that are consistent with the function of the block valves. The prime importance for the capability to close the block valve is to isolate a stuck-open PORV. Therefore, as reflected in this modified ACTION statement, when the block valves are inoperable, the associated PORV is placed in manual control to preclude the potential of a stuck-open PORV.

Surveillance Requirement 4.4.4.1 is modified to include testing of the mechanical and electrical aspects of the air-operated PORV control systems and to perform testing of the PORVs in MODEs 3 or 4. In these MODEs, the valve environmental conditions will be representative of those during normal plant operations.

Commonwealth Edison Company's (CECo) responses to GL 90-06, dated December 6, 1990 and August 27, 1991 addressed Surveillance Requirements 4.4.4.3a and 4.4.4.3b proposed by the GL. Current designs at Byron and Braidwood Station dictate that the OPEN and CLOSE functions of the PORVs are supplied by emergency power and the AUTO and ARMED LO TEMP functions are supplied by non-emergency power. As demonstrated in Chapter 15 of the Updated Final Safety Analysis Report (UFSAR), automatic PORV operation is not needed in mitigating the consequences of MODE 1, 2, and 3 transients. ARMED LO TEMP function of the PORV is intended for low temperature overpressure protection in MODE 4 and 5. Therefore, only the manual OPEN and CLOSE functions of the PORVs are needed to satisfy TS 3/4.4.4 which are applicable in MODEs 1, 2, and 3. As indicated in Appendix E.32 to the UFSAR, the block valves are normally powered from a separate emergency power source at all times. Therefore, GL 90-06 proposed Surveillance Requirements 4.4.4.3a and 4.4.4.3b have already been met by the current design and the existing TS. Consequently, CECo has proposed to eliminate GL proposed Surveillance Requirements 4.4.4.3a and 4.4.4.3b from the TS.

The Bases Section 3/4.4.4 has been expanded to define operability of the PORVs and block valves as follows:

1. Manual control of reactor coolant system pressure following accidents.
2. Maintaining reactor coolant pressure boundary integrity by controlling leakage.

3. Manual control of block valves to isolate and unblock PORVs (for manual pressure control and for controlling PORV seat leakage).
4. Manual control of block valves to isolate a stuck-open PORV.

The existing TS Bases Section 3/4.4.4. stated that the PORVs are considered operable in either the manual or automatic MODE. For MODE 1, 2, and 3, only the manual operations of the PORVs are needed to satisfy the TS requirements. Therefore, the licensee proposed to eliminate the automatic control of PORVs as an operability criterion in this Bases Section as shown in Attachment A-3 to GL 90-06.

For reasons stated earlier, with the exception of the GL proposed Surveillance Requirements 4.4.4.3a and 4.4.4.3b, the expanded Bases Section for Surveillance Requirements 4.4.4.1 and 4.4.4.2 are consistent with those proposed by GL 90-06.

The staff has reviewed the licensee's proposed modifications to the Byron and Braidwood Technical Specifications and its associated Bases Sections. Since the proposed modifications are consistent with the staff's position previously stated in the Generic Letter and any deviations are found to be justified in the above mentioned regulatory analysis, the staff finds the proposed modifications to be acceptable.

2.2 EVALUATION FOR GENERIC ISSUE 94

The actions proposed by the NRC staff to improve the availability of the low-temperature overpressure protection (LTOP) system represents a substantial increase in the overall protection of the public health and safety and a determination has been made that the attendant costs are justified in view of this increased protection. The technical findings and the regulatory analysis related to Generic Issue 94 are discussed in NUREG-1326, "Regulatory Analysis for the Resolution of Generic Issue 94, Additional Low-Temperature Overpressure Protection for Light-Water Reactors."

The TS changes in response to Generic Issue 94, "Additional Low-Temperature Overpressure Protection for Light Water Reactors," consist of the following changes to TS 3/4.4.9.3, "Overpressure Protection Systems."

1. The Limiting Condition for Operation (LCO) is rewritten to require any two overpressure mitigation devices when the reactor coolant system (RCS) is not depressurized through a 2 square inch or larger vent. This is a slight modification of the current LCO, which requires either two PORVs in the Armed Low Temperature MODE or two residual heat removal (RHR) suction relief valves to be operable.
2. With only one overpressure mitigation device operable in MODE 4, the current 7-day allowed outage time is retained. With only one overpressure mitigation device operable in MODE 5 or MODE 6 with the vessel head on, the allowed outage time is reduced to 24 hours.

3. Surveillance Requirement 4.4.9.3.3 is rewritten as an ACTION statement because of its conditional nature.

An assessment of the proposed TS against the model TS of GL 90-06 for a Westinghouse plant follows.

The licensee proposed, in TS 3.4.9.3, that at least two overpressure protection devices shall be operable, and each device shall be either an RHR suction relief valve or a PORV. This is consistent with the new standard technical specifications for recent Westinghouse designed plants as described in Enclosure B to GL 90-06. For LTOP protection, newer Westinghouse plants have TS that require either two PORVs or two RHR suction relief valves. The licensee's proposed changes to TS 3.4.9.3, Limiting Conditions for Operation, satisfies the single failure design criterion and provides more flexibility than the original TS. The staff finds this acceptable.

The licensee also proposed, in accordance with GL 90-06, that TS 3.4.9.3.c be removed and depressurization and venting of the RCS not be classified as overpressure protection devices. The staff finds this acceptable.

The licensee proposed to maintain the TS 3.4.9.3 applicability as it currently exists. This is more encompassing than is proposed by GL 90-06 and the staff finds it acceptable.

In the ACTION statements, "PORV and RHR suction relief valve" are replaced by "required overpressure protection devices" to reflect the new definition of the overpressure protection device in the LCO.

ACTION statement a. is proposed to be modified to clarify that it is only applicable in MODE 4. This is consistent with the guidance in the GL and is acceptable.

ACTION statement b. is added to reduce the allowable outage time for an inoperable overpressure protection device in MODEs 5 or 6 from 7 days to 24 hours. This is consistent with a key position of GL 90-06 for the resolution of Generic Issue 94 and is acceptable.

Surveillance Requirement 4.4.9.3.1 is modified to clarify that it is applicable when the PORVs are being used for cold overpressure protection.

Surveillance Requirement 4.4.9.3.3 and its associated footnote are relocated to be ACTION statement d. because of its conditional nature. These proposed changes in the Surveillance Requirements are consistent with GL 90-06 and the staff finds it acceptable.

The Bases Section 3/4.4.4, RELIEF VALVES, is expanded to identify the major functions of the PORVs and block valves and its operability determination. Since no credit for PORV operation is taken in the UFSAR analyses for MODE 1, 2, and 3 transients, the PORVs are considered operable in either the manual

or automatic MODE. This is consistent with Attachment A-3 to CL 90-06. Bases Section 3/4.4.9, PRESSURE/TEMPERATURE LIMITS, is modified to include the two overpressure protection devices as proposed for TS 3.4.9.3. The staff finds the changes for the Bases Sections acceptable.

Since the proposed modifications are consistent with the staff's position previously stated in the generic letter and any deviations are justified in the above mentioned regulatory analysis, the staff finds the proposed modifications to be 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 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 (56 FR 43804). 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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