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ComEd

SVP-98-184

May 18, 1998

U. S. Nuclear Regulatory Commission
Washington, DC 20555

Attention: Document Control Desk

Subject: Application for Amendment to Appendix A,
Technical Specifications, to Facility Operating Licenses
for Dresden Station Units 2 and 3
Facility Operating Licenses DPR-19 and 25
and Quad Cities Station Units 1 and 2
Facility Operating Licenses DPR-29 and 30
Request for License Amendment Change to Various Acceptance Values to Reconcile with Design Values
NRC Docket Nos. 50-237, and 50-249, 50-254, 50-265, respectively

Pursuant to 10 CFR 50.90, ComEd proposes to amend Appendix A, Technical Specification, of Facility Operating Licenses DPR-19, DPR-25, DPR-29, and DPR-30. The proposed amendment requests a change to the following Technical Specifications (TSs) to reconcile acceptance values with design values:

1) TS 4.9.C.2.c, 125/250 Vdc electrolyte temperature (from >60°F to >65°F)

2) TS 4.3.G, Control Rod Drive (CRD) accumulator pressure (from ≥ 800 psig to ≥ 940 psig)

3) TS Figure 3.4.A-1, Standby Liquid Control solution temperature requirements changed to provide 10°F margin to saturation

4) TS 3.8.C.1, Ultimate Heat Sink minimum water level (from 500 ft. to 501 ft. 6 inch. Mean Sea Level for Dresden Station and from 561 ft. to 568 ft. Mean Sea Level for Quad Cities Station)

5) QUAD CITIES ONLY: TS 3.5.C.2, Shutdown Suppression Chamber level (from ≥ 7 ft. to ≥ 8.5 ft.)

6) QUAD CITIES UNIT 2 ONLY: TS Table 3.2.B-1, 6.b to increase the degraded voltage setpoint from ≥ 3833 Volts to ≥ 3845 Volts

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The above changes will correct the current values in the TSs to reconcile them with design basis values.

The proposed changes are conservative and ensure the associated equipment is capable of fulfilling design basis requirements. ComEd requests approval of this amendment by December 15, 1998, with a 60-day implementation period. This proposed amendment request is subdivided as follows:

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

2) Attachment B includes the marked up TS pages with the requested changes indicated.

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 by ComEd Onsite and Offsite Review in accordance with ComEd procedures.

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.

If you have any questions concerning this letter, please contact Charles Peterson, Regulatory Affairs Manager, at (309) 654-2241, extension 3609.

Sincerely,

Joel P. Dimmette, Jr.
Site Vice President
Quad Cities Station

Subscribed and Sworn to before me

on this 18 day of May, 1998

OFFICIAL SEAL
ALLEN J CHERNICK
NOTARY PUBLIC, STATE OF ILLINOIS
MY COMMISSION EXPIRES: 10/06/01

Notary Public Allen J Chernick

Attachments: Attachment A Description and Safety Analysis for proposed changes
Attachment B Marked Up Pages for Proposed Changes
Attachment C Significant Hazards Consideration
Attachment D Environmental Assessment

cc: Regional Administrator - RIII
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A. SUMMARY OF PROPOSED CHANGES

Pursuant to 10 CFR 50.90, ComEd proposes to amend Appendix A, Technical Specifications (TSs), of Facility Operating Licenses DPR-19, DPR-25, DPR-29, and DPR-30. The proposed amendment requests a change to the following TSs:

1) TS 4.9.C.2.c, 125/250 Vdc electrolyte temperature (from >60°F to >65°F)
2) TS 4.3.G, Control Rod Drive (CRD) accumulator pressure (from ≥800 psig to ≥940 psig)
3) TS Figure 3.4.A-1, Standby Liquid Control solution temperature requirements changed to provide 10°F margin to saturation.
4) TS 3.8.C.1, Ultimate Heat Sink minimum water level (from 500 ft. to 501 ft. 6 inch Mean Sea Level for Dresden Station and from 561 ft. to 568 ft. Mean Sea Level for Quad Cities Station)
5) QUAD CITIES ONLY: TS 3.5.C.2, Shutdown Suppression Chamber level (from ≥7 ft. to ≥8.5 ft.)
6) QUAD CITIES UNIT 2 ONLY: TS Table 3.2.B-1, 6.b to increase the degraded voltage setpoint from ≥3833 Volts to ≥3845 Volts.

The above changes will correct the current values in the TSs to reconcile them with design basis values. The proposed changes are conservative and ensure the associated equipment is capable of fulfilling design basis requirements.

B. DESCRIPTION OF THE CURRENT REQUIREMENTS

1) TS 4.9.C.2.c, 125/250 Vdc electrolyte temperature (from >60°F to >65°F)

The 125Vdc and 250Vdc station battery systems are designed to provide a source of dc power to certain safety related functions including: breaker control power, safety-related logic functions, and motive power to selected safety related equipment. The station battery systems are capable of supplying all the required connected loads for a period of four hours to safely shutdown one unit while mitigating the consequences of a design basis accident on the other unit.

To ensure the battery systems are OPERABLE, the TSs provide Surveillance Requirements (SRs) which periodically verify key performance parameters. ComEd has determined that the minimum electrolyte temperature specified in SR 4.9.C.2.c (average electrolyte temperature of all connected cells >60°F) is non-conservative. The battery sizing calculations were performed in accordance with IEEE-485-1983 and assume conservative input assumptions, including battery electrolyte temperature. The sizing calculations performed for the Dresden and Quad Cities battery systems are performed using a minimum average electrolyte temperature of 65°F. Therefore, ComEd has determined the appropriate temperature limit should be > 65°F.

To ensure the battery systems are OPERABLE, the TSs provide SRs which periodically verify key performance parameters. The current SR for average electrolyte temperature, 4.9.C.2.c, maintains electrolyte temperature >60°F.

ComEd proposes to change SR 4.9.C.2.c for Dresden and Quad Cities to increase the average electrolyte temperature requirement from > 60°F to > 65°F.

2) TS 4.3.G, Control Rod Drive (CRD) accumulator pressure (from ≥800 psig to ≥940 psig)

During abnormal plant conditions the Control Rod Drive (CRD) system is designed to safely shut down the reactor by rapidly inserting the control rods (Scram). The motive force for the control rod drives during a Scram is supplied by a combination of stored energy (pressure) in the Hydraulic Control Unit (HCU) Accumulators and the reactor vessel. Each HCU Accumulator (177 total) consists of a piston accumulator and a nitrogen gas cylinder. The water accumulator and nitrogen cylinder provide an independent source of hydraulic pressure for Scram insertion.

The Dresden and Quad Cities TSs provide the minimum operability requirements for the HCU Accumulators to ensure the Scram function is operable. Specifically, SR 4.3.G requires a weekly verification that HCU Accumulator pressure is ≥ 800 psig when operating above MODE 3 (or in MODE 5 with a control rod withdrawn).

ComEd has determined that the current HCU Accumulator SR (≥ 800 psig) does not ensure that the plant scram performance requirements, as defined in TS Section 3.3, will be satisfied over the entire range of reactor operating pressures. The original equipment specifications required a pressure setting of 940-970 psig. The ≥ 800 psig SR value was included as part of TSUP, and was not supported by a formal engineering evaluation.

The Dresden and Quad Cities TSs provide the minimum operability requirements for the HCU Accumulators to ensure the Scram function is operable. Specifically, SR 4.3.G requires a weekly verification that HCU Accumulator pressure is ≥ 800 psig. ComEd has determined that the current HCU Accumulator SR (≥ 800 psig) does not ensure that the plant scram performance requirements, as defined in TS Section 3.3, will be satisfied over the entire range of reactor operating pressures.

ComEd proposes to amend the Dresden and Quad Cities TSs to change the minimum pressure requirements specified in SR 4.3.G from ≥ 800 psig to ≥ 940 psig.

3) **TS Figure 3.4.A-1, Standby Liquid Control solution temperature requirements changed to provide 10°F margin to saturation.**

In the event that normal control rod insertion is unavailable for shutdown of the reactor core, the Standby Liquid Control (SBLC) system may be used as an alternative method of achieving reactor shutdown. The Standby Liquid Control system provides an additional and independent means of reactivity control and is capable of making and holding the reactor core subcritical from any hot standby or hot operating condition. The SBLC system is actuated manually, and is designed to inject an aqueous solution of sodium pentaborate into the reactor vessel.

The total volume of sodium pentaborate solution is maintained at a minimum concentration of 14% (by weight) and can be delivered to the reactor core at a minimum flow rate of 40 gpm (per pump). In addition, the temperature of the sodium pentaborate solution is controlled to ensure the boron remains fully in solution.

The minimum ambient temperature of the sodium pentaborate solution is specified by TS SR 4.4.A.1(a) and Figure 3.4.A-1. The temperature requirements (as a function of weight percent concentration) specified in Figure 3.4.A-1 should include a 10°F margin from the theoretical solubility curve as described in the TS Bases for the SBLC system. However,

ComEd has determined that the minimum temperature limit specified in Figure 3.4.A-1 does not ensure a 10°F margin to the solubility temperature for an aqueous solution of sodium pentaborate.

For this reason, ComEd proposes to change Figure 3.4.A-1 to restore the 10°F margin as specified in the TS Bases for the SBLC system.

4) **TS 3.8.C.1, Ultimate Heat Sink minimum water level (from 500 ft. to 501 ft.6 inch Mean Sea Level for Dresden Station and from 561 ft. to 568 ft. Mean Sea Level for Quad Cities Station)**

The Ultimate Heat Sink (UHS) at Dresden and Quad Cities provides sufficient cooling water capacity for both normal cooldown loads or to mitigate the effects of an accident condition. At Dresden, UHS level is monitored from the Unit 2/3 cribhouse intake bays. Quad Cities has a similar arrangement.

The UHS provides the suction source for the containment cooling pumps - Containment Cooling Service Water Pumps (CCSW) at Dresden and the Residual Heat Removal Service Water Pumps (RHRSW) at Quad Cities. The TSs provide minimum acceptable conditions (LCOs) to ensure Operability of the UHS. Specifically, TS 3.8.C.1 requires that the UHS water level is maintained at or greater than 500 ft. Mean Sea Level at Dresden and at or greater than 561 ft. Mean Sea Level at Quad Cities. As discussed below, ComEd has determined that the current UHS water level limits provided in the TS are not sufficient to ensure the UHS will perform in accordance with design basis requirements.

Dresden

During a review of the plant's design basis, Dresden discovered that the current TS limits for UHS water level were not supported by a formal design calculation. Formal calculations were generated as part of Dresden's Design Basis Initiative (DBI) program. The calculations determined both the available NPSH and the margin to pump vortexing at the pump intake bay.

It was determined that a UHS water level of 501 ft. 6 inch Mean Sea Level (MSL) is required to ensure adequate Net Positive Suction Head (NPSH) to the CCSW pumps and to avoid air entrainment from the effects of vortexing. Therefore, ComEd proposes to amend the Dresden TSs to raise the UHS minimum water level requirement in TS 3.8.C.1 from 500 ft. to 501 ft. 6 inch MSL.

Quad Cities

The normal level of the Mississippi River near the plant is maintained at 572 ft. MSL by downstream Lock and Dam No. 14. The TS minimum water level for the UHS, 561 ft. MSL, is based on the normal water level downstream of Lock and Dam No. 14. However, a sandbar located near the intake plume isolates the UHS from the Mississippi River at a level of 565 ft. MSL. Therefore, 565 ft. MSL serves as the baseline for the minimum water level. An additional three feet of level is also required to ensure adequate water flow is maintained over the sandbar to meet the demands of normal operation and post accident scenarios. The resulting river level requirement at the intake bay is 568 ft. MSL.

Therefore ComEd proposes to amend the Quad Cities TSs to raise the minimum UHS water level requirement in TS 3.8.C.1 from 561 ft. to 568 ft. MSL.

5) <u>QUAD CITIES ONLY: TS 3.5.C.2, Shutdown Suppression Chamber level (from ≥7 ft. to ≥ 8.5 ft.)</u>

This change is an amendment to TS Section 3.5.C.2, "Suppression Chamber." This amendment raises the allowable level in the suppression pool while in Modes 4 or 5 (Section 3.5.C.2) from ≥7 ft. to ≥8.5 ft..

Current TS Section 3.5.C.2 requires the suppression chamber to be OPERABLE in OPERATIONAL MODE(s) 4 and 5 with a contained volume equivalent to a water level of ≥ 7 ft. above the bottom of the suppression chamber. An exception is provided for MODE 5, allowing removal of all water from the suppression pool when the reactor vessel head is removed, the cavity is flooded or being flooded from the suppression pool, the spent fuel pool gates are removed when the cavity is flooded, and the water level is maintained within the limits of Specification 3.10.G and 3.10.H (reactor vessel and spent fuel pool water level requirements during refuel operations).

The current water level requirement in OPERATIONAL MODE(s) 4 and 5 was based on providing adequate NPSH for a single ECCS pump start. However, under certain scenarios, there could be an autostart of as many as 6 low pressure ECCS pumps operating at unthrottled flows. Thus, the current TS allowable level is non-conservative, and may not provide the required ECCS NPSH during an event. Therefore, ComEd proposes to raise the suppression chamber level requirements from ≥7 ft. to ≥ 8.5 ft..

6) **QUAD CITIES UNIT 2 ONLY: TS Table 3.2.B-1, 6.b to increase the degraded voltage setpoint from ≥3833 Volts to ≥3845 Volts.**

The station electrical distribution system is designed to include sufficient power sources and redundant busses to provide reliable electrical power during all modes of station operation and shutdown conditions.

To protect the Essential Service System equipment from the effects of a low voltage condition, two sets of undervoltage relays are provided to monitor the safety related 4160 volt busses 13-1, 14-1, 23-1 and 24-1. The first set of undervoltage relays are designed to detect a complete loss of voltage to busses 13-1, 14-1, 23-1 and 24-1. The proposed change involves the setpoint for the second set of relays, which are designed to detect a sustained degraded voltage condition. The degraded voltage relays will initiate protective measures (i.e., load shedding, bus separation from offsite power, and associated Emergency Diesel Generator start) in the event of a sustained degraded voltage condition.

The minimum required voltage on the Diesel Generator secured busses (13-1, 14-1, 23-1, 24-1) was determined to be 3845 volts. This voltage level provides adequate voltage at the terminals of all required Safety Related electrical equipment required during a design bases event. Degraded voltage calculations were performed in accordance with the criteria and staff positions pertaining to degraded grid voltage protection transmitted by NRC Generic Letter dated June 2, 1977.

The results of the degraded voltage calculations provide an analytical minimum voltage of ≥3845 volts (Unit 2) for Emergency Core Cooling System Actuation Instrumentation Table 3.2.B-1, 6.b.

The TSs provide instrument setpoint values and SRs which periodically verify key performance parameters. The current minimum voltage for sustained low voltage actuation of the Emergency Diesel Generators is ≥3845 for Unit 1 and ≥3833 volts for Unit 2.

ComEd proposes to change Table 3.2.B-1, 6.b to increase the setpoint for Unit 2 from ≥3833 volts to ≥3845.

C. BASES FOR THE CURRENT REQUIREMENTS

1) TS 4.9.C.2.c, 125/250 Vdc electrolyte temperature (from >60°F to >65°F)

To ensure the battery systems are OPERABLE, the TSs provide SRs which periodically verify key performance parameters. The current requirements specify that average electrolyte temperature of all connected cells is maintained >60°F. ComEd has determined that this requirement is non-conservative.

2) TS 4.3.G, Control Rod Drive (CRD) accumulator pressure (from ≥800 psig to ≥940 psig)

The current SR 4.3.G HCU Accumulator pressure requirement (≥ 800 psig) was included as part of the TS Upgrade (TSUP) project, and was not supported by a formal engineering evaluation. ComEd has determined that the current HCU Accumulator SR (≥ 800 psig) does not ensure that the plant scram performance requirements, as defined in TS Section 3.3, will be satisfied over the entire range of reactor operating pressures. The original equipment specifications for the CRD system require a pressure setting between 940-970 psig.

3) TS Figure 3.4.A-1, Standby Liquid Control solution temperature requirements changed to provide 10°F margin to saturation.

The minimum ambient temperature of the solution is specified by TS SR (SR) 4.4.A.1(a) and Figure 3.4.A-1. The temperature requirements (as a function of weight percent concentration) specified in Figure 3.4.A-1 include a 10°F margin from the theoretical solubility curve and is consistent with the TS bases for the SBLC system. However, ComEd has determined that the minimum temperature limit specified in Figure 3.4.A-1 does not ensure a 10°F margin to the solubility temperature for an aqueous solution of sodium pentaborate.

4) TS 3.8.C.1, Ultimate Heat Sink minimum water level (from 500 ft. to 501 ft.6 inch Mean Sea Level for Dresden Station and from 561 ft. to 568 ft. Mean Sea Level for Quad Cities Station)

Dresden

The Ultimate Heat Sink (UHS) at Dresden provides sufficient cooling water capacity for both normal cooldown loads or to mitigate the effects of an accident condition. At

Dresden, the UHS is the station's service water intake canal. The minimum UHS water level provided in TS 3.8.C.1 ensures adequate NPSH for the CCSW pumps. During a review of the plant's design basis, Dresden discovered that the current TS limit for UHS water level is not supported by formal design calculations. Formal calculations were generated as part of Dresden's Design Basis Initiative (DBI) program. The calculations determined that the current TS requirement does not provide adequate margin to NPSH and pump vortexing limits.

Quad Cities

The Ultimate Heat Sink (UHS) at Quad Cities provides sufficient cooling water capacity for both normal cooldown loads or to mitigate the effects of an accident condition. At Quad Cities the UHS is the station's service water intake canal which is connected to the Mississippi River. The minimum UHS water level provided in TS 3.8.C.1 ensures an adequate water level in the Station's service water intake canal to provide sufficient margin to NPSH and vortexing limits for the Residual Heat Removal Service Water (RHRSW) and Diesel Generator Cooling Water Pumps. The TS minimum water level for the UHS, 561 ft. MSL, is based on normal water level downstream of Lock and Dam No. 14. However, a sandbar located near the intake plume isolates the UHS from the Mississippi River at a level of 565 ft. MSL. Therefore the current TS requirement does not provide sufficient margin.

5) **QUAD CITIES ONLY: TS 3.5.C.2, Shutdown Suppression Chamber level (from ≥7 ft. to ≥ 8.5 ft.)**

The current requirement for suppression chamber level while in modes 4 and 5 is based on ensuring that a sufficient supply of water is available to the Core Spray and Low Pressure Coolant Injection (LPCI) systems in the event of a Loss of Coolant Accident (LOCA). Since pressure suppression is not required below 212°F, the minimum water volume is based on net positive suction head (NPSH), recirculation volume and vortex prevention plus a safety margin for conservatism. The calculation which supports this requirement assumed one low pressure ECCS pump operating at design flow.

6) **QUAD CITIES UNIT 2 ONLY: TS Table 3.2.B-1, 6.b to increase the degraded voltage setpoint from ≥3833 Volts to ≥3845 Volts.**

To protect the Essential Service System equipment from the effects of a sustained low voltage condition a second set of undervoltage relays were added to 4160 volt busses 13-1, 14-1, 23-1 and 24-1. The current TS requirement for degraded voltage is ≥3833 volts for Unit 2. ComEd has determined that this requirement is non-conservative.

D. NEED FOR REVISION OF THE REQUIREMENT

1) TS 4.9.C.2.c, 125/250 Vdc electrolyte temperature (from >60°F to >65°F)

To ensure the battery systems are OPERABLE, the TSs provide SRs which periodically verify key performance parameters. ComEd has determined that the minimum electrolyte temperature specified in SR 4.9.C.2.c (average electrolyte temperature of all connected cells >60°F) is non-conservative. ComEd has determined the appropriate temperature limit should be greater than 65°F.

The safety related 125Vdc and 250Vdc batteries at Dresden and Quad Cities are sized to provide adequate power under design basis accident conditions. The sizing calculations were performed in accordance with IEEE-485-1983 and assume conservative input assumptions, including battery electrolyte temperature. The sizing calculations performed for the Dresden and Quad Cities battery systems are performed using a minimum average electrolyte temperature of 65 °F.

ComEd proposes to change SR 4.9.C.2.c for Dresden and Quad Cities to increase the average electrolyte temperature requirement from > 60°F to > 65°F.

2) TS 4.3.G, Control Rod Drive (CRD) accumulator pressure (from ≥800 psig to ≥940 psig)

ComEd has determined that the current HCU Accumulator SR (≥ 800 psig) does not ensure that the plant scram performance requirements, as defined in TS Section 3.3, will be satisfied over the entire range of reactor operating pressures. The original equipment specifications require a pressure setting between 940-970 psig. General Electric has performed a confirmatory evaluation that concludes the minimum HCU Accumulator pressure should be maintained at or above 940 psig to assure compliance with the TS Scram time limits specified in Section 3.3. The proposed change is consistent with the design basis of the CRD system.

3) TS Figure 3.4.A-1, Standby Liquid Control solution temperature requirements changed to provide 10°F margin to saturation.

ComEd has determined that the minimum temperature limit specified in Figure 3.4.A-1 does not ensure a 10°F margin to the solubility temperature for an aqueous solution of sodium pentaborate. By ensuring the temperature of the sodium pentaborate solution remains sufficiently above the solubility temperature, the SBLC system can perform its specified design basis safety function. The margin requirements are defined in the TS

Bases for the SBLC system. For this reason, ComEd proposes to change Figure 3.4.A-1 to restore the 10°F margin as specified in the TS Bases for the SBLC system.

4) **TS 3.8.C.1, Ultimate Heat Sink minimum water level (from 500 ft. to 501 ft.6 inch Mean Sea Level for Dresden Station and from 561 ft. to 568 ft. Mean Sea Level for Quad Cities Station)**

Dresden

The minimum UHS water level provided in TS 3.8.C.1 does not provide adequate margin to NPSH and pump vortexing. Raising the minimum water level to 501 ft. 6 inch MSL ensures the UHS will perform in accordance with the design basis requirements.

Quad Cities

The minimum UHS water level provided in TS 3.8.C.1 does not provide sufficient level to provide a continuous supply of water to the intake canal. The elevation of the sandbar, which isolates the UHS from the Mississippi River, is at elevation 565 ft. MSL. At this elevation, the plant is limited to only the volume of water located within the intake and discharge structures; therefore, this elevation presents the limiting condition for operation. Raising the minimum water level to 568 ft. MSL in the intake canal ensures the UHS will perform in accordance with the design basis requirements.

5) **QUAD CITIES ONLY: TS 3.5.C.2, Shutdown Suppression Chamber level (from ≥7 ft. to ≥ 8.5 ft.)**

The assumption of one low pressure ECCS pump operating at design flow was determined to be non-conservative. Immediately after an event, there could be an autostart of as many as 6 low pressure ECCS pumps operating at unthrottled flows, even though one pump would be sufficient to ensure core coverage, and only two pumps are required to be operable during Modes 4 and 5. Thus, the current TS allowable level is non-conservative, and may not provide the required ECCS NPSH or vortex protection during a design basis event.

6) **QUAD CITIES UNIT 2 ONLY: TS Table 3.2.B-1, 6.b to increase the degraded voltage setpoint from ≥3833 Volts to ≥3845 Volts.**

ComEd has determined the appropriate setpoint should be greater than or equal to 3845 volts for Unit 2. The current degraded voltage setpoint on Unit 2 does not provide adequate protection during low voltage conditions.

To protect the Essential Service Equipment from the effects of a degraded grid condition, degraded voltage relays were added to Safety Related busses 13-1, 14-1, 23-1, and 24-1. Degraded voltage calculations were performed in accordance with the criteria and staff positions pertaining to degraded grid voltage protection transmitted by NRC Generic Letter dated June 2, 1977. The results determined the analytical minimum voltage for the degraded voltage relays for Unit 2 is $\geq$3845 volts.

E. DESCRIPTION OF THE PROPOSED CHANGES

1) TS 4.9.C.2.c, 125/250 Vdc electrolyte temperature (from >60°F to >65°F)

ComEd proposes to change SR 4.9.C.2.c for Dresden and Quad Cities to increase the average electrolyte temperature requirement from > 60°F to > 65°F.

Current Requirement:

"The average electrolyte temperature of all connected cells is above 60°F."

Proposed Requirement:

"The average electrolyte temperature of all connected cells is above 65°F."

2) TS 4.3.G, Control Rod Drive (CRD) accumulator pressure (from ≥800 psig to ≥940 psig)

ComEd proposes to amend TS SR 4.3.G to increase the HCU Accumulator pressure requirement from ≥ 800 psig to ≥ 940 psig.

3) TS Figure 3.4.A-1, Standby Liquid Control solution temperature requirements changed to provide 10°F margin to saturation.

ComEd proposes to change Figure 3.4.A-1 to restore the 10°F temperature margin as specified in the TS Bases for the SBLC system. The proposed figure is provided in Attachment B. Note that solubility data for an aqueous solution of sodium pentaborate was taken from the *Journal of Chemical and Engineering Data,* Vol. 12, No.3, July 1967.

4) **TS 3.8.C.1, Ultimate Heat Sink minimum water level (from 500 ft. to 501 ft.6 inch Mean Sea Level for Dresden Station and from 561 ft. to 568 ft. Mean Sea Level for Quad Cities Station)**

ComEd proposed to amend TS 3.8.C.1 as follows:

Dresden

"C. Ultimate Heat Sink

The ultimate heat sink shall be OPERABLE with:
1. A minimum water level at or above elevation 501 ft 6 inch Mean Sea Level, and"

Quad Cities

"C. Ultimate Heat Sink

The ultimate heat sink shall be OPERABLE with:
1. A minimum water level at or above elevation 568 ft Mean Sea Level, and"

5) **QUAD CITIES ONLY: TS 3.5.C.2, Shutdown Suppression Chamber level (from ≥7 ft. to ≥ 8.5 ft.)**

This change will amend TS Section 3.5.C.2 to raise the allowable level in the suppression chamber while in Modes 4 or 5 from ≥7 ft. to ≥8.5 ft..

6) **QUAD CITIES UNIT 2 ONLY: TS Table 3.2.B-1, 6.b to increase the degraded voltage setpoint from ≥3833 Volts to ≥3845 Volts.**

ComEd proposes to change TRIP SETPOINT setting of TABLE 3.2.B-1, 6.b for Unit 2 from ≥3833 volts to ≥3845 volts.

F. SAFETY ANALYSIS OF THE PROPOSED CHANGES

1) TS 4.9.C.2.c, 125/250 Vdc electrolyte temperature (from >60°F to >65°F)

The 125Vdc and 250Vdc station battery systems are designed to provide a source of dc power to certain safety related functions including: breaker control power, safety-related logic functions, and motive power to selected safety related equipment. The station battery systems are capable of supplying all the required connected loads for a period of four hours to safely shutdown one unit while mitigating the consequences of a design basis accident on the other unit.

To ensure the battery systems are OPERABLE, the TS provide SRs which periodically verify key performance parameters. ComEd has determined that the minimum electrolyte temperature specified in SR 4.9.C.2.c (average electrolyte temperature of all connected cells >60°F) is non-conservative. ComEd has determined the appropriate temperature limit should be greater than 65°F.

As noted above, the safety related 125V and 250V batteries at Dresden and Quad Cities are sized to provide adequate power under design basis accident conditions. The sizing calculations were performed in accordance with IEEE-485-1983 and assume conservative input assumptions, including battery electrolyte temperature. The sizing calculations performed for the Dresden and Quad Cities battery systems are performed using a minimum average electrolyte temperature of 65°F.

ComEd proposes to change SR 4.9.C.2.c for Dresden and Quad Cities to increase the average electrolyte temperature requirement from > 60°F to > 65°F.

For these reasons, the proposed TS amendment to raise the temperature requirement specified in SR 4.9.C.2.c from > 60°F to > 65°F is acceptable and poses no safety consequences.

2) TS 4.3.G, Control Rod Drive (CRD) accumulator pressure (from ≥800 psig to ≥940 psig)

During abnormal plant conditions the Control Rod Drive (CRD) system is designed to safely shut down the reactor by rapidly inserting the control rods (Scram). The motive force for the control rod drives during a Scram is supplied by a combination of stored energy (pressure) in the Hydraulic Control Unit (HCU) Accumulators and the reactor vessel.

ComEd has determined that the current HCU Accumulator SR (≥ 800 psig) does not ensure that the plant scram performance requirements, as defined in TS Section 3.3, will be satisfied over the entire range of reactor operating pressures. The proposed change increases the SR 4.3.G pressure requirement from ≥ 800 psig to ≥ 940 psig. The proposed change is conservative and restores conformance with the original design basis of the CRD system.

For these reasons, the proposed TS amendment to raise the pressure requirement specified in SR 4.3.G from ≥ 800 psig to ≥ 940 psig is acceptable and poses no safety consequences.

3) **TS Figure 3.4.A-1, Standby Liquid Control solution temperature requirements changed to provide 10°F margin to saturation.**

In the event that normal control rod insertion is unavailable for shutdown of the reactor core, the Standby Liquid Control (SBLC) system may be used as an alternative method of achieving reactor shutdown. The Standby Liquid Control system provides an additional and independent means of reactivity control and is capable of making and holding the reactor core subcritical from any hot standby or hot operating condition. The SBLC system is actuated manually, and is designed to inject an aqueous solution of sodium pentaborate into the reactor vessel.

The volume of sodium pentaborate solution is maintained at a minimum concentration of 14% (by weight) and can be delivered to the reactor core at a minimum flow rate of 40 gpm (per pump). In addition, the temperature of the sodium pentaborate solution is controlled to ensure the boron remains fully in solution. The minimum ambient temperature of the solution is specified by TS SR 4.4.A.1(a) and Figure 3.4.A-1. The proposed change to the TSs restores the 10°F margin from the theoretical solubility curve. By ensuring the temperature of the sodium pentaborate solution remains sufficiently above the solubility temperature, the SBLC system can perform its specified design basis safety function. Therefore, the proposed changes represent a safety benefit, and align the TSs with the Bases requirements.

4) **TS 3.8.C.1, Ultimate Heat Sink minimum water level (from 500 ft. to 501 ft.6 inch Mean Sea Level for Dresden Station and from 561 ft. to 568 ft. Mean Sea Level for Quad Cities Station)**

Dresden

The Ultimate Heat Sink (UHS) at Dresden provides sufficient cooling water capacity for both normal cooldown loads or to mitigate the effects of an accident condition. At Dresden, UHS level is monitored from the Unit 2/3 cribhouse intake bays.

The UHS provides the suction source for the containment cooling pumps (Containment Cooling Service Water Pumps). The TSs provide minimum acceptable conditions (LCOs) to ensure Operability of the UHS. Specifically, TS 3.8.C.1 currently requires that the UHS water level be maintained at or above 500 ft. MSL.

During a review of the plant's design basis, Dresden discovered that the current TS limits for UHS water level were not supported by a formal design calculation. Formal calculations were generated as part of Dresden's Design Basis Initiative (DBI) program. The calculations determined both the available NPSH and the margin to pump vortexing.

It was determined that a UHS water level of 501 ft. 6 inch above MSL is required to ensure adequate Net Positive Suction Head (NPSH) to the CCSW pumps and to avoid air entrainment from the effects of vortexing. Therefore, ComEd proposes to amend the Dresden TSs to raise the UHS minimum water level requirement in TS 3.8.C.1 from 500 ft. to 501 ft. 6 inch MSL. The proposed change restores the required margin to NPSH and pump vortexing and therefore is acceptable and poses no safety consequences.

Quad Cities

The Ultimate Heat Sink (UHS) at Quad Cities provides sufficient cooling water capacity for both normal cooldown loads or to mitigate the effects of an accident condition. At Quad Cities, the UHS is the station's service water intake canal, which can receive water from the Mississippi River.

The UHS provides the suction source for the containment cooling pumps - Residual Heat Removal Service Water (RHRSW) and Diesel Generator Cooling Water Pumps. The TSs provide minimum acceptable conditions (LCOs) to ensure Operability of the UHS. Specifically, TS 3.8.C.1 currently requires that the UHS water level is maintained greater than 561 ft. MSL at Quad Cities.

Downstream Lock and Dam No. 14 maintains the normal level of the Mississippi River near the plant at 572 ft. MSL. The current TS minimum water level for the UHS, 561 ft. MSL, is based on normal water level downstream of Lock and Dam No. 14. However, a sandbar located near the intake plume isolates the UHS from the Mississippi River at a level of 565 ft. MSL. Therefore, 565 ft. MSL serves as the baseline for the minimum water level. Three feet of additional level will ensure sufficient water flow is maintained over the sandbar to meet the demands of normal operation and post accident scenarios. The additional three feet provides sufficient margin for accelerated shutdown of both units on failure of Lock and Dam No. 14. Therefore ComEd proposed to amend the Quad Cities TSs to raise the minimum UHS water level requirement in TS 3.8.C.1 from 561 ft. to 568 ft. MSL. The proposed change restores the required margin to mitigate the effects of an accident condition; therefore, the proposed change is acceptable and poses no safety consequences.

5) **QUAD CITIES ONLY: TS 3.5.C.2, Shutdown Suppression Chamber level (from ≥7 ft. to ≥ 8.5 ft.)**

The current requirement for suppression chamber level during modes 4 and 5 is ≥7. This requirement assumes one low pressure ECCS pump running at design flow. The potential exists for an auto start signal in Modes 4 and 5 starting as many as 6 low pressure ECCS pumps operating at unthrottled flows, even though one pump would be sufficient to ensure core coverage. The TS allowable level is non-conservative, and may not provide the required ECCS NPSH during such an event to provide protection to the ECCS pumps. Initiation of six low pressure ECCS pumps with zero reactor pressure will result in pump cavitation until the pumps are either shutdown or throttled to design flows. Existing procedures require pump shutdown or throttling of pump flow on indication of cavitation. Quad Cities ECCS pumps have been tested for short term cavitation without causing damage which would prevent long term operation. The proposed TS change restores NPHS margin to ensure the ECCS pumps are protected and are available to perform their design basis function.

6) **QUAD CITIES UNIT 2 ONLY: TS Table 3.2.B-1, 6.b to increase the degraded voltage setpoint from ≥3833 Volts to ≥3845 Volts.**

To protect the Essential Service System equipment from the effects of a sustained low voltage condition, a second set of undervoltage relays were added to 4160 volt busses 13-1, 14-1, 23-1 and 24-1.

The minimum required voltage on the Diesel Generator secured busses was determined to be 3845 volts. This provides adequate voltage at the terminals of all required Safety Related electrical equipment for a design bases event.

The results of the degraded voltage calculations provide a setpoint of ≥3845 volts (Unit 2) for Emergency Core Cooling System Actuation Instrumentation Table 3.2.B-1, 6.b.

ComEd proposes to change Table 3.2.B-1, 6.b to increase the current requirement for Unit 2 from ≥3833 volts to ≥3845. The proposed change is conservative and restores conformance with the degraded voltage calculations.

For these reasons, the proposed TS amendment to raise the trip setpoint requirement in Table 3.2.B-1, 6.b from ≥3833 volts to ≥3845 volts is acceptable and poses no safety consequences.

G. SCHEDULE REQUIREMENTS

Approval of this TS change is requested by December 15, 1998. These issues comprise a set of values in the TSs that are non-conservative with respect to the design basis of Dresden and Quad Cities. Administrative controls are in place to ensure that the design basis of the Dresden and Quad Cities is enforced while this TS change is under review. Timely approval of this TS change will ensure that the TSs reflect the current station design requirements. A 60-day implementation period will provide sufficient time to reflect the changes to the TSs in plant procedures, processes and training.