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Dresden Generating Station  
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January 13, 1997

JSPLTR 97-0007

U. S. Nuclear Regulatory Commission  
Attn.: Document Control Desk  
Washington, D. C. 20555-0001

SUBJECT: Dresden Nuclear Power Station Units 2 and 3  
Emergency Application for Amendment to Facility Operating  
Licenses DPR-19 and DPR-25  
**Amendment to Resolve Issues Related to ECCS Suction Strainer  
Pressure Drop**  
Docket Nos. 50-237 and 50-249

Reference: NRC Information Notice 96-55, "Inadequate Net Positive Suction Head  
of Emergency Core Cooling and Containment Heat Removal Pumps  
under Design Basis Accident Conditions."

Pursuant to 10 CFR 50.90, ComEd proposes to amend Facility Operating Licenses  
DPR-19 and DPR-25 and requests NRC Staff review and approval of an emergency  
Technical Specification (TS) change and an Unreviewed Safety Question (USQ)  
resulting from ComEd's efforts to reconcile a recently discovered error in the head  
loss of its Emergency Core Cooling System (ECCS) suction strainers.

To resolve this issue, ComEd has performed design calculations for the affected plant  
systems to demonstrate that ECCS pump Net Position Suction Head (NPSH) is  
maintained for the applicable spectrum of postulated Design Basis Accidents. ComEd  
has concluded that the revised analyses demonstrate that for the applicable spectrum of  
postulated Loss of Coolant Accidents (LOCA) and main steam line breaks, the short  
term (less than 10 minutes with no operator actions credited) and long term (greater  
than 10 minutes after a DBA LOCA) core and containment cooling capability are not  
compromised.

However, ComEd's analyses require that the initial Suppression Chamber and Ultimate  
Heat Sink (UHS) water temperature be limited to a value more restrictive than the  
current Technical Specifications, and the analyses must utilize pressure in the  
containment to assure adequate NPSH to the ECCS system pumps. As a result, the  
margin to safety as defined in the Bases for Technical Specification 3.7.K, will be  
reduced by now requiring a nominal containment pressure of 2 psi for the first 10  
minutes after a postulated DBA to ensure adequate NPSH for the ECCS pumps.

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The requested change to the Suppression Chamber and UHS water temperature limits are consistent with the existing TS limits. TS 3.7.K limits the Suppression Chamber pool maximum temperature to less than or equal to 95 degrees Fahrenheit (F) and TS 3.8.C limits the UHS average water temperature to less than 95 degrees F. The proposed change will further restrict these water temperatures to less than or equal to 75 degrees F.

The analyses also indicate that the postulated peak post-accident suppression chamber pressure is reduced to 160 degrees F. This reduction in peak temperature results in a reduction in two TS temperature limits in specification 3/4.7.K which are based on assuring adequate margin to this postulated post-accident temperature.

These changes will assure that the facility continues to operate in compliance with the requirements of 10 CFR 50.46. ComEd has concluded that, as described in Attachment C, this change does not involve a significant hazards consideration.

The previously existing ECCS pump NPSH analyses indicated that with no containment over pressure, a deficiency of approximately three feet of head existed. The current, recently completed analyses indicate that with the 75 degree F suppression pool temperature, and a two psi over pressure, a deficit of approximately four feet of head will exist. ComEd has determined that the reduction in the margin of safety as a result of utilizing pressure in the containment to assure adequate NPSH to the ECCS system pumps is minimal, however the analyses result in an Unreviewed Safety Question as determined by 10 CFR 50.59(a)(2)(iii). Therefore, in accordance with 10 CFR 50.59(c), ComEd requests review and approval of this proposed license amendment in accordance with 10CFR50.90. The following outlines ComEd's proposed license amendment request.

Attachment A to this letter provides the description and evaluation of the proposed changes to Facility Operating Licenses DPR-19 and DPR-25 for Dresden Unit 2 and Unit 3 and the basis for an emergency approval.

Attachment B provides revised Technical Specification, Technical Specification Bases, and UFSAR pages.

Attachment C provides the Evaluation of No Significant Hazards Consideration.

Attachment D provides calculations which demonstrate that assuming a containment over pressure of 2 psi during the first 10 minutes after a DBA is conservative.

Pursuant to 10CFR 50.91(a)(5) ComEd requests emergency approval of this amendment request to support the return to service of Dresden Unit 3. Pending resolution of one other issue, Dresden Unit 3 will be ready to return to service after the current forced outage on or before January 16, 1997 and, considering the

guidance provided in Generic Letter 91-18, approval of this emergency amendment is required prior to startup. The basis for this emergency amendment is detailed in Attachment A. The Technical Specification amendment provided herein has been reviewed by onsite and offsite review in accordance with Company procedures and policies.

The scope of this amendment is limited to restricting the Suppression Chamber and UHS water temperature, and crediting containment pressure, and does not resolve all issues that exist concerning the LPCI/CCSW systems. The changes to the UFSAR provided with this amendment request include information to address issues other than the LPCI/CCSW suction strainer head discrepancy. ComEd will submit a license amendment request no later than January 31, 1997 which will resolve the identified concerns with post-LOCA ECCS and containment cooling capability. ComEd will also submit a report in accordance with 10 CFR 50.46 which further details the effects of this condition.

ComEd appreciates the Staff's consideration regarding these efforts. If there are any questions regarding this issue, please contact Frank Spangenberg of my staff at (815) 942-2920, extension 3800.

Sincerely,

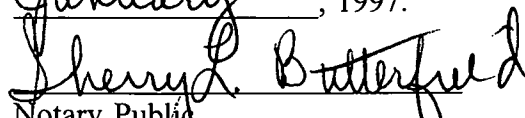


Stephen Perry  
Site Vice President  
Dresden Station

Subscribed and Sworn to before me

on this 13 day of

January, 1997.

  
Notary Public



Attachments:

- A - Background and Evaluation of the Proposed Changes
- B - Revised UFSAR and Technical Specification Bases Pages
- C - Significant Hazards Consideration
- D - Supporting Calculations

cc: A. Bill Beach, Regional Administrator - RIII  
Senior Resident Inspector -Dresden  
J. F. Stang, Dresden Project Manager, NRR  
Office of Nuclear Facility Safety - IDNS

**Attachment A**  
**Background and Evaluation of the Proposed Changes**

**Background for the Need for Amending the Technical Specification and Bases**

Dresden Station's original design basis as identified in the UFSAR and on vendor drawings included a one foot head loss across the Emergency Core Cooling System (ECCS) suction strainers located within the suppression pool. This pressure drop is utilized in the calculations which demonstrate that adequate Net Positive Suction Head (NPSH) is available to support the operation of the ECCS pumps during design basis accident (DBA) conditions. The design basis for the ECCS has been under review and ComEd has determined that the one foot head loss drop across the suction screen which was previously utilized is not representative of the actual pressure drop which could exist.

As a part of the design basis review, ComEd has concluded that the original design basis of Dresden Station assumed an elevated pressure in the containment following a postulated DBA. Many similar vintage Boiling Water Reactors (BWRs) were constructed with ECCS designs which utilize ECCS pumps and pump locations which do not provide as much NPSH margin as later designs. Dresden is an early vintage plant, and the design does not include the additional margin which is available in later designs.

Safety Guide 1, and later Regulatory Guide 1.1, provide guidance regarding the use of post-accident over-pressure to assure adequate NPSH is available to support ECCS pump operation. In summary, the guides prohibit the use of postulated post-accident over-pressure to assure adequate NPSH is available during DBAs. Dresden was designed and constructed prior to issuance of the guides, as an early vintage plant.

This assumption of an elevated post-accident pressure in the suppression chamber was not fully credited in the licensing basis, although a limited discussion is included in the Updated Final Safety Analysis Report (UFSAR), Section 6.3.3.4.3. This section of the UFSAR describes an analysis performed to verify the NPSH available for the ECCS pumps. The description of the analysis indicates that for at least one of the analyzed cases, the presence of a two psig pressure in the drywell is adequate to offset the calculated deficiency in the available NPSH. This implies that the over-pressure is a required design basis assumption of the facility.

However, the design and licensing basis for the Dresden station also contains a number of statements which indicate that the facility does not require containment pressure to assure adequate NPSH is available to the ECCS pumps. These inconsistencies and discrepancies are shown in the UFSAR pages provided in Attachment B to this letter. Attachment B includes details of the required changes to the Technical Specification Bases, and provides marked-up Dresden UFSAR pages to clarify the actual design and licensing basis of the facility. ComEd has concluded that these discrepancies and inconsistencies, when taken together, do not support a clear basis for assuming the availability of the two psig pressure following a postulated DBA, and an unreviewed safety question exists. In summary, the existing analyses requires two psi of pressure or cavitation will occur, the new analyses indicates that even with two psi of pressure, limited cavitation will occur.

**Attachment A**  
**Background and Evaluation of the Proposed Changes**

In addition, calculations which include the increased head loss across the ECCS suction strainer indicate that to preserve the existing margin of safety, the initial accident analysis assumptions regarding the Ultimate Heat Sink (UHS) and Suppression Pool average water temperature must be reduced. The current TS limits in Limiting Condition for Operation (LCO) 3.7.K and 3.8.C limit these water temperatures to less than or equal to 95 degrees Fahrenheit (F). ComEd has concluded that these temperatures should be limited to less than or equal to 75 degrees F to assure that the design basis accident analyses results are consistent with the existing licensing basis. Therefore this amendment requests the temperature limits of these LCOs be restricted to less than or equal to 75 degrees F.

The reduced limit on Suppression Pool average water temperature also results in reduced water temperature limits, allowed during the conduct of required testing which causes heat to be added to the Suppression Pool. The current TS permit a 10 degree F increase in temperature for up to 24 hours, require heat addition to be terminated, and the average water temperature restored below the long term limit, if a temperature rise of greater than 10 degrees occurs. This limit will be preserved, i.e. the allowable increases above the long term limit will be preserved, as shown in Attachment B to this letter. Temporary, limited allowance for this slightly elevated Suppression Pool temperature during testing is consistent with the construction of the Dresden TS which permit limited operation outside the design basis of the facility while operating in accordance with the Action requirements of an LCO. The allowance is required to permit testing of systems (Automatic Depressurization System and High Pressure Coolant Injection) which are similarly important to the safe operation of the facility.

Furthermore, the postulated peak post-accident suppression pool average temperature of 170 degrees F is being reduced to support the analyses which assure adequate ECCS and core spray pump NPSH. The new analyses indicate that the appropriate temperature is 160 degrees F. The current TS permit a rise in suppression pool temperature of 15 degrees, to 110 degrees F, before the reactor mode switch must be placed in shutdown. The current TS also require the plant to maintain the suppression pool temperature below 120 degrees F with the Main Steam Isolation Valves closed following a reactor scram. The reduction in peak post-accident suppression pool average temperature by ten degrees, results in the need to reduce both of these TS limits. The current TS limit of 110 degrees F is being reduced to 100 degrees F, and the current TS limit of 120 degrees F is being reduced to 110 degrees F.

Attachment B includes marked-up TS pages which reflect the proposed changes.

**Attachment A**  
**Background and Evaluation of the Proposed Changes**

**Basis for Emergency Amendment**

On December 20, 1996, ComEd discovered a calculation that had been performed by a vendor in 1983. The 1983 calculation was identified during design reviews in support of the installation of new ECCS Suction Strainers (resulting from actions which are being taken in response to Generic Letter 96-03) after the calculation was identified as a reference in another design document. The 1983 calculation was prepared to assess the structural adequacy of the strainers as part of the Mark I containment program. The calculation specified an actual 5.8 foot head loss across the ECCS Suction Strainers. The UFSAR and original installation drawings identify a 1 foot head loss across the strainers. The 1983 calculation was not turned over to ComEd and could only be accessed through the vendor. The calculation is identified in the Primary Containment Design Basis Document in reference to the structural adequacy of the ECCS Suction Strainers. ComEd was not aware of the discrepancy between the 1983 calculation and the UFSAR, nor its impact on ECCS NPSH until December 1996.

Dresden Unit 3 is currently ready to return to service after a forced outage and, considering the guidance provided in Generic Letter 91-18, approval of this emergency amendment is required prior to startup. Therefore, ComEd believes that the circumstances described satisfy the criteria of 10CFR50.91(a)(5) for review of the proposed amendment on an emergency basis.

**Description of the Proposed Change**

Pursuant to 10 CFR 50.90, ComEd proposes to amend Appendix A, Technical Specifications 3/4.7.K, "Suppression Chamber," 3/4.8.C, "Ultimate Heat Sink", and the associated Bases of Facility Operating Licenses DPR-19 and DPR-25. In addition, ComEd requests review of the proposed changes to the facility UFSAR which clarify and resolve the issue of allowing two psi of pressure in the containment following a postulated design basis accident to support the safety analyses conclusions associated with Dresden Station. The purpose of this amendment request is to revise the TS, TS Bases and request review of the Unreviewed Safety Question to allow credit for a nominal amount of containment pressure during the short-term, accident injection phases.

Technical Specification 3/4.7.K requires the Suppression Pool maximum average water temperature to be maintained at less than or equal to 95 degrees F. The existing specification also establishes limiting temperatures of 105 degrees F, 110 degrees F, and 120 degrees F, for a limited time during testing which adds heat to the pool and to require immediate shutdown or depressurization of the unit. Attachment B includes marked up copies of the existing TS pages. ComEd proposes to revise the temperature limits such that the Suppression Pool maximum average water temperature must be maintained at less than or equal to 75 degrees F. In addition, the 105 degree limit will be reduced to 85 degrees, to maintain the established allowance for a 10 degree temperature rise during testing which adds heat to the suppression pool. The 110 degrees F limit will be reduced to 100 degrees F and the 120 degrees F limit with the Main Steam Line Isolation Valves closed after a scram is being reduced to 110 degrees F, to maintain the margin between the postulated post-accident peak suppression pool average temperature and the limits

**Attachment A**  
**Background and Evaluation of the Proposed Changes**

which will result in an immediate manual shutdown and depressurization respectively.

Technical Specification 3/4.8.C requires the Ultimate Heat Sink (UHS) average water temperature to be maintained at less than or equal to 95 degrees F. ComEd proposes to revise the temperature limit to require the UHS average water temperature to less than or equal to 75 degrees F.

ComEd proposes to revise the Technical Specification Bases to reflect the proposed amendment by clarifying the inconsistencies regarding the use of containment over-pressure in design basis calculations as a result of the resolution of the Unreviewed Safety Question. TS Bases section 3/4.7.K will be effected as a result of this change. Copies of the effected pages are included in Attachment B to this letter.

ComEd will also revise the Updated Final Safety Analyses Report to reflect the proposed amendment by clarifying the inconsistencies regarding the use of containment over-pressure in design basis calculations as a result of the resolution of the Unreviewed Safety Question. These changes will primarily effect UFSAR sections 6.2, 6.3, and 9.2, following NRC approval of the amendment. Copies of the effected pages with the proposed changes are included in Attachment B to this Letter.



**Attachment B**  
**Revised UFSAR and Technical Specification Bases Pages**

**Affected Technical Specification Pages**

**Remove**

3/4.7-16

3/4.7-17

3/4.8-5

B 3/4.7-6

**Insert**

3/4.7-16

3/4.7-17

3/4.8-5

B 3/4.7-6