

October 31, 2000

Mr. Oliver D. Kingsley, President  
Nuclear Generation Group  
Commonwealth Edison Company  
Executive Towers West III  
1400 Opus Place, Suite 500  
Downers Grove, IL 60515

SUBJECT: DRESDEN - ISSUANCE OF AMENDMENTS RAISING THE CONDENSATE STORAGE TANK LEVEL-LOW SETPOINT (TAC NOS. MA8348 AND MA8280)

Dear Mr. Kingsley:

The U.S. Nuclear Regulatory Commission (Commission) has issued the enclosed Amendment No. 182 to Facility Operating License No. DPR-19 and Amendment No. 177 to Facility Operating License No. DPR-25 for Dresden, Units 2 and 3. The amendments are in response to your application dated February 21, 2000.

The amendments change Technical Specification (TS) 3.2.B to increase the condensate storage tank (CST) level-low setpoint and change TS 4.2.B to specify the Channel Calibration frequency for new CST level instruments. The CST level instrument Channel Functional Test frequency matter in the application dated February 21, 2000, was addressed separately and issued as Amendments 177 and 173 dated August 2, 2000.

A copy of the Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's biweekly Federal Register notice.

Sincerely,

/RA/  
Lawrence W. Rossbach, Project Manager, Section 2  
Project Directorate III  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-237 and 50-249

- Enclosures: 1. Amendment No. 182 to DPR-19  
2. Amendment No. 177 to DPR-25  
3. Safety Evaluation

cc w/encls: See next page

DISTRIBUTION:

PUBLIC PD3 r/f OGC, O15B18  
GHill (4), T5C3 WBeckner, O13H15 ZAbdullahi  
ACRS, T2E26 MRing, RIII SMazumdar

#see previous page for concurrence

\* concurred by SE dated 7/10/00, no significant changes made

\*\* concurred by SE dated 6/23/00, no significant changes made

OFFICE	PM:LPD3	LA:LPD3	SC:SRXB*	OGC	SC:LPD3	SC:EEIB**
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DATE	10/27/00	10/27/00	07/10/00	10/23/00	10/31/00	06/23/00

DOCUMENT NAME: G:\PDIII-2\dresden\AMDa8348R.wpd

OFFICIAL RECORD COPY

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DATE	09/28/00	09/28/00	07/10/00	09/28/00	09/ /00	06/23/00



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

October 31, 2000

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Nuclear Generation Group  
Commonwealth Edison Company  
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Docket Nos. 50-237 and 50-249

Enclosures: 1. Amendment No. 182 to DPR-19  
2. Amendment No. 177 to DPR-25  
3. Safety Evaluation

cc w/encls: See next page

O. Kingsley  
Commonwealth Edison Company

Dresden Nuclear Power Station  
Units 2 and 3

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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

COMMONWEALTH EDISON COMPANY

DOCKET NO. 50-237

DRESDEN NUCLEAR POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 182  
License No. DPR-19

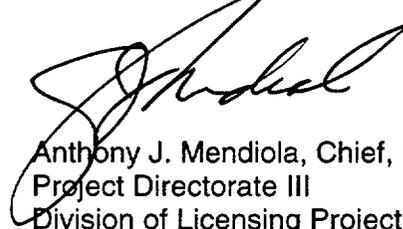
1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by the Commonwealth Edison Company (the licensee) dated February 21, 2000, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of the Act and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 2.C.(2) of Facility Operating License No. DPR-19 is hereby amended to read as follows:

2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 182, are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 120 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Anthony J. Mendiola, Chief, Section 2  
Project Directorate III  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: October 31, 2000



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

COMMONWEALTH EDISON COMPANY

DOCKET NO. 50-249

DRESDEN NUCLEAR POWER STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 177  
License No. DPR-25

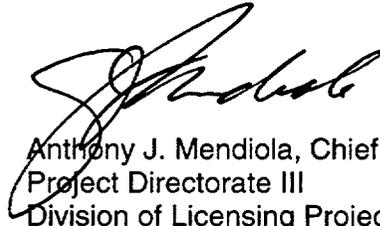
1. The Nuclear Regulatory Commission (the Commission) has found that:
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  - B. The facility will operate in conformity with the application, the provisions of the Act and the rules and regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment and paragraph 3.B. of Facility Operating License No. DPR-25 is hereby amended to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 177 , are hereby incorporated in the license. The licensee shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of the date of its issuance and shall be implemented within 120 days.

FOR THE NUCLEAR REGULATORY COMMISSION



Anthony J. Mendiola, Chief, Section 2  
Project Directorate III  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: October 31, 2000

ATTACHMENT TO LICENSE AMENDMENT NOS. 182 AND 177

FACILITY OPERATING LICENSE NOS. DPR-19 AND DPR-25

DOCKET NOS. 50-237 AND 50-249

Revise the Appendix "A" Technical Specifications by replacing the pages identified below with the attached pages. The revised pages are identified by amendment number and contain a vertical line in the margin indicating the area of change.

REMOVE

3/4.2-14

3/4.2-18

INSERT

3/4.2-14

3/4.2-18

TABLE 3.2.B-1(Continued)

ECCS ACTUATION INSTRUMENTATION

<u>Functional Unit</u>	<u>Trip Setpoint<sup>(h)</sup></u>	<u>Minimum CHANNEL(s) per Trip Function<sup>(a)</sup></u>	<u>Applicable OPERATIONAL MODE(s)</u>	<u>ACTION</u>
<b>3. <u>HIGH PRESSURE COOLANT INJECTION (HPCI) SYSTEM<sup>(d)</sup></u></b>				
a. Reactor Vessel Water Level - Low Low	≥84 inches	4	1, 2, 3	37
b. Drywell Pressure - High <sup>(f)</sup>	≤2 psig	4	1, 2, 3	37
c. Condensate Storage Tank Level - Low <sup>(f)</sup>				
2/3 A Condensate Storage Tank	≥10.8'	2	1, 2, 3	35
2/3 B Condensate Storage Tank	≥7.3'	2	1, 2, 3	35
d. Suppression Chamber Water Level - High <sup>(f)</sup>	≤15' 5" above bottom of chamber	2	1, 2, 3	35
e. Reactor Vessel Water Level - High (Trip)	≤194 inches	1	1, 2, 3	31
f. HPCI Pump Discharge Flow - Low (Bypass)	≥600 gpm	1	1, 2, 3	33
g. Manual Initiation	NA	1/system	1, 2, 3	34
<b>4. <u>AUTOMATIC DEPRESSURIZATION SYSTEM - TRIP SYSTEM 'A'<sup>(d)</sup></u></b>				
a. Reactor Vessel Water Level - Low Low	≥84 inches	2	1, 2, 3	38
b. Drywell Pressure - High <sup>(f)</sup>	≤2 psig	2	1, 2, 3	38
c. Initiation Timer	≤120 sec	1	1, 2, 3	31
d. Low Low Level Timer	≤10 min	1	1, 2, 3	31
e. CS Pump Discharge Pressure - High (Permissive)	≥100 psig & ≤150 psig	2/pump	1, 2, 3	31
f. LPCI Pump Discharge Pressure - High (Permissive)	≥100 psig & ≤150 psig	2/pump	1, 2, 3	31

DRESDEN - UNITS 2 & 3

3/4.2-14

Amendment Nos. 182, 177

TABLE 4.2.B-1

ECCS ACTUATION INSTRUMENTATION  
SURVEILLANCE REQUIREMENTS

<u>Functional Unit</u>	<u>CHANNEL CHECK</u>	<u>CHANNEL FUNCTIONAL TEST</u>	<u>CHANNEL CALIBRATION</u>	<u>Applicable OPERATIONAL MODE(s)</u>
<u>1. CORE SPRAY (CS) SYSTEM</u>				
a. Reactor Vessel Water Level - Low Low	S	Q	E <sup>(e)</sup>	1, 2, 3, 4 <sup>(b)</sup> , 5 <sup>(b)</sup>
b. Drywell Pressure - High <sup>(d)</sup>	NA	Q	Q	1, 2, 3
c. Reactor Vessel Pressure - Low (Permissive)	NA	Q	Q	1, 2, 3, 4 <sup>(b)</sup> , 5 <sup>(b)</sup>
d. CS Pump Discharge Flow - Low (Bypass)	NA	Q	E <sup>(e)</sup>	1, 2, 3, 4 <sup>(b)</sup> , 5 <sup>(b)</sup>
<u>2. LOW PRESSURE COOLANT INJECTION (LPCI) SUBSYSTEM</u>				
a. Reactor Vessel Water Level - Low Low	S	Q	E <sup>(e)</sup>	1, 2, 3, 4 <sup>(b)</sup> , 5 <sup>(b)</sup>
b. Drywell Pressure - High <sup>(d)</sup>	NA	Q	Q	1, 2, 3
c. Reactor Vessel Pressure - Low (Permissive)	NA	Q	Q	1, 2, 3, 4 <sup>(b)</sup> , 5 <sup>(b)</sup>
d. LPCI Pump Discharge Flow - Low (Bypass)	NA	Q	E <sup>(e)</sup>	1, 2, 3, 4 <sup>(b)</sup> , 5 <sup>(b)</sup>
<u>3. HIGH PRESSURE COOLANT INJECTION (HPCI) SYSTEM<sup>(a)</sup></u>				
a. Reactor Vessel Water Level - Low Low	S	Q	E <sup>(e)</sup>	1, 2, 3
b. Drywell Pressure - High <sup>(d)</sup>	NA	Q	Q	1, 2, 3
c. Condensate Storage Tank Level - Low	NA	Q	E	1, 2, 3
d. Suppression Chamber Water Level - High	NA	Q	NA	1, 2, 3
e. Reactor Vessel Water Level - High (Trip)	NA	Q	E <sup>(e)</sup>	1, 2, 3
f. HPCI Pump Discharge Flow - Low (Bypass)	NA	Q	Q	1, 2, 3
g. Manual Initiation	NA	E	NA	1, 2, 3

DRESDEN - UNITS 2 & 3

3/4.2-18

Amendment Nos. 182,  
177

INSTRUMENTATION

ECCS Actuation 3/4.2.B



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 182 TO FACILITY OPERATING LICENSE NO. DPR-19

AND AMENDMENT NO. 177 TO FACILITY OPERATING LICENSE NO. DPR-25

COMMONWEALTH EDISON COMPANY

DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3

DOCKET NOS. 50-237 AND 50-249

1.0 INTRODUCTION

By letter dated February 21, 2000, (Ref. 1) Commonwealth Edison Company (ComEd, the licensee) submitted a request to amend the Technical Specifications (TS) for the Dresden Nuclear Power Station (Dresden), Units 2 and 3. The proposed changes will revise requirements for Functional Unit 3.c, Condensate Storage Tank Level - Low, in TS Tables 3.2.B-1 and 4.2.B-1, "Emergency Core Cooling System (ECCS) Actuation Instrumentation." The proposed change to Table 3.2.B-1 will increase the condensate storage tanks (CSTs) level-low setpoint, which is the setpoint at which the high pressure coolant injection (HPCI) pump suctions swap from the CST to the torus. This change is being made to avoid entrainment of air into the HPCI systems suction lines. The proposed change to Table 4.2.B-1 specifies the Channel Calibration frequency for new CST level instruments.

Currently, the suction for the HPCI systems is transferred from the CSTs to the torus when the CSTs usable water volume drops below the level-low setpoint of 10,000 gallons (approximately 3.5 feet from the bottom of the tank). The amendment proposes to reset the CST level-low setpoints from 3.5 feet above the bottom of the tank to 10.8 feet for CST 2/3A and 7.3 feet for CST 2/3B.

The proposed changes stem from a licensee event report (LER) dated December 26, 1997 (Ref. 2). The LER stated that the original HPCI design did not consider the effect of vortexing in the HPCI systems suction lines. The licensee stated that "if the HPCI suction is aligned to only one CST, significant amounts of air could be entrained into the HPCI suction piping before the CST low level would be reached and transfer of the HPCI suction from the CST to the torus initiated." In preliminary calculations, the licensee determined that if the HPCI systems were aligned to both CSTs, the transfer of the HPCI system suctions to the torus would occur before significant entrained air could enter the suction lines of the HPCI pumps. As interim corrective actions, the licensee realigned the suction of the HPCI pumps to both CSTs and instituted administrative controls to ensure that the water level in the CSTs was maintained at or above the level-low setpoints. These administrative controls were instituted in accordance with the guidelines of the NRC's Administrative Letter 98-10, "Dispositioning of Technical Specifications that are Insufficient to Assure Plant Safety."

Administrative control of the level-low setpoints was necessary because the existing level switches are float type switches which have no provision for setpoint adjustment. ComEd

stated that they are replacing the four float-type level switches with eight pressure switches that will provide the Functional Unit 3.c, Condensate Storage Tank Level - Low function, as well as local and remote indications. The new pressure switches will allow the level setpoint to be adjusted; thus, the suction would automatically transfer to the torus at the higher levels (10.5 feet for CST 2/3A and 7.3 feet for CST 2/3B). The proposed hardware changes will replace the administrative controls. Because the new pressure switches will require calibration, ComEd proposed to add Channel Calibration frequency requirements to TS Table 4.2.B-1.

## 2.0 EVALUATION

### System Background

The HPCI system is designed to provide adequate core cooling for all primary coolant system break sizes smaller than the break sizes that will depressurize the reactor coolant system and enable operation of the low-pressure core cooling systems (low pressure coolant injection systems and the core spray systems). Dresden has two CSTs (2/3 A and B) that are designed to provide 90,000 gallons of demineralized water each, and the CSTs are the preferred water source for the HPCI systems. There is one HPCI system per unit with a cross-tie capability to provide cooling water to each unit and the HPCI systems can also take suction from either CST 2/3A or CST 2/3B. The HPCI system suctions are normally aligned to the CSTs; however, the CSTs and their associated standpipes are not seismically qualified. The torus serves as the safety-related water source for the HPCI systems, and if the level in any one of the tanks drops to the level-low setpoint of 10,000 gallons, any one of the redundant level switches on either tank will cause the HPCI pump suction valves from the suppression pool to open for both units. When the HPCI pump suction valves from the suppression pool reach the fully open position, the HPCI suction valves from the CST will close, completing the HPCI pump suction transfer.

### Proposed Change to TS Table 3.2.B-1

ComEd proposes to change Item 3.c. of Table 3.2.B-1, "ECCS Actuation Instrumentation" of the Dresden TSs as follows:

Function Unit	Trip setpoint	Minimum CHANNEL(s) per Trip Function	Applicable OPERATIONAL MODE(s)	ACTION
<b>Current TS Requirements</b>				
3.c. Condensate Storage Tank Level - Low	≥ 10,000 gal	2	1, 2, 3	35
<b>Proposed Change</b>				
2/3 A Condensate Storage Tank	≥ 10.8'	2	1, 2, 3	35
2/3 B Condensate Storage Tank	≥ 7.3'	2	1, 2, 3	35

### Proposed Change to TS Table 4.2.B-1

The licensee is replacing the four float-type level switches with eight pressure switches that will provide the Functional Unit 3.c, Condensate Storage Tank Level - Low function, as well as local and remote indications. Because the new pressure switches will require calibration, ComEd proposed to add Channel Calibration frequency requirements to TS Table 4.2.B-1.

### Evaluation of Licensee's Justification

According to the licensee, the current level-low setpoint of 10,000 gallons (3.5 feet from the bottom of the tank) for the HPCI suction transfer may be too low to prevent air intake into the HPCI system suction lines. The original HPCI pump suction design did not account for vortexing and air entrainment in calculating the minimum usable CST volume. Therefore, if both HPCI systems take the suction from one CST, significant air intake into the suction line may degrade the performance of the HPCI pumps or reduce the capabilities of the pumps to provide core cooling when required to operate.

In the development of the level-low setpoints for the CSTs, the licensee considered various combinations of HPCI system operation and CST suction alignment. The limiting configuration for the CST 2/3B setpoint occurs when both Unit 2 and Unit 3 HPCIs are operating and aligned to CSTs 2/3A and 2/3B. CST 2/3B has a larger nozzle (less flow resistance) and the level-low setpoint in the 2/3B tank will be reached before the CST 2/3A setpoint. The level-low setpoint of any tank will result in suction transfer to the torus for both HPCI systems. The CST 2/3A setpoint is limited by the operation of a single HPCI system, either Unit 2 or Unit 3.

ComEd used an industry-accepted Froude number of 0.8 based on NUREG/CR-2772 (Ref. 3) to determine the acceptable level-low setpoints. The Froude number is a dimensionless parameter that relates the pump suction velocity, pressure head, and gravitational acceleration (inertia forces) and is used to determine the water level necessary to prevent air from being drawn into a pump's suction. Significant air intake into the pumps will result in a loss of pressure head and damage to the pumps. The licensee stated that with a Froude number of 0.8, the tests documented in NUREG/CR-2772 showed almost no air entrainment. The licensee added that the experiments in NUREG/CR-2772 were not limited to suction through strainers, and the study included suction from tanks as well. Suction strainers inhibit vortexing and air entrainment in comparison to suction from tanks without strainers.

The licensee also proposed to specify the CST level-low setpoint in feet from the bottom of the tank instead of gallons. The control room indications are in feet and the TS values given in Table 3.2.B-1 will be in agreement with the control room indications.

ComEd concluded that CST 2/3A and CST 2/3B level-low setpoints of 10.8 feet and 7.3 feet respectively above the bottom of the tank will prevent both entrainment of significant air and degradation of the HPCI pumps.

The staff reviewed the amendment request and found that the proposed changes to TS Table 3.2.B-1 conservatively increases the CST level-low setpoint to prevent vortexing and the associated air intake into the HPCI pumps. Therefore, the staff approves the proposed changes to TS Table 3.2.B-1, "ECCS Actuation Instrumentation," Function Unit 3.c, Condensate Storage Tank Level - Low.

The new pressure switches with setpoint adjustment facility need calibration. The proposed change in the Channel Calibration frequency to 18 months for Functional Unit 3.c, Condensate Storage Tank Level - Low, in TS Table 4.2.B-1 is based on the manufacturer's recommendation and is in line with the requirements for similar instrument channels in the current TS. Considering the merits of the proposed changes the staff finds the proposed change to TS Table 4.2.B-1 acceptable.

### 3.0 CONCLUSION

ComEd proposed to raise the level-low setpoint in TS Table 3.2.B-1 for both CSTs in order to prevent air entrainment into the HPCI suction lines. In addition, the licensee proposed to specify the CST level-low setpoints in feet instead of gallons in TS Table 3.2.B-1. The staff concluded that the proposed changes to TS Table 3.2.B-1 conservatively increases the CST level-low setpoint to prevent vortexing and the associated air intake into the HPCI pumps and that these changes are acceptable. The new pressure switches, which will perform the Condensate Storage Tank Level - Low Functional Unit 3.c function, require calibration. The calibration frequency being added to TS Table 4.2.B-1 is acceptable. The proposed changes will protect the HPCI pump function of ensuring a supply of coolant to the reactor during accident conditions. The staff finds the amendment request acceptable.

### 4.0 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.

### 5.0 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 a surveillance requirement. 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 (65 FR 15376). 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.

## 6.0 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.

## 7.0 REFERENCES

1. Commonwealth Edison Company, "Request for an Amendment to Technical Specification: Emergency Core Cooling System Actuation Instrumentation," February 21, 2000.
2. License Event Report (9701700), "Potential Vortex Formation in the CST to HPCI Suction Nozzle Due to Original Design Error," Dresden Unit 3, December 26, 1997.
3. NRC NUREG/CR-2772, "Hydraulic Performance of Pump Suction Inlet for Emergency Core Cooling Systems in Boiling Water Reactors," M. Padmanabhan, Alden Research Laboratory, June 1982.

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Date: October 31, 2000