

June 8, 2004

Mr. Christopher M. Crane, President
and Chief Nuclear Officer
Exelon Generation Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: ISSUANCE OF AMENDMENTS - DRESDEN NUCLEAR POWER STATION,
UNITS 2 AND 3, REQUEST FOR AMENDMENT TO TECHNICAL
SPECIFICATIONS ASSOCIATED WITH DIRECT CURRENT ELECTRICAL
POWER (TAC NOS. MC0295 and MC0296)

Dear Mr. Crane:

The Commission has issued the enclosed Amendment No. 207 to Facility Operating License No. DPR-19 and Amendment No. 199 to Facility Operating License No. DPR-25 for the Dresden Nuclear Power Station, Units 2 and 3, respectively. The amendments are in response to your application dated July 29, 2003, as supplemented by a letter dated January 14, 2004.

The amendments revise the Technical Specifications by adding required actions for inoperable 250 VDC or 125 VDC battery charger, by relocating certain DC power surveillance requirements and criteria to a licensee controlled program, and by providing alternative criteria for battery charger testing and battery monitoring with required actions. Additionally, a new program for battery monitoring and maintenance is added to the Technical Specifications.

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/

Maitri Banerjee, 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. 207 to DPR-19
2. Amendment No. 199 to DPR-25
3. Safety Evaluation

cc w/encls: See next page

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Dresden and Quad Cities Nuclear Power Stations

- 2 -

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EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-237

DRESDEN NUCLEAR POWER STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 207
License No. DPR-19

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Exelon Generation Company, LLC (the licensee) dated July 29, 2003, as supplemented by a letter dated January 14, 2004, 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. 207, 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 60 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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: June 8, 2004

EXELON GENERATION COMPANY, LLC

DOCKET NO. 50-249

DRESDEN NUCLEAR POWER STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 199
License No. DPR-25

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by the Exelon Generation Company, LLC (the licensee) dated July 29, 2003, as supplemented by a letter dated January 14, 2004, 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 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. 199, 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 60 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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: June 8, 2004

ATTACHMENT TO LICENSE AMENDMENT NOS. 207 AND 199

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

DOCKET NOS. 50-237 AND 50-249

Revise the Appendix A Technical Specifications by removing the pages identified below and inserting the attached pages. The revised pages are identified by amendment number and contains a line in the margin indicating the area of change.

REMOVE

iii
3.8.4-1
3.8.4-2
3.8.4-3
3.8.4-4
3.8.4-5
3.8.4-6
3.8.4-7
3.8.5-2
3.8.6-1
3.8.6-2
3.8.6-3
3.8.6-4
5.5-12

INSERT

iii
3.8.4-1
3.8.4-2
3.8.4-3
3.8.4-4
3.8.4-5
3.8.4-6

3.8.5-2
3.8.6-1
3.8.6-2
3.8.6-3
3.8.6-4
5.5-12

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 207 TO FACILITY OPERATING LICENSE NO. DPR-19,
AMENDMENT NO. 199 TO FACILITY OPERATING LICENSE NO. DPR-25,
EXELON GENERATION COMPANY, LLC
DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3, AND
DOCKET NOS. 50-237, 50-249

1.0 INTRODUCTION

By application dated July 29, 2003 (Ref. 1), as supplemented by a letter dated January 14, 2004 (Ref. 2), Exelon Generation Company, LLC (the licensee) requested an amendment to Facility Operating License Nos. DPR-19 and DPR-25 for Dresden Nuclear Power Station (DNPS), Units 2 and 3. The supplement dated January 14, 2004, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on October 14, 2003 (68 FR 59215).

The licensee proposes changes to technical specification (TS) Sections 3.8.4, "D.C. Sources - Operating," 3.8.5, "D.C. Sources - Shutdown," 3.8.6, "Battery Cell Parameters," and 5.5, "Programs and Manuals. The proposed changes request new actions for an inoperable battery charger and alternate battery charger testing criteria for Limiting Condition for Operation (LCO)s 3.8.4 and 3.8.5. The proposed changes also include the relocation of a number of Surveillance Requirements (SRs) in TS Section 3.8.4, that perform preventative maintenance of the safety related batteries, to a licensee controlled program. Also, TS Table 3.8.6-1, "Battery Cell Parameter Requirements," is to be relocated to a licensee controlled program, and specific actions with associated completion times for out-of-limits conditions for battery cell voltage, electrolyte level, and electrolyte temperature be added to TS Section 3.8.6. In addition, specific SRs are being proposed for verification of these parameters.

A new program is proposed for the maintenance and monitoring of station batteries based on the recommendations of the Institute of Electrical and Electronics Engineers (IEEE) Standard 450-1995, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications." The items proposed to be relocated will be contained in this new program.

The licensee indicated that the proposed changes are consistent with the standard TS (STS) in Technical Specification Task Force (TSTF) Traveler TSTF-360, Revision 1, "DC Electrical Rewrite."

2.0 REGULATORY EVALUATION

2.1 Conformance to TSTF-360, Revision 1

The TSTF-360, Revision 1, "DC Electrical Rewrite," was approved for incorporation into STS by the staff on December 18, 2000, as set forth in a letter from W. D. Beckner, NRC to A.R. Pietrangelo, NEI. This TSTF provides guidance for the rewrite of current TS requirements for Class 1E DC power supply systems as referenced in the Standard Technical Specifications NUREGs, (including NUREG-1433 for General Electric BWR/4, and NUREG-1434 for General Electric BWR/6). In adopting the staff-approved TSTF-360, Revision 1, licensees are expected to address the following areas to be consistent with TSTF-360 during conversion of plant TSs to the improved standard TS format of the above stated NUREGs:

1. Relocation of preventive maintenance SRs to licensee-controlled programs;
2. Specification of alternate testing criteria for battery charger testing;
3. Replacement of battery specific gravity monitoring with float current monitoring;
4. Relocation of the maintenance surveillance requirements for cell voltage and electrolyte level to a licensee-controlled program based on the industry recommendations in IEEE Standard 450-1995, and creation of a new section in Chapter 5 of the plant TS (this new section in Chapter 5 will be a TS-controlled activity with its detailed requirements relocated to a plant procedure); and
5. Addition of specific Actions and Increased Completion Times for out-of-limits conditions for battery cell voltage, electrolyte level, and electrolyte temperature;

In particular, the staff reviewed the licensee's justifications for adopting the various elements of TSTF-360 for consistency with the revised Bases of the TSTF. These Bases were reviewed and accepted by the staff during the review of TSTF-360, Revision 0, and TSTF-360, Revision 1, which were submitted by NEI on behalf of the industry on February 4, 2000, and November 6, 2000, respectively.

2.2 10 CFR 50.36 C(2)(ii) Requirements

Section 182a of the Atomic Energy Act requires applicants for nuclear power plant operating licenses to state the TSs to be included as part of the license. The Commission's regulatory requirements related to the content of the TSs are set forth in Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.36. That regulation requires the TSs to include items in five specific categories, including: (1) safety limits, limiting safety system settings, and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements; (4) design features; and (5) administrative controls. However, the regulation does not specify the particular requirements to be included in a plant TS.

Under 10 CFR 50.36(c)(2)(ii), a limiting condition for operation must be included in the TSs for any item meeting one or more of the following four criteria:

1. Installed instrumentation that is used to detect and indicate in the control room a significant abnormal degradation of the reactor coolant pressure boundary;
2. A process variable, design feature, or operating restriction that is an initial condition of a design-basis accident or transient analysis that either assumes the failure of or presents a challenge to the integrity of a fission product barrier;

3. A structure, system, or component that is part of the primary success path and which functions or actuates to mitigate a design-basis accident or transient that either assumes the failure of or presents a challenge to the integrity of a fission product barrier; and
4. A structure, system, or component which operating experience or probabilistic risk assessment has shown to be significant to public health and safety.

As a result, existing TS requirements that fall within or satisfy any of the criteria in 10 CFR 50.36 must be retained in the TSs, while those TS requirements that do not fall within or satisfy these criteria may be relocated to other licensee controlled documents.

2.3 General Design Criterion (GDC) 17

GDC 17, "Electric Power System," of Appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities," requires that an onsite electric power system and an offsite electric power system are provided to permit functioning of structures, systems and components (SSC) important to safety. The onsite system is required to have sufficient independence, redundancy, and testability to perform its safety function, assuming a single failure. The offsite power system is required to be supplied by two physically independent circuits that are designed and located so as to minimize, to the extent practical, the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. In addition, this criterion requires provisions to minimize the probability of losing electric power from the remaining electric power supplies as a result of loss of power from the unit, the offsite transmission network, or the onsite power supplies.

2.4 General Design Criterion (GDC) 18

GDC 18, "Inspection and Testing of Electric Power Systems," requires that electric power systems that are important to safety must be designed to permit appropriate periodic inspection and testing.

3.0 TECHNICAL EVALUATION

The 125 VDC electrical power system of each DNPS unit consists of a 125 VDC battery and two 125 VDC full capacity battery chargers (i.e., a total of four 125 VDC full capacity battery chargers), and associated control equipment and interconnecting cabling. Each 125 VDC unit source (i.e., 125 VDC battery and associated chargers) supplies power to the associated unit Division 1 125 VDC electrical power distribution subsystem and the opposite unit Division 2 125 VDC electrical power distribution subsystem. The Division 1 and Division 2 125 VDC electrical power distribution subsystems provide power to redundant loads, therefore both unit 125 VDC sources are needed to support the operation of both units.

Each DNPS unit also includes a 250 VDC source consisting of a 250 VDC battery and an associated 250 VDC full capacity battery charger (i.e., a total of two 250 VDC full capacity battery chargers), as well as associated control equipment and interconnecting cabling. An additional 250 VDC full capacity swing charger is available for use between the units. The swing charger can only be aligned to one battery at a time. Each 250 VDC battery and charger supplies power to both Unit 2 and Unit 3 loads. Therefore, each unit has two 250 VDC

electrical power subsystems. One 250 VDC electrical power subsystem includes the associated unit 250 VDC battery and full capacity battery charger while the other 250 VDC electrical power subsystem includes the opposite unit 250 VDC battery and the full capacity charger.

Portable battery chargers are available for both 125 VDC and 250 VDC systems, which are identical in size and operating characteristics to the normal chargers.

During normal operation, the DC loads are powered from the battery chargers with the batteries floating on the system (i.e., float-charge mode). Float charge is the condition in which the charger is supplying the connected loads and the battery cells are receiving adequate current to optimally charge the battery. This assures the internal losses of a battery are overcome and the battery is maintained in a fully charged state. In the case of loss of normal power to the battery charger, the DC loads are automatically powered from the associated batteries.

Each battery has adequate capacity to start and carry the normal DC loads plus DC loads required for safe shutdown on one unit and operations required to limit the consequences of a design basis accident on the other unit for a period of four hours following a loss of offsite power plus a single active failure, without taking credit for the battery chargers. The batteries are designed with additional capacity above that required by the design duty cycle to allow for temperature variations and other factors.

Each DC electrical power subsystem battery charger, including the swing charger for the 250 VDC electrical power subsystem, has ample power output capacity for the steady state operation of connected loads required during normal operation, while at the same time maintaining its battery bank fully charged. Each battery charger has sufficient excess capacity to restore the battery from the design minimum charge to its fully charged state within 24 hours while supplying normal steady state loads.

Each unit also has an alternate 125 VDC battery to allow the unit 125 VDC battery to undergo rated discharge testing with both units online. The alternate battery is available to supply system loads upon failure of a unit 125 VDC battery. The alternate battery is of similar type as the unit battery. Although the alternate battery is of different size than the unit battery, it is sized to support the same loads. The alternate battery is normally disconnected from the system and is maintained on float charge.

The staff reviewed and evaluated the proposed changes to the TS as follows:

Change 1: Provide Specific Actions and an Increased Completion Time for an Inoperable Battery Charger

Two new conditions A and E with their associated Required Actions and Completion Times would be added to TS 3.8.4 to address the condition where a required 250 VDC or 125 VDC battery charger, respectively, becomes inoperable.

Required Actions A.1 and E.1 require that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage within 2 hours. Required Actions A.2 and E.2 require verification that the battery float current be less than or equal to 2 amps once

per 12 hours. Required Actions A.3 and E.3 limit the restoration time for the required inoperable battery charger to 7 days. Existing TS 3.8.4 Conditions A, B, C, D, E, F, G, and H are re-designated to reflect the addition of new Conditions A and E.

Each of these Conditions addresses a situation where one required battery charger becomes inoperable. The revised LCO focuses on retaining battery capabilities based on the following:

1. Required Actions A.1 and E.1 assure the discharge is terminated by requiring that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage within 2 hours. This time period provides an allowance for returning the inoperable charger to operable status or for establishing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage. This provides assurance that the battery will be restored to its fully charged condition from any discharge that might have occurred due to the charger inoperability. A discharged battery having terminal voltage of at least the minimum established float voltage indicates that the battery is on the exponential charging current portion of its recharging cycle. There is no comparable limitation in the current DNPS TS. As such, including this action provides for continued safe plant operation.
2. Required Actions A.2 and E.2 requires that once per 12 hours, battery float current be verified to be less than or equal to 2 amps. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it has now been fully charged. If at the expiration of the 12-hour period, the battery float current is not less than or equal to 2 amps, there may be additional battery problems and the battery must be declared inoperable. This verification provides assurance that the battery has sufficient capacity to perform its assumed duty cycle.

Given that the DC bus remains energized, the battery discharge (i.e., if it were occurring) is terminated (i.e., Required Actions A.1 and E.1), and the battery is fully recharged (i.e., Required Actions A.2 and E.2), there is reasonable basis for extending the restoration time for an inoperable charger beyond the existing 2-hour limit to 7 days (i.e., Required Actions A.3 and E.3). Required Actions A.3 and E.3 are applicable if an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage has been used (e.g., the portable battery chargers).

The revised actions focus efforts on retaining battery capabilities, retaining the requirement for charger operability, and applying a reasonable restoration time for an inoperable battery charger to avoid an unnecessary plant shutdown transient. Therefore, the staff finds the proposed change is reasonable, meets 10 CFR 50.36 requirements, is consistent with the intent of NUREG 1433, Revision 2, and, therefore, is acceptable.

Change 2: Relocate Preventive Maintenance SRs to Licensee Controlled Programs

SR 3.8.4.2 (Verification of visible corrosion at battery terminals and connectors, or verification of battery connection resistance values).

SR 3.8.4.4 (Visual indication of battery cell, cell plate, and rack damage or abnormal deterioration).

SR 3.8.4.5 (Removal of visible corrosion and verification that connections are coated with anti-corrosion material).

SR 3.8.4.6 (Verification of battery connection resistance values).

The above SRs, listed in SR 3.8.5.1, are also being deleted from SR 3.8.5.1.

Failure to meet the above SRs does not necessarily mean equipment failure in terms of its ability to meet its safety functions. Corrective action is generally a routine or preventive maintenance-type activity. The proposed relocation of these SRs to a licensed controlled program being added as TS Section 5.5.13, "Battery Maintenance and Monitoring Program," provide adequate assurance of system operability commensurate with the safety significance since the relocated SRs will continue to be performed, and any changes will be evaluated in accordance with 10 CFR 50.59, "Changes, tests and experiments," and 10 CFR 50.71, "Maintenance of records, making of reports," paragraph (e). This is acceptable. Therefore, the staff finds the proposed change is reasonable, meets 10 CFR 50.36 requirements, is consistent with the intent of NUREG 1433, Revision 2, and, therefore, is acceptable.

Change 3: Provide Alternative Testing Criteria for Battery Charger Testing

Current SR 3.8.4.3 is being re-designated as SR 3.8.4.2; and SR 3.8.4.7, is being re-designated as SR 3.8.4.3. These SRs provide for battery charger performance test acceptance criteria for the 250 VDC and 125 VDC battery chargers, respectively. This test is intended to confirm the charger design capacity. Alternate acceptance criteria are proposed that would allow an actual in service demonstration that the charger can recharge the battery to the fully charged state within 24 hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state. This accomplishes the objective of the existing test and allows for normal in-place demonstration of the charger capability thereby minimizing the time when the charger would be disconnected from the DC bus.

SR 3.8.4.1 requires verification that battery terminal voltage is within limits. This provides assurances that the battery will be restored to its fully charged condition from any discharge that might have occurred due to charger inoperability. The battery is recharged when the measured charging current is ≤ 2 amps. The proposed changes relocate the specific terminal voltage values to the licensee controlled program being added as TS Section 5.5.13. Therefore, the staff finds the proposed changes are reasonable, are consistent with the intent of NUREG 1433, Revision 2, and, therefore, are acceptable.

Change 4: Relocate SR 3.8.4.9 to SR 3.8.6.6

In the relocation of SR 3.8.4.9 (Battery Capacity Testing) to TS Section 3.8.6 (Battery Parameters) as SR 3.8.6.6 no changes are proposed to SR 3.8.4.9. Therefore, the staff finds the proposed change is consistent with the intent of NUREG 1433, Revision 2 and therefore is acceptable.

Change 5: Replace Battery Specific Gravity Monitoring with Float Current Monitoring

Existing SR 3.8.6.1 and SR 3.8.6.2, in conjunction with Table 3.8.6-1, require monitoring of individual cell specific gravity. However, the provision of Table 3.8.6-1, Footnote (c), allows the use of a battery charging current less than 2 amps when on float charge to be used to satisfy specific gravity requirements.

The use of float current is the most accurate indicator of the status of the battery. Specific gravity readings may not be accurate when the battery is on charge following a discharge or following the addition of water. Therefore, the staff finds the proposed change is reasonable, meets 10 CFR 50.36 requirements, is consistent with the intent of NUREG 1433, Revision 2, and, therefore, is acceptable.

Change 6: Relocate Limiting Values for Battery Cell Float Voltage, Electrolyte Level, and Electrolyte Temperature to a Licensee Controlled Program

The proposed change is to relocate TS 3.8.6 Condition A, SR 3.8.6.1, SR 3.8.6.2, SR 3.8.6.3, and Table 3.8.6-1 to the licensee controlled program described in proposed TS Section 5.5.13, with the exception that battery specific gravity monitoring is being replaced with float current monitoring, as described above.

Currently TS Table 3.8.6-1 has various categories (A, B, and C) of limitations on battery cell voltage, electrolyte level, and specific gravity parameters. Category A and Category B limits reflect nominal fully charged battery parameter values which provide significant margin above that required for declaration of an operable battery. These Category A and B values represent appropriate monitoring levels and appropriate preventive maintenance levels for long-term battery quality and extended battery life. The licensee proposed that these values and the actions associated with restoration of battery cell parameters be relocated to a licensee controlled program being added as TS Section 5.5.13 that is under the control of 10 CFR 50.59. Required actions associated with Category C limits in TS Table 3.8.6-1 are retained in the TS as discussed in changes numbered 5 and 8.

The proposed changes provide adequate assurance of system operability commensurate with the safety significance since the relocated SRs will continue to be performed, and any changes will be evaluated in accordance with 10 CFR 50.59.

The proposed changes to delete the word "cell" from the title of TS Section 3.8.6 and to revise the wording of the LCO are editorial changes, and therefore are acceptable.

The proposed changes ensure the battery parameters (maintenance, testing and monitoring) are performed in accordance with the "Battery Monitoring and Maintenance Program" as specified in Specification 5.5.13. Therefore, the staff finds the proposed changes are reasonable, meets 10 CFR 50.36 requirements, are consistent with the intent of NUREG 1433, Revision 2, and, therefore, are acceptable.

Change 7: Create an Administrative Program Under TS Section 5.5.13 to Reference Actions for Cell Voltage and Electrolyte Level

The proposed change adds a new TS Section 5.5.13 "Battery Monitoring and Maintenance Program." The program will monitor various battery parameters and is based on the recommendation of IEEE 450-1995. This program will have the elements relocated from the affected TS LCOs, and changes to the program will be reviewed by the licensee under 10 CFR 50.59 to determine if the changes require prior NRC review and approval. This change contains the necessary elements to ensure that the batteries continue to be maintained in a highly reliable condition. Therefore, the staff finds the proposed change reasonable, meets 10 CFR 50.36 requirements, is consistent with the intent of NUREG 1433, Revision 2, and therefore is acceptable.

Change 8: Provide Specific Actions with Increased Completion Times for Out-of-Limits Conditions for Cell Voltage, Electrolyte Level, and Electrolyte Temperature

The licensee proposes Specific Actions for parameters that have a unique impact on the battery and its continued operability. The licensee proposed changes to TS Section 3.8.6 in order to provide increase Completion Times for Out-of-Limits Conditions for cell voltage, electrolyte level, and electrolyte temperature. These Completion Times recognize the margins available, the minimal impact on battery capacity and capability to perform its intended function, and the likelihood of effecting restoration in a timely fashion thereby avoiding unnecessary plant shutdown. In addition, SRs are proposed to verify that the batteries are maintained within the established limitations.

Condition A addresses the condition where a battery has one or more cells with a float voltage of less than 2.07 V. With a float voltage of less than 2.07 V, the battery cell must be considered degraded. Within 2 hours, verification of the required battery charger operability is made by monitoring the battery terminal voltage (i.e., performance of SR 3.8.4.1), and determining the overall state of charge by monitoring the battery float current (i.e., performance of SR 3.8.6.1). These actions assure that there is still sufficient battery capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of one or more cells in one or more batteries being less than 2.07 V, and continued operation is permitted for a limited period up to 24 hours. This is considered a reasonable time to effect restoration of the out-of-limit condition.

Condition B represents the condition where a battery is found with float current greater than 2 amps, and indicates that a partial discharge of the battery capacity has occurred. This may be due to a temporary loss of the battery charger, or possibly due to one or more battery cells in a low voltage condition reflecting some loss of capacity. Within 2 hours, verification of the required battery charger operability is made by monitoring the battery terminal voltage (i.e., performance of SR 3.8.4.1). If the terminal voltage is found to be less than the minimum established float voltage, there are two possibilities: the battery charger is inoperable or is operating in the current limit mode. Conditions A and E of LCO 3.8.4 address charger inoperability. If the charger is operating in the current limit mode after 2 hours, that is an indication that the battery has been substantially discharged and likely cannot perform its required design functions. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, load on the associated DC system, the

amount of the previous discharge, and the recharge characteristic of the battery. If the charge time is extensive, and there is not adequate assurance that it can be recharged within 12 hours (Required Action B.2) the battery must be declared inoperable.

If the float voltage is found to be satisfactory but there are one or more battery cells with float voltage less than 2.07 V, Condition C is applicable and the battery must be declared inoperable immediately.

If float voltage is satisfactory and there are no cells less than 2.07 V, there is assurance that, within 12 hours, the battery will be restored to its fully charged condition (Required Action B.2) from any discharge that might have occurred due to a temporary loss of the battery charger. The time to return a battery to its fully charged state under this condition is a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus, there is assurance of fully recharging the battery within 12 hours, thereby avoiding a premature unit shutdown with its own attendant risk.

If the condition is due to one or more cells in a low voltage condition but still greater than 2.07 V, and float voltage is found to be satisfactory, this is not an indication of a substantially discharged battery and 12 hours is a reasonable time prior to declaring the battery inoperable.

Condition C specifies actions to take when a battery with one or more battery cells is found with float voltage less than 2.07 V and float current greater than 2 amps. This indicates that the battery capacity may not be sufficient to perform the intended functions. The battery must, therefore, be declared inoperable immediately.

Condition D addresses the condition where a battery is found with the electrolyte level in one or more cells less than minimum established design limits. With the electrolyte level in one or more cells above the top of the plates, but below the minimum established design limits, the battery still retains sufficient capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of the electrolyte level requirement not being met. Within 31 days, the minimum established design limits for electrolyte level must be restored. This is reasonable and acceptable.

With electrolyte level below the top of the plates, there is a potential for dryout and plate degradation. Required Actions D.1 and D.2 address this potential as well as provisions in TS Section 5.5.13. Required Actions D.1 and D.2 are only applicable if electrolyte level was below the top of the plates. The Required Action D.2 requirement to verify that there is no leakage by visual inspection and the Specification 5.5.13, Item b, to initiate action to equalize and test in accordance with manufacturer's recommendation are taken from Annex D of IEEE 450-1995. They are performed following the restoration of the electrolyte level to above the top of the plates. Based on the results of the testing, the battery may have to be declared inoperable and the affected cell(s) replaced. Therefore, the staff finds the proposed change reasonable and acceptable.

Condition E addresses the condition where a battery is found with a pilot cell temperature less than the minimum established design limits. A low electrolyte temperature limits the current and power available from the battery. Since the battery is sized with margin, while battery capacity is degraded, sufficient capacity exists to perform the intended function. Therefore, the

affected battery is not required to be considered inoperable solely as a result of the pilot cell temperature not being met, and the 12 hour Completion Time provides a reasonable time to restore the temperature within established limits.

Condition F addresses the condition with one or more batteries in redundant divisions with battery parameters not within limits. Given this condition, there is not sufficient assurance that battery capacity has not been affected to the degree that the batteries can still perform their required function, given that redundant batteries are involved. With redundant batteries involved, this potentially could result in a total loss of function on multiple systems that rely upon the batteries. The longer completion times specified for battery parameters on non-redundant batteries not within limits are therefore not appropriate, and the parameters must be restored to within limits on at least one division within 2 hours.

Condition G specifies actions to take when the Required Action and associated Completion Time of Condition A, B, D, E, or F are not met. When any battery parameter is outside the allowances of the Required Actions for Condition A, B, D, E, or F sufficient capacity to supply the maximum expected load requirement is not ensured and the corresponding battery must be declared inoperable. The battery must therefore be declared inoperable immediately.

SR 3.8.6.1 requires verification that each battery float current be less than or equal to 2 amps. Verifying battery float current while on float charge is used to determine the state of charge of the battery. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and to maintain the battery in a charged state. The float current requirements are based on the float current indicative of a charged battery. Use of float current to determine the state of charge of the battery and the 7-day Surveillance Frequency is acceptable.

SR 3.8.6.2 and SR 3.8.6.5 verify that the cell voltage of either pilot cells or each connected cell are equal to or greater than the short-term absolute minimum voltage, representing the point where battery operability is in question. Optimal long-term battery performance is obtained by maintaining a float voltage greater than or equal to the minimum established design limits provided by the battery manufacturer, which corresponds to 260.4 V at the 250 VDC battery terminals and 125.9 V at the 125 VDC battery terminals, or 2.17 volts per cell (Vpc). This provides adequate over-potential, which limits the formation of lead sulfate and self-discharge, which could eventually render the battery inoperable. Float voltage in this range or less, but greater than 2.07 Vpc, is addressed in new TS Section 5.5.13. The Surveillance Frequency for cell voltage verification every 31 days for pilot cells and 92 days for each connected cell is consistent with IEEE 450-1995.

SR 3.8.6.3 requires verification that each battery connected cell electrolyte level be greater than or equal to minimum established design limits. The limits specified for electrolyte level ensures that the plates suffer no physical damage and that the cell maintains adequate electron transfer capability. The Surveillance Frequency of 31 days is consistent with IEEE 450-1995.

SR 3.8.6.4 requires verification that each battery pilot cell temperature be greater than or equal to the minimum established design limit (i.e., 65 °F). Pilot cell electrolyte temperature is maintained above this temperature to assure the battery can provide the required current and

voltage to meet design requirements. Temperatures lower than assumed in battery sizing calculations act to inhibit or reduce battery capacity. The Surveillance Frequency of 31 days is consistent with IEEE 450-1995.

Based on the above review, the staff finds the proposed change provides adequate assurance of system operability, meets 10CFR 50.36 requirements, is consistent with NUREG 1433, Revision 2; and therefore is acceptable.

3.1 Evaluation Summary

The proposed changes to the DC electrical power subsystems specifications TS 3.8.4, TS 3.8.5, and TS 3.8.6 and the addition of new TS administrative control program 5.5.13, "Battery Maintenance and Monitoring Program," based on the recommendations of Institute of Electrical and Electronics Engineers (IEEE) Standard 450-1995, are consistent, except for noted plant-specific difference, with the considerations and proposed changes provided in TSTF-360, Revision 1, as incorporated in NUREG-1433, Revision 2. The proposed changes do not affect the current design requirements and meet GDC 17. Each of these proposed changes has been evaluated in accordance with the requirements of 10 CFR 50.36 and determined not to adversely affect nuclear safety or continued safe plant operations; and therefore, the proposed changes are acceptable.

The NRC staff also reviewed the associated Bases provided with the licensee's submittal for consistency with the Bases that were accepted by the staff during the review of TSTF-360. The staff finds the proposed revised Bases to contain wording that is generally consistent with that of the staff-approved wordings in TSTF-360, Revision 1; and therefore, the NRC staff has no objection to the proposed Bases.

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. 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 (68 FR 59215). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR Part 51.22(c)(9). Pursuant to 10 CFR Part 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. Letter from P. R. Simpson, Exelon Generation Company, LLC, to U.S. Nuclear Regulatory Commission, Request for Amendment to Technical Specifications Associated with Direct Current Electrical Power, dated July 29, 2003.
2. Letter from P.R. Simpson, Exelon Generation Company, LLC, to U.S. Nuclear Regulatory Commission, Additional Information Supporting the Request for Amendment to Technical Specifications Associated with Direct Current Electrical Power, dated January 14, 2004.

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