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May 15, 2009

U.S. Nuclear Regulatory Commission
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Washington, DC 20555-001

Subject: Duke Energy Carolinas, LLC

McGuire Nuclear Station, Units 1 and 2
Docket Nos. 50-369 and 50-370

Catawba Nuclear Station, Units 1 and 2
Docket Nos. 50-413 and 50-414

License Amendment Request Applicable to Technical Specifications 3.8.4, DC Sources-Operating," and 3.8.5, "DC Sources-Shutdown"

In accordance with the provisions of Section 50.90 of Title 10 of the Code of Federal Regulations (10CFR), Duke Energy Carolinas, LLC (Duke) proposes a license amendment request (LAR) for the Renewed Facility Operating Licenses (FOL) and Technical Specifications (TS) for the McGuire (MNS) and Catawba (CNS) Nuclear Stations, Units 1 and 2.

It is proposed that Section 5.5, "Programs and Manuals," of the McGuire and Catawba Technical Specifications be revised to include a new Battery Monitoring and Maintenance Program. The program is based upon manufacturer's recommendations, industry practices and the recommendations of the Institute of Electrical and Electronics Engineers (IEEE) Standard 450, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications."

The proposed LAR also relocates MNS TS 3.8.4 Surveillance Requirements (SRs) 3.8.4.2 through 3.8.4.5 and CNS TS 3.8.4 SRs 3.8.4.3 through 3.8.4.6 to the respective station's (new) Battery Monitoring and Maintenance Program and revises MNS and CNS TS SR 3.8.5.1 by deleting reference to these relocated SRs. The TS Bases (TSB) associated with MNS TS 3.8.4 SRs 3.8.4.2 through 3.8.4.5 and CNS TS 3.8.4 SRs 3.8.4.3 through 3.8.4.6 are deleted.

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The relocation of these SRs to a licensee controlled program is based upon Technical Specification Task Force (TSTF) Improved Standard Technical Specifications Change Traveler TSTF-360-A, Revision 1, "Requirements for DC Sources." TSTF-360-A, Revision 1 was approved by the NRC on December 18, 2000. Other portions of TSTF-360-A, Revision 1 will not be adopted at this time due to the pending nature of TSTF-500, "DC Electrical Rewrite - Update to TSTF-360."

Duke has reviewed the changes contained in TSTF-360-A, Revision 1, and it's supporting material, and has determined that it applies to McGuire and Catawba. Therefore, TSTF-360-A, Revision 1, is referenced as the basis for the changes proposed within this McGuire and Catawba LAR.

On October 8, 2008, Catawba submitted an administrative LAR to remove obsolete information regarding the batteries for the emergency diesel generators. The proposed changes from that LAR have been added into the marked up pages in this LAR for Catawba to preclude any confusion during the review of this LAR.

Attachment 1 provides Duke's evaluation of the LAR which contains a description of the proposed changes, the technical analysis, the determination that this LAR contains No Significant Hazards Considerations, the basis for the categorical exclusion from performing an Environmental Assessment/Impact Statement, and precedent.

Attachment 2a provides existing Technical Specification pages for McGuire Units 1 and 2, marked-up to show the proposed changes. The associated Bases changes are included for information.

Attachment 2b provides existing Technical Specification pages for Catawba Units 1 and 2, marked-up to show the proposed changes. The associated Bases changes are included for information.

This LAR contains no regulatory commitments for McGuire or Catawba.

Duke requests NRC review and approval of this LAR by April 30, 2010 in order to provide for the timely resolution of Operable But Degraded Nonconforming conditions noted regarding non-conservative battery connection resistance values in MNS TS SR 3.8.4.2 and SR 3.8.4.5 and CNS TS SR 3.8.4.3 and 3.8.4.6, as documented in Duke's Corrective Action Program (PIP). This issue is similar to that identified at the Quad Cities Station during the NRC's Component Design Basis Inspection on November 28, 2006 as discussed in NRC Inspection Report 2006-003. Duke has determined that a 60 day implementation grace period will be sufficient to implement this LAR.

Revisions to the McGuire and Catawba UFSARs will be made in accordance with 10CFR50.71(e).

Reprinted McGuire and Catawba Technical Specification and Bases pages will be provided to the NRC upon issuance of the approved amendments.

In accordance with Duke internal procedures and the Quality Assurance Topical Report, the proposed amendment has been reviewed and approved by the McGuire and Catawba Plant Operations Review Committees and the Duke Corporate Nuclear Safety Review Board.

Pursuant to 10CFR50.91, a copy of this LAR has been forwarded to the appropriate North Carolina and South Carolina state officials.

Please direct any questions you may have in this matter to K. L. Ashe at (704) 875-4535.

Very truly yours,

Bruce Hamilton

B. H. Hamilton

cc w/ Attachments:

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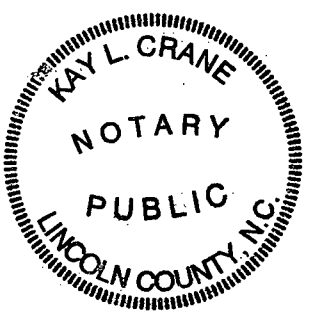
Bruce H. Hamilton affirms that he is the person who subscribed his name to the foregoing statement, and that all the matters and facts set forth herein are true and correct to the best of his knowledge.

Bruce Hamilton

Bruce H. Hamilton, Site Vice President, McGuire Nuclear Station

Subscribed and sworn to me: 5-15-09
Date

Kay L Crane, Notary Public



My commission expires: 4-1-2012
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bxc w/attachments:

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Catawba Document Control File 801.01 - CN04DM
MNS Master File (MG01DM)
Catawba RGC Date File
NRIA/ELL (EC05O)
NSRB Support Staff (EC05N)
NCMPA-1
NCEMC
PMPA

ATTACHMENT 1

EVALUATION OF PROPOSED AMENDMENT

1.0 SUMMARY DESCRIPTION

Pursuant to 10CFR50.90, Duke Energy Carolinas, LLC (Duke) proposes a license amendment request (LAR) for the Renewed Facility Operating License (FOL) and Technical Specifications for McGuire and Catawba Nuclear Stations, Units 1 and 2.

The proposed LAR revises Section 5.5, "Programs and Manuals," of the McGuire and Catawba Technical Specifications to include a new Battery Monitoring and Maintenance Program. The program is based upon manufacturer's recommendations, industry practices and the recommendations of the Institute of Electrical and Electronics Engineers (IEEE) Standard 450, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications."

The proposed LAR also relocates MNS TS 3.8.4 Surveillance Requirements (SRs) 3.8.4.2 through 3.8.4.5 and CNS TS 3.8.4 SRs 3.8.4.3 through 3.8.4.6 to the respective station's (new) Battery Monitoring and Maintenance Program and revises MNS and CNS TS SR 3.8.5.1 by deleting reference to these relocated SRs. The TS Bases (TSB) associated with MNS TS 3.8.4 SRs 3.8.4.2 through 3.8.4.5 and CNS TS 3.8.4 SRs 3.8.4.3 through 3.8.4.6 are deleted.

The relocation of these SRs to a licensee controlled program is based upon Technical Specification Task Force (TSTF) Improved Standard Technical Specifications Change Traveler TSTF-360-A, Revision 1, "Requirements for DC Sources." TSTF-360-A, Revision 1 was approved by the NRC on December 18, 2000. Duke has reviewed the changes contained in TSTF-360-A, Revision 1, and it's supporting material, and has determined that it applies to McGuire and Catawba. Therefore, TSTF-360-A, Revision 1, is referenced as the basis for the changes proposed within this McGuire and Catawba LAR.

Duke has elected not to adopt other portions of TSTF-360-A, Revision 1 due to the pending nature of TSTF-500, "DC Electrical Rewrite - Update to TSTF-360." Consideration of additional changes will be made once TSTF-500 has received NRC approval.

Approval of this LAR will provide for the timely resolution of Operable But Degraded Nonconforming conditions noted regarding non-conservative battery connection resistance values in MNS TS SR 3.8.4.2 and SR 3.8.4.5 and CNS TS SR 3.8.4.3 and SR 3.8.4.6, as documented in Duke's Corrective Action Program (PIP). This issue is similar to that identified at the Quad Cities Station during the NRC's Component Design Basis Inspection on November 28, 2006 as discussed in NRC Inspection Report 2006-003.

2.0 DETAILED DESCRIPTION

2.1 System Description

The station DC electrical power system provides the AC emergency power system with control power. It also provides both motive and control power to selected safety related equipment and preferred AC vital bus power (via inverters). As required by 10 CFR 50, Appendix A, GDC 17, the DC electrical power system is designed to have sufficient independence, redundancy, and testability to perform its safety functions, assuming a single failure. The DC electrical power system also conforms to the recommendations of Regulatory Guide 1.6 and IEEE-308.

The McGuire station's 125 VDC electrical power system consists of two independent and redundant safety related Class 1E DC electrical power subsystems (Train A and Train B) which are shared by Units 1 and 2. Each subsystem (train) consists of two channels of 125 VDC batteries, the associated battery charger(s) for each battery, and all the associated control equipment and interconnecting cabling.

At Catawba, each Unit's 125 VDC Vital Instrumentation and Control Power System consists of four independent and redundant safety related Class 1E DC electrical power subsystems (Channels A, B, C, and D). Channels A and C provide power for Train A; Channels B and D provide power for Train B. Each 125 VDC system is not shared between Units. Each channel consists of one 125 VDC battery (each battery is capable of supplying 2 channels of DC loads for a train), the associated battery charger(s) for each battery, and all the associated control equipment and interconnecting cabling.

Catawba's 125 VDC Essential Diesel Auxiliary Power System is comprised of 125 VDC Diesel Auxiliary Power Batteries 1DGBA, 1DGBB, 2DGBA, and 2DGBB and 125 VDC Diesel Auxiliary Power Battery Chargers 1DGCA, 1DGCB, 2DGCA, and 2DGCB. Each 125 VDC battery is sized to carry its duty cycle load without its battery charger for two hours during a LOOP/LOCA and four hours during a Station Blackout.

There is one spare battery charger at McGuire and two spare battery chargers (one per Unit) at Catawba for the 125 VDC Vital Instrumentation and Control Power System which provides backup service in the event that the preferred battery charger is out of

service. If the spare battery charger is substituted for one of the preferred battery chargers, the requirements of independence and redundancy between subsystems are maintained. Catawba's 125 VDC Essential Diesel Generator Auxiliary Power System does not include a spare battery charger.

During normal operation, the 125 VDC load is powered from the battery chargers with the batteries floating on the system. In case of loss of normal power to the battery charger, the DC load is automatically powered from the station batteries.

At McGuire, Train A and Train B DC electrical power subsystems provide the control power for its associated Class 1E AC power load group, 4.16 kV switchgear, and 600 V load centers. The DC electrical power subsystems also provide DC electrical power to the inverters, which in turn power the AC vital buses.

At Catawba, Channels A and D of DC electrical power subsystems or the Diesel Generator (DG) DC electrical power subsystems provide power through auctioneering diode assemblies to A train bus EDE and B train bus EDF to supply the control power for its associated Class 1E AC power load group, 4.16 kV switchgear, and 600 V load centers. The DC electrical power subsystems also provide DC electrical power to the inverters, which in turn power the AC vital buses.

At McGuire, each battery (EVCA, EVCB, EVCC, EVCD) has adequate storage capacity to carry the required duty cycle for one hour after the loss of the battery charger output. In addition, the battery is capable of supplying power for the operation of anticipated momentary loads during the one hour period.

At Catawba, each 125 V vital DC battery (EBA, EBB, EBC, EBD) has adequate storage capacity to carry the required duty cycle of its own load group and the loads of another load group for a period of two hours. Each 125 V vital DC battery is also capable of supplying the anticipated momentary loads during this two hour period. The 125 V DC DG batteries have adequate storage capacity to carry the required duty cycle for 2 hours.

Each McGuire and Catawba 125 VDC Vital battery is separately housed in a ventilated room apart from its charger and distribution centers. Each channel is located in an area separated physically and electrically from the other channel to ensure that a single failure in one subsystem does not cause a failure in a redundant subsystem.

The batteries for the four channels of Vital DC are sized to produce the required capacity at 80 percent of nameplate rating, corresponding to warranted capacity at end of life cycles and the 100 percent design demand (i.e., a 1.25 aging factor is used to size the battery). The battery cells are of flooded lead acid construction with a nominal specific gravity of 1.215. Optimal long term performance is obtained by maintaining a float voltage of 2.17 to 2.25 Volts per cell (Vpc), which corresponds to a float voltage range of 130.2 to 135.0 VDC for a 60 cell battery. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge.

At McGuire and Catawba, the battery charger for each channel of DC 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 also has sufficient capacity to restore the battery from the design minimum charge to its fully charged state within 8 hours while supplying normal steady state loads discussed in the UFSAR, Chapter 8.

2.2 Detailed Description

The proposed LAR revises Section 5.5, "Programs and Manuals," of the McGuire and Catawba Technical Specifications to include a new Battery Monitoring and Maintenance Program. The program is based upon manufacturer's recommendations, industry practices and the recommendations of the Institute of Electrical and Electronics Engineers (IEEE) Standard 450, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications."

The proposed LAR then relocates MNS TS 3.8.4 Surveillance Requirements (SRs) 3.8.4.2 through 3.8.4.5 and CNS TS 3.8.4 SRs 3.8.4.3 through 3.8.4.6 to the respective station's Battery Monitoring and Maintenance Program and revises MNS and CNS TS SR 3.8.5.1 by deleting reference to these relocated SRs.

The relocation of these SRs to a licensee controlled program is based upon Technical Specification Task Force (TSTF) Improved Standard Technical Specifications Change Traveler TSTF-360-A, Revision 1, "Requirements for DC Sources." TSTF-360-A, Revision 1 was approved by the NRC on December 18, 2000. Duke has reviewed the changes contained in TSTF-360-A, Revision 1, and it's supporting material, and has determined that it applies to

McGuire and Catawba. Therefore, TSTF-360-A, Revision 1, is referenced as the basis for the changes proposed within this McGuire and Catawba LAR.

Due to the pending nature of TSTF-500, other portions of TSTF-360-A, Revision 1 will not be adopted at this time.

The following changes are specifically requested:

- Revision of Section 5.5, "Programs and Manuals," of the McGuire and Catawba Technical Specifications to include a new Battery Monitoring and Maintenance Program.
- MNS TS SRs 3.8.4.2 through 3.8.4.5 are relocated to the station's Battery Monitoring and Maintenance Program. TS SR 3.8.5.1 is revised by deleting reference to these relocated SRs.
- The TSBs associated with MNS TS SRs 3.8.4.2 through 3.8.4.5 are deleted.
- MNS TSB 3.8.5.1 is revised to delete reference to SRs 3.8.4.2 through 3.8.4.5.
- CNS TS SRs 3.8.4.3 through 3.8.4.6 are relocated to the station's Battery Monitoring and Maintenance Program. TS SR 3.8.5.1 is revised by deleting reference to these relocated SRs.
- The TSBs associated with CNS TS SRs 3.8.4.3 through 3.8.4.6 are deleted.
- CNS TSB 3.8.5.1 is revised to delete reference to SRs 3.8.4.3 through 3.8.4.6.

3.0 TECHNICAL EVALUATION

In accordance with TS SR 3.0.1, when any TS SR is not met, the Limiting Condition for Operation is not met. This is based on the premise that TS SRs represent the minimum acceptable requirements for operability of the required equipment. However, for McGuire TS SRs 3.8.4.2, 3.8.4.3, 3.8.4.4 and 3.8.4.5 (Catawba TS SRs 3.8.4.3, 3.8.4.4, 3.8.4.5 and 3.8.4.6), failure to meet the SR does not necessarily mean that the equipment is incapable of performing its safety function, and the corrective action is generally a routine or preventative maintenance activity. For example, McGuire TS SR 3.8.4.4 (Catawba 3.8.4.5) requires visual

inspection to detect corrosion and terminal connections to provide an indication of physical damage or abnormal deterioration which could potentially degrade battery performance. This action is not required for the battery to perform its safety function, but reflects ongoing preventive maintenance activities. These activities are inappropriate for operability SRs and are better controlled under the maintenance programs for batteries.

The changes relocate preventive maintenance SRs to each station's Battery Monitoring and Maintenance Program, a licensee-controlled program addressed in proposed TS Section 5.5.17.

The program will be included in McGuire and Catawba's Selected Licensee Commitments (SLC) manuals. Changes to the SLC manuals are evaluated under the provisions of 10 CFR 50.59, "Changes, Tests, and Experiments," to determine if the proposed changes require prior NRC review and approval. Furthermore, the battery and its preventive maintenance and monitoring are under the regulatory requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants."

Based on the above, the proposed changes provide adequate assurance of system operability commensurate with the safety significance since the relocated SRs will continue to be performed.

In order to address the Operable But Degraded Nonconforming conditions noted regarding non-conservative battery connection resistance values in MNS TS SR 3.8.4.2 and SR 3.8.4.5 and CNS TS SR 3.8.4.3 and SR 3.8.4.6 (similar to that identified at the Quad Cities Station during the NRC's Component Design Basis Inspection on November 28, 2006 as discussed in NRC Inspection Report 2006-003), McGuire and Catawba revised the associated procedures incorporating conservative administrative limits for battery connection resistance values. Corrective action is taken if these administrative limits are exceeded.

Based on current loading conditions, McGuire and Catawba have established a maximum battery bank average inter-cell connection resistance and individual inter-cell connection resistance value for terminal connections based on manufacturer technical bulletins, applicable IEEE standards, and industry recommendations.

McGuire and Catawba class 1E batteries are made by the GNB division of Exide Corporation. GNB uses a maximum voltage drop of 0.02 VDC per connection in the sizing data provided to the industry. However, Nuclear Logistics, Inc. (NLI) has evaluated McGuire's and Catawba's 125 VDC Vital Instrumentation and Control Power System and Catawba's 125 VDC

Diesel Essential Auxiliary Power System duty cycle load requirements and determined that 0.05 VDC per connection is acceptable based on past performance testing technical information.

When GNB sizes the connectors, they use the published 1 hour discharge rate for duty cycles less than or equal to 2 hours. MNS uses a 1 hour duty cycle and CNS uses a 2 hour duty cycle for both the 125 VDC Vital I&C and 125 VDC Diesel Essential Auxiliary Power Systems, so both plants connectors are sized using the published 1 hour discharge rate.

Based purely on battery terminal voltage, not considering connection heat generation for this short period, the most limiting portion of the duty cycle is the 1 minute discharge rate. It is during this period that battery terminal voltage reaches its lowest value throughout the duty cycle. The increase in temperature associated with the connection resistance during this 1 minute period is not significant. The heat would be dissipated by the air and battery electrolyte. Applying temperature correction and an additional conservative factor for future load growth, a maximum duty cycle load current can be calculated. Using Ohm's Law E=IR, a voltage of 0.05V and the maximum current that bounds the duty cycle, a maximum average intercell connection resistance can be calculated.

Connection heat generation is the cumulative effect of the battery currents throughout the entire duty cycle. Applying the same temperature and load growth correction factors, the weighted average duty cycle load current can be determined for the entire 60 minute duty cycle for McGuire and 120 minute duty cycle for Catawba. Using the power equation P=EI and the manufacturer's sizing data of 0.05VDC and manufacturer's 1 hour rate yields a design power dissipation at each connection. Using the $P=I^2R$ version of the power equation, a maximum individual connection resistance can be calculated based on a maximum power and a maximum weighted average duty cycle load current. This provides a bounding upper intercell connection resistance limit for a single connection.

The relocation of these SRs to a licensee controlled program is based upon Technical Specification Task Force (TSTF) Improved Standard Technical Specifications Change Traveler TSTF-360-A, Revision 1, "Requirements for DC Sources." TSTF-360-A, Revision 1 was approved by the NRC on December 18, 2000. Duke has reviewed the changes contained in TSTF-360-A, Revision 1, and it's supporting material, and has determined that it applies to McGuire and Catawba. Therefore, TSTF-360-A, Revision 1, is referenced as the basis for the changes proposed within this McGuire and Catawba LAR.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

10CFR50, Appendix A, General Design Criterion (GDC) 17, "Electric Power Systems," requires, in part, that "An onsite electric power system and an offsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety ... The onsite electric power supplies, including the batteries, and the onsite electric distribution system, shall have sufficient independence, redundancy, and testability to perform their safety functions assuming a single failure. Provisions shall be included to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electric power supplies."

GDC 18, "Inspection and Testing of Electric Power Systems," requires, in part, that "Electric power systems important to safety shall be designed to permit appropriate periodic inspection and testing of important areas and features ... "

10CFR50.63, "Loss of All Alternating Current Power," requires, in part, that "Each light-water-cooled nuclear power plant licensed to operate must be able to withstand for a specified duration and recover from a station blackout as defined in 10CFR50.2 ..."

This license amendment request is supported by justification that demonstrates that the design requirements for McGuire and Catawba's DC electrical power system will continue to be met following implementation of the proposed changes.

Compliance with these regulatory requirements is assured through the conduct of periodic battery inspections performed in accordance with McGuire and Catawba's Technical Specifications and Battery Monitoring and Maintenance Program.

4.2 Precedent

Similar License Amendment Requests have been approved for:

LaSalle Units 1 and 2, by NRC Safety Evaluation Report (SER) dated December 19, 2006

Susquehanna Units 1 and 2, by SER dated September 28, 2006, and

Columbia Generating Station, by SER dated May 1, 2007.

4.3 Significant Hazards Consideration

The proposed LAR relocates MNS TS 3.8.4 Surveillance Requirements (SRs) 3.8.4.2 through 3.8.4.5 and CNS TS 3.8.4 SRs 3.8.4.3 through 3.8.4.6 to the respective station's Battery Monitoring and Maintenance Program and revises MNS and CNS TS SR 3.8.5.1 by deleting reference to these relocated SRs. The TS Bases (TSB) associated with MNS TS 3.8.4 SRs 3.8.4.2 through 3.8.4.5 and CNS TS 3.8.4 SRs 3.8.4.3 through 3.8.4.6 are deleted. MNS and CNS TSB 3.8.5.1 are revised to delete reference to these relocated SRs.

Duke Energy Carolinas, LLC (Duke) has concluded that operation of McGuire and Catawba Nuclear Station Units 1 & 2, in accordance with the proposed changes to the Technical Specifications (TS) does not involve a significant hazards consideration. Duke's conclusion is based on its evaluation, in accordance with 10CFR50.91(a)(1), of the three standards set forth in 10CFR50.59(c) as discussed below:

A. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

Operation of the facilities in accordance with this amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated. The Class 1E DC power system is not an initiator to any accident sequence analyzed in the Updated Final Safety Analysis Report. The safety features of the batteries will continue to function as designed. The design and operation of the system is not being modified by this proposed amendment.

The relocation of MNS TS 3.8.4 SRs 3.8.4.2 through 3.8.4.5 and CNS TS 3.8.4 SRs 3.8.4.3 through 3.8.4.6 to the respective station's Battery Monitoring and Maintenance Program is based upon Technical Specification Task Force (TSTF) Improved Standard Technical Specifications Change Traveler TSTF-360-A, Revision 1, "Requirements for DC

Sources." TSTF-360-A, Revision 1 was approved by the NRC on December 18, 2000.

Based on the above, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

B. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

Operation of the facilities in accordance with this amendment would not create the possibility of a new or different kind of accident from any accident previously evaluated. No new accident causal mechanisms are created as a result of this proposed amendment. No changes are being made to any structure, system, or component which will introduce any new accident causal mechanisms. This amendment request does not impact any plant systems that are accident initiators and does not impact any safety analysis.

C. Does the proposed amendment involve a significant reduction in the margin of safety?

Response: No.

Margin of safety is related to the confidence in the ability of the fission product barriers to perform their design functions during and following an accident situation. These barriers include the fuel cladding, the reactor coolant system, and the containment system. The performance of the fuel cladding, reactor coolant and containment systems will not be impacted by the proposed change.

The proposed McGuire and Catawba battery cell connection resistance limits ensure the continued availability and operability of the vital batteries. As such, sufficient DC capacity to support operation of mitigation equipment is enhanced.

Thus, it is concluded that the proposed changes do not involve a significant reduction in the margin of safety.

4.4 Conclusions

The proposed changes relocate preventive maintenance SRs to each station's Battery Monitoring and Maintenance Program, a licensee-controlled program, addressed in proposed TS Section 5.5.17. The program will be included in McGuire and Catawba's Selected Licensee Commitments (SLC) manuals. Changes to the SLC manuals are evaluated under the provisions of 10 CFR 50.59, "Changes, Tests, and Experiments," to determine if the proposed changes require prior NRC review and approval. Furthermore, the battery and its preventive maintenance and monitoring are under the regulatory requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." This provides sufficient assurance that the batteries are maintained in a reliable condition.

5.0 ENVIRONMENTAL CONSIDERATIONS

The proposed change does not involve a significant hazards consideration, a significant change in the types of or significant increase in the amounts of any effluents that may be released offsite, or a significant increase in individual or cumulative occupational radiation exposure. Therefore, the proposed change meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9).

Pursuant to 10 CFR 51.22(b), an environmental assessment of the proposed change is not required.

ATTACHMENT 2a

Marked-Up McGuire Technical Specification and Bases

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is ≥ 125 V on float charge.	7 days
SR 3.8.4.2	~~Verify no visible corrosion at battery terminals and connectors~~. Not Used ~~OR~~ ~~Verify connection resistance of these items is ≤ 1.5 E-4 ohm.~~	~~92 days~~. Not Used
SR 3.8.4.3	~~Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.~~. Not Used	~~18 months~~. Not Used
SR 3.8.4.4	~~Remove visible terminal corrosion, verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.~~. Not Used	~~18 months~~. Not Used
SR 3.8.4.5	~~Verify battery connection resistance is ≤ 1.5 E-4 ohm for inter-cell connections, and ≤ 1.5 E-4 ohm for terminal connections.~~. Not Used	~~18 months~~. Not Used
SR 3.8.4.6	Verify each battery charger supplies ≥ 400 amps at ≥ 125 V for ≥ 1 hour.	18 months

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or required boron concentration. AND	Immediately
	A.2.4 Initiate action to restore required channel(s) of DC source(s) to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.5.1 ----------NOTE---------- The following SRs are not required to be performed: SR 3.8.4.6, SR 3.8.4.7, and SR 3.8.4.8. ----------	
For DC sources required to be OPERABLE, the following SRs are applicable: ~~SR 3.8.4.1~~ ~~SR 3.8.4.4~~ SR 3.8.4.7 ~~SR 3.8.4.2~~ ~~SR 3.8.4.5~~ SR 3.8.4.8. ~~SR 3.8.4.3~~ SR 3.8.4.6	In accordance with applicable SRs

5.5 Programs and Manuals

5.5.16 Control Room Envelope Habitability Program (continued)

b. Requirements for maintaining the CRE boundary in its design condition including configuration control and preventive maintenance.

c. Requirements for (i) determining the unfiltered air inleakage past the CRE boundary into the CRE in accordance with the testing methods and at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, "Demonstrating Control Room Envelope Integrity at Nuclear Power Reactors," Revision 0, May 2003, and (ii) assessing CRE habitability at the Frequencies specified in Sections C.1 and C.2 of Regulatory Guide 1.197, Revision 0.

d. Measurement, at designated locations, of the CRE pressure relative to atmospheric pressure during the pressurization mode of operation by one train of the CRAVS, operating at a makeup flow rate of $\leq$ 2200 cfm, at a Frequency of 18 months on a STAGGERED TEST BASIS. The results shall be trended and used as part of the periodic assessment of the CRE boundary in accordance with Regulatory Guide 1.197, Figure 1.

e. The quantitative limits on unfiltered air inleakage into the CRE. These limits shall be stated in a manner to allow direct comparison to the unfiltered air inleakage measured by the testing described in paragraph c. The unfiltered air inleakage limit for radiological challenges is the inleakage flow rate assumed in the licensing basis analyses of DBA consequences. Unfiltered air inleakage limits for hazardous chemicals must ensure that exposure of CRE occupants to these hazards will be within the assumptions in the licensing basis.

f. The provisions of SR 3.0.2 are applicable to the Frequencies for assessing CRE habitability, determining CRE unfiltered inleakage, and measuring CRE pressure and assessing the CRE boundary as required by paragraphs c and d, respectively.

5.5.17 Battery Monitoring and Maintenance Program (new)

This program provides for battery restoration and maintenance based on manufacturer's recommendations, industry practices, and IEEE Standard 450, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications."

BASES

BACKGROUND (continued)

Each battery (EVCA, EVCB, EVCC, EVCD) has adequate storage capacity to carry the required duty cycle for one hour after the loss of the battery charger output. In addition, the battery is capable of supplying power for the operation of anticipated momentary loads during the one hour period.

Each 125 VDC battery is separately housed in a ventilated room apart from its charger and distribution centers. Each channel is located in an area separated physically and electrically from the other channel to ensure that a single failure in one subsystem does not cause a failure in a redundant subsystem. There is no sharing between redundant Class 1E subsystems, such as batteries, battery chargers, or distribution panels.

~~The batteries for the channels of DC 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. Battery size is based on 125% of required capacity and, after selection of an available commercial battery, results in a battery capacity in excess of 150% of required capacity. The individual cell voltage limit is 2.13 V per cell. The minimum battery terminal voltage limit is greater than or equal to 125 V while on float charge as discussed in the UFSAR, Chapter 8 (Ref. 4). The criteria for sizing large lead storage batteries are defined in IEEE-485 (Ref. 5).~~ INSERT 1

Each channel of DC 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 also has sufficient capacity to restore the battery from the design minimum charge to its fully charged state within 8 hours while supplying normal steady state loads discussed in the UFSAR, Chapter 8 (Ref. 4).

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 6 (Ref. 6), and in the UFSAR, Chapter 15 (Ref. 7), assume that Engineered Safety Feature (ESF) systems are OPERABLE.

The OPERABILITY of the DC sources is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit. This includes maintaining the DC sources OPERABLE during accident conditions in the event of:

INSERT 1

The batteries for the channels of DC are sized to produce required capacity at 80 percent of nameplate rating, corresponding to warranted capacity at end of life cycles and the 100 percent design demand. The battery cells are of flooded lead acid construction with a nominal specific gravity of 1.215. Optimal long term performance is obtained by maintaining a float voltage of 2.17 to 2.25 V per cell, which corresponds to a float voltage range of 130.2 to 135.0 VDC for a 60 cell battery. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge. The criteria for sizing large lead acid storage batteries are defined in IEEE-485 (Ref. 5).

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.4.2 NOT USED

~~Visual inspection to detect corrosion of the battery cells and connections, or measurement of the resistance of each intercell, interrack, intertier, and terminal connection, provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance.~~

~~The Surveillance Frequency for these inspections, which can detect conditions that can cause power losses due to resistance heating, is 92 days. This Frequency is considered acceptable based on operating experience related to detecting corrosion trends.~~

SR 3.8.4.3 NOT USED

~~Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The presence of physical damage or deterioration does not necessarily represent a failure of this SR, provided an evaluation determines that the physical damage or deterioration does not affect the OPERABILITY of the battery (its ability to perform its design function). Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

SR 3.8.4.4 and SR 3.8.4.5 NOT USED

~~Visual inspection and resistance measurements of intercell, interrack, intertier, and terminal connections provide an indication of physical damage or abnormal deterioration that could indicate degraded battery condition. The anticorrosion material is used to help ensure good electrical connections and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each terminal connection. The removal of visible corrosion is a preventive maintenance SR. The presence of visible corrosion does not necessarily represent a failure of this SR provided visible corrosion is removed during performance of SR 3.8.4.4. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

BASES

ACTIONS (continued)

concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM.

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required DC sources and to continue this action until restoration is accomplished in order to provide the necessary DC electrical power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required DC sources should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

SURVEILLANCE REQUIREMENTS

SR 3.8.5.1

SR 3.8.5.1 requires performance of all Surveillances required by SR 3.8.4.1 and SR 3.8.4.6 through SR 3.8.4.8. Therefore, see the corresponding Bases for LCO 3.8.4 for a discussion of each SR.

Insert

This SR is modified by a Note. The reason for the 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 15.
3. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).

ATTACHMENT 2b

Marked-Up Catawba Technical Specification and Bases

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. A and/or D channel of DC electrical power subsystem inoperable. AND Associated train of DG DC electrical power subsystem inoperable.	D.1 Enter applicable Condition(s) and Required Action(s) of LCO 3.8.9, "Distribution Systems-Operating", for the associated train of DC electrical power distribution subsystem made inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify DC channel and DG battery terminal voltage is $\geq$ 125 V on float charge.	7 days
SR 3.8.4.2	Not Used	Not Used
SR 3.8.4.3	~~Verify no visible corrosion at the DC channel and DG battery terminals and connectors.~~ Not Used OR ~~(For the DC channel and DG batteries utilizing lead acid cells only) Verify battery connection resistance of these items is $\leq$ 1.5 E-4 ohm.~~	~~92 days~~ Not Used

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.4.4	~~Verify DC channel and DG battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.~~ Not Used	~~18 months~~ Not Used
SR 3.8.4.5	~~Remove visible terminal corrosion, verify DC channel and DC battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.~~ Not Used	~~18 months~~ Not Used
SR 3.8.4.6	~~Verify DC channel and DG lead-acid battery connection resistance is ≤ 1.5 E-4 ohm.~~ Not Used	~~18 months~~ Not Used
SR 3.8.4.7	Verify each DC channel battery charger supplies ≥ 200 amps and the DG battery charger supplies ≥ 75 amps with each charger at ≥ 125 V for ≥ 8 hours.	18 months
SR 3.8.4.8	----------NOTES---------- 1. The modified performance discharge test in SR 3.8.4.9 may be performed in lieu of the service test in SR 3.8.4.8. 2. This Surveillance shall not be performed for the DG batteries in MODE 1, 2, 3, or 4. --- Verify DC channel and DG battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	18 months

(continued)

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.3 Suspend operations involving positive reactivity additions that could result in loss of required SDM or required boron concentration. AND	Immediately
	A.2.4 Initiate action to restore required DC electrical power subsystems to OPERABLE status.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	----------NOTE---------- The following SRs are not required to be performed: SR 3.8.4.7, SR 3.8.4.8, and SR 3.8.4.9. ----------	
	For DC sources required to be OPERABLE, the following SRs are applicable: SR 3.8.4.1 ~~SR 3.8.4.4~~ SR 3.8.4.7 ~~SR 3.8.4.2~~ ~~SR 3.8.4.5~~ SR 3.8.4.8 ~~SR 3.8.4.3~~ ~~SR 3.8.4.6~~ SR 3.8.4.9	In accordance with applicable SRs

5.5 Programs and Manuals

5.5.16 Control Room Envelop Habitability Program (future, LAR in NRC review)

5.5.17 Battery Monitoring and Maintenance Program (new)

This program provides for battery restoration and maintenance based on manufacture's recommendations, industry practices and IEEE Standard 450, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications."

BASES

BACKGROUND (continued)

The DC power distribution system is described in more detail in Bases for LCO 3.8.9, "Distribution System—Operating," and LCO 3.8.10, "Distribution Systems—Shutdown."

Each 125 V vital DC battery (EBA, EBB, EBC, EBD) has adequate storage capacity to carry the required duty cycle of its own load group and the loads of another load group for a period of two hours. Each 125 V vital DC battery is also capable of supplying the anticipated momentary loads during this two hour period. The 125 V DC DG batteries have adequate storage capacity to carry the required duty cycle for 2 hours.

Each 125 V vital DC battery is separately housed in a ventilated room apart from its charger and distribution centers. Each subsystem or channel is located in an area separated physically and electrically from the other subsystem to ensure that a single failure in one subsystem does not cause a failure in a redundant subsystem. There is no sharing between redundant Class 1E subsystems, such as batteries, battery chargers, or distribution panels, except for the spare battery charger which may be aligned to either train.

~~The batteries for each channel DC electrical power subsystems 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. Battery size is based on 125% of required capacity. The voltage limit is 2.13 V per cell, which corresponds to a total minimum voltage output of 125 V per battery discussed in the UFSAR, Chapter 8 (Ref. 4). The criteria for sizing large lead storage batteries are defined in IEEE-485 (Ref. 5).~~ INSERT 1

Each channel of DC 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 also has sufficient capacity to restore the battery from the design minimum charge to its fully charged state within 8 hours while supplying normal steady state loads discussed in the UFSAR, Chapter 8 (Ref. 4).

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the UFSAR, Chapter 6 (Ref. 6), and in the UFSAR, Chapter 15 (Ref. 7), assume that Engineered Safety Feature (ESF) systems are OPERABLE. The DC electrical power system provides

INSERT 1

The batteries for the channels of DC are sized to produce required capacity at 80 percent of nameplate rating, corresponding to warranted capacity at end of life cycles and the 100 percent design demand. The battery cells are of flooded lead acid construction with a nominal specific gravity of 1.215. Optimal long term performance is obtained by maintaining a float voltage of 2.17 to 2.25 V per cell, which corresponds to a float voltage range of 130.2 to 135.0 VDC for a 60 cell battery. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge. The criteria for sizing large lead acid storage batteries are defined in IEEE-485 (Ref. 5).

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.4.3 (Not Used)

~~For the DC channel and DG batteries utilizing lead acid cells, visual inspection to detect corrosion of the battery terminals and connections, or measurement of the resistance of each intercell, interrack, intertier, and terminal connection, provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The presence of visible corrosion does not necessarily represent a failure of this SR, provided an evaluation determines that the visible corrosion does not affect the OPERABILITY of the battery.~~

~~For the DG batteries utilizing nickel cadmium cells, visual inspection to detect corrosion of the battery terminals and connections provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The presence of visible corrosion does not necessarily represent a failure of this SR, provided an evaluation determines that the visible corrosion does not affect the OPERABILITY of the battery.~~

~~The Surveillance Frequency for these inspections, which can detect conditions that can cause power losses due to resistance heating, is 92 days. This Frequency is considered acceptable based on operating experience related to detecting corrosion trends.~~

SR 3.8.4.4 (Not Used)

~~For the DG channel batteries, visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The presence of physical damage or deterioration does not necessarily represent a failure of this SR, provided an evaluation determines that the physical damage or deterioration does not affect the OPERABILITY of the battery (its ability to perform its design function).~~

~~For the DG batteries, visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. Since the DG nickel cadmium battery cell jars are not transparent, a direct visual inspection of the cell plates cannot be performed. Instead, the cell plates are inspected for physical damage and abnormal deterioration by: 1) visually inspecting the jar sides of each cell for excessive bowing and/or deformation, and 2) visually inspecting the electrolyte of each cell for abnormal appearance.~~

SURVEILLANCE REQUIREMENTS (continued)

~~Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

SR 3.8.4.5 and SR 3.8.4.6 (Not Used)

~~Visual inspection and resistance measurements of intercell, interrack, intertier, and terminal connections provide an indication of physical damage or abnormal deterioration that could indicate degraded battery condition. The anticorrosion material, as recommended by the manufacturer for the batteries, is used to help ensure good electrical connections and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each terminal connection. The removal of visible corrosion is a preventive maintenance SR. The presence of visible corrosion does not necessarily represent a failure of this SR provided visible corrosion is removed during performance of SR 3.8.4.5.~~

~~For the DG batteries utilizing nickel cadmium cells, the cell to cell terminal pole screws should be set from 14 to 15 foot pounds of torque. Operating experience has shown that these components usually pass the SR when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

SR 3.8.4.7

This SR requires that each battery charger for the DC channel be capable of supplying at least 200 amps and at least 75 amps for the DG chargers. All chargers shall be tested at a voltage of at least 125 V for $\geq$ 8 hours. These requirements are based on the design capacity of the chargers (Ref. 4). According to Regulatory Guide 1.32 (Ref. 10), the battery charger supply is required to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The minimum required amperes and duration ensures that these requirements can be satisfied.

The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these 18 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

ACTIONS (continued)

limits is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that what would be required in the RCS for minimum SDM or refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operation. Introduction of temperature changes including temperature increases when operating with a positive MTC must also be evaluated to ensure they do not result in a loss of required SDM.

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required DC electrical power subsystems and to continue this action until restoration is accomplished in order to provide the necessary DC electrical power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required DC electrical power subsystems should be completed as quickly as possible in order to minimize the time during which the unit safety systems may be without sufficient power.

SURVEILLANCE REQUIREMENTS

SR 3.8.5.1

Delete Insert

SR 3.8.5.1 ~~requires performance of all~~ Surveillances required by SR 3.8.4.1, ~~SR 3.8.4.2,~~ and SR 3.8.4.7 through SR 3.8.4.9. Therefore, see the ~~corresponding Bases for LCO 3.8.4~~ for a discussion of each SR.

This SR is modified by a Note. The reason for the 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 15.
3. 10 CFR 50.36, Technical Specifications, (c)(2)(ii).