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Exelon SM
Nuclear

RS-06-126

10 CFR 50.90

September 13, 2006

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

LaSalle County Station, Units 1 and 2
Facility Operating License Nos. NPF-11 and NPF-18
NRC Docket Nos. 50-373 and 50-374

Subject: Additional Information Supporting the License Amendment Request Associated With Direct Current Electrical Power

References:

1. Letter from K. R. Jury (Exelon Generation Company, LLC) to U.S. NRC, "Request for an Amendment to Technical Specifications Associated With Direct Current Electrical Power," dated December 9, 2004
2. U.S. NRC to C. M. Crane (Exelon Generation Company, LLC), "LaSalle County Power Station, Units 1 and 2 – Request for Additional Information Related to Request for Amendment to Technical Specifications Associated With Direct Current Electrical Power," dated June 2, 2006
3. Letter from D. M. Benyak (Exelon Generation Company, LLC) to U.S. NRC, "Additional Information Supporting the License Amendment Request Associated With Direct Current Electrical Power," dated August 16, 2006
4. Letter from D. M. Benyak (Exelon Generation Company, LLC) to U.S. NRC, "Additional Information Suuporting the License Amendment Request Associated With Direct Current Electrical Power, " dated August 24, 2006
5. Summary of July 12, 2006, NRC Public Meeting, "Meeting with the Technical Specifications Task Force (TSTF) to discuss TSTF-360, Revision 1, 'DC Electrical Rewrite'," dated August 15, 2006

In Reference 1, Exelon Generation Company, LLC, (EGC), requested an amendment to Appendix A, Technical Specifications (TS), of Facility Operating License Nos. NPF-11 and NPF-18 for LaSalle County Station (LSCS) Units 1 and 2 respectively. Specifically, the proposed changes were to modify TS Sections 3.8.4, "DC Sources - Operating," 3.8.5, "DC Sources - Shutdown," 3.8.6, "Battery Cell Parameters," and 5.5, "Programs and Manuals." The proposed changes also requested new actions for an inoperable battery charger and alternate battery charger testing criteria for Limiting Condition for Operation (LCO) 3.8.4 and 3.8.5.

The proposed changes also included the relocation of a number of Surveillance Requirements (SRs) in TS Section 3.8.4 that perform preventive maintenance on the safety related batteries to a licensee-controlled program. It was proposed that TS Table 3.8.6-1, "Battery Cell Parameter Requirements," 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 were proposed for verification of these parameters.

A new program was also proposed for the maintenance and monitoring of station batteries based on the recommendations of 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 relocated would be contained within this new program.

In Reference 2, the NRC requested additional information to complete the review of the license amendment. References 3 and 4 provided the requested information.

In a teleconference on August 24, 2006 additional information was requested by the NRC to complete the review of the proposed license amendment taking into consideration the NRC concerns with TSTF-360 that were discussed at a public meeting on July 12, 2006. Attachments 1 through 3 provide the additional information requested including specific responses to NRC concerns 2 and 5a, (i.e., Reference 5).

NRC concern 2 identified the need for additional justification to replace battery specific gravity monitoring with float current monitoring in the TS. The NRC agreed that concurrence from the battery manufacturer endorsing the use of float current as an acceptable method to determine the battery state of charge would provide the additional justification. Attachment 1 provides this concurrence from the battery manufacturers (i.e., GNB/NLI for the Division 1 250 VDC, Division 1 125 VDC and Division 2 125 VDC and C&D Technologies for the Division 3 125 VDC). In addition, the equipment used to monitor float current will have the necessary accuracy and capability to measure current in the expected range.

NRC concern 5a identified that the licensees seeking to create a new battery monitoring and maintenance program need to provide assurance that the relocated battery parameter values will continue to be controlled at their current level, and actions will be implemented in accordance with the licensee's corrective action program. Reference 3 Attachment 3 provided a draft copy of the new section in the LSCS owner controlled Technical Requirements Manual, TRM 3.8.d "Battery Monitoring and Maintenance." In addition, EGC is making a regulatory commitment to relocate the current battery parameters (i.e., specific gravity, electrolyte level, cell temperature, float voltage, connection resistance, and physical condition) to a new Battery Monitoring and Maintenance Program. This program (i.e., LSCS TRM 3.8.d) will be controlled by 10 CFR 50.59, "Changes, tests, and experiments," and the EGC Corrective Action Program. This regulatory commitment is documented in Attachment 4.

EGC is also making a regulatory commitment to reserve a 5% design margin for the Division 1 and Division 2 batteries and a 10% design margin for the Division 3 batteries. This requirement will be added to the TS Bases on approval of the proposed amendment. The margin requirements were addressed in Reference 3 Attachment 2 and are documented in Attachment 4.

Additional wording to be included in the TS and TS Bases was agreed on during the NRC teleconference on August 24, 2006. These changes are provided in Attachments 2 and 3.

Specifically TS 5.5.14 is revised to remove the reference to IEEE-450; change TS 5.5.14.b from "... below the minimum established design limit" to "... below the top of the plates" and to add TS 5.5.14.c to "verify that the remaining cells are > 2.07 V when a cell or cells have been found to be < 2.13V".

TS Bases Section B 3.8.4 is revised to include a specific statement that references the backup battery chargers associated with the Division 1 and Division 2 125 VDC system as being fully qualified chargers that are powered from a diesel generator backed safety related distribution system. In addition, these 100% capacity battery chargers are the "alternate means" for supporting the Division 1 and Division 2 125 VDC systems.

TS Bases Section B 3.8.6 is revised to include specific wording that the Technical Requirements Manual implements the program specified in Specification 5.5.14 for monitoring various battery parameters including temperature, voltage, and level requirements.

Note that the associated revised TS Bases pages are provided for information only and do not require NRC approval.

EGC has reviewed the information supporting a finding of no significant hazards consideration that was previously provided to the NRC in Attachment 1 of Reference 1. The supplemental information provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration.

Regulatory commitments for LSCS are provided in Attachment 4 of this letter. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments. Should you have any questions concerning this letter, please contact Ms. Alison Mackellar at (630) 657-2817.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 13th day of September 2006.

Respectfully,

Darin M Benyak

Darin M. Benyak
Manager, Licensing and Regulatory Affairs

Attachment 1: Letters from GNB/NLI and C&D Technologies
Attachment 2: Revised Technical Specification Page
Attachment 3: Revised Technical Specification Bases Pages
Attachment 4: Summary of Regulatory Commitments

ATTACHMENT 1

LaSalle County Station
Facility Operating License Nos. NPF-11 and NPF-18

Letters from GNB/NLI for the Division 1 250 VDC, Division 1 125 VDC and Division 2 125 VDC

Letter from C&D Technologies for the Division 3 125 VDC

GNB
INDUSTRIAL POWER
A Division of EXIDE Technologies

GNB Industrial Power
3950 Sussex Avenue
Aurora, IL 60504-7932
USA

630.862.2200 tel
800.872.0471 toll free
630.862.2325 fax
www.gnb.com

8 September 2006

Float Current Monitoring

From: Robert J. Schmitt
Staff Engineer
GNB Network Power

To: Mr. Don Davis
NLI

GNB's position on the use of float current measurements by Exelon's LaSalle Station to determine the state of charge of flooded stationary lead-calcium batteries is as follows:

- The concept of utilizing float current levels of a flooded, stationary string battery to determine a state of charge throughout the life of the battery is reasonable.
- There is a relationship between percentage of ampere-hours returned following a successful discharge capacity test and battery state of charge.
- Proper follow-up and verification of satisfactory float charge voltage, current and specific gravities is necessary to determine whether the battery is operating properly per GNB's Installation and Operating Manual, section 93.10.
- The charge current of each battery and can be affected by impurity levels, age, operating environment and maintenance history.

I hope this addresses your concerns on this matter and that you will contact me with any further questions.

Best regards,

RjS

NLI
NUCLEAR LOGISTICS INC

July 21, 2004

MEMO-1558

To: Hassan Abughofah
Sargent Lundy

Subject:: Float Current

Reference. E-mail dated July 16, 2004

Dear Hassan,

Per your e-mail request for float current for both NCN-17 and NCN-27 at 100% charge and 95% charge. Attached is a graph which shows current vs. temperature. The provided graph represents the average of the entire line of lead-calcium cells.

In accordance with the manufactures Instruction and Operation Manual, the Float Charge for Lead Calcium Cells with 1.215 specific gravity electrolyte is 2.17 to 2.25 volts per cell (VPC). Both the NCN-17 and NCN-27 cells fall into this category. Requiring that the current be less than 1 amp when the cells are 100% fully charged ensures that the float current is enveloped on the graph, regardless of temperature.

The cells should be approximately 95% charged following an equalize charge. Using the manufactures recommended equalizing voltages (2.24 to 2.39 VPC), we can show on the graph that a requirement of 2 amps envelops the float current for all temperatures below 89°F. At 2.33 VPC the 2-amp requirement envelops the float current for all temperatures below 105°F.

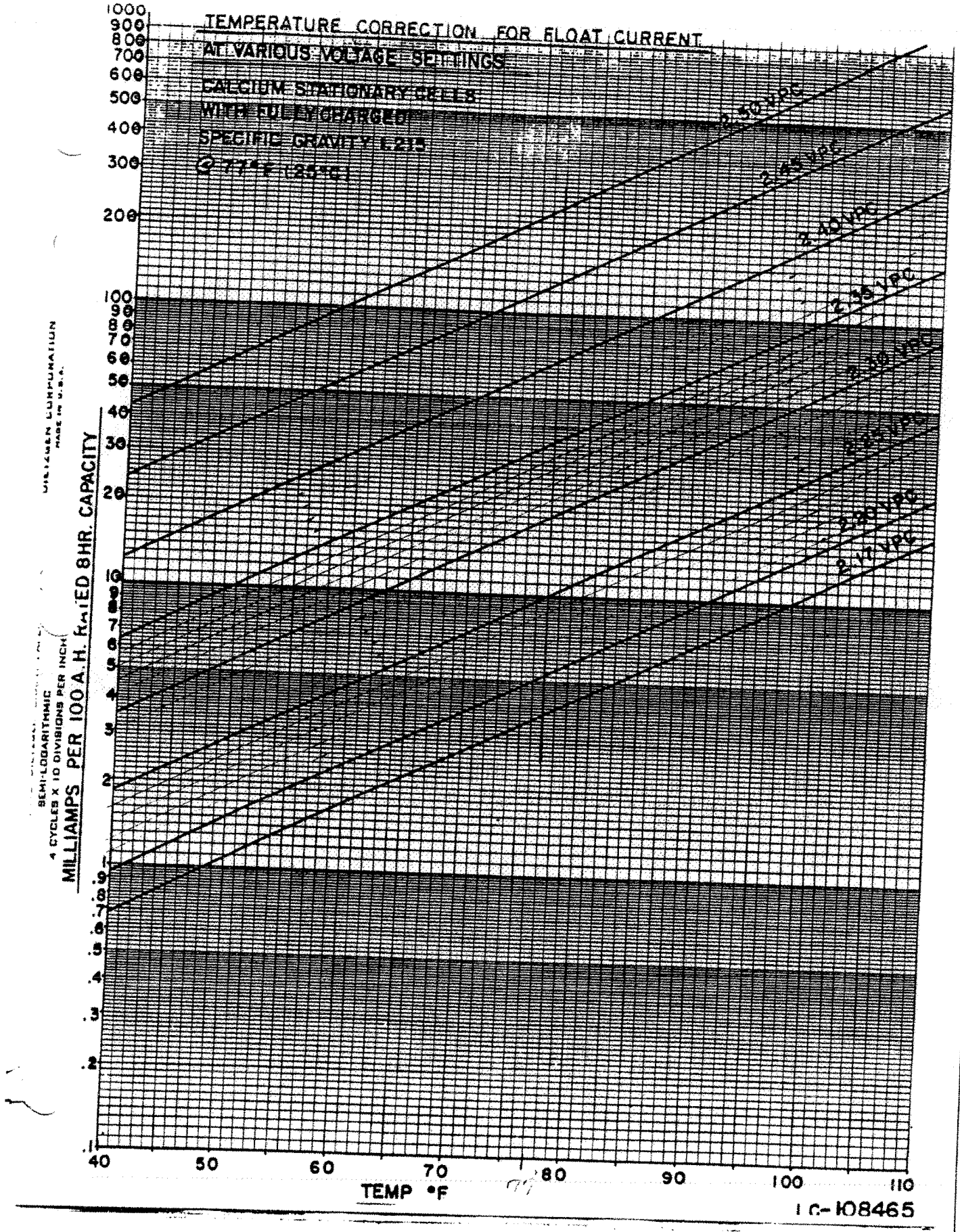
If you have any further questions, please do not hesitate to contact myself or Archie Bell, Vice-President at extension 304 or email at acbell@nuclearlogistics.com.

Yours truly,

Don Davis,
Project Engineer
Nuclear Logistics, Inc.
Tel: 817-284-0077 ext 335
Email: ddavis@nuclearlogistics.com

Cc: Archie Bell, NLI

Enclosure (1): Temp. Correction for Float Current at Various Voltage Settings Graph


TEMPERATURE CORRECTION FOR FLOAT CURRENT
AT VARIOUS VOLTAGE SETTINGS
CALCIUM STATIONARY CELLS
WITH FULLY CHARGED
SPECIFIC GRAVITY 1.215
@ 77°F (25°C)
2.50 VPC
2.45 VPC
2.40 VPC
2.35 VPC
2.30 VPC
2.25 VPC
2.20 VPC
2.17 VPC
MILLIAMPS PER 100 A.H. RATED 8HR. CAPACITY
1000
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
10
9
8
7
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1
.9
.8
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.2
.1
40
50
60
70
80
90
100
110
TEMP °F
SEMI-LOGARITHMIC
4 CYCLES X 10 DIVISIONS PER INCH

IC-108465

C&D TECHNOLOGIES, INC.

Power Solutions

1400 Union Meeting Road
P.O. Box 3053
Blue Bell, PA 19422-0858
Telephone (215) 619-2700
Fax (215) 619-7840

August 25, 2006

Mr. Kent C. Nelson
Exelon Generation Company, LLC
LaSalle County Station
2601 N. 21St Road
Marseilles, IL 61341-9757

Subject: Float Current Used as an Indicator of Battery Charge State

Reference: LaSalle County Station

Dear Mr. Nelson:

As requested, I wish to state C&D's position that a float current value of less than 2-Amps is a both a reliable and an accurate parameter to use to ascertain a state of full charge in lieu of specific gravity readings. That is to say, a float current value of ≤2.0 Amps on C&D batteries used in the subject generating plant is a reasonable indicator of a full state of charge. The accuracy and reliability of this reading will hold true over the expected life of these batteries (i.e. 20-years).

Please contact me if you have any questions at telephone 215-619-2700 extension 365 or via e-mail at jhohenstein@cdtechno.com.

Very truly yours,

J. J. Hohenstein
Manager, Nuclear Applications Engineering

ATTACHMENT 2

LaSalle County Station
Facility Operating License Nos. NPF-11 and NPF-18

Revised Technical Specification Page

5.5-13

5.5 Programs and Manuals

5.5.13 Primary Containment Leakage Rate Testing Program (continued)

2. NEI 94-01 - 1995, Section 9.2.3: The first Unit 2 Type A test performed after December 8, 1993 Type A test shall be performed no later than December 7, 2008.

b. The peak calculated primary containment internal pressure for the design basis loss of coolant accident, P_a, is 39.9 psig.

c. The maximum allowable primary containment leakage rate, L_a, at P_a, is 0.635% of primary containment air weight per day.

d. Leakage rate acceptance criteria are:

1. Primary containment overall leakage rate acceptance criterion is $\leq 1.0\ L_a$. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are $\leq 0.60\ L_a$ for the combined Type B and Type C tests, and $\leq 0.75\ L_a$ for Type A tests.

2. Air lock testing acceptance criteria are:

a) Overall air lock leakage rate is $\leq 0.05\ L_a$ when tested at $\geq P_a$.

b) For each door, the seal leakage rate is ≤ 5 scf per hour when the gap between the door seals is pressurized to ≥ 10 psig.

e. The provisions of SR 3.0.3 are applicable to the Primary Containment Leakage Rate Testing Program.

5.5.14 Battery Monitoring and Maintenance Program

This Program provides for restoration and maintenance, which includes the following:

a. Actions to restore battery cells with float voltage < 2.13 V; and

b. Actions to equalize and test battery cells that had been discovered with electrolyte level below the top of the plates; and

c. Actions to verify that the remaining cells are > 2.07 V when a cell or cells have been found to be < 2.13 V.

ATTACHMENT 3

LaSalle County Station
Facility Operating License Nos. NPF-11 and NPF-18

Revised Technical Specification Bases Pages

B 3.8.4-3
B 3.8.4-13
B 3.8.6-1
B 3.8.6-10

BASES

BACKGROUND (continued)

Based on LaSalle Station battery sizing calculations, Divisions 1 and 2 batteries have a margin of at least 5% (Ref. 10). The Division 3 batteries have a margin of at least 10% (Ref. 10).

The backup battery chargers associated with the Division 1 and Division 2 125 VDC system are fully qualified chargers that are powered from a diesel generator backed safety related (Class 1E) distribution system, and are fully capable of supporting system design requirements. These 100% capacity battery chargers are the "alternate means" for supporting the Division 1 and Division 2 125 VDC systems.

The batteries for a DC electrical power subsystem are sized to produce required capacity at 80% of nameplate rating, corresponding to warranted capacity at end of life cycles and the 100% design demand. The minimum design voltage limit is 105/210 V.

The battery cells are of flooded lead acid construction with a nominal specific gravity of 1.215. This specific gravity corresponds to an open circuit battery voltage of approximately 120 V for a 58 cell battery and 240 V for a 116 cell battery (i.e., cell voltage of 2.065 volts per cell (Vpc)). The open circuit voltage is the voltage maintained when there is no charging or discharging. Once fully charged with its open circuit voltage $\geq$ 2.065 Vpc, the battery will maintain its capacity for 30 days without further charging per manufacturers instructions. Optimal long term performance however, is obtained by maintaining a float voltage 2.17 Vpc to 2.25 Vpc for Division 1 and Division 2 and maintaining a float voltage of 2.20 Vpc to 2.25 Vpc for Division 3. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge. The nominal float voltage of 2.23 Vpc corresponds to a total float voltage output of 129.3 V for a 58 cell battery and 258.7 V for a 116 cell battery as discussed in the UFSAR, Section 8.3.2 (Ref. 4).

Each Division 1, 2, and 3 DC electrical power subsystem battery charger 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 capacity to restore the battery bank from the design minimum charge to its fully charged state within

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.4 (continued)

Technical Specifications exempts performance of an opposite unit SR (however, as stated in the opposite unit SR 3.8.5.1 Note 1, while performance of an SR is exempted, the SR must still be met).

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. Regulatory Guide 1.6, March 10, 1971.
3. IEEE Standard 308, 1971.
4. UFSAR, Section 8.3.2.
5. UFSAR, Chapter 6.
6. UFSAR, Chapter 15.
7. Regulatory Guide 1.93, December 1974.
8. IEEE Standard 450, 1995.
9. Regulatory Guide 1.32, August 1972.
10. NRC Regulatory Commitment documented in letter from D. M. Benyak to NRC, "Additional Information Supporting the License Amendment Request Associated with Direct Current Electrical Request," dated September 13, 2006.

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.6 Battery Parameters

BASES

BACKGROUND

This LCO delineates the limits on battery float current as well as electrolyte temperature, level, and float voltage for the DC power source batteries. A discussion of these batteries and their OPERABILITY requirements is provided in the Bases for LCO 3.8.4, "DC Sources—Operating," and LCO 3.8.5, "DC Sources—Shutdown." In addition to the limitations of this Specification, the Battery Monitoring and Maintenance Program described in the Technical Requirements Manual (Ref. 7) implements the program specified in Specification 5.5.14 for monitoring various battery parameters including temperature, voltage, and level requirements that are based on the recommendations of IEEE Standard 450-1995, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications" (Ref. 4).

The battery cells are of flooded lead acid construction with a nominal specific gravity of 1.215. This specific gravity corresponds to an open circuit battery voltage of approximately 120 V for a 58 cell battery and 240 V for a 116 cell battery (i.e., cell voltage of 2.065 volts per cell (Vpc)). The open circuit voltage is the voltage maintained when there is no charging or discharging. Once fully charged with its open circuit voltage $\geq$ 2.065 Vpc, the battery will maintain its capacity for 30 days without further charging per manufacturers instructions. Optimal long term performance however, is obtained by maintaining a float voltage 2.20 to 2.25 Vpc. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge. The nominal float voltage of 2.23 Vpc corresponds to a total float voltage output of 129.3 V for a 58 cell battery and 258.7 V for a 116 cell battery as discussed in the UFSAR, Section 8.3.2 (Ref. 2).

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in UFSAR, Chapter 6 (Ref. 1) and Chapter 15 (Ref. 3), assume Engineered Safety Feature systems are OPERABLE. The DC electrical power subsystems provide normal and emergency DC electrical power for the diesel generators, emergency auxiliaries, and control and switching during all MODES of operation.

(continued)

BASES (continued)

partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment. Credit may be taken for unplanned events that satisfy this SR.

The reason for the second Note is to preclude requiring the OPERABLE DC sources from being discharged below their capability to provide the required power supply or otherwise rendered inoperable during the performance of SRs. It is the intent that these SRs must still be capable of being met, but actual performance is not required.

REFERENCES

1. UFSAR, Chapter 6.

2. UFSAR, Chapter 8.

3. UFSAR, Chapter 15.

4. IEEE Standard 450, 1995.

5. IEEE Standard 485, 1983.

6. Technical Requirements Manual

7. NRC Regulatory Commitment documented in letter from D. M. Benyak to NRC, "Additional Information Supporting the License Amendment Request Associated with Direct Current Electrical Request," dated September 13, 2006.

ATTACHMENT 4

SUMMARY OF REGULATORY COMMITMENTS

The following table identifies commitments made in this document. (Any other actions discussed in the submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments.)

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (Yes/No)	Programmatic (Yes/No)
EGC is making a regulatory commitment to relocate the current battery parameters (i.e., specific gravity, electrolyte level, cell temperature, float voltage, connection resistance, and physical condition) to a new Battery Monitoring and Maintenance Program. This program will be located in the LaSalle County Station (LSCS) Units 1 and 2 owner controlled Technical Requirements Manual (TRM), and controlled by 10 CFR 50.59 and the EGC Corrective Action Program.	Implemented by TS Amendment implementation date.	Yes	Yes
EGC is making a regulatory commitment to reserve a 5% design margin for the Division 1 and Division 2 batteries and a 10% design margin for the Division 3 batteries. The 5% design margin for the Division 1 and Division 2 batteries and the 10% design margin for the Division 3 batteries will be added to the TS Bases.	Implemented by TS Amendment implementation date.	Yes	Yes