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September 29, 1989

Dr. Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Dresden Nuclear Power Station Units 2 and 3
Proposed Anticipated Transient Without Scram
Related Technical Specification Changes
NRC Docket Nos. 50-237 and 50-249

References: See Attachment 4

Dr. Murley:

Pursuant to the provisions of 10 CFR 50.90, Commonwealth Edison (CECo) proposes to amend Provisional Operating License No. DPR-19 and Facility Operating License No. DPR-25, Appendix A Technical Specifications, to reflect a) modifications to the Standby Liquid Control System (SBLC) system, and b) addition of the ATWS Recirculation Pump Trip (RPT). These plant changes have been previously implemented to comply with the 10 CFR 50.62 (ATWS) Rule.

A summary of the proposed changes is provided in Attachment 2. The proposed Technical Specification page changes are provided in Attachment 3. Attachment 4 lists other documents referenced in this submittal.

Attachment 1 provides a discussion of the bases for the proposed Technical Specifications and also documents our determination of No Significant Hazards Consideration (NSHC) based on the criteria in 10 CFR 50.92. The proposed amendment has been reviewed and approved by CECo On-Site and Off-Site Review in accordance with Company procedures. It should be noted that similar SBLC system Technical Specification changes have been previously NRC approved for CECo's Quad Cities Units 1 and 2 in References 9 and 10, respectively.

CECo is notifying the State of Illinois of our request and our determination of NSHC by providing a copy of this letter and the attachments to the Illinois Department of Nuclear Safety.

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If you have any questions regarding this matter, please contact this office.

Very truly yours,

J.A. Silady
Nuclear Licensing Administrator

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Attachments 1: Description of Amendment Request Bases and Evaluation of Significant Hazards Consideration
2: Summary of Proposed Changes
3: Proposed Technical Specification Changes for Unit 2 (DPR-19) and Unit 3 (DPR-25)
4: List of References
5: Derivation of SBLC Minimum Requirements

cc: B.L. Siegel - Project Manager, NRR
A.B. Davis - Regional Administrator, RIII
S.G. DuPont - Senior Resident Inspector, Dresden
Illinois Department of Nuclear Safety

SUBSCRIBED AND SWORN to
before me this 29th day
of September, 1989
Lelia F. Mayo
Notary Public

"OFFICIAL SEAL"
LELIA F. MAYO
Notary Public, State of Illinois
My Commission Expires 4/25/93

ATTACHMENT 1

DESCRIPTION OF AMENDMENT REQUEST BASES
AND
EVALUATION OF SIGNIFICANT HAZARDS CONSIDERATION

A. GENERAL BACKGROUND

In July of 1984, the Code of Federal Regulations was amended to include Section 10 CFR 50.62, "Requirements for Reduction of Risk from Anticipated Transients Without Scram (ATWS) Events for Light Water Cooled Nuclear Power Plants". An ATWS is an expected operational transient which is accompanied by a failure of the Reactor Protection System (RPS) to shutdown the reactor. In summary, the ATWS rule required the following elements for boiling water reactors such as Dresden:

1. A system that automatically trips the recirculation pumps under an ATWS condition. This system will be referred to here as Recirculation Pump Trip (RPT) but should not be confused with the RPT added at some plants for MCPR margin improvement at the end of cycle (i.e. for non-ATWS pressurization events).

2. A Standby Liquid Control System (SBLC) with a minimum flow capacity and boron content equivalent in control capacity to 86 gallons per minute of 13 weight percent sodium pentaborate solution. In May of 1989, this requirement was amended to clarify the assumed isotopic enrichment of Boron-10 (natural) and assumed vessel size (251 inch diameter) for these flow rate and concentration values and to acknowledge the use of equivalent values.

3. An alternate rod insertion (ARI) system that is diverse from the RPS and has redundant scram air header pressure exhaust valves.

All of the above elements have previously been implemented for Dresden Units 2 and 3. This proposed amendment provides corresponding Technical Specification changes and additions to reflect the required SBLC modifications and RPT additions, respectively, for the two Dresden operating units. This amendment does not propose specifications for the third element (ARI) based on References 5 and 6 and related discussions between the BWR Owners Group (BWROG) and the NRC Staff.

B. BASES FOR STANDBY LIQUID CONTROL SYSTEM CHANGES

10 CFR 50.62 requires that the SBLC system must have a minimum flow capacity and boron content at least equivalent in reactivity control capacity to that resulting from injection of 86 gallons per minute of 13 weight percent sodium pentaborate decahydrate solution.

SBLC BASES (Cont'd)

For the Dresden units, this was accomplished by modifying the SBLC system to allow dual pump operation. The modification consisted of providing a second pump suction line from the SBLC tank to the common suction header, modifying the SBLC tank to provide a nozzle for the suction piping, and lastly, modifying the controls to provide for running both pumps simultaneously. These system changes were performed under Modification M12-2(3)-84-119 which was completed in 1987 on Unit 2 and 1988 on Unit 3.

Since the pump flow rate of 86 gpm at 1275 psig with both pumps in operation may not always be feasible, 80 gpm was selected as an appropriate capacity that both pumps together could meet reliably. The control of 86 gpm of 13 weight percent sodium pentaborate is equivalent to 80 gpm of 14 weight percent sodium pentaborate. With this minimum 14 weight percent concentration, only 3329 gallons of solution are required to meet the design objective of no less than 600 ppm of boron concentration in the reactor core in less than 100 minutes.

As discussed in the Final Safety Analysis Report, the 600 ppm concentration of boron is determined by the negative reactivity required to render and maintain the reactor subcritical with the control rods withdrawn to their full power position. The 600 ppm of boron in the reactor core is required to bring the reactor from full power to a 3% delta k or more subcritical condition considering the reactivity swing from hot to cold and changes in xenon concentration. An additional allowance of 25% boron is added to compensate for possible nonuniform mixing of the solution injected into the reactor coolant, translating to a concentration of 750 ppm boron in the reactor core. The minimum solution concentration and minimum volume of solution per the proposed Technical Specifications is therefore equivalent to 750 ppm of boron concentration in the reactor core. As shown in Attachment 5, a minimum volume of 3605 gallons (3329 gallons plus the 276 gallons that are contained below the pump suction) in the SBLC tank can be established to meet this shutdown requirement. Since minimum solution concentration and minimum tank volume limits have been established, the existing Figure 3.4.1, Boron Concentration versus Solution Volume Curve, can be eliminated.

System operability will continue to be defined as the ability to meet the design basis (see References 5 and 6 listed in Attachment 4). With one pump operation the design basis will continue to be met while two pump operation satisfies 10 CFR 50.62.

As a result of two pump SBLC system operations, discharge pressures are higher. Accordingly, the allowable system pressure relief valve setpoints have been increased by approximately 55 psig.

Due to the increased sodium pentaborate concentration, the saturation temperature of the solution is also increased to 62°F.

C. BASES FOR THE RECIRCULATION PUMP TRIP SPECIFICATIONS

10 CFR 50.62 requires a system that automatically trips the recirculation pumps under an ATWS condition. The RPT function at Dresden was installed under Modification M12-2(3)-79-23 which was completed in 1983. RPT initiates automatically on low low water level (84 inches above top of active fuel) or high reactor pressure (1240 psig). It should be noted that the RPT trip on low low reactor level has an associated nine second time delay to lessen the severity of a postulated design basis Loss of Coolant Accident. To prevent spurious ATWS initiation, a two-out-of-two taken once logic is employed.

The ATWS rule, Part 10 CFR 50.62(c)(6), required licensees to submit sufficient information to demonstrate to the Commission the adequacy of all three ATWS mitigating components. This review as performed by Commonwealth Edison's BWR Engineering Department using the requirements set forth in the approved General Electric (GE) Licensing Topical Report NEDE-31096-A (Reference 1). The results of this review were transmitted to the NRC on September 30, 1987 (Reference 2). In summary, the review concluded that the RPT system at Dresden was modeled after the Monticello design which is an acceptable NRC-approved design as discussed in References 3 and 11.

Prior to resolution that plant-specific ATWS analyses were not required, an analysis was performed for Dresden and Quad Cities by General Electric (Reference 4) which demonstrated that the ATWS mitigating systems would prevent vessel pressure from exceeding the emergency ASME stress Level C pressure limit of 1500 psig. Subsequently, Dresden Technical Specifications which provide for indefinite operation with a single relief valve out-of-service (RVOOS) have been implemented (References 7 and 8). Since a reduction in relief valve capacity could adversely affect the system response during a postulated ATWS, CECo performed a supplementary evaluation which concluded that the ATWS mitigating system will continue to protect the 1500 psig emergency pressure limit with a relief valve OOS. Comparison of current licensing analysis input values for relief and safety valve capacities with those assumed in the GE ATWS analysis indicated that the GE analysis utilized overly conservative valve capacities. It is estimated that, with a relief valve OOS, vessel peak pressure will increase only 10.6 psig above the value previously calculated by GE when more appropriate relief/safety valve capacities are assumed. This pressure increase would not result in the ASME 1500 psig emergency pressure limit being exceeded under ATWS with RVOOS conditions.

D. BASIS FOR PROPOSED NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

Commonwealth Edison has evaluated the proposed Technical Specification changes and determined they do not represent a significant hazards consideration. Based on the criteria for defining a significant hazards consideration established in 10 CFR 50.92(c), operation of Dresden Units 2 and 3 in accordance with the proposed amendment will not:

1. Involve a significant increase in the probability or consequences of an accident previously evaluated because:

   a. The proposed SBLC related changes clarify the design basis and maintain the total amount of boron injection previously required by the Technical Specifications thereby maintaining the previous shutdown reactivity capability. The proposed changes are needed to reflect implementation of 10 CFR 50.62 and have no impact on systems or equipment that could potentially initate or increase the probability of an accident.

   b. The RPT functions are diverse from the reactor protection system. Failure of these functions will, in no way, impact the ability of the reactor protection system to safely shutdown the reactor. Analyses of anticipated transients and accident conditions have incorporated the RPT on high pressure. The low low water level RPT does not affect LOCA analyses which conservatively assume the pumps trip immediately (independent of ATWS RPT), while the ATWS trip has an associated nine second delay.

   Therefore, the probability or consequences of previously evaluated accidents is unchanged by the proposed amendment.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated because:

   a. The SBLC related changes involve a system whose only function is to provide a backup shutdown capability. The changes do not affect any systems or equipment which could initiate an accident.

   b. The primary purpose of the RPT function is to provide a means to quickly reduce reactor power in the event the reactor protection system fails during an anticipated transient. Since this system acts as a backup to RPS and functions independently from it, no new accident scenario exists.

   As a result, the proposed amendment does not create a new or different kind of potential accident scenario.

3. Involve a significant reduction in the margin of safety because:

   a. The overall shutdown reactivity capability (i.e., total boron injection) of the SBLC system is not reduced by these changes. The proposed amendment reflects modifications which have increased the SBLC system injection rate, thereby increasing the margin of safety for Anticipated Transient Without Scram events.

   b. The margin of safety is assured by operating within the Limiting Conditions for Operation defined in the Technical Specifications. Cycle specific reload analyses for various pressurization transients, as well as accident conditions, are performed to establish these operating limits. The RPT on high reactor pressure has been included as input to these analyses. The RPT on low low reactor water level does not affect LOCA analyses since it is conservatively assumed that the pumps trip immediately (independent of ATWS RPT), whereas the ATWS trip has an associated nine second delay.

   Neither the SBLC or RPT related changes, therefore, involve a reduction in safety margins.

In consideration of the above, Commonwealth Edison has determined that the proposed amendments do not represent a significant hazards consideration and requests their approval under the provisions of 10 CFR 50.91(a)(4).

ATTACHMENT 2

SUMMARY OF PROPOSED CHANGES
(BOTH UNITS)

SBLC RELATED CHANGES

1) Page viii

Change: Show deletion of Figure 3.4.1.

Reason for Change: Boron Concentration versus Solution Curve no longer needed.

2) Page 3/4.4-1, Paragraph 4.4.A.1

Change: Replace pump flow rate of 39 with 40 gpm.

Reason for Change: To provide 80 gpm when both pumps are running.

3) Page 3/4.4-1, Paragraph 4.4.A.2.a

Change: Add tank suction operability test.

Reason for Change: To demonstrate that suction lines are not plugged.

4) Page 3/4.4-2, Paragraph 4.4.A.2.c

Change: Increase system pressure relief setpoint from the current band (1400 to 1490 psig) to a higher band (1455 to 1545 psig).

Reason for Change: To reflect increased pump discharge pressure during two pump operation.

5) Page 3/4.4-3, Paragraph 3.4.C

Change: Replace boron concentration curve (Figure 3.4.1) with a minimum allowable volume of 3605 gallons and a minimum allowable concentration of 14 weight percent.

Reason for Change: To satisfy the requirement of equivalent capacity of 86 gpm at 13 weight percent.

6) Page 3/4.4-3, Paragraph 4.4.C.1

Change: Add minimum weight percent sodium pentaborate.

Reason for Change: To identify new minimum solution requirements.

7) Page 3/4.4-4

Change: Delete Figure.

Reason for Change: Figure 3.4.1, Boron Concentration versus Solution Volume Curve, has been eliminated.

8) Page B 3/4.4-6, Paragraph 3.4.A

Change: Limiting Condition for Operation has been revised.

Reason for Change: To reflect change necessary to meet both the shutdown design objectives and 10 CFR 50.62.

9) Page B 3/4.4-7, Paragraph 3.4.C

Change: The weight percent sodium pentaborate has been changed from 13.4% to 14%. The solution saturation temperature has been raised from 59°F to 62°F. The figure number has been changed from 3.3.1 to 3.4.2.

Reason for Change: New minimum percent concentration requirements and associated saturation temperature. Figure number was incorrect.

10) Page B 3/4.4-7, Paragraph 4.4

Change: Added Surveillance Requirements Bases.

Reason for Change: To justify single pump surveillance.

RPT RELATED CHANGES

1) Page ii

Change: The Table of Contents has been revised.

Reason for Change: To include Section 3.2.H, "Recirculation Pump Trip Initiation".

2) Page vii

Change: The List of Tables has been revised.

Reason for Change: To include Table 3.2.7, "Instrumentation That Initiates Recirculation Pump Trip", and Table 4.2.5 "Minimum Test and Calibration Frequency for the Recirculation Pump Trip System".

3) New Page following Current Page 3/4.2-7*

Change: Section 3.2.H, Recirculation Pump Trip Initiation" has been added.

Reason for Change: This section outlines the LCO requirements for this trip function.

4) New Page following current Page 3/4.2-18*

Change: Table 3.2.7, "Instrumentation That Initiates Recirculation PUmp Trip" has been added.

Reason for Change: To outline the operability requirements and trip levels for the RPT system.

5) New Page following current Page 3/4.2-27*

Change: Table 4.2.5, "Minimum Test and Calibration Frequency for the Recirculation Pump Trip System" has been added.

Reason for Change: To include calibration frequency for the RPT Instrumentation.

6) New Page following Current Page B 3/4.2-33*

Change: The Technical Specification Bases for Section 3.2 has been revised.

Reason for Change: To include a description of the design bases for the RPT function.

7) Current Page B 3/4.2-37*

Change: The Bases Section 4.2 has been revised to reflect RPT Surveillance.

Reason for Change: To include a discussion of the surveillance requirements.

*NOTE: Pagination changes created by these additions are not included in Attachment 3.

ATTACHMENT 3

PROPOSED TECHNCIAL SPECIFICATION CHANGES

FOR THE STANDBY LIQUID CONTROL

SYSTEM AND RECIRCULATION PUMP TRIP

A. Dresden Unit 2 (DPR-19) Page Changes

ii
vii
viii
New Page after Current Page 3/4.2-7
New Page after Current Page 3/4.2-18
New Page after Current Page 3/4.2-27
New Page after Current Page B 3/4.2-33
B 3/4.2-37
3/4.4-1
3/4.4-2
3/4.4-3
3/4.4-4 (Delete Fig. 3.4.1)
B 3/4.4-6
B 3/4.4-7

B. Dresden Unit 3 (DPR-25) Page Changes

ii
vii
viii
New Page after Current Page 3/4.2-7
New Page after Current Page 3/4.2-18
New Page after Current Page 3/4.2-27
New Page after Current Page B 3/4.2-33
B 3/4.2-37
3/4.4-1
3/4.4-2
3/4.4-3
3/4.4-4 (Delete Fig. 3.4.1)
B 3/4.4-6
B 3/4.4-7

UNIT 2