Commonwealth Edison Company
1400 Opus Place
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ComEd

October 30, 1998

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Subject: Application for Amendment to Appendix A, Technical Specifications, to Facility Operating Licenses

Byron Station, Units 1 and 2
Facility Operating Licenses NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Braidwood Station Units 1 and 2
Facility Operating Licenses NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Change to Spent Fuel Storage Pool Inadvertent Drain Elevation

References: (1) K. L. Graesser letter to NRC Document Control Desk dated August 26, 1998 replying to Notice of Violation, NRC Inspection Report 50-454(455)/98014.

(2) T. J. Tulon letter to NRC Document Control Desk dated June 11, 1998, replying to Notice of Violation, NRC Inspection Report 50-456(457)/98005.

Pursuant to 10 CFR 50.90, Commonwealth Edison (ComEd) proposes to amend Appendix A, Technical Specifications, of Facility Operating Licenses NPF-37, NPF-66, NPF-72 and NPF-77. As committed in References (1) and (2), the proposed amendment requests a change to the Byron and Braidwood Station (B/B) Technical Specifications (TS) Design Features description contained in Section 5.6.2, "Fuel Storage Drainage," to identify the Spent Fuel Pool (SFP) level sufficient to ensure that the Standard Review Plan

A001

(SRP) acceptance criteria for inadvertent draining are met while accounting for the failure effects of both the SFP cooling and skimmer loops.

TS Design Features Section 5.6.2 states that the spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 423 feet 2 inches for Byron Station, and 423 feet 0 inches for Braidwood Station. As documented in References (1) and (2), the selected elevation was placed in the TS design features description because it represents the general elevation of the anti-siphon hole in the SFP cooling discharge lines at each station. However, neither the skimmer loop nor the cooling suction line configurations were considered during the initial generation of the TS value. Upon identification of this condition, a review of the design was initiated. It was concluded that the SFP configuration is a standard Westinghouse design and is in compliance with Regulatory Guide 1.13, and that the SRP acceptance criteria of at least 10 feet above the active fuel was met for potential dewatering scenarios.

As committed in References (1) and (2), a License Amendment Request is being processed herein. Full compliance between the plant configuration and the TS will be achieved with NRC approval of this amendment request to allow revision of the B/B TS to account for the as-built configuration of both the SFP cooling and skimmer loops in setting the SFP inadvertent drainage level.

This proposed amendment request is subdivided as follows:

1. Attachment A gives a description and safety analysis of the proposed change in this amendment.

2. Attachments B-1 and B-2 include the marked-up Current Technical Specifications (CTS) Design Features Section 5.6.2, page 5-5, with the requested change indicated for Byron and Braidwood, respectively. Additionally, Attachments B-3 and B-4 include similarly marked-up Improved Technical Specifications (ITS) Design Features Section 4.3.2, page 4.0-2, the subject of which is under separate NRC review.

3. Attachment C describes ComEd's evaluation performed in accordance with 10 CFR 50.92(c), which confirms that no significant hazards consideration is involved.

4. Attachment D provides the Environmental Assessment.

This proposed amendment has been reviewed and approved in accordance with the requirements of ComEd's Quality Assurance Program.

ComEd is notifying the State of Illinois of this application for amendment by transmitting a copy of this letter and its attachments to the designated State Official.

Please direct any questions you may have concerning this submittal to David J. Chrzanowski at (630) 663-7205 of this office.

Respectfully,

R. M. Krich
Vice President - Regulatory Services

Attachments: Affidavit
A - Description and Safety Analysis
B-1 - Byron Station CTS mark-ups
B-2 - Braidwood Station CTS mark-ups
B-3 - Byron Station ITS mark-ups
B-4 - Braidwood Station mark-ups
C - No Significant Hazards
D - Environmental Assessment

cc: Regional Administrator - USNRC, RIII
NRC Senior Resident Inspector - Byron Station
NRC Senior Resident Inspector - Braidwood Station
Office of Nuclear Facility Safety - IDNS

STATE OF ILLINOIS	)	
COUNTY OF DUPAGE	)	
IN THE MATTER OF	)	
COMMONWEALTH EDISON (COMED) COMPANY	)	Docket Numbers
BYRON STATION UNITS 1 & 2	)	STN 50-454 & STN 50-455
AND	)	
BRAIDWOOD STATION UNITS 1 & 2	)	STN 50-456 & STN 50-457

SUBJECT: Change to Spent Fuel Storage Pool Inadvertent Drain Elevation

AFFIDAVIT

I affirm that the content of this transmittal is true and correct to the best of my knowledge, information and belief.

R. M. Krich
Vice President - Regulatory Services

Subscribed and sworn to before me, a Notary Public in and for the State above named, this 30th day of October, 1998.

Jacqueline T. Evans
Notary Public

OFFICIAL SEAL
JACQUELINE T EVANS
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES:02/24/02

ATTACHMENT A

DESCRIPTION AND SAFETY ANALYSIS FOR PROPOSED CHANGE

A. SUMMARY OF PROPOSED CHANGE

Pursuant to 10 CFR 50.90, Commonwealth Edison (ComEd) proposes to amend Appendix A, Technical Specifications, of Facility Operating Licenses NPF-37, NPF-66, NPF-72 and NPF-77. The proposed amendment requests a change to Technical Specifications (TS) to revise the Byron and Braidwood (B/B) Design Features Section 5.6.2, "Fuel Storage Drainage," to identify the Spent Fuel Pool (SFP) level sufficient to ensure that the NUREG-0800 Standard Review Plan (SRP) acceptance criteria for inadvertent draining are met while accounting for the failure effects of both the SFP cooling and skimmer loops. Section 5.6.2 currently states that the spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 423 feet 2 inches for Byron Station, and 423 feet 0 inches for Braidwood Station. As documented in References (1) and (2), the selected elevation was placed in the TS design features description because this value represents the general elevation of the anti-siphon hole in the SFP cooling discharge lines at each station. However, the skimmer loop and cooling suction line configurations were not considered during the initial generation of the TS value. NRC approval of this amendment request will allow a B/B TS revision to account for the as-built configuration of both the SFP cooling and skimmer loops in setting the SFP inadvertent drainage level.

In conjunction with NRC approval of the above change, the corresponding description of "Spent Fuel Pool Dewatering Protection" contained in Section 9.1.3.3 of the B/B Updated Final Safety Analysis Report (UFSAR) will be clarified to reflect the effects of both the SFP cooling and skimmer loops in setting the SFP inadvertent drainage level.

The proposed change is described in Section E of this Attachment A. The marked-up TS pages are provided in Attachments B-1 through B-4 for Byron and Braidwood Stations, respectively.

B. DESCRIPTION OF THE CURRENT REQUIREMENTS

TS Design Features Section 5.6.2, "Fuel Storage Drainage," currently states that the spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 423 feet 2 inches for Byron Station, and 423 feet 0 inches for Braidwood Station.

C. BASES FOR THE CURRENT REQUIREMENTS

The selected elevation currently placed in the B/B TS Design Features description as the inadvertent drain limit represents the general elevation of the anti-siphon hole in the SFP cooling discharge lines at each station. This feature provides inadvertent drain protection against postulated cooling discharge loop failures. The B/B UFSAR Section 9.1.3.3, "Safety Evaluation,"

discusses spent fuel pool dewatering protection. As currently described, the most serious failure of this system would be complete loss of water in the storage pool. System piping is arranged so that failure of any pipeline cannot drain the spent fuel pool below the water level required for adequate radiation shielding.

SFP Cooling Loops Anti-siphon Protection

The B/B UFSAR Section 9.1.3.2, "System Description," concerning the SFP Cooling System, page 9.1-36, states for each cooling train that the suction line, which is protected by a strainer, is located at an elevation 4 feet below the normal spent fuel pool water level, while the return line contains an anti-siphon hole near the surface of the water to prevent gravity drainage of the pool. (However, the as-built SFP cooling suction lines/strainers are placed approximately 6 ½ feet below the normal SFP water level reasonably near the normal water level so that the pool cannot be gravity drained given postulated cooling suction loop failures. This discrepancy will be addressed in the UFSAR revision.) Further, the B/B UFSAR Section 9.1.3.3, "Safety Evaluation," page 9.1-41, states that the spent fuel pool cooling pump suction connections enter near the normal water level so that the pool cannot be gravity drained. The return lines contain an anti-siphon hole to prevent the possibility of gravity draining of the pool via these lines.

SFP Skimmer Loops Anti-siphon Protection

To address the consequences of skimmer suction flexible hose degradation, the Braidwood Station SFP skimmer loop suction piping has recently been provided with an anti-siphon hole for protection similar in design to that afforded the SFP cooling discharge piping discussed above. The modification to the Braidwood SFP skimmer/suction included drilling an anti-siphon hole in the skimmer suction piping at elevation 423' 4¼", near the normal SFP water level to provide gravity drain protection against potential suction side failure scenarios. Byron Station is currently evaluating a similar change. Additionally, the skimmer loops discharge into the SFP at 418' 3¾" and 418' 3¼" elevation at Byron, and at 419' 1" and 418' 8" elevation at Braidwood. This corresponds to an approximate 5 to 6 foot submergence without an anti-siphon hole. This is reasonably near the surface and provides adequate anti-siphon protection similar to the cooling suction design.

The anti-siphon protection design of both the SFP cooling and clean-up piping was reviewed and found to be acceptable as documented in NUREG-0876, Byron SER Section 9.1.3, page 9-5, which states that *"all connections to the spent-fuel pool are either near the normal water level or are provided with antisiphon holes to preclude possible siphon draining of the pool water."* This review is applicable to Braidwood as documented in NUREG-1002, Braidwood SER. The conclusion reached is that submergence of SFP piping connections near the surface without an anti-siphon hole or the use of an anti-siphon hole for protection of SFP piping connections at deeper submergence levels provide adequate protection.

SRP Section 9.1.3, "Spent Fuel Pool Cooling and Cleanup System," (Reference 3) Review Procedures, Paragraph III.1.e states: *"The spent fuel pool and cooling systems have been designed so that in the event of failure of inlets, outlets, piping, or drains, the pool level will not be inadvertently drained below a point approximately 10 feet above the top of the active fuel. Pipes or external lines*

extending into the pool that are equipped with siphon breakers, check valves, or other devices to prevent drainage are acceptable as a means of implementing this requirement." These requirements formed the basis for the B/B SFP piping configuration.

D. NEED FOR REVISION OF THE REQUIREMENT

As described in References (1) and (2), a discrepancy currently exists between the stated B/B TS Design Features Section 5.6.2, "Fuel Storage Drainage," SFP inadvertent drain elevation and the existing design siphon capability. The selected elevation was placed in the Design Features description because this value generally represents the elevation of the anti-siphon hole in the SFP cooling discharge lines at each station. However, neither the skimmer loop nor the cooling suction line configurations were considered during the initial generation of the TS value. Approval of this amendment request will revise the B/B TS inadvertent drainage level to account for the as-built configuration of both the SFP cooling and skimmer loops while ensuring the SRP acceptance criteria are met.

In addition, the description of the B/B UFSAR Section 9.1.3.3, "Safety Evaluation," will be clarified to address the effects of both the SFP cooling and skimmer loop configurations. Approval of the B/B TS change described below will allow for the appropriate B/B UFSAR text to be updated and restore consistency of both plants with their licensing basis.

E. DESCRIPTION OF THE PROPOSED CHANGE

B/B TS Design Features Section 5.6.2, "Fuel Storage Drainage," inadvertent drainage elevations are being revised from 423 feet 2 inches for Byron, and 423 feet 0 inches for Braidwood, to 410 feet 0 inches for both stations. This SFP level is sufficient to ensure that the SRP acceptance criteria are met while accounting for the potential effects of all SFP cooling and skimmer loop inadvertent drain scenarios.

F. SAFETY ANALYSIS OF THE PROPOSED CHANGE

SRP Section 9.1.3, "Spent Fuel Pool Cooling and Cleanup System," Acceptance Criteria 1.g.(4) requires *"the capability to prevent reduction in fuel storage coolant inventory under accident conditions in accordance with the guidelines of position C.6 of Regulatory Guide 1.13."* Regulatory Guide 1.13, "Spent Fuel Storage Facility Design Basis" (Reference 4), Regulatory Position C.6 states that *"drains, permanently connected mechanical or hydraulic systems, or other features that by maloperation or failure could cause loss of coolant that would uncover fuel should not be installed or included in the design. Systems for maintaining water quality and quantity should be designed so that any maloperation or failure of such systems will not cause fuel to be uncovered."* The B/B UFSAR Appendix A commitment to Regulatory Guide 1.13 states that the plant design conforms to the requirements of Revision 1 of this guide as presented in Subsections 9.1.2.3 and 9.1.3.3.

As stated in B/B UFSAR Subsection 9.1.3.3, "Spent Fuel Pool Dewatering Protection," system piping is arranged so that failure of any pipeline cannot drain the spent fuel pool below the water level required for adequate radiation shielding. This shielding requirement continues to be met with this proposed B/B TS change. The existing anti-siphon design of both the SFP cooling and skimmer loops described in Section C above protects the SFP against inadvertent siphoning below the water level required for adequate radiation shielding.

SFP Dewatering Incidents

The most limiting postulated SFP dewatering incidents discussed in B/B UFSAR Section 9.1.3.3 involve SFP drainage to (a) a dry transfer canal, (b) a dry transfer canal and cask fill area, and (c) a dry transfer canal and cask fill area which additionally communicates through an open transfer tube to an empty refuel cavity. The initial conditions of these dewatering incidents assume approximately 26 feet of water above the top of the active region of the spent fuel assemblies. This corresponds to the SFP low level alarm elevation and ensures that sufficient shielding remains over the fuel after any postulated spent fuel pool dewatering incident to allow recovery operations to continue. These dewatering incidents involve initiating circumstances/failures such as accidental gate openings, gate seal failures, or an open transfer tube. The initial conditions of the dewatering incident analysis are not affected by this proposed TS change as they are not taken coincidentally with the additional dewatering effects of postulated SFP cooling or skimmer loop piping/component failures. The current dewatering incident shielding analysis and resultant water levels over the spent fuel remain valid.

SFP Fuel Handling Accidents

The minimum water depth between the top of damaged fuel rods and the SFP surface is one of the key parameters used in the fuel handling accident analyses described in the B/B UFSAR Subsection 15.7.4, "Fuel Handling Accidents." For this parameter, Table 15.7-7 assumes the minimum depth is greater than or equal to 23 feet. The B/B Refuel Operations TS LCO 3.9.11 ensures this 23-foot depth is maintained. If this minimum specified depth is not satisfied, all fuel movement and crane operations with loads are suspended and the water level is restored. Therefore, any potential dewatering effects from postulated SFP cooling or skimmer loop piping/component failures would be detected and addressed by the required LCO Actions ensuring that fuel handling analyses remain unaffected.

Bounding Inadvertent Drain Elevation

In determining the bounding inadvertent drain down elevation due to potential SFP cooling and skimmer loop failures, the reference SFP elevations are provided in Attachment A, Table 1. The maximum potential inadvertent drain down elevation due to gravity siphoning from either the SFP cooling or skimmer loop failures is 415' ¼" at Byron Station due to the siphoning impact of the skimmer suction (without an anti-siphon hole), and 417' 9 3/8" at Braidwood Station due to the siphoning impact of the cooling suction lines. The existing SFP configuration is in compliance with the SRP acceptance criteria. The anti-siphon protection ensures that inadvertent drainage can not occur below at least 10 feet above the top of the active fuel, that suitable

shielding is maintained by a minimum water level above the fuel, and that fuel uncovering due to system maloperation or failure is prevented.

The revised B/B TS inadvertent drain limit is being proposed to conservatively bound all SFP cooling and skimmer loop failures, under any maloperation or failure scenario. The proposed B/B TS inadvertent drain limit of 410 feet 0 inches meets the SRP acceptance criteria of being at least 10 feet above the top of the active fuel to maintain adequate radiation shielding, and bounds the siphon potential from all submerged cooling and skimmer loops.

G. IMPACT ON PREVIOUS SUBMITTALS

On December 13, 1996, ComEd submitted a request for conversion from the Byron and Braidwood Current Technical Specifications (CTS) to Improved Technical Specifications (ITS). The impact of the proposed change on the ITS conversion is similar to the impact on the CTS. The affected ITS pages are being provided along with the affected CTS pages in Attachment B, and will be similarly addressed in separate ITS submittal and/or correspondence to the NRC as needed.

H. SCHEDULE REQUIREMENTS

Although no specific schedule requirements for this submittal were established in References (1) and (2), due to the technical nature of the change involved, a less than 6-month approval cycle is requested.

I. REFERENCES

1. K. L. Graesser letter to NRC Document Control Desk dated August 26, 1998 replying to Notice of Violation, NRC Inspection Report 50-454(455)/98014.

2. T. J. Tulon letter to NRC Document Control Desk dated June 11, 1998, replying to Notice of Violation, NRC Inspection Report 50-456(457)/98005.

3. NUREG-0800 "NRC Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR Edition," Section 9.1.3, Revision 1 dated July 1981.

4. NRC Regulatory Guide 1.13 "Spent Fuel Storage Facility Design Basis," Regulatory Position C.6, Revision 1 dated December 1975.

TABLE 1

Spent Fuel Pool Reference Elevations		
Description	**Braidwood**	**Byron**
1. SFP Hi-level Alarm	424' 9"	424' 9½"
2. Normal SFP Water Level	Between Hi & Lo	Between Hi & Lo
3. SFP Lo-level Alarm	424' 2"	424' 2"
4. Cooling Discharge Lines Anti-Siphon Hole	423' 5"	423' 1½"
5. Skimmer Suction Lines Anti-Siphon Hole	423' 4¼"	N/A
6. Current TS Inadvertent Drain Limit	*423' 0"*	*423' 2"*
7. Skimmer Discharge Return Lines	419' 1" 418' 8"	418' 3¾" 418' 3¼"
8. Cooling Suction Lines/Strainers	417' 9 3/8"	417' 9¼"
9. Maximum Skimmer Loop Suction	410' 6½"	415' 3" 415' ¼"
10. Proposed TS Inadvertent Drain Limit	*410' 0"*	*410' 0"*
11. Nominal Top of Active Fuel *(Failed Fuel Canisters)*	398' 8"	398' 8"
12. Nominal Top of Active Fuel *(Spent Fuel Racks)*	398' 1"	398' 1"

ATTACHMENT B-1

MARKED-UP PAGE FOR PROPOSED CHANGE
TO CURRENT TECHNICAL SPECIFICATIONS (CTS)

BYRON STATION UNITS 1 & 2

CHANGE TO SPENT FUEL STORAGE POOL INADVERTENT DRAIN ELEVATION

REVISED PAGE:

5-5

REVISED PARAGRAPH:

5.6.2