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May 31, 2005
GO2-05-099

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397 LICENSE AMENDMENT REQUEST TO TECHNICAL SPECIFICATIONS ASSOCIATED WITH AC AND DC ELECTRICAL POWER**

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, "Application for Amendment of License or Construction Permit," Energy Northwest hereby requests an amendment to the Technical Specifications (TS) for Columbia Generating Station (Columbia) Operating License (NPF-21). The proposed change modifies TS Sections 3.8.1, "AC Sources – Operating," 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 change requests incorporation of clarifying requirements in surveillance testing of diesel generators and new actions for an inoperable battery charger for Limiting Condition for Operation (LCO) 3.8.4 and LCO 3.8.5. The proposed change also includes a revision of the Administrative Program to be consistent with Institute of Electrical and Electronics Engineers (IEEE) Standard 450-2002, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," the supporting standard.

This change is consistent with Technical Specifications Task Force (TSTF) Traveler TSTF-360, Revision 1, "DC Electrical Rewrite," which was approved by the NRC on December 18, 2000 and TSTF-451, Revision 0, "Correct the Battery Monitoring and Maintenance Program and the Bases of SR 3.8.4.2." The proposed change includes 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. These changes propose 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-limit conditions for battery cell voltage, electrolyte level, and electrolyte temperature be added to TS Section 3.8.6. Specific SRs are being proposed for verification of these parameters. The items proposed to be relocated will be contained within the new program proposed in the new TS Section 5.5.13.

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In accordance with TSTF-360, the proposed change will allow additional time for maintenance and testing of the nominal 125 volt direct current (VDC) and 250 VDC divisional battery chargers. In addition, relocation of the preventive maintenance SRs and battery cell parameter requirements to a licensee-controlled program will continue to provide an adequate level of control of these requirements, assure the batteries are maintained at current levels of performance, allow flexibility to monitor and control these limits at values directly related to the batteries' ability to perform their function, and allow the TS to focus on parameter value degradations that approach levels that may impact battery operability.

This proposed change modifies mode restrictions on the performance of Surveillances in Specifications 3.8.1 and 3.8.4. The MODE restriction Notes on Surveillances in Specifications 3.8.1 and 3.8.4 are modified to allow performance of the Surveillances in the currently prohibited MODES in order to reestablish OPERABILITY. This proposed change is consistent with TSTF-283, Revision 3, "Modify Section 3.8 Mode Restriction Notes."

The proposed change requests clarifying language associated with power factor criteria when testing diesel generators in TS Section 3.8.1. This proposed change is consistent with NUREG-1434, Revision 3, "Standard Technical Specifications General Electric Plants, BWR/6 Specifications."

This request is subdivided as follows.

- Attachment 1 provides an evaluation supporting the proposed TS changes, including differences between the proposed changes and TSTF-360 due to plant-specific design features and ease of use considerations.

- Attachment 2 contains the marked-up TS pages with the proposed changes indicated.

- Attachment 3 provides the TS Bases pages with the proposed changes indicated. The TS Bases pages are provided for information only.

- Attachment 4 provides a listing of Regulatory Commitments made with this submittal.

The proposed changes have been reviewed by the Columbia Generating Station Plant Operations Committee (POC) and Corporate Nuclear Safety Review Board (CNSRB) and recommended for submission to the NRC in accordance with the requirements of the Columbia Quality Assurance Program.

Energy Northwest requests approval of these changes prior to January 15, 2006. Once approved, the amendment will be implemented within 120 days. This implementation period will provide adequate time for station documents to be revised using the appropriate change control mechanisms.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), Energy Northwest is notifying the State of Washington of this application for change to the TS by transmitting a copy of this letter and its attachments to the designated State Official.

If you have any questions or require additional information regarding this matter, please contact GV Cullen, Licensing Supervisor at (509) 377-6105.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 5/31, 2005.

Respectfully,

WS Oxenford
Vice President, Technical Services
Mail Drop PE04

Attachments:
1. Evaluation of Proposed Changes
2. Markup of Technical Specification Pages
3. Markup of Technical Specification Bases Pages
4. List of Regulatory Commitments

cc: BS Mallett - NRC RIV
BJ Benney - NRC NRR
NRC Sr. Resident Inspector - 988C
RR Cowley - WDOH
RN Sherman - BPA/1399
WA Horin - Winston & Strawn
JO Luce – EFSEC

ATTACHMENT 1
Evaluation of Proposed Changes

COLUMBIA GENERATING STATION
FACILITY OPERATING LICENSE NO NPF-21

Request for Amendment to Technical Specifications
Associated With AC and DC Electrical Power

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ATTACHMENT 1
Evaluation of Proposed Changes

1.0 DESCRIPTION

Pursuant to 10 CFR 50.90, "Application for Amendment of License or Construction Permit," Energy Northwest hereby requests an amendment to the Technical Specifications (TS) for Columbia Generating Station (Columbia) Operating License (NPF-21). The proposed changes modify TS Sections 3.8.1, "AC Sources – Operating," 3.8.4, "DC Sources - Operating," 3.8.5, "DC Sources - Shutdown," 3.8.6, "Battery Cell Parameters," and 5.5, "Programs and Manuals."

1.1 TSTF 283-A Description

The proposed change modifies mode restrictions on the performance of Surveillances in Specifications 3.8.1 and 3.8.4. The MODE restriction Notes on Surveillances in Specifications 3.8.1 and 3.8.4 are modified to allow performance of the Surveillances in the currently prohibited MODES in order to reestablish OPERABILITY. The Surveillances may either be fully or partially performed.

The Technical Specifications (Appendix A of the Operating License) include Surveillance Requirements (SRs) that require the performance of testing to confirm OPERABILITY of the station emergency/standby diesel generators (DGs) and batteries. Testing, monitoring and inspection per these SRs are required to be performed on a periodic basis, but in some cases such activities may also be performed to verify or re-establish OPERABILITY following repairs or other unanticipated corrective maintenance. Testing per some of the applicable SRs can be performed during any plant MODE. However, some of the SRs contain the provision that the surveillance is not to be performed during certain plant MODES. The proposed changes would modify such MODE restrictions by revising the Note associated with each applicable SR to conditionally allow the surveillance to be performed (or partially performed) during currently prohibited MODES.

Specifically, the proposed changes would modify Notes associated with SR 3.8.1.8 (transfer of power supply test), SR 3.8.1.11 (loss-of-offsite-power test), SR 3.8.1.12 (safety injection actuation signal test), SR 3.8.1.16 (synchronizing test), SR 3.8.1.18 (load sequencing test), SR 3.8.1.19 (combined safety injection actuation signal and loss-of-offsite-power test), SR 3.8.4.7 (re-designated as SR 3.8.4.3, battery service test), and SR 3.8.4.8 (relocated to SR 3.8.6.6, battery performance test) to allow performance or partial performance of these surveillances in order to re-establish OPERABILITY following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns during plant operation.

These proposed changes are consistent with Nuclear Regulatory Commission (NRC) approved Industry/Technical Specification Task Force (TSTF) Standard Technical Specification (STS) change TSTF-283-A, Revision 3 (Reference 1).

1.2 TSTF 360 Description

The proposed changes modify the TS DC System Limiting Condition for Operation (LCO) 3.8.4, LCO 3.8.5, and LCO 3.8.6 requirements. The proposed changes are consistent with TSTF-360 (Reference 2), which was approved by the NRC in Reference 3. There are some differences between the proposed changes and TSTF-360 due to plant-specific design features and ease of use considerations. These differences are explained in Sections 2.2, beginning on page 10, and 4.2, beginning on page 25.

The proposed changes include the following:

- Provide a specific action and increase the Completion Time for an inoperable battery charger.
- Relocate the preventive maintenance SRs safety related battery and battery charger testing to a licensee-controlled program.
- Replace battery specific gravity monitoring with float current monitoring.
- Revise the Administrative Program, adding 5.5.13, "Battery Monitoring and Maintenance Program," to be consistent with Institute of Electrical and Electronics Engineers (IEEE) Standard 450-2002, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications" (Reference 4), the supporting standard.
- Relocate TS Table 3.8.6-1, "Battery Cell Parameter Requirements" and the following actions for cell voltage and electrolyte limits to a new licensee-controlled program:
  - Category A and B value limits for cell voltage and electrolyte level, along with the associated compensatory actions.
  - Category C specific value limit for electrolyte level, electrolyte temperature and minimum battery float voltage.
- Add specific actions with associated completion times for out-of-limit conditions for battery cell voltage, electrolyte level, and electrolyte temperature to TS Section 3.8.6.

1.3 TSTF 451 Description

Administrative Program 5.5.13, "Battery Monitoring and Maintenance Program," is established consistent with IEEE-450-2002, the supporting standard. The program requirements described in TSTF-360 are revised to require actions to equalize and test battery cells with electrolyte level below the top of the plates, not below the minimum established design limit. These proposed changes are consistent with NRC approved STS change TSTF-451, Revision 0 (Reference 5).

1.4 NUREG 1434 Revision 3 Description

The proposed change would clarify language associated with power factor criteria when testing diesel generators. The proposed language is currently contained in Revision 3 of NUREG 1434. The NRC has issued NUREG 1434 Revision 3 for use by licensees for requesting changes to their Technical Specifications. These proposed changes are consistent with NRC approved NUREG 1434, Revision 3 (Reference 6).

2.0 PROPOSED CHANGES

Energy Northwest has reviewed the proposed changes for impact on previous submittals awaiting NRC approval for Columbia, and has determined there is no technical impact.

A markup of the affected TS pages is provided in Attachment 2. Attachment 3 provides changes to the affected TS Bases pages. Information contained in Attachment 3 is provided for information only.

2.1 TSTF 283-A Proposed Changes

The following proposed changes would modify the existing TS to allow more flexibility for DG and battery testing, when required to reestablish OPERABILITY following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns during plant operation, in accordance with TSTF-283, Revision 3. The changes would be implemented by revising the applicable Note associated with each affected surveillance.

- SR 3.8.1.8 currently contains a Note which states:

  "The automatic transfer function of this Surveillance shall not be performed in MODE I or 2. However, credit may be taken for unplanned events that satisfy this SR."

  For the proposed change to this SR, this Note would be replaced with the following Note:

  " The automatic transfer function of this Surveillance shall not normally be performed in MODE I or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR."

- SR 3.8.1.11 currently contains Note 2 which states:

  "This Surveillance shall not be performed in MODE I, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR."

  For the proposed change to this SR, this Note would be replaced with the following Note 2:

  "This Surveillance shall not normally be performed in MODE I, 2, or 3. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR."

- SR 3.8.1.12 currently contains Note 2, which states:

  "This Surveillance shall not be performed in MODE I or 2. However, credit may be taken for unplanned events that satisfy this SR."

  For the proposed change to this SR, this Note would be replaced with the following Note 2:

  "This Surveillance shall not normally be performed in MODE I or 2. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR."

- SR 3.8.1.16 currently contains the following Note:

  "This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR."

  For the proposed change to this SR, this Note would be replaced with the following Note:

  "This Surveillance shall not normally be performed in MODE 1, 2, or 3. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR."

- SR 3.8.1.18 currently contains the following Note:

  "This Surveillance shall not be performed in MODE I, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR."

  For the proposed change to this SR, this Note would be replaced with the following Note:

  "This Surveillance shall not normally be performed in MODE I, 2, or 3. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR."
- SR 3.8.1.19 currently contains Note 2, which states:

  "This Surveillance shall not be performed in MODE I, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR."

For the proposed change to this SR, this Note would be replaced with the following Note 2:

"This Surveillance shall not normally be performed in MODE I, 2, or 3. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR."

- SR 3.8.4.7 (changed below to SR 3.8.4.3) currently contains Note 2, which states:

  "This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR."

  For the proposed change to this SR, this Note would be replaced with the following Note 2:

  "This Surveillance shall not normally be performed in MODE 1, 2, or 3 for the Division 1 and 2 125 V DC batteries. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR."

  The restriction of this note to only Division 1 and 2 125 V DC batteries is evaluated below in association with TSTF-360.

- SR 3.8.4.8 (changed below to SR 3.8.6.6) currently contains a Note, which states:

  "This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR."

  For the proposed change to this SR, this Note would be replaced with the following Note:

  "This Surveillance shall not normally be performed in MODE 1, 2, or 3 for the Division 1 and 2 125 V DC batteries. However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR."

  The restriction of this note to only Division 1 and 2 125 V DC batteries is evaluated below in association with TSTF-360.

Incorporating TSTF-283 for the affected SRs will give the flexibility to perform (or partially perform) these Surveillances online for the purpose of reestablishing OPERABILITY without having to shut down the plant. This can eliminate any transients potentially involved with a plant shutdown.

2.2 TSTF 360 Proposed Changes

The proposed changes revise TS 3.8.4, TS 3.8.5, TS 3.8.6, and TS Section 5.5 to be consistent with Reference 2. Each related change is grouped and discussed in detail below. These groupings follow the general presentation found in Reference 2. Section 4.0, "Technical Analysis," presents subsections that are organized following the below lettered summary of proposed changes.

To account for the Columbia plant design and current licensing basis and for ease of use considerations, some differences from the Reference 2 proposed changes are necessary. These differences are numbered from 1 through 8 and discussed at the end of this section (beginning on page 10) and in Section 4.2 (beginning on page 25). These numbered differences are also indicated as boxed numbers on the proposed TS markups in Attachment 2 for ease of reference.

A. Provide Specific Actions and an Increased Completion Time for an Inoperable Battery Charger

TS 3.8.4 is being revised to add new Conditions A, B and C. Condition A addresses the condition in which a required Division 1 or 2 125 VDC battery charger on one division becomes inoperable, Condition B addresses the condition in which a required Division 3 125 VDC battery charger becomes inoperable, and Condition C addresses the condition in which a required Division 1 250 VDC battery charger becomes inoperable. Required Actions are proposed that provide a tiered response that focuses on returning the battery to the fully charged state and restoring a charger to operable status in a reasonable time. Required Action A.1, B.1 or C.1 requires that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage within two hours. Required Action A.2, B.2 or C.2 requires verification that the battery float current be less than or equal to two amps once per 12 hours. Required Action A.3, B.3 or C.3 limits the restoration time for the required inoperable battery charger to seven days.

Existing TS 3.8.4 Conditions A, B, C, and D are re-designated to reflect the addition of new Conditions A through F.

TS 3.8.5 is being revised to add new Condition A, which specifies required actions and associated completion times for one required battery charger on one division inoperable with the redundant required division battery and charger operable. The Required Actions and Completion are the same as new Condition A for TS 3.8.4 described above.

TS 3.8.5 Condition B (previously Condition A) is revised to adopt wording consistent with TSTF-360 and to address the situation in which the Required Actions and associated Completion Times of Condition A are not met or for reasons other than Condition A.

B. Relocate Preventive Maintenance SRs to Licensee-Controlled Programs

Existing SR 3.8.4.2, SR 3.8.4.3, SR 3.8.4.4, and SR 3.8.4.5 are being deleted from the Columbia TS and relocated to a licensee-controlled program. These SRs are also listed in SR 3.8.5.1 and will be deleted from SR 3.8.5.1. This requires renumbering of SR 3.8.4.6 as SR 3.8.4.2, and SR 3.8.4.7 as SR 3.8.4.3.

C. Relocate Battery Terminal Voltage Values to Licensee-controlled Programs

SR 3.8.4.1 is being revised to require verification that battery terminal voltage is greater than or equal to the minimum established float voltage, which will be established in a licensee-controlled program.

SR 3.8.4.7 (re-designated as SR 3.8.4.3), Note 1 is modified from the current TS wording to match the TSTF-360 wording. The statements, "the service test in" and "once per 60 months" are removed from the current TS to match the TSTF-360 wording. The reference to the relocated SR 3.8.4.8 is also revised.

SR 3.8.4.7 (re-designated as SR 3.8.4.3), Note 2 is modified to limit the mode restriction to the Division 1 and 2 125 VDC batteries.

D. Relocate SR 3.8.4.8 to SR 3.8.6.6

SR 3.8.4.8 is being relocated to TS Section 3.8.6 as SR 3.8.6.6. This SR was also listed in SR 3.8.5.1 and SR 3.8.4.7.

The references to section 3.8.4 SRs in current SR 3.8.5.1 are renumbered based on renumbering of the SRs in section 3.8.4.

SR 3.8.4.8 (re-designated as SR 3.8.6.6), Note is modified to limit the mode restriction to the Division 1 and 2 125 VDC batteries.

E. Replace Battery Specific Gravity Monitoring with Float Current Monitoring

The specific gravity limits of Table 3.8.6-1 and associated footnotes (b) and (c) are being deleted. Currently, verification of battery cell specific gravity is required by existing SR 3.8.6.1 and SR 3.8.6.2. Under the proposed changes, specific gravity monitoring will be replaced with float current monitoring. New SR 3.8.6.1 requires verification that each battery float current is less than or equal to two amps when battery terminal voltage is greater than or equal to the minimum established float voltage. The Frequency of new SR 3.8.6.1 is seven days.

F. Relocate Limiting Values for Battery Cell Float Voltage and Electrolyte Level to a Licensee-Controlled Program

The proposed changes delete Condition A of TS 3.8.6, SR 3.8.6.1, SR 3.8.6.2, SR 3.8.6.3, and the remainder of Table 3.8.6-1 (i.e., the portion not discussed in Section E above) from TS Section 3.8.6. These requirements are being relocated 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.

In addition, the title of TS Section 3.8.6 is being revised to "Battery Parameters" and the LCO is being revised to read: "Battery parameters for the Division 1, 2 and 3 batteries shall be within limits." A corresponding change to the TS Table of Contents is being made to be consistent with the revised TS Section 3.8.6 title.

G. Create an Administrative Program Under TS Section 5.5.13 to Reference Actions for Cell Voltage and Electrolyte Level

A new program is being added to TS Section 5.5. Specifically, TS Section 5.5.13, "Battery Monitoring and Maintenance Program," is added to provide for restoration and maintenance actions for station batteries based on the recommendations of Reference 2.

H. Provide Specific Actions with Increased Completion Times for Out-of-limit Conditions for Cell Voltage, Electrolyte Level, and Electrolyte Temperature

Five new Conditions are being added to TS 3.8.6. These Conditions with their associated Required Actions provide compensatory actions for a specific abnormal battery condition.

- Condition A addresses the situation in which one or more batteries have one or more battery cells with a float voltage less than 2.07 V.
- Condition B addresses the situation in which one or more batteries are found with a float current greater than two amps.
- Condition C addresses the situation in which one or more batteries have one or more battery cells with electrolyte level less than the minimum established design limits.
- Condition D addresses the situation in which one or more batteries are found with pilot cell electrolyte temperature less than minimum established design limits.
- Condition E addresses the situation in which two or more batteries in redundant divisions are found with battery parameters not within limits.

As a result of the new conditions, existing Condition B is being re-designated as Condition F to account for the added conditions. This Condition is also revised to address the situation in which one or more batteries have one or more cells with float voltage less than 2.07 volts and float current greater than two amps.

The following new SRs are being added to TS 3.8.6, in addition to new SR 3.8.6.1 discussed above.

- SR 3.8.6.2 requires verification that each battery pilot cell voltage is greater than or equal to 2.07 V every 31 days.
- SR 3.8.6.3 requires verification that each battery connected cell electrolyte level is greater than or equal to minimum established design limits every 31 days.
- SR 3.8.6.4 requires verification that each battery pilot cell temperature is greater than or equal to minimum established design limits every 31 days.
- SR 3.8.6.5 requires verification that each battery connected cell voltage is greater than or equal to 2.07 V every 92 days.

Differences from TSTF-360 proposed changes

1. Add additional Conditions to TSTF-360 TS 3.8.4 Condition A to reflect plant-specific equipment.
   TSTF-360 TS 3.8.4 new Condition A is modified as follows.
   - The wording "One or two battery chargers ..." is revised to state, "One required Division 1 or 2 125 VDC battery charger...."
   - New Condition B is added to include the situation in which one required Division 3 125 VDC battery charger is inoperable.
   - New Condition C is added to include the situation in which one required Division 1 250 VDC battery charger is inoperable.

   In addition, the word "required" is added to the Condition statement and Required Actions A.3, B.3 and C.3.

2. Re-designate and add additional Conditions to TSTF-360 TS 3.8.4 Condition B to reflect plant-specific equipment.
   TSTF-360 TS 3.8.4 new Condition B is modified as follows.
   - Condition B is re-designed as Condition D.
   - The wording "One or two batteries..." is revised to state, "One required Division 1 or 2 125 VDC battery...."
   - New Condition E is added to include the situation in which one required Division 3 125 VDC battery is inoperable.
   - New Condition F is added to include the situation in which one required Division 1 250 VDC battery is inoperable.

3. Provide appropriate Conditions and end states consistent with current licensing basis.
   Existing TS 3.8.4 Conditions A, B and C (revised to G, H, and I) are revised to provide the appropriate Conditions and end state for situations in which the Required Actions and associated Completion Times for Condition A, B or C are not met.

4. Leave battery charger test duration and acceptance criteria as it currently exists in the Columbia TS.
   For SR 3.8.4.6 (re-designated as SR 3.8.4.2) the wording will remain consistent with the current design basis, with the exception of deleting the Note to be consistent with TSTF-360. The current testing is per manufacturer's recommendations and provides adequate assurance of operability.

5. Clarify applicability of Note 2.
   The wording in SR 3.8.4.7 (re-designated as 3.8.4.3) Note 2 and SR 3.8.4.8 (re-designated as 3.8.6.6) Note is changed to clarify that the notes only apply to Division 1 and 2 125 VDC batteries.

6. Incorporate TS conventional wording to acknowledge the condition in which only some equipment may be required.
   For TS 3.8.5 Condition A, the word "required" is added to the TSTF-360 Condition A statement and Required Action A.3.

7. Reflect additional non-redundant divisions of batteries in the Columbia design to avoid inappropriate entry into LCO 3.0.3.
   The wording in TS 3.8.6 new Conditions A through D and F is revised from the TSTF-360 wording, "one or two batteries," to state "one or more batteries." The words "on one division" are removed. The wording in Condition E is revised from the TSTF-360 wording, "one or more batteries in redundant divisions," to state "two or more redundant division batteries." An additional OR statement is added to Condition F to read "One or more batteries with a required Battery Parameter not met for reasons other than Condition A, B, C, D or E".

8. Change the IEEE 450-1995 reference to IEEE 450-2002.
   Though not specifically stated in TS 5.5.13, the IEEE 450 reference is changed from the 1995 edition to the 2002 edition. The IEEE 450-2002 fully supports the intent of TSTF-360, replacing specific gravity with float current monitoring.

Need for Revision of the Requirements

The current TS completion time for an inoperable battery charger is the same time as for an inoperable battery or a completely de-energized DC distribution subsystem. The proposed changes will allow additional time for maintenance and testing of the 125 VDC and 250 VDC divisional battery chargers. In addition, relocation of the preventive maintenance SRs and battery cell parameter requirements to a licensee-controlled program will continue to provide an adequate level of control of these requirements, assure the batteries are maintained at current levels of performance, allow flexibility to monitor and control these limits at values directly related to the batteries' ability to perform their function, and allow the TS to focus on parameter value degradations which approach levels that may impact battery operability.

2.3 TSTF 451 Proposed Changes

The proposed changes revise Section 5.5.13, "Battery Monitoring and Maintenance Program," which was added by the previous paragraphs to be consistent with TSTF-360. The wording recommended by TSTF 360 for paragraph b states:

> b. Actions to equalize and test battery cells that had been discovered with electrolyte level below the minimum established design limit.

Item 5.5.13, paragraph b is revised in accordance with TSTF 451 to state:

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

2.4 NUREG 1434 Revision 3 Proposed Changes

The following proposed changes modify the existing TS to provide clarifying language to existing power factor requirements associated with grid conditions during DG testing in accordance with Revision 3 of NUREG 1434. The changes would be implemented by revising the applicable Note associated with each affected surveillance.

- SR 3.8.1.9 currently contains Note 2, which states:

  "If performed with the DG synchronized with offsite power, it shall be performed at a power factor as close to the power factor of the single largest post-accident load as practicable."

  For the proposed change to this SR, this Note would be replaced with the following Note 2:

  "If performed with the DG synchronized with offsite power, it shall be performed at a power factor as close to the power factor of the single largest post-accident load as practicable. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition, the power factor shall be maintained as close to the limit as practicable."

- SR 3.8.1.10 currently contains Note 2 which states:

  "If performed with the DG synchronized with offsite power, it shall be performed at the accident load power factor, or at a power factor as close to the accident load power factor as practicable with the field excitation current > 90% of the continuous rating."

  For the proposed change to this SR, this Note would be replaced with the following Note 2:

"If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤0.9 for Division 1 and 2 DGs and ≤0.91 for Division 3 DG. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition, the power factor shall be maintained as close to the limit as practicable."

- SR 3.8.1.14 currently contains Note 3 which states:

  "If performed with the DG synchronized with offsite power, it shall be performed at the accident load power factor, or at a power factor as close to the accident load power factor as practicable with the field excitation current > 90% of the continuous rating."

  For the proposed change to this SR, this Note would be replaced with the following Note 3:

  "If performed with the DG synchronized with offsite power, it shall be performed at a power factor ≤0.9 for Division 1 and 2 DGs and ≤0.91 for Division 3 DG. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition, the power factor shall be maintained as close to the limit as practicable."

3.0 BACKGROUND

3.1 Description of Class IE Alternating Current (AC) Power System and Emergency Diesel Generators

The Columbia Generating Station Class 1E AC Electrical Power Distribution System AC sources consist of the offsite power sources and the onsite standby power sources (diesel generators (DGs) 1, 2, and 3). As required by 10 CFR 50, Appendix A, GDC 17, the design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems.

The Class 1E AC distribution system supplies electrical power to three divisional load groups, Divisions 1, 2, and 3, with each division powered by an independent Class 1E 4.16 kV ESF bus. Divisions 1 and 2 4.16 kV ESF buses have two separate and independent offsite sources of power. Division 3 4.16 kV ESF bus has one offsite source of power. Each 4.16 kV ESF bus has a dedicated onsite DG. The ESF systems of any two of the three divisions provide for the minimum safety functions necessary to shut down the unit and maintain it in a safe shutdown condition.

Offsite power is supplied to the switchyard from the transmission network. From the switchyard two qualified, electrically and physically separated circuits provide AC power to the Divisions 1 and 2 4.16 kV ESF buses (SM-7 and SM-8), while one qualified circuit provides AC power to the Division 3 4.16 kV ESF bus (SM-4). One qualified circuit (to all 4.16 kV ESF buses) is from the 230 kV Ashe substation stepped down through the

230 kV/4.16 kV windings of a 230 kV/6.9 kV/4.16 kV transformer (the startup transformer, TR-S). The other qualified circuit (to Divisions 1 and 2 4.16 kV ESF buses only) is from the 115 kV Benton substation stepped down through a 115 kV/4.16 kV transformer (the backup transformer, TR-B). The offsite AC electrical power sources are designed and located so as to minimize to the extent practicable the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. A detailed description of the offsite power network and circuits to the onsite Class 1E 4.16 kV ESF buses is found in the Columbia Generating Station Final Safety Analysis Report (FSAR), Chapter 8.

A qualified offsite circuit consists of all breakers, transformers, switches, interrupting devices, cabling, and controls required to transmit power from the offsite transmission network to the onsite Class 1E ESF bus(es).

The startup transformer normally provides power to all 4.16 kV ESF buses when the main generator is not tied to the grid. An automatic transfer feature is provided for Divisions 1 and 2 such that if power is lost to a 4.16 kV ESF bus (SM-7 and SM-8) due to a loss of the startup transformer supply, the backup transformer supply breaker to the bus will automatically close and provide power. Manual live transfer capability of power between the startup and backup transformer sources is also provided. Power is provided to all the 4.16 kV ESF buses, when the main generator is tied to the grid, by a 25 kV/4.16 kV auxiliary transformer (TR-N1) fed from the main generator 25 kV isolated phase bus. However, this power source is not allowed to be credited with meeting the requirements of LCO 3.8.1.a since it is not available in sufficient time following a loss of all onsite power. Automatic transfer capability is provided so that failure of the auxiliary transformer supply (from TR-N1) causes immediate tripping of the auxiliary transformer supply breakers and simultaneous closing of the startup transformer supply breakers to the ESF buses. Each startup transformer supply breaker is interlocked to close only if the associated auxiliary transformer supply breaker is not locked out, thus preventing closing onto a fault or tying a credited source to a non-credited source. Manual live transfer capability of power between the auxiliary transformer source and the startup and backup (Divisions 1 and 2 only) transformer sources is also provided.

Following an accident signal, certain required Division 1 and 2 plant loads are started in a predetermined sequence in order to prevent overloading the startup transformer supplying offsite power to the onsite Class 1E Distribution System.

The onsite standby power source for each 4.16 kV ESF bus is a dedicated DG. A DG starts automatically on loss of coolant accident (LOCA) signal (i.e., low reactor water level signal; Level 1 for DG-1 and DG-2, Level 2 for DG-3, or high drywell pressure signal) or on an ESF bus degraded voltage or undervoltage signal. After the DG has started, it automatically ties to its respective ESF bus after offsite power is tripped as a consequence of emergency bus undervoltage or degraded voltage, independent of or coincident with a LOCA signal. The DGs also start and operate in the standby mode without tying to the ESF bus on a LOCA signal alone.

In the event of a loss of offsite power, the ESF electrical loads are automatically connected to the DGs in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a Design Basis Accident (DBA) such as a LOCA.

AC sources satisfy the requirements of Criterion 3 of 10 CFR 50.36(c)(2)(ii).

3.2 Description of Direct Current (DC) Power Source

The Columbia Generating 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. As required by 10 CFR 50, Appendix A, General Design Criterion 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 125 VDC electrical power system consists of three independent Class 1E DC electrical power subsystems, Divisions 1, 2, and 3. The 250 VDC electrical power system consists of one Class 1E DC electrical power subsystem, Division 1. Each subsystem consists of a battery, associated battery charger, and all the associated control equipment and interconnecting cabling. The Division 1 and 2 125 VDC subsystems each also have an additional full-capacity 125 VDC battery charger.

During normal operation, the DC loads are 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 loads are automatically powered from the Engineered Safety Feature (ESF) batteries.

The Division 1 125 V battery provides the control power for its associated Class 1E AC power load group, 4.16 kV switchgear and 480 V load centers. Also, the 125 V battery provides DC power to the Division 1 critical instrument power inverter, emergency lighting system, diesel generator (DG) auxiliaries and the DC control power for DG-1. Division 1 125 V DC subsystem also includes a full sized Class 1E backup charger.

The Division 2 safety related DC power source consists of a 125 V battery bank and two full capacity chargers, one of which is normally in service and the other is normally electrically isolated from the distribution system. This DC power source provides the control power for its associated Class 1E AC power load group, 4.16 kV switchgear and 480 V load centers. Also, this DC power source provides DC power to the Division 2 critical instrument power inverter, emergency lighting system, DG auxiliaries and the DC control power for DG-2. Division 2 125 V DC subsystem also includes a full sized Class 1E backup charger.

The Division 3 125 VDC power system provides power for HPCS DG field flashing control logic and control and switching function of 4.16 kV Division 3 breakers. It also provides motive and control power for the HPCS System logic, HPCS DG control and protection, and all Division 3 related control.

The 250 V battery supplies power to various reactor core isolation cooling system, residual heat removal and reactor water cleanup system valves. It also supplies power on an uninterruptible basis to plant controls, instrumentation, computer and communication equipment through a solid state inverter and the main and feedwater turbine auxiliary oil pumps; however, these loads are not TS related loads.

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 24 hours while supplying normal steady state loads.

3.3 NUREG 1434 Revision 3 Background

The initial conversion of Columbia Technical Specifications was to Revision 1 of NUREG 1434. NUREG 1434 Revision 1 did not have specific language to provide exemption of the power factor requirements for those Surveillances that specified power factor requirements. Columbia proposed and the NRC approved the existing language. Subsequently, NUREG 1434 was revised to standardize specific identification of the intent of providing an exemption from meeting the power factor criteria. This change was to identify that when grid conditions do not allow the DG to be loaded to meet both the capacity and power factor requirements, that the power factor requirement does not need to be met in order to meet the surveillance requirement for load rejection testing and 24 hour full load testing.

4.0 TECHNICAL ANALYSIS

4.1 TSTF 283-A Technical Analysis

Technical justification for the proposed changes is presented below. The justifications presented are consistent with the justifications presented in Reference 1.

The proposed change modifies the Notes in SRs 3.8.1.8 (transfer of AC sources test), 3.8.1.9 (single load rejection test), 3.8.1.11 (loss of offsite power test), 3.8.1.12 (safety injection actuation signal test), 3.8.1.16 (synchronizing test), 3.8.1.17 (test mode change-over test), 3.8.1.18 (engineered safety feature and auto-transfer load sequencing test), 3.8.1.19 (combined safety injection actuation signal and loss of offsite power test), 3.8.4.7 (re-designated as 3.8.4.3, battery service test), and 3.8.4.8 (relocated to 3.8.6.6, battery performance test) to allow performance of the surveillances or in some cases only portions of the surveillances in the currently prohibited modes in order to reestablish operability. The changes to these Notes are consistent with NRC approved change TSTF-283, Revision 3.

The TS Bases will be revised to allow testing to reestablish operability provided an assessment is performed to assure plant safety is maintained or enhanced. The TS

Bases will be updated consistent with TSTF-283 to provide the following guidance relative to this assessment: "This assessment *shall* consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the 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 the Surveillance, or portions of the Surveillance, is performed in these normally restricted modes. Risk insights or deterministic methods may be used for this assessment."

4.2 TSTF 360 Technical Analysis

Technical justification for the proposed changes is presented below. The justifications presented are consistent with the justifications presented in Reference 2. Justifications for the differences from the TSTF-360 changes (i.e., the differences numbered 1 through 8 in Section 2.2 above, beginning on page 10) are presented at the end of this section (beginning on page 25).

A. Provide Specific Actions and an Increased Completion Time for an Inoperable Battery Charger

Current TS 3.8.4 Condition A requires restoration of the Division 1 or 2 125 VDC subsystem (including battery chargers) within two hours. Conditions B and C require immediate actions to declare supported equipment inoperable with the Division 1 250 VDC or Division 3 125 VDC subsystems (including battery chargers) inoperable. These Conditions and Completion Times also include an inoperable battery or a completely de-energized DC distribution subsystem.

Three new Conditions, with associated Required Action and Completion Times are being added to TS 3.8.4 to separately address battery charger inoperability. These Conditions address the situation in which one required battery charger becomes inoperable. A proposed Completion Time of seven days focuses on a tiered approach to assure adequate battery capability is maintained.

The first priority with an inoperable battery charger is to minimize the battery discharge. Required Actions A.1, B.1 and C.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 two hours. This time provides for returning the inoperable charger to operable status or providing 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 Columbia TS. As such, including this action provides for continued safe plant operation.

The second tiered action (i.e., Required Actions A.2, B.2 and C.2) requires that once per 12 hours, battery float current be verified to be less than or equal to two 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 two 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 duty cycle.

Given that the DC bus remains energized, any battery discharge is terminated and the battery is fully recharged by the above Actions, there is reasonable basis for extending the restoration time for an inoperable charger beyond the existing two-hour limit to seven days (i.e., Required Action A.3, B.3, or C3).

The revised actions are acceptable because they 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.

Similar changes and justification are proposed for TS 3.8.5 Condition A and associated Required Actions and Completion Times.

B. Provide Specific Actions and Completion Time for an Inoperable Battery

Current TS 3.8.4 Condition A requires restoration of the Division 1 or 2 125 VDC battery operability within two hours. Current Conditions B and C require immediate actions to declare supported equipment inoperable with a battery inoperable. These are the same Completion Times specified for a completely de-energized DC distribution subsystem.

Three new Conditions (D, E and F), with associated Required Actions and Completion Times are being added to TS 3.8.4 to separately address battery inoperability. These Conditions address the situation in which one required battery becomes inoperable. The current completion time of 2 hours will remain for an inoperable battery. The addition of these new Conditions will allow a 2 hour Completion time to restore battery operability prior to declaring supported systems inoperable or initiating a plant shutdown.

The revised actions are acceptable because they focus efforts on restoring battery capabilities and applying a reasonable restoration time for an inoperable battery to avoid an unnecessary plant shutdown transient.

C. Relocate Preventive Maintenance SRs to Licensee-controlled Programs

In accordance with SR 3.0.1, when any SR is not met, the LCO is not met. This is based on the premise that SRs represent the minimum acceptable requirements for operability of the required equipment. However, for existing SR 3.8.4.2, SR 3.8.4.3, SR 3.8.4.4, and SR 3.8.4.5, 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 preventive maintenance-type activity. For example, SR 3.8.4.2 requires visual inspection to detect corrosion of the battery cells and connections to provide an indication of physical damage or abnormal deterioration that 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 proposed changes relocate preventive maintenance SRs to a licensee-controlled program addressed in proposed TS Section 5.5.13. These activities will be included in the Columbia Generating Station Licensee Controlled Specifications (LCS) and will continue to be performed consistent with the recommendations in Reference 2. Changes to the LCS 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. In addition, changes implemented which do not require prior NRC review and approval will be reported to the NRC in accordance with 10 CFR 50.71, "Maintenance of records, making of reports," paragraph (e). 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, and any changes will be evaluated in accordance with 10 CFR 50.59.

Similar changes and justification are proposed for TS 3.8.5 SRs.

D. Relocate Battery Terminal Voltage Values to Licensee-controlled Programs

Revised SR 3.8.4.1 requires verification that battery terminal voltage is within limits. This provides assurance that the battery will be restored to its fully charged condition from any discharge that might have occurred due to charger inoperability. The proposed change relocates the specific terminal voltage values to the licensee-controlled program addressed in proposed TS Section 5.5.13.

E. Relocate SR 3.8.4.8 to SR 3.8.6.6

The relocation of SR 3.8.4.8 to SR 3.8.6.6 and associated renumbering is administrative. This SR demonstrates the operability of the battery and is therefore proposed to be included in TS Section 3.8.6 related to battery operability.

F. 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 two amps when on float charge to be used to satisfy specific gravity requirements.

New SR 3.8.6.1 requires verification that each battery float current is less than or equal to two amps every seven days. This will replace the existing requirements for specific gravity monitoring. Use of float current to determine the state of charge of the battery is consistent with Section 4.5 of Reference 2. Therefore, deleting the requirement for specific gravity measurements will not have a significant impact on safety or the ability to accurately determine the operability of the batteries. Reference 2 provides further detailed generic technical support, which the NRC found acceptable in Reference 3 for this change.

G. Relocate Limiting Values for Battery Cell Float Voltage and Electrolyte Level to a Licensee-controlled Program

The proposed changes 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 (including footnote (a)) 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.

TS Table 3.8.6-1 contains various levels (i.e., Categories) of limitations on battery cell voltage, electrolyte level, and specific gravity parameters. The Category A and 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. These limits, however, do not reflect the 10 CFR 50.36, "Technical Specifications," criteria for LCOs of the lowest functional capability or performance levels of equipment required for the safe operation of the facility. It is proposed that these values and the actions associated with restoration be relocated to a licensee-controlled program (added as proposed 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 lettered E and H.

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 administrative changes.

H. Create an Administrative Program Under TS Section 5.5.13 to Reference Actions for Cell Voltage and Electrolyte Level

The proposed changes create an administrative program for maintenance, monitoring, and restoration actions for batteries by adding TS Section 5.5.13. This program will be based on the recommendations of Reference 2 and will contain the elements relocated from the affected TS LCOs. The parameter values will continue to be controlled, and any corrective actions will be implemented in accordance with the Energy Northwest Corrective Action Program. Furthermore, preventive maintenance and monitoring of batteries are in part governed by the regulatory requirements of 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants." The relocation of the elements from TS will not compromise the current levels of battery performance, and focuses the TS on parameter value degradations that approach values that may impact battery operability.

The program will require actions to restore battery cells with float voltage less than 2.13 V and actions to equalize and test battery cells that have been discovered with electrolyte level below the top of the plates. Corrective actions for these conditions will be based on Annex D of Reference 4.

The items proposed to be relocated will be contained in the LCS, which is incorporated by reference in the Columbia Final Safety Analysis Report (FSAR). Thus, changes to the program will be subject to review under 10 CFR 50.59 to determine if the proposed changes require prior NRC review and approval. In addition, changes will be reported to the NRC in accordance with 10 CFR 50.71, "Maintenance of records, making of reports," paragraph (e).

Based on the above, the proposed battery monitoring and maintenance program will contain the necessary elements to ensure that the batteries continue to be maintained in a highly reliable condition.

I. Provide Specific Actions with Increased Completion Times for Out-of-limit Conditions for Cell Voltage, Electrolyte Level, and Electrolyte Temperature

Specific Required Actions are proposed for parameters that have a unique impact on the battery and its continued operability. The proposed changes to TS Section 3.8.6 provide specific Required Actions and increased Completion Times for out-of-limit conditions for cell voltage, electrolyte level, and electrolyte temperature. These Completion Times recognize the margins available, the minimal impact on battery capacity and the capability to perform its intended function, and the likelihood of restoration in a timely fashion avoiding an unnecessary plant shutdown. In addition, SRs are proposed to verify that the

batteries are maintained within the established limitations. The bases for the specific actions and SRs are as follows.

- Condition A addresses the situation in which 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 two 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 restore the out-of-limit condition.

- Condition B represents the situation in which a battery is found with float current greater than two 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 two 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, B and C of LCO 3.8.4 address charger inoperability. If the charger is operating in the current limit mode after two hours, this indicates that the battery has been substantially discharged and likely cannot perform its required design function. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive and, without adequate assurance that it can be recharged within 12 hours (Required Action C.2), the battery must be declared inoperable.

  If the float voltage of the battery is found to be satisfactory but there are one or more battery cells with float voltage less than 2.07 V and float current greater than 2 amps, Condition F 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 simply 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, 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 addresses the situation in which 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 its intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of electrolyte level. Within 31 days, the minimum established design limits for electrolyte level must be restored.

  With electrolyte level below the top of the plates, there is a potential for dryout and plate degradation. Required Actions C.1 and C.2 address this potential as well as provisions in TS Section 5.5.13. These actions are only applicable if electrolyte level was below the top of the plates. Within 8 hours, level is required to be restored to above the top of the plates. The Required Action C.2 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 Reference 4. They are performed following the restoration of the electrolyte level to above the top of the plates. Based on the results of the manufacturer's recommended testing, the battery may have to be declared inoperable and the affected cell(s) replaced.

- Condition D addresses the situation in which 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 its intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of the pilot cell temperature, and the 12 hour Completion Time provides a reasonable time to restore the temperature within established limits.

- Condition E addresses the situation in which two or more batteries in redundant divisions have battery parameters not within limits. Given that redundant batteries are involved, the longer completion times specified for battery parameters not within limits on non-redundant batteries are not appropriate, and the parameters must be restored to within limits on at least one division within two hours.

- Condition F specifies actions to take when the Required Action and associated Completion Times are not met. When any battery parameter is outside the allowances of the Required Actions for Condition A, B, C, D, or E, 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.

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

- SR 3.8.6.1 requires verification that each battery float current is less than or equal to two 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 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 seven-day Frequency is consistent with Reference 2.

- 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 252.0 V at the 250 VDC battery terminals and 126.0 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 Frequencies for pilot cell voltage verification every 31 days and 92 days for each connected cell are consistent with Reference 2.

- SR 3.8.6.3 requires verification that each battery connected cell electrolyte level is greater than or equal to the minimum established design limit. The limit specified for electrolyte level ensures that the plates suffer no physical damage and that the cell maintains adequate electron transfer capability. The Frequency of 31 days is consistent with Reference 2.

- SR 3.8.6.4 requires verification that each battery pilot cell temperature is greater than or equal to the minimum established design limit. 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 Frequency of 31 days is consistent with Reference 2.

Justification for differences from the TSTF-360 markups

The Columbia design (BWR/5) differs from that of the typical BWR/6 design that forms the bases of the BWR/6 Improved Standard Technical Specifications (ISTS) and TSTF-360. The current Columbia DC Power TS and the proposed changes to adopt TSTF-360 incorporate these differences. Like a BWR/6, Columbia has two redundant ESF buses designated Division 1 and Division 2. In addition, a third division designated Division 3 contains the High Pressure Core Spray (HPCS) System, which is redundant to Divisions 1 and 2 for the Emergency Core Cooling System (ECCS) function. Columbia also has a Reactor Core Isolation Cooling (RCIC) System; however, unlike the BWR/6 ISTS, the 250 VDC power system that supports the operation of RCIC is incorporated into the LCO requirements for DC power.

The discussion below is numbered to correspond to the boxed numbers on the TS markups.

1. This difference adds additional conditions to TSTF-360 TS 3.8.4 Condition A and adds new Conditions B and C to reflect additional plant-specific equipment. The purpose of LCO 3.8.4 Condition A of TSTF-360 is to allow additional outage time if one DC electrical division is degraded due to the inoperability of its qualified battery charger provided the associated battery is maintained operable. The restriction to one division is intended to ensure that no more than one redundant ESF division is degraded at any one time since the remaining fully operable redundant divisions ensure that the associated ESF functions will be accomplished in the event of an accident. Because the BWR/6 ISTS is constructed to describe the actions for two or three redundant divisions, the TSTF-360 markup does not address plant configurations in which LCO 3.8.4 requires other non-redundant DC electrical divisions to be operable. Therefore, to meet the purpose of TSTF-360, the first Condition statement was modified and two additional Conditions were added to describe the actions to be taken when these non-redundant division battery chargers become inoperable. The statement in Condition A reflects the redundancy between Divisions 1 and 2. Condition B describes the Division 3 125 VDC subsystem, which provides DC power to only the HPCS system. The Columbia safety analysis for the capability to mitigate all accidents and safely shut down the plant is based on the availability of Division 1 <u>or</u> 2 <u>and</u> Division 3 or Division 1 <u>and</u> 2 ECCS systems. Condition C describes the 250 VDC subsystem, which does not power redundant components supported by Division 1, 2, or 3 125 VDC subsystems. These changes to TSTF-360 allow for non-redundant or non-required DC battery chargers to be inoperable simultaneously, while preventing redundant Division 1 and 2 chargers

from being simultaneously inoperable. The proposed Columbia TS Bases were also modified to adequately describe the basis of the proposed Conditions A, B and C.

The word "required" was added to the Condition Statement and Actions because some of the DC electrical subsystems have two 100% capacity qualified chargers. In accordance with Section 4.1.3.b of NEI 01-03, "Writers Guide for the Improved Standard Technical Specifications," the term "required" is to be used in cases where the LCO only requires some of all possible components that can be used to satisfy the LCO requirement.

2. This difference adds additional conditions to TSTF-360 TS 3.8.4 Condition B (re-designated as Condition D) and adds new Conditions E and F to reflect additional plant-specific equipment. The justification for adding the Condition E, describing the Division 3 125 VDC subsystem, and Condition F, describing the 250 VDC subsystem, is provided in change number 1 above.

3. This difference provides appropriate Conditions and end states consistent with current licensing basis. The purpose of LCO 3.8.4 Condition A of TSTF-360 is to allow additional outage time if one DC electrical division is degraded due to the inoperability of its qualified battery charger, provided the associated battery is maintained operable. If the battery cannot be maintained operable or the battery charger cannot be restored within the seven-day Completion Time, the subsequent action would be to progress to the appropriate end state for an inoperable DC electrical power subsystem consistent with the actions that would be required if the battery was determined to be inoperable.

   For Division 1 or 2, the end state progression of the BWR/6 ISTS following the two-hour Completion Time of ISTS Condition A is the shutdown action of Condition C. Thus, TSTF-360 was constructed to transition to the shutdown end state following the expiration of the Completion Times of the revised Condition A. However, besides the Division 1 and Division 2 subsystems, Columbia has other subsystems specified in LCO 3.8.4 whose end states are not shutdown actions. For those, the appropriate end state for an inoperability of their DC electric power subsystems is to declare the supported system inoperable and follow the actions required by their associated LCOs.

   - For Division 1 and Division 2 125 VDC– Mode 3 in 12 hours, Mode 4 in 36 hours.
   - For Division 3 125 VDC – Immediately declare HPCS inoperable.
   - For Division 1 250 VDC - Immediately declare associated supported features (e.g., RCIC) inoperable.

   These modifications are required to account for the Columbia design and, as described above, are consistent with the purpose of TSTF-360 and the Columbia current licensing basis for inoperable batteries. The proposed Columbia TS Bases were also modified to adequately describe the basis of the proposed Condition Statements.

4. The test and durations currently described in the Columbia TS are in accordance with manufacturers' recommendations and approved by the NRC for Columbia. The Surveillance Requirement consists of a test using three different load steps. This is a more comprehensive test to verify proper operation of all the charger components. The existing Surveillance Requirement is retained in lieu of the TSTF prescribed test and durations.

5. This difference modifies the wording in SR 3.8.4.7 (re-designated as 3.8.4.3) Note 2 and SR 3.8.4.8 (re-designated 3.8.6.6) Note to clarify that these notes only apply to Division 1 and 2 125 VDC batteries. The restriction of these Notes is removed from the Division 3 (HPCS) 125 VDC battery as the HPCS system can be inoperable for up to 14 days during modes 1 and 2. The restriction of these Notes is also being removed from the Division 1 250 VDC battery because it is more appropriate to cascade to the individual system LCOs.

6. This difference incorporates TS conventional wording to acknowledge the condition in which only some equipment may be required. Columbia LCO 3.8.5 specifies four DC electrical power subsystems that are applicable to the Specification. Depending on the plant conditions and operational activities in progress, as few as one and as many as three of these subsystems may be required to be operable by LCO 3.8.5. The word "required" was added to the Condition Statement and Actions to describe these possible configuration requirements. In accordance with Section 4.1.3.b of NEI 01-03, the term "required" is to be used in cases where the LCO only requires some of all possible components that can be used to satisfy the LCO requirement.

7. This difference is necessary to reflect the additional non-redundant divisions of batteries in the Columbia design and the additional condition for a battery that fails a capacity test in order to avoid inappropriate entry into LCO 3.0.3. The purpose of TS LCO 3.8.6 Conditions A through F of TSTF-360 is to provide the appropriate actions for a battery having out-of-limit parameters and to limit this level of degradation to one battery on one of the redundant divisions. It is also intended that even if redundant division batteries become degraded, that the applicable actions of Conditions A through F be applied to each battery as indicated by the Separate Condition Entry Note, such that if one of the two redundant division batteries is restored to within limits within the two hour Completion Time of Condition E, the remaining degraded battery would be governed by the compensatory actions specified in Conditions A through D, or F, as applicable. The manner in which TSTF-360 presents these options in Conditions A through F is to address the assumed ISTS plant configuration of two redundant divisions. Thus, Conditions A through D and F represent the condition of one of the two divisions being degraded and Condition E represents the additional degradation of the redundant division.

   Because the Columbia design and corresponding LCO requirements specify other non-redundant divisions of batteries, the wording presented in TSTF-360 could result in a conflict with LCO 3.0.3. Specifically, the Bases for LCO 3.0.3 states:

LCO 3.0.3 establishes the actions that must be implemented when an LCO is not met and:

a. .....

b. The condition of the unit is not specifically addressed by the associated ACTIONS. This means that no combination of Conditions stated in the ACTIONS can be made that exactly corresponds to the actual condition of the unit...

The language in TSTF-360 that states, "One battery on one division with [specified battery parameter not within limits]" could result in an unnecessary entry into LCO 3.0.3 based on the Columbia design and the Bases statement above. The following example illustrates this point. If the Division 2 125 VDC battery was discovered with a cell float voltage < 2.07 V, Condition A would be entered. If the Division 1 250 VDC battery were subsequently discovered to have the same condition, Condition A would be entered again (separate condition entry allowed); however, the current condition of the unit is two batteries on two non-redundant divisions with battery parameters not within limits. Because no combination of Conditions describes the actual condition of the unit, LCO 3.0.3 would be entered, albeit inappropriately based on the purpose of TSTF-360 as discussed in the TSTF-360 Bases for Condition E.

To alleviate this conflict, Condition Statements A through D and F have been reworded to state "One or more batteries with [specified battery parameter not within limits]". The presentation of "One or more [components]..." is standard language used extensively within the ISTS for LCOs which utilize a Separate Condition Entry allowance to prevent potential LCO 3.0.3 conflicts (see BWR/6 ISTS LCOs 3.1.5, 3.1.8, various 3.3 instrument, 3.4.6, 3.6.1.2, 3.6.1.3, 3.6.4.2, 3.10.3, etc.).

Additionally, Condition E was modified to state "Two or more redundant division batteries with battery parameters not within limits" to be consistent with the structure of the proposed Condition A, B, C, D, and F statements and to reflect the fact that the Columbia design does not have redundant divisions being served by a single battery. Thus, one battery on redundant divisions is not a possible plant configuration; two batteries must be inoperable in order to affect redundant divisions.

Condition F was modified to add "One or more batteries with a required Battery Parameter not met for reasons other than Condition A, B, C, D or E". This is required to provide specific actions to declare the battery inoperable if battery capacity requirements (SR 3.8.6.6) are found not to be met. Without specific actions for this condition, it would default to an entry into LCO 3.0.3.

These modifications, required to account for the Columbia design, are consistent with the purpose of TSTF-360 as described above and eliminate any potential conflict with the ISTS LCO 3.0.3 Bases. The proposed Columbia TS Bases for LCO 3.8.6 were also modified to describe the basis of proposed Condition Statements.

8. This difference updates the IEEE 450 reference to the current standard. One of the descriptions listed in TSTF-360 is "(4) Replace battery specific gravity monitoring with float current monitoring." IEEE 450-2002 more fully supports the intent of this aspect of TSTF- 360 by replacing specific gravity readings with float current readings during monthly and quarterly maintenance inspections.

4.3 TSTF 451 Technical Analysis

IEEE 450-1995, Annex D, Section D.1 states:

> For capacity, the addition of water is not urgent unless the tops of the plates are in danger of being exposed. However, for safety, if flame-arresting vents are provided, water should be added before the electrolyte level reaches the bottom of the funnel stem. Electrolyte level above the high-level line will not affect safety or capacity unless the cell reaches an electrolyte overflow condition.
>
> If the level of electrolyte had dropped low enough to expose plates, check the specific gravity where possible and then add water to at least the low-level line. If visual inspection shows no evidence of leakage, then equalize and test in accordance with the manufacturer's recommendations.

IEEE 450-2002 has similar requirements. The last paragraph recommends actions to equalize and test when the electrolyte level is below the top of the plates, not below the minimum established design limit. The minimum established design level is a level above the top of the plates.

4.4 NUREG 1434 Revision 3 Technical Analysis

The revision of the language for Note 2 of SR 3.8.1.9 and SR 3.8.1.10, and Note 3 of 3.8.1.14 of the associated Surveillance requirements is not a technical change to the Surveillance Requirement. It is an administrative change that provides clarification of the notes. This administrative change provides a specific condition (i.e., when grid conditions do not permit) for when failure to meet the power factor requirements does not affect meeting the Surveillance Requirement. The single largest load and accident load power factors are provided in the bases.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

According to 10 CFR 50.92, "Issuance of amendment," paragraph (c), a proposed amendment to an operating license involves no significant hazards consideration if operation of the facility in accordance with the proposed amendment would not:

(1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or

(2) Create the possibility of a new or different kind of accident from any accident previously evaluated; or

(3) Involve a significant reduction in a margin of safety.

The proposed changes are to Technical Specifications (TS) Section 3.8.1, "AC Sources – Operating," Section 3.8.4, "DC Sources – Operating," Section 3.8.5, "DC Sources – Shutdown," Section 3.8.6, "Battery Cell Parameters," and Section 5.5, "Programs and Manuals." The proposed changes request new actions for an inoperable battery charger for limiting condition for operation (LCO) 3.8.4 and LCO 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 preventive maintenance on the safety related batteries, to a licensee-controlled program. It is proposed that TS Table 3.8.6-1, "Battery Cell Parameter Requirements," be relocated to a licensee-controlled program, and specific Required Actions with associated Completion Times for out-of-limit 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 being proposed for the maintenance and monitoring of station batteries based on the recommendations of Institute of Electrical and Electronics Engineers (IEEE) Standard 450-2002, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications." This program will be described in new TS Section 5.5.13, "Battery Monitoring and Maintenance Program." The items proposed to be relocated will be contained within this new program.

Energy Northwest has evaluated the proposed changes to the TS for Columbia Generating Station using the criteria in 10 CFR 50.92, and has determined that the proposed changes do not involve a significant hazards consideration. The following information is provided to support a finding of no significant hazards consideration.

1. **Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?**

   Response: No

   The emergency diesel generators (DGs) and their associated emergency loads are accident-mitigating features. As such, testing of the DGs themselves is not associated with any potential accident initiating mechanism. Each DG is dedicated to a specific vital bus and these buses and DGs are independent of each other. There is no common mode failure provided by the testing changes proposed in this license amendment request (LAR) that would cause multiple bus failures. Therefore, there will be no significant impact on any accident probabilities by the approval of the requested amendment.

SR changes that are consistent with Industry/Technical Specification Task Force (TSTF) Standard Technical Specification (STS) change TSTF-283, Revision 3 have been approved by the NRC and the online tests allowed by the TSTF are only to be performed for the purpose of establishing operability. Performance of these SRs during normally restricted modes will require an assessment to assure plant safety is maintained or enhanced.

The proposed changes restructure the TS for the direct current (DC) electrical power system, consistent with TSTF-360, Revision 1. The proposed changes add actions to specifically address battery and battery charger inoperability. The DC electrical power system, including associated battery chargers, is not an initiator of any accident sequence analyzed in the Final Safety Analysis Report (FSAR). Operation in accordance with the proposed TS ensures that the DC electrical power system is capable of performing its function as described in the FSAR. Therefore, the mitigating functions supported by the DC electrical power system will continue to provide the protection assumed by the analysis.

The relocation of preventive maintenance surveillances, and certain operating limits and actions, to a newly-created licensee-controlled Battery Monitoring and Maintenance Program will not challenge the ability of the DC electrical power system to perform its design function. Appropriate monitoring and maintenance, consistent with industry standards, will continue to be performed. In addition, the DC electrical power system is within the scope of 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," which will ensure the control of maintenance activities associated with the DC electrical power system.

The integrity of fission product barriers, plant configuration, and operating procedures as described in the FSAR will not be affected by the proposed changes. Therefore, the consequences of previously analyzed accidents will not increase by implementing these changes.

Therefore, the proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. **Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?**

Response: No

The proposed changes involve restructuring the TS for the DC electrical power system. The DC electrical power system, including associated battery chargers, is not an initiator to any accident sequence analyzed in the FSAR. Rather, the DC electrical power system is used to supply equipment used to mitigate an accident.

The proposed change would create no new accidents since no changes are being made to the plant that would introduce any new accident causal mechanisms. Diesel Generators will be operated in the same configuration currently allowed by other DG SRs that allow testing in plant Modes 1 and 2 and 3. This license amendment request does not impact any plant systems that are accident initiators or adversely impact any accident mitigating systems.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any previously evaluated.

3. **Does the proposed change involve a significant reduction in a margin of safety?**

Response: No

The proposed change does not involve a significant reduction in the margin of safety. The margin of safety is related to 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 proposed changes to the testing requirements for the plant DGs do not affect the operability requirements for the DGs, as verification of such operability will continue to be performed as required. Continued verification of operability supports the capability of the DGs to perform their required function of providing emergency power to plant equipment that supports or constitutes the fission product barriers. Consequently, the performance of these fission product barriers will not be impacted by implementation of this proposed amendment.

In addition, the margin of safety is established through equipment design, operating parameters, and the setpoints at which automatic actions are initiated. The proposed changes will not adversely affect operation of plant equipment. These changes will not result in a change to the setpoints at which protective actions are initiated. Sufficient AC and DC capacity to support operation of mitigation equipment is ensured. The changes associated with the new battery maintenance and monitoring program will ensure that the station batteries are maintained in a highly reliable manner. The equipment fed by the DC electrical sources will continue to provide adequate power to safety related loads in accordance with analysis assumptions.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based upon the above, Energy Northwest concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c). Accordingly, a finding of no significant hazards consideration is justified.

5.2 Applicable Regulatory Requirements/Criteria

10 CFR 50.36, "Technical specifications," provides the regulatory requirements for the content required in a licensee's TS. Criterion 3 of 10 CFR 50.36(c)(2)(ii) requires a limiting condition for operation to be established for 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. The DC sources satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

Portions of the proposed license amendment result in relocating certain surveillances, surveillance acceptance criteria, and Required Actions that do not meet the criteria of 10 CFR 50.36(c)(2)(ii). Existing TS Table 3.8.6-1 limits reflect nominal fully charged battery parameter values, with margin above that required for declaration of an operable battery. These limits represent appropriate monitoring levels and appropriate preventive maintenance criteria for long-term battery quality and extended battery life. As such, they do not reflect the 10 CFR 50.36 criteria for LCOs of the lowest functional capability or performance levels of equipment required for safe operation of the facility. The proposed changes relocate these values and actions associated with restoration to a licensee-controlled program under the control of 10 CFR 50.59, "Changes, tests, and experiments."

The proposed items to be relocated to a licensee-controlled program will have changes subject to review under 10 CFR 50.59 to determine if the proposed changes will require prior NRC review and approval, and will require reporting of all changes to the NRC in accordance with 10 CFR 50.71(e). This provides sufficient control of the requirements to assure the batteries are maintained in a highly reliable condition.

The increased restoration times and revised criteria for monitoring the capacity of the batteries and battery chargers to perform their intended functions, are reasonable and consistent with approved standards, guidance, and regulations. The revised testing criteria ensure that full functionality is maintained and that Criterion 3 of 10 CFR 50.36(c)(2)(ii) is met.

In conclusion, based on the considerations discussed above, (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 amendment will not be inimical to the common defense and security or to the health and safety of the public.

The NRC has granted similar license amendments for Clinton Power Station, Unit 1 (Reference 7), Limerick Generating Station, Units 1 and 2 (Reference 8), Dresden Nuclear Power Station (Reference 9), and Byron and Braidwood Stations (Reference 10).

6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, "Standards for Protection Against Radiation," or would change an inspection or surveillance requirement. However, the proposed amendment does not involve: (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22, "Criterion for categorical exclusion; identification of licensing and regulatory actions eligible for categorical exclusion or otherwise not requiring environmental review," paragraph (c)(9). Therefore, pursuant to 10 CFR 51.22, paragraph (b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. Technical Specifications Task Force (TSTF) Traveler TSTF-283-A, Revision 3, "Modify Section 3.8 Mode Restriction Notes"

2. Technical Specifications Task Force (TSTF) Traveler TSTF-360, Revision 1, "DC Electrical Rewrite"

3. Letter from W. D. Becker (U. S. NRC) to A. R. Pietrangelo (Nuclear Energy Institute), dated December 18, 2000

4. Institute of Electrical and Electronics Engineers (IEEE) Standard 450-2002, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," dated April 3, 2003

5. Technical Specifications Task Force (TSTF) Traveler TSTF-451, Revision 0, "Correct the Battery Monitoring and Maintenance Program and the Bases of SR 3.8.4.2"

6. NUREG-1434, Vol. 1 and 2, Revision 3, "Standard Technical Specifications, General Electric Plants, BWR/6 Specifications," dated June 2004

7. Letter from J. B. Hopkins (U. S. NRC) to O. D. Kingsley (Exelon Generation Company, LLC), "Clinton Power Station, Unit 1 – Issuance of Amendment (TAC No. MB3071)," dated February 15, 2002

8. Letter from S. P. Wall (U. S. NRC) to J. L. Skolds (Exelon Generation Company, LLC), "Limerick Generating Station, Units 1 and 2 – Issuance of Amendment Re: DC Electrical Power Sources Based on TSTF-360 (TAC Nos. MB5257 and MB5258)," dated January 29, 2003

9. Letter from M. Banerjee (U. S. NRC) to C. M. Crane (Exelon Generation Company, LLC), "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)," dated June 8, 2004

10. Letter from M. Chawla (U. S. NRC) to J. L. Skolds (Exelon Generation Company, LLC), "Byron Station, Units 1 and 2, and Braidwood Station, Units 1 and 2 – Issuance of Amendments (TAC Nos. MB4450, MB4451, MB4448, and MB4449)," dated September 19, 2002

ATTACHMENT 2
Markup of Technical Specification Pages

COLUMBIA GENERATING STATION

FACILITY OPERATING LICENSE NO NPF-21

Request for Amendment to Technical Specifications Associated With AC and DC Electrical Power

REVISED TECHNICAL SPECIFICATIONS PAGES

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Note: Differences from the TSTF-360 recommended wording are indicated by boxed numbers on the markups and are explained in Attachment 1, Sections 2.2 (beginning on page 10) and 4.2 (beginning on page 25).

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.6	Verify each required fuel oil transfer subsystem operates to automatically transfer fuel oil from the storage tank to the day tank.	92 days
SR 3.8.1.7	----------NOTE---------- All DG starts may be preceded by an engine prelube period. ---------- Verify each required DG starts from standby condition and achieves: a. For DG-1 and DG-2 in ≤ 15 seconds, voltage ≥ 3910 V and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz; and b. For DG-3, in ≤ 15 seconds, voltage ≥ 3910 V and frequency ≥ 58.8 Hz, and after steady state conditions are reached, maintains voltage ≥ 3910 V and ≤ 4400 V and frequency ≥ 58.8 Hz and ≤ 61.2 Hz.	184 days
SR 3.8.1.8	----------NOTE---------- The automatic transfer function of this Surveillance shall not normally be performed in MODE 1 or 2. ~~However,~~ However, portions of the surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify automatic and manual transfer of the power supply to safety related buses from the startup offsite circuit to the backup offsite circuit.	24 months

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.9	----------NOTES---------- 1. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with the DG synchronized with offsite power, it shall be performed at a power factor as close to the power factor of the single largest post-accident load as practicable. ---------- Verify each required DG rejects a load greater than or equal to its associated single largest post-accident load, and following load rejection, the frequency is ≤ 66.75 Hz.	24 months
SR 3.8.1.10	----------NOTES---------- 1. Credit may be taken for unplanned events that satisfy this SR. 2. If performed with the DG synchronized with offsite power, it shall be performed ~~at the accident load power factor, or~~ at a power factor ~~as close to the accident load power factor as practicable with the field excitation current ≥ 90% of the continuous rating.~~ ≤ 0.9 for DG-1 and DG-2, and ≤ 0.91 for DG-3. ---------- Verify each required DG does not trip and voltage is maintained ≤ 4784 V during and following a load rejection of a load ≥ 4400 kW for DG-1 and DG-2 and ≥ 2600 kW for DG-3.	24 months

However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition, the power factor shall be maintained as close to the limit as practicable.

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.11	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, or 3. ~~However,~~ Credit may be taken for unplanned events that satisfy this SR. ----------	
However, this surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.	Verify on an actual or simulated loss of offsite power signal: a. De-energization of emergency buses; b. Load shedding from emergency buses for Divisions 1 and 2; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 15 seconds for DG-1 and DG-2, and in ≤ 18 seconds for DG-3, 2. energizes auto-connected shutdown loads, 3. maintains steady state voltage ≥ 3910 V and ≤ 4400 V, 4. maintains steady state frequency ≥ 58.8 Hz and ≤ 61.2 Hz, and 5. supplies permanently connected and auto-connected shutdown loads for ≥ 5 minutes.	24 months

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1 or 2. ~~However,~~ Credit may be taken for unplanned events that satisfy this SR. ----------	
However, this surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.	Verify on an actual or simulated Emergency Core Cooling System (ECCS) initiation signal each required DG auto-starts from standby condition and: a. For DG-1 and DG-2, in ≤ 15 seconds achieves voltage ≥ 3910 V, and after steady state conditions are reached, maintains voltage ≥ 3910 V and ≤ 4400 V and, for DG-3, in ≤ 15 seconds achieves voltage ≥ 3910 V, and after steady state conditions are reached, maintains voltage ≥ 3910 V and ≤ 4400 V; b. In ≤ 15 seconds, achieves frequency ≥ 58.8 Hz and after steady state conditions are achieved, maintains frequency ≥ 58.8 Hz and ≤ 61.2 Hz; c. Operates for ≥ 5 minutes; d. Permanently connected loads remain energized from the offsite power system; and e. Emergency loads are auto-connected to the offsite power system.	24 months

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.14	----------NOTES---------- 1. Momentary transients outside the load, excitation current, and power factor ranges do not invalidate this test. 2. Credit may be taken for unplanned events that satisfy this SR. 3. If performed with the DG synchronized with offsite power, it shall be performed ~~at the accident load power factor, or~~ at a power factor ~~as close to the accident load power factor as practicable with the field excitation current ≥ 90% of the continuous rating.~~ ≤0.9 for DG-1 and DG-2, and ≤0.91 for DG-3. ---------- Verify each required DG operates for ≥ 24 hours: a. For ≥ 2 hours loaded ≥ 4650 kW for DG-1 and DG-2, and ≥ 2850 kW for DG-3; and b. For the remaining hours of the test loaded ≥ 4400 kW for DG-1 and DG-2, and ≥ 2600 kW for DG-3.	24 months

However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition, the power factor shall be maintained as close to the limit as practicable.

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.16	----------NOTE---------- normally This Surveillance shall not be performed in MODE 1, 2, or 3. ~~However,~~ Credit may be taken for unplanned events that satisfy this SR. ---------- However, this surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Verify each required DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power; b. Transfers loads to offsite power source; and c. Returns to ready-to-load operation.	24 months
SR 3.8.1.17	----------NOTE---------- Credit may be taken for unplanned events that satisfy this SR. ---------- Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ECCS initiation signal overrides the test mode by: a. Returning DG to ready-to-load operation; and b. Automatically energizing the emergency load from offsite power.	24 months

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.18	----------NOTE---------- This Surveillance shall not normally be performed in MODE 1, 2, or 3. ~~However,~~ Credit may be taken for unplanned events that satisfy this SR. ---------- Verify interval between each sequenced load block is within ± 10% of design interval for each time delay relay.	24 months
SR 3.8.1.19	----------NOTES---------- 1. All DG starts may be preceded by an engine prelube period. 2. This Surveillance shall not normally be performed in MODE 1, 2, or 3. ~~However,~~ However, this surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR. ---------- Verify, on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ECCS initiation signal: a. De-energization of emergency buses; b. Load shedding from emergency buses for DG-1 and DG-2; and c. DG auto-starts from standby condition and: 1. energizes permanently connected loads in ≤ 15 seconds, 2. energizes auto-connected emergency loads, 3. maintains steady state voltage ≥ 3910 V and ≤ 4400 V,	24 months

(continued)

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources – Operating

LCO 3.8.4 The Division 1, Division 2, and Division 3 DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

Insert 3.8.4 Actions

CONDITION	REQUIRED ACTION		COMPLETION TIME
G~~A~~. Division 1 or 2 125 V DC electrical power subsystem inoperable for reasons other than Condition A or D.	~~A~~.1 G	Restore Division 1 and 2 125 V DC electrical power subsystems to OPERABLE status.	2 hours
OR H~~B~~. Division 3 DC electrical power subsystem inoperable for reasons other than Condition B or E.	~~B~~.1 H	Declare High Pressure Core Spray System inoperable.	Immediately
OR I~~C~~. Division 1 250 V DC electrical power subsystem inoperable for reasons other than Condition C or F.	~~C~~.1 I	Declare associated supported features inoperable.	Immediately
J~~D~~. Required Action and associated Completion Time of Condition A or D not met.	J ~~D~~.1	Be in MODE 3.	12 hours
	AND		
OR	J ~~D~~.2	Be in MODE 4.	36 hours
Required Action and associated Completion Time of Condition G not met.			

Required Action and associated Completion Time of Condition C or F not met.

Required Action and associated Completion Time of Condition B or E not met.

3

ATTACHMENT 2
Markup of Technical Specification Pages

Insert to Page 3.8.4-1

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required Division 1 or 2 125 V DC battery charger inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND A.2 Verify battery float current ≤ 2 amps. AND A.3 Restore required battery charger to OPERABLE status.	2 hours Once per 12 hours 7 days
B. One required Division 3 125 V DC battery charger inoperable.	B.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND B.2 Verify battery float current ≤ 2 amps. AND B.3 Restore required battery charger to OPERABLE status.	2 hours Once per 12 hours 7 days
C. One required Division 1 250 V DC battery charger inoperable.	C.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND C.2 Verify battery float current ≤ 2 amps. AND C.3 Restore required battery charger to OPERABLE status.	2 hours Once per 12 hours 7 days

ATTACHMENT 2
Markup of Technical Specification Pages

Insert to Page 3.8.4-1 (Continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
2 D. One required Division 1 or 2 125 V DC battery inoperable. 2	D.1 Restore battery to OPERABLE status.	2 hours
E. One required Division 3 125 V DC battery inoperable.	E.1 Restore battery to OPERABLE status.	2 hours
F. One required Division 1 250 V DC battery inoperable.	F.1 Restore battery to OPERABLE status.	2 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage ~~on float charge is:~~ is greater than or equal to the minimum established float voltage. ~~a. ≥ 126 V for the 125 V batteries; and~~ ~~b. ≥ 252 V for the 250 V battery.~~	7 days
SR 3.8.4.2	Verify no visible corrosion at battery terminals and connectors. OR Verify battery connection resistance is ≤ 24.4 E-6 ohms for inter-cell connectors of the Division 1 and 2 batteries, ≤ 169 E-6 ohms for inter-cell connectors of the Division 3 battery, and ≤ 20% above the resistance as measured during installation for inter-tier and inter-rack connectors.	92 days
SR 3.8.4.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that degrades battery performance.	12 months
SR 3.8.4.4	Remove visible corrosion, and verify battery cell to cell and terminal connections are coated with anti-corrosion material.	12 months

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
~~SR 3.8.4.5~~	~~Verify battery connection resistance is ≤ 24.4 E-6 ohms for inter-cell connectors of the Division 1 and 2 batteries, ≤ 169 E-6 ohms for inter-cell connectors of the Division 3 battery, and ≤ 20% above the resistance as measured during installation for inter-tier and inter-rack connectors.~~	~~12 months~~
SR 3.8.4.~~5~~2	~~NOTE~~ ~~This Surveillance shall not be performed in MODE 1, 2, or 3. However, credit may be taken for unplanned events that satisfy this SR.~~ Verify each required battery charger supplies the required load for ≥ 1.5 hours at: a. ≥ 126 V for the 125 V battery chargers; and b. ≥ 252 V for the 250 V battery charger.	24 months 4

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.4.~~1~~3	----------NOTES---------- 6.6 1. The modified performance discharge test in SR 3.8.~~4.8~~ may be performed in lieu of ~~the service test in~~ SR 3.8.4.~~7~~3 ~~once per 60 months~~. 2. This Surveillance shall not normally be performed in MODE 1, 2, or 3 for the Division 1 and 2 125 VDC batteries. ~~However~~, Credit may be taken for unplanned events that satisfy this SR. ----------	5
	Verify 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.	24 months

However, portions of the surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.

(continued)

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.8.~~4.8~~ 6.6 ----------NOTE---------- This Surveillance shall not normally be performed in MODE 1, 2, or 3. ~~However,~~ Credit may be taken for unplanned events that satisfy this SR. ----------	
Verify battery capacity is ≥ 80% of the manufacturer's rating for the 125 V batteries and ≥ 83.4% of the manufacturer's rating for the 250 V battery, when subjected to a performance discharge test or a modified performance discharge test. However, portions of the surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. for the Division 1 and 2 125 VDC batteries 5	60 months AND 12 months when battery shows degradation or has reached 85% of expected life with capacity < 100% of manufacturer's rating AND 24 months when battery has reached 85% of the expected life with capacity ≥ 100% of manufacturer's rating
Move SR to 3.8.6 (SR 3.8.6.6)	

3.8 ELECTRICAL POWER SYSTEMS

3.8.5 DC Sources – Shutdown

LCO 3.8.5 DC electrical power subsystem(s) shall be OPERABLE to support the electrical power distribution subsystem(s) required by LCO 3.8.8, "Distribution Systems – Shutdown."

APPLICABILITY: MODES 4 and 5,
During movement of irradiated fuel assemblies in the secondary containment.

ACTIONS

----------NOTE----------
LCO 3.0.3 is not applicable.

Insert 3.8.5 Actions

	CONDITION	REQUIRED ACTION	COMPLETION TIME
B~~A~~.	One or more required DC electrical power subsystems inoperable, for reasons other than Condition A OR Required Action and Completion Time of Condition A not met.	B~~A~~.1 Declare affected required feature(s) inoperable. OR B~~A~~.2.1 Suspend CORE ALTERATIONS. AND B~~A~~.2.2 Suspend movement of irradiated fuel assemblies in the secondary containment. AND	Immediately Immediately Immediately (continued)

ATTACHMENT 2
Markup of Technical Specification Pages

Insert to Page 3.8.5-1

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required battery charger inoperable. 6 AND The redundant division battery and battery charger OPERABLE.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND A.2 Verify battery float current ≤ 2 amps. AND 6 A.3 Restore required battery charger to OPERABLE status.	2 hours Once per 12 hours 7 days

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B ~~A~~. (continued)	B ~~A~~.2.3 Initiate action to suspend operations with a potential for draining the reactor vessel.	Immediately
	AND	
	B ~~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.~~5~~ 2, and SR 3.8.4.~~7, and SR 3.8.4.8.~~ 3 ----------	
	For DC electrical power subsystems required to be OPERABLE the following SRs are applicable: SR 3.8.4.1, SR 3.8.4.2, and SR 3.8.4.3, ~~SR 3.8.4.4, SR 3.8.4.5, SR 3.8.4.6, SR 3.8.4.7, and SR 3.8.4.8.~~	In accordance with applicable SRs

3.8 ELECTRICAL POWER SYSTEMS

3.8.6 Battery ~~Cell~~ Parameters

LCO 3.8.6 Battery ~~cell~~ parameters for the Division 1, 2, and 3 batteries shall be within ~~the~~ limits ~~of Table 3.8.6-1~~.

APPLICABILITY: When associated DC electrical power subsystems are required to be OPERABLE.

ACTIONS

Insert 3.8.6 Actions

----------NOTE----------
Separate Condition entry is allowed for each battery.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more batteries with one or more battery cell parameters not within Category A or B limits.	A.1 Verify pilot cell(s) electrolyte level and float voltage meet Table 3.8.6-1 Category C limits.	1 hour
	AND	
	A.2 Verify battery cell parameters meet Table 3.8.6-1 Category C limits.	24 hours AND Once per 7 days thereafter
	AND	
	A.3 Restore battery cell parameters to Category A and B limits of Table 3.8.6-1.	31 days

(continued)

ATTACHMENT 2
Markup of Technical Specification Pages

Insert to Page 3.8.6-1

CONDITION 7	REQUIRED ACTION	COMPLETION TIME
A. One or more batteries with one or more battery cells float voltage < 2.07 V. 7	A.1 Perform SR 3.8.4.1. AND A.2 Perform SR 3.8.6.1. AND A.3 Restore affected cell voltage ≥ 2.07 V.	2 hours 2 hours 24 hours
B. One or more batteries with float current > 2 amps.	B.1 Perform SR 3.8.4.1. AND B.2 Restore battery float current to ≤ 2 amps.	2 hours 12 hours
----------NOTE---------- Required Action C.2 shall be completed if electrolyte level was below the top of plates. ---------- C. One or more batteries with one or more cells electrolyte level less than minimum established design limits. 7	----------NOTE---------- Required Actions C.1 and C.2 are only applicable if electrolyte level was below the top of plates. ---------- C.1 Restore electrolyte level to above top of plates. AND C.2 Verify no evidence of leakage. AND C.3 Restore electrolyte level to greater than or equal to minimum established design limits.	8 hours 12 hours 31 days

Insert to Page 3.8.6-1 (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One or more batteries with pilot cell electrolyte temperature less than minimum established.	D.1 Restore battery pilot cell temperature to greater than or equal to minimum established design limits.	12 hours
E. Two or more redundant division batteries with battery parameters not within limits.	E.1 Restore battery parameters for affected battery in one division to within limits.	2 hours

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
~~F.B. Required Action and associated Completion Time of Condition A not met.~~ ~~OR~~ ~~One or more batteries with average electrolyte temperature of the representative cells ≤ 60°F.~~ ~~OR~~ ~~One or more batteries with one or more battery cell parameters not within Category C limits.~~	F ~~B~~.1 Declare associated battery inoperable. Insert 3.8.6 F	Immediately

ATTACHMENT 2
Markup of Technical Specification Pages

Insert to Page 3.8.6-2

INSERT: 3.8.6 F

	CONDITION	REQUIRED ACTION	COMPLETION TIME
7	F. One or more batteries with a required Battery Parameter not met for reasons other than Condition A, B, C, D or E. OR Required Action and associated Completion Time of Condition A, B, C, D or E not met. OR One or more batteries with one ~~or more~~ battery cell(s) float voltage < 2.07 V and float current > 2 amps.		

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify battery cell parameters meet Table 3.8.6-1 Category A limits.	7 days
SR 3.8.6.2	Verify battery cell parameters meet Table 3.8.6-1 Category B limits.	92 days AND Once within 24 hours after battery discharge < 110 V for 125 V batteries and < 220 V for the 250 V battery AND Once within 24 hours after battery overcharge > 150 V for 125 V batteries and > 300 V for the 250 V battery
SR 3.8.6.3	Verify average electrolyte temperature of representative cells is > 60°F.	92 days

Insert 3.8.6 SRs

<<Move SR 3.8.6.6 (from SR 3.8.4.8)>>

ATTACHMENT 2
Markup of Technical Specification Pages

Insert to Page 3.8.6-3

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	----------NOTE---------- Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. ---------- Verify each battery float current is ≤ 2 amps.	7 days
SR 3.8.6.2	Verify each battery pilot cell voltage is ≥ 2.07 V.	31 days
SR 3.8.6.3	Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	31 days
SR 3.8.6.4	Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	31 days
SR 3.8.6.5	Verify each battery connected cell voltage is ≥ 2.07 V.	92 days

Table 3.8.6-1 (page 1 of 1)
Battery Cell Parameter Requirements

PARAMETER	CATEGORY A: LIMITS FOR EACH DESIGNATED PILOT CELL	CATEGORY B: LIMITS FOR EACH CONNECTED CELL	CATEGORY C: LIMITS FOR EACH CONNECTED CELL
Electrolyte Level	> Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark[a]	> Minimum level indication mark, and ≤ ¼ inch above maximum level indication mark[a]	Above top of plates, and not overflowing
Float Voltage	≥ 2.13 V	≥ 2.13 V	> 2.07 V
Specific Gravity[b][c]	≥ 1.200	≥ 1.195 AND Average of all connected cells > 1.205	Not more than 0.020 below average of all connected cells AND Average of all connected cells ≥ 1.195

(a) It is acceptable for the electrolyte level to temporarily increase above the specified maximum level during and following equalizing charges provided it is not overflowing.

(b) Corrected for electrolyte temperature and level. Level correction is not required, however, when battery charging is < 2 amps when on float charge.

(c) A battery charging current of < 2 amps when on float charge is acceptable for meeting specific gravity limits following a battery recharge, for a maximum of 7 days. When charging current is used to satisfy specific gravity requirements, specific gravity of each connected cell shall be measured prior to expiration of the 7 day allowance.

5.5 Programs and Manuals

5.5.12 Primary Containment Leakage Rate Testing Program (continued)

specified in ANSI/ANS 56.8-1994 will be accomplished by increasing the actual instrument reading by the amount of the full scale inaccuracy when assessing the effect of local leak rates against the criteria established in Specification 5.5.12.a.

The peak calculated primary containment internal pressure for the design basis loss of coolant accident, P_a, is 38 psig.

The maximum allowable primary containment leakage rate, L_a, at P_a, shall be 0.5% of primary containment air weight per day.

Leakage rate acceptance criteria are:

a. Primary containment 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 $< 0.60\ L_a$ for the Type B and Type C tests (except for main steam isolation valves) and $< 0.75\ L_a$ for Type A tests;

b. Primary containment air lock testing acceptance criteria are:

   1) Overall primary containment air lock leakage rate is $\leq 0.05\ L_a$ when tested at $\geq P_a$; and

   2) For each door, leakage rate is $\leq 0.025\ L_a$ when pressurized to ≥ 10 psig.

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

Insert 5.5.13

ATTACHMENT 2
Markup of Technical Specification Pages

Insert to Page 5.5-12

5.5.13 Battery Monitoring and Maintenance Program

8 This Program provides for battery restoration and maintenance, based on the recommendations of IEEE Standard 450, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," or of the battery manufacturer, including 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.

ATTACHMENT 3
Markup of Technical Specification Bases Pages

COLUMBIA GENERATING STATION

FACILITY OPERATING LICENSE NO NPF-21

Request for Amendment to Technical Specifications Associated With AC and DC Electrical Power

REVISED TECHNICAL SPECIFICATIONS BASES PAGES

B3.8.1.22	B 3.8.4-7
B3.8.1.24	B 3.8.4-8
B3.8.1.25	B 3.8.4-9
B3.8.1.26	B 3.8.4-10
B3.8.1.27	B 3.8.4-11
B3.8.1.28	B 3.8.4-12
B3.8.1.30	B 3.8.5-2
B3.8.1.31	B 3.8.5-3
B3.8.1.32	B 3.8.5-4
B3.8.1.34	B 3.8.6-1
B3.8.1.35	B 3.8.6-2
B 3.8.4-2	B 3.8.6-3
B 3.8.4-3	B 3.8.6-4
B 3.8.4-4	B 3.8.6-5
B 3.8.4-5	B 3.8.6-6
B 3.8.4-6	B 3.8.6-7

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.6 (continued)

The Frequency for this SR corresponds to the testing requirements for pumps as contained in the ASME Boiler and Pressure Vessel Code, Section XI (Ref. 17).

SR 3.8.1.8

Transfer of Division 1 and 2 4.16 kV ESF buses (SM-7 and SM-8) power supply from the startup offsite circuit to the backup offsite circuit demonstrates the OPERABILITY of the alternate circuit distribution network to power the Division 1 and 2 shutdown loads. The 24 month Frequency of the Surveillance is based on engineering judgment taking into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. Operating experience has shown that these components usually pass the SR when performed on the 24 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

This SR is modified by a Note which applies to verification of the automatic transfer function. The reason for the Note is that, during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. Bases Insert 1A

The Note is not applicable to verification of manual transfer of the unit power supply from the preferred offsite circuit to the alternate offsite circuit, since this evolution does not cause perturbations of the electrical distribution systems.

Credit may be taken for unplanned events that satisfy this SR.

SR 3.8.1.9

Each DG is provided with an engine overspeed trip to prevent damage to the engine. Recovery from the transient caused by the loss of a large load could cause diesel engine overspeed, which, if excessive, might result in a trip of

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Insert to Page B 3.8.1-22

BASES INSERT 1A

This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1 or 2. Risk insights or deterministic methods may be used for this assessment.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

under load conditions that are as close to design basis conditions as possible, Note 2 requires that, if synchronized to offsite power, testing must be performed at a power factor as close to the power factor of the single largest post-accident load as practicable. The power factor ~~limit~~ is ≤ 0.92 for DG-1, ≤ 0.86 for DG-2, and ≤ 0.92 for DG-3. These power factors are representative of the actual single largest inductive load that the DGs could experience when running isolated from offsite power. ~~To meet these power factor limits, the DGs must be loaded to the following reactive values when the SR is performed: 580 kVAR for DG-1, 760 kVAR for DG-2, and 1015 kVAR for DG-3. However, if the offsite electrical power distribution system voltage is high, increased excitation will be necessary for the DG to match system voltage when synchronizing to the associated ESF bus. Once tied to the ESF bus, it may not be possible to increase DG excitation sufficiently to meet the required reactive load value that ensures the power factor limit is met, without exceeding the DG excitation system ratings.~~

[Plant specific information not required in the Bases]

value

approximate analyzed

Insert B SR 3.8.1.9

Therefore, to ensure the DG is not placed in an unsafe condition during this test, the power factor limit does not have to be met if grid voltage does not permit the power factor limit to be met when the DG is tied to the grid. When this occurs, the power factor should be maintained as close to the limit as practicable.

SR 3.8.1.10

Consistent with Regulatory Guide 1.9 (Ref. 12), paragraph C.2.2.8, this Surveillance demonstrates the DG capability to reject a full load without overspeed tripping or exceeding the predetermined voltage limits. The DG full load rejection may occur because of a system fault or inadvertent breaker tripping. This Surveillance ensures proper engine generator load response under the simulated test conditions. This test simulates the loss of the total connected load that the DG experiences following a full load rejection and verifies that the DG does not trip upon loss of the load.

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Insert to Page B 3.8.1-24

BASES INSERT FOR SR 3.8.1.9

Under certain conditions, however, Note 2 allows the surveillance to be conducted at a power factor other than these single largest load values. These conditions occur when grid voltage is high, and the additional field excitation needed to get the power factor to these levels results in voltages on the emergency busses that are higher than recommended. Under these conditions, the power factor should be maintained as close as practicable to these values while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DG excitation levels needed to obtain a power factor as close as practicable to the analyzed value of 0.92 for DG-1, 0.86 for DG-2, and 0.92 for DG-3 may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DG. In such cases, the power factor shall be maintained as close a practicable to these levels, allowing margin for changing grid conditions, without exceeding the DG excitation limits.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.10 (continued)

These acceptance criteria provide DG damage protection. While the DG is not expected to experience this transient during an event, and continues to be available, this response ensures that the DG is not degraded for future application, including reconnection to the bus if the trip initiator can be corrected or isolated.

In order to ensure that the DG is tested under load conditions that are as close to design basis conditions as possible, testing must be performed at a power factor as close to the accident load power factor as practicable. The power factor ~~limit~~ value is ≤ 0.89 for DG-1, ≤ 0.88 for DG-2, and ≤ 0.91 for DG-3. These power factors are representative of the actual design basis inductive loading that the DGs could experience when running isolated from offsite power. ~~To meet these power factor limits, the DGs must be loaded to the following reactive values when the SR is performed; 2165 kVAR for DG-1, 2085 kVAR for DG-2, and 1150 kVAR for DG-3.~~

approximate analyzed

[Plant specific information not required in the Bases]

Testing performed for this SR is normally conducted with the DG being tested (and the associated safety-related and/or non safety-related distribution buses) connected to one offsite source, while the remaining safety-related (and associated non safety-related) distribution buses are aligned to the unit auxiliary transformers (or other offsite source). This minimizes the possibility of common cause failures resulting from offsite/grid voltage perturbations.

The 24 month Frequency takes into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This SR has been modified by two Notes. The reason for Note 1 is that credit may be taken for unplanned events that satisfy this SR. ~~Note 2 is provided in recognition that if the offsite electrical power distribution system voltage is high, increased excitation will be necessary for the DG to match system voltage when synchronizing to the associated ESF bus. Once tied to the ESF bus, it may not be possible to increase DG excitation sufficiently to meet the required~~

Insert B SR 3.8.1.10 for Note 2

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Insert to Page B 3.8.1-25

BASES INSERT FOR SR 3.8.1.10

Note 2 ensures that the DG is tested under load conditions that are as close to design basis conditions as practicable. When synchronized with offsite power, testing should be performed as close as practicable to the analyzed value of the accident load power factor of 0.89 for DG-1, 0.88 for DG-2, and 0.91 for DG-3. This power factor is representative of the actual inductive loading that the DGs could experience when running isolated from offsite power. However, Note 2 allows the Surveillance to be conducted at a power factor other than these levels. These conditions occur when grid voltage is high, and the additional field excitation needed to get these power factors results in voltage on the emergency busses that are higher than recommended. Under these conditions, the power factor should be maintained as close as practicable to these levels while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DG excitation levels needed to obtain these power factors may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DG. In such cases, the power factor shall be maintained as close to practicable to these levels, allowing margin for changing grid conditions, without exceeding the DG excitation limits.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.10 (continued)

~~reactive load value that ensures the power factor limit is met, without exceeding the DG excitation system ratings. Therefore, to ensure the DG is not placed in an unsafe condition during this test, the power factor limit does not have to be met if grid voltage does not permit the power factor limit to be met when the DG is tied to the grid. When this occurs, the reactive load may be reduced to maintain excitation current within the continuous rating. However, the excitation current shall be maintained ≥ 90% of the continuous rating of 142.4 amps for DG 1 and DG 2 and 94 amps for DG 3. This is to avoid conditions where the generator excitation system continuous rating limits can be exceeded or excessive transients can challenge equipment ratings due to network disturbances or spurious operation of breakers in the AC distribution system.~~

SR 3.8.1.11

Consistent with Regulatory Guide 1.9 (Ref. 12), paragraph C.2.2.4, this Surveillance demonstrates the as designed operation of the standby power sources during loss of the offsite source. This test verifies all actions encountered from the loss of offsite power, including shedding of the nonessential loads and energization of the emergency buses and respective loads from the DG. It further demonstrates the capability of the DG to automatically achieve the required voltage and frequency within the specified time.

The DG auto-start and energization of permanently connected loads times of 15 seconds for Division 1 and 2 and 18 seconds for Division 3 are derived from requirements of the accident analysis for responding to a design basis large break LOCA (Ref. 16). The DG-3 18 second start time includes the Loss of Voltage — Time Delay Function specified in LCO 3.3.8.1. The Surveillance should be continued for a minimum of 5 minutes in order to demonstrate that all starting transients have decayed and stability has been achieved.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.11 (continued)

The requirement to verify the connection and power supply of permanent and auto-connected loads is intended to satisfactorily show the relationship of these loads to the DG loading logic. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not desired to be stroked open, systems are not capable of being operated at full flow, or RHR systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of the connection and loading of these loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of 24 months takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil being continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge plant safety systems. Credit may be taken for unplanned events that satisfy this SR.

Bases Insert 2B

SR 3.8.1.12

Consistent with Regulatory Guide 1.9 (Ref. 12), paragraph C.2.2.5, this Surveillance demonstrates that the DG automatically starts and achieves the required voltage and frequency within the specified time (15 seconds) from the

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Insert to Page B 3.8.1-27, B 3.8.1-35, B 3.8.4-9, B 3.8.4-11

BASES INSERT 2B

This restriction from normally performing the Surveillance in MODE 1, 2 or 3 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed 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, 2 or 3. Risk insights or deterministic methods may be used for this assessment.

BASES

SURVEILLANCE REQUIREMENT

SR 3.8.1.12 (continued)

design basis actuation signal (LOCA signal) and operates for ≥ 5 minutes. The 5 minute period provides sufficient time to demonstrate stability. SR 3.8.1.12.d and SR 3.8.1.12.e ensure that permanently connected loads and emergency loads are energized from the offsite electrical power system on an ECCS signal without loss of offsite power.

The requirement to verify the connection and power supply of permanent and autoconnected loads is intended to satisfactorily show the relationship of these loads to the loading logic for loading onto offsite power. In certain circumstances, many of these loads cannot actually be connected or loaded without undue hardship or potential for undesired operation. For instance, ECCS injection valves are not desired to be stroked open, systems are not capable of being operated at full flow, or RHR systems performing a decay heat removal function are not desired to be realigned to the ECCS mode of operation. In lieu of actual demonstration of the connection and loading of these loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of 24 months takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with the expected fuel cycle lengths.

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil being continuously circulated and temperature maintained consistent with manufacturer recommendations. The reason for Note 2 is that during operation with the reactor critical, performance of this SR could cause perturbations to the electrical distribution systems that could challenge continued steady state operation and, as a result, plant safety systems. Credit may be taken for unplanned events that satisfy this SR.

Bases Insert 2A

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Insert to Page B 3.8.1-28

BASES INSERT 2A

This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed 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.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.14 (continued)

In order to ensure that the DG is tested under load conditions that are as close to design conditions as possible, testing must be performed at a power factor as close to the accident load power factor as practicable. The power factor ~~limit~~ value is ≤ 0.89 for DG-1, ≤ 0.88 for DG-2, and ≤ 0.91 for DG-3. These power factors are representative of the actual design basis inductive loading that the DGs could experience when running isolated from offsite power. ~~To meet these power factor limits, the DGs must be loaded to the following reactive values when the SR is performed: 2165 kVAR for DG-1, 2085 kVAR for DG-2, and 1150 kVAR for DG-3.~~

approximate analyzed

[Plant specific information not required in the Bases]

Testing performed for this SR is normally conducted with the DG being tested (and the associated safety-related and/or non safety-related distribution buses) connected to one offsite source, while the remaining safety-related (and associated non safety-related) distribution buses are aligned to the unit auxiliary transformers (or other offsite source). This minimizes the possibility of common cause failures resulting from offsite/grid voltage perturbations.

The 24 month Frequency takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This Surveillance is modified by three Notes. Note 1 states that momentary transients due to changing bus loads do not invalidate this test. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. Similarly, momentary transients of excitation current or power factor do not invalidate the test. The reason for Note 2 is that credit may be taken for unplanned events that satisfy this SR. ~~Note 3 is provided in recognition that if the offsite electrical power distribution system voltage is high, increased excitation will be necessary for the DG to match system voltage when synchronizing to the associated ESF bus. Once tied to the~~

Insert B SR 3.8.1.14 for Note 3

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Insert to Page B 3.8.1-30

BASES INSERT FOR SR 3.8.1.14

Note 3 ensures that the DG is tested under load conditions that are as close to design basis conditions as practicable. When synchronized with offsite power, testing should be performed as close as practicable to the analyzed value of the accident load power factor of 0.89 for DG-1, 0.88 for DG-2, and 0.91 for DG-3. This power factor is representative of the actual inductive loading a DG would see under design bases accident conditions. Under these conditions, the power factor should be maintained as close as practicable to these levels while still maintaining acceptable voltage limits on the emergency busses. In other circumstances, the grid voltage may be such that the DG excitation levels needed to obtain power factors of these levels may not cause unacceptable voltages on the emergency busses, but the excitation levels are in excess of those recommended for the DG. In such cases, the power factor shall be maintained as close a practicable to these levels, allowing margin for changing grid conditions, without exceeding the DG excitation limits.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.14 (continued)

~~ESF bus, it may not be possible to increase DG excitation sufficiently to meet the required reactive load value that ensures the power factor limit is met, without exceeding the DG excitation system ratings. Therefore, to ensure the DG is not placed in an unsafe condition during this test, the power factor limit does not have to be met if grid voltage does not permit the power factor limit to be met when the DG is tied to the grid. When this occurs, the reactive load may be reduced to maintain excitation current within the continuous rating. However, the excitation current shall be maintained ≥ 90% of the continuous rating of 142.4 amps for DG-1 and DG-2 and 94 amps for DG-3. This is to avoid conditions where the generator excitation system continuous rating limits can be exceeded or excessive transients can challenge equipment ratings due to network disturbances or spurious operation of breakers in the AC distribution system.~~

SR 3.8.1.15

This Surveillance demonstrates that the diesel engine can restart from a hot condition, such as subsequent to shutdown from normal Surveillances, and achieve the required voltage and frequency within 15 seconds. The 15 second time is derived from the requirements of the accident analysis for responding to a design basis large break LOCA (Ref. 16).

The 24 month Frequency takes into consideration the plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This SR has been modified by two Notes. Note 1 ensures that the test is performed with the diesel sufficiently hot. The requirement that the diesel has operated for at least 1 hour at full load conditions prior to performance of this Surveillance is based on manufacturer recommendations for achieving hot conditions. Momentary transients due to changing bus loads do not invalidate this test. Note 2 allows all DG starts to be preceded by an engine prelube period to minimize wear and tear on the diesel during testing.

(continued)

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.16

Consistent with Regulatory Guide 1.9 (Ref. 12), paragraph C.2.2.11, this Surveillance ensures that the manual synchronization and load transfer from the DG to the offsite source can be made and that the DG can be returned to ready-to-load status when offsite power is restored. It also ensures that the auto-start logic is reset to allow the DG to reload if a subsequent loss of offsite power occurs. The DG is considered to be in ready-to-load status when the DG is at rated speed and voltage, the output breaker is open and can receive an auto-close signal on bus undervoltage, and the individual load timers are reset.

The Frequency of 24 months takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycles.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge safety systems. Credit may be taken for unplanned events that satisfy this SR.

Bases Insert 1B

SR 3.8.1.17

Consistent with Regulatory Guide 1.9 (Ref. 12), paragraph C.2.2.13, demonstration of the parallel test mode override ensures that the DG availability under accident conditions is not compromised as the result of testing. Interlocks to the LOCA sensing circuits cause the DG to automatically reset to ready-to-load operation if an ECCS initiation signal is received during operation in the test mode. Ready-to-load operation is defined as the DG running at rated speed and voltage with the DG output breaker open. These provisions for automatic switchover are required by IEEE-308 (Ref. 18), paragraph 6.2.6(2).

The requirement to automatically energize the emergency loads with offsite power is essentially identical to that of SR 3.8.1.12. The intent in the requirement associated with SR 3.8.1.17.b is to show that the emergency loading is not

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Insert to Page B 3.8.1-32, B 3.8.1-34

BASES INSERT 1B

This restriction from normally performing the Surveillance in MODE 1, 2 or 3 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1, 2 or 3. Risk insights or deterministic methods may be used for this assessment.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.18 (continued)

The Frequency of 24 months takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths. This SR is modified by a Note. The reason for the Note is that performing the Surveillance during these MODES would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge plant safety systems. Credit may be taken for unplanned events that satisfy this SR.

Bases Insert 1B

SR 3.8.1.19

In the event of a DBA coincident with a loss of offsite power, the DGs are required to supply the necessary power to ESF systems so that the fuel, RCS, and containment design limits are not exceeded.

This Surveillance demonstrates the DG operation, as discussed in the Bases for SR 3.8.1.11, during a loss of offsite power actuation test signal in conjunction with an ECCS initiation signal. Since the DG-3 Loss of Voltage—Time Delay Function is bypassed during an ECCS initiation signal, a 15 second DG-3 start time applies, consistent with the DBA LOCA analysis (Ref. 16). In lieu of actual demonstration of connection and loading of loads, testing that adequately shows the capability of the DG system to perform these functions is acceptable. This testing may include any series of sequential, overlapping, or total steps so that the entire connection and loading sequence is verified.

The Frequency of 24 months takes into consideration plant conditions required to perform the Surveillance, and is intended to be consistent with an expected fuel cycle length.

This SR is modified by two Notes. The reason for Note 1 is to minimize wear and tear on the DGs during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil being continuously circulated and temperature maintained

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Insert to Page B 3.8.1-32, B 3.8.1-34

BASES INSERT 1B

This restriction from normally performing the Surveillance in MODE 1, 2 or 3 is further amplified to allow the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed Surveillance, a successful Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of plant shutdown and startup to determine that plant safety is maintained or enhanced when the Surveillance is performed in MODE 1, 2 or 3. Risk insights or deterministic methods may be used for this assessment.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.19 (continued)

consistent with manufacturer recommendations. The reason for Note 2 is that performing the Surveillance would remove a required offsite circuit from service, perturb the electrical distribution system, and challenge plant safety systems. Credit may be taken for unplanned events that satisfy this SR.

Bases Insert 2B

SR 3.8.1.20

This Surveillance demonstrates that the DG starting independence has not been compromised. Also, this Surveillance demonstrates that each engine can achieve proper speed within the specified time when the DGs are started simultaneously.

The 10 year Frequency is consistent with the recommendations of Regulatory Guide 1.9 (Ref. 12), paragraph C.2.2.14.

This SR is modified by a Note. The reason for the Note is to minimize wear on the DG during testing. For the purpose of this testing, the DGs must be started from standby conditions, that is, with the engine coolant and oil continuously circulated and temperature maintained consistent with manufacturer recommendations.

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.
2. FSAR, Chapter 8.
3. Deleted
4. FSAR, Tables 8.3-1, 8.3-2, and 8.3-3.
5. Safety Guide 9, Revision 0, March 1971.
6. FSAR, Chapter 6.
7. FSAR, Chapters 15 ~~and 15.F~~.
8. 10 CFR 50.36(c)(2)(ii).

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Insert to Page B 3.8.1-27, B 3.8.1-35, B 3.8.4-9, B 3.8.4-11

BASES INSERT 2B

This restriction from normally performing the Surveillance in MODE 1, 2 or 3 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed 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, 2 or 3. Risk insights or deterministic methods may be used for this assessment.

BASES

BACKGROUND (continued)

also supplies power on an uninterruptible basis to plant controls, instrumentation, computer and communication equipment through a solid state inverter and the main and feedwater turbine auxiliary oil pumps; however, these loads are not TS related loads.

The Division 2 safety related DC power source consists of a 125 V battery bank and two full capacity chargers, one of which is normally in service and the other is normally electrically isolated from the distribution system. This DC power source provides the control power for its associated Class 1E AC power load group, 4.16 kV switchgear and 480 V load centers. Also, this DC power source provides DC power to the emergency lighting system, DG auxiliaries and the DC control power for DG-2.

The Division 3 125 VDC power system provides power for HPCS DG field flashing control logic and control and switching function of 4.16 kV Division 3 breakers. It also provides motive and control power for the HPCS System logic, HPCS DG control and protection, and all Division 3 related control.

The DC power distribution system is described in more detail in Bases for LCO 3.8.7, "Distribution Systems—Operating," and LCO 3.8.8, "Distribution Systems—Shutdown."

Each Division 1, 2, and 3 battery has adequate storage capacity to ~~carry the required load continuously for at least 2 hours as discussed in the FSAR, Section 8.3.2 (Ref. 4).~~

Insert Battery capacity

The Division 1 125 V and 250 V, and Division 2 125 VDC electrical power subsystem components are located in the radwaste/control building, a Seismic Category I structure. The Divisions 1 and 2 DC buses and the associated equipment are located such that redundant counterparts are physically separated from each other. The Division 3 DC electrical power subsystem components are located in the diesel generator building, also a Seismic Category I structure. There are no connections between DC systems of different divisions, and there is no sharing between redundant Class 1E subsystems such as batteries, battery chargers, or distribution panels.

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Insert to Page B 3.8.4-2

INSERT: BATTERY CAPACITY

...meet the duty cycle(s) discussed in the FSAR, Chapter 8 (Ref. 4). The battery is designed with additional capacity above that required by the design duty cycle to allow for temperature variations, and other factors.

BASES

BACKGROUND (continued)

The 125 V batteries are sized to produce required capacity at 80% of nameplate rating. The 250 V battery is sized to produce the required capacity at 83.4% of the nameplate rating. These values correspond to warranted capacity at end-of-life cycles and the 100% design demand for each of the batteries. ~~The voltage design limit is 1.81 volts per cell (Refs. 5 and 6).~~

Insert V_{pc} Bases

Each 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 excess capacity to restore the battery bank from the design minimum charge to its fully charged state within 24 hours while supplying normal steady state loads (Ref. 4).

Insert Charger Bases

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in the FSAR, Chapter 6 (Ref. 7) and Chapters 15 ~~and 15.F~~ (Ref. 8), assume that ESF systems are OPERABLE. The DC electrical power system provides normal and emergency DC electrical power for the DGs, emergency auxiliaries, and control and switching during all MODES of operation.

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

a. An assumed loss of all offsite AC power or of all onsite AC power; and

b. A worst case single failure.

The DC sources satisfy Criterion 3 of Reference 9.

LCO

The DC electrical power subsystems, each subsystem consisting of one battery, one battery charger, and the corresponding control equipment and interconnecting cabling supplying power to the associated bus within the divisions,

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Inserts to Page B 3.8.4-3

INSERT: V_{PC} BASES

...The minimum design voltage limit is 105 V for the 125 V batteries and 210 V for the 250 V battery.

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 (i.e., cell voltage of 2.06 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 $\geq$ 2.06 Vpc, the battery cell will maintain its capacity for 30 days without further charging per manufacturer's instructions. Optimal long term performance however, is obtained by maintaining a float voltage 2.17 to 2.26 Vpc. This provides adequate over-potential which limits the formation of lead sulfate and self discharge. The nominal float voltage of 2.25 Vpc corresponds to a total float voltage output of 130.5 V for a 58 cell battery as discussed in the FSAR, Chapter 8 (Ref. 4).

INSERT: CHARGER

The battery charge is normally in the 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.

When desired, the charger can be placed in the equalize mode. The equalize mode is at a higher voltage than the float mode and charging current is correspondingly higher. The battery charge is operated in the equalize mode after a battery discharge or for routine maintenance. Following a battery discharge, the battery recharge characteristic accepts current at the current limit of the battery charger (if the discharge was significant, e.g., following a battery service test) until the battery terminal voltage approaches the charger voltage setpoint. Charging current then reduces exponentially during the remainder of the recharge cycle. Lead-calcium batteries have recharge efficiencies of greater than 95%, so once at least 105% of the ampere-hours discharged have been returned, the battery capacity would be restored to the same condition as it was prior to the discharge. This can be monitored by direct observation of the exponentially decaying charging current or by evaluating the amp-hours discharged from the battery and amp-hours returned to the battery.

BASES

LCO (continued)

are required to be OPERABLE to ensure the availability of the required power to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence (AOO) or a postulated DBA. Loss of any DC electrical power subsystem does not prevent the minimum safety function from being performed (Ref. 4).

APPLICABILITY

The DC electrical power sources are required to be OPERABLE in MODES 1, 2, and 3 to ensure safe unit operation and to ensure that:

a. Acceptable fuel design limits and reactor coolant pressure boundary limits are not exceeded as a result of AOOs or abnormal transients; and

b. Adequate core cooling is provided, and containment integrity and other vital functions are maintained in the event of a postulated DBA.

The DC electrical power requirements for MODES 4 and 5 and other conditions in which the DC electrical power sources are required are addressed in LCO 3.8.5, "DC Sources—Shutdown."

ACTIONS

Insert 3.8.4 Action Bases

G ~~K~~.1

Condition G ~~K~~ represents one division with a loss of ability to completely respond to an event, and a potential loss of ability to remain energized during normal operation. It is, therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for complete loss of 125 VDC power to the affected division. The 2 hour limit is consistent with the allowed time for an inoperable DC distribution system division.

If one of the required Division 1 or 2 125 VDC electrical power subsystems is inoperable for reasons other than Condition A or D (e.g., ~~inoperable battery, inoperable battery charger, or~~ inoperable battery charger and associated inoperable battery), the remaining 125 VDC electrical power subsystems have the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst case single failure could, however, result in the loss of minimum necessary 125 VDC electrical

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Inserts to Page B 3.8.4-4

INSERT: 3.8.4 ACTION Bases

1

ACTIONS A.1, A.2, A.3, B.1, B.2, B.3, C.1, C.2 and C.3

1

1

Condition A, B, or C represents one division with one required battery charger inoperable (e.g., the voltage limit of SR 3.8.4.1 is not maintained). The ACTIONS provide a tiered response that focuses on returning the battery to the fully charged state and restoring a fully qualified charger to OPERABLE status in a reasonable time period. Required Action A.1, B.1 or C.1 requires that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage within 2 hours. This time provides for returning the inoperable charger to OPERABLE status or providing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage. Restoring the battery terminal voltage to greater than or equal to the minimum established float voltage provides good assurance that, within 12 hours, the battery will be restored to its fully charged condition (Required Action A.2, B.2 or C.2) 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 (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus, there is good assurance of fully recharging the battery within 12 hours, avoiding a premature shutdown with its own attendant risk.

If battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within 2 hours, and the charger is not operating in the current-limiting mode, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide adequate assurance that it can revert to and operate properly in the current limit mode that is necessary during the recovery period following a battery discharge event for which the DC system is designed.

Inserts to Page B 3.8.4-4 (continued)

INSERT: 3.8.4 ACTION Bases (continued)

If the charger is operating in the current limit mode after 2 hours, that is an indication that the battery is partially discharged and its capacity margins will be reduced. The time to return the battery to its fully charged condition, in this case, is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within 12 hours (Required Action A.2, B.2 or C.2).

Required Action A.2, B.2 or C.2 requires that the battery float current be verified as 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 recharged. If, at the expiration of the initial 12 hour period, the battery float current is not less than or equal to 2 amps, this indicates there may be additional battery problems and the battery must be declared inoperable.

Required Action A.3, B.3 or C.3 limits the restoration time for the inoperable battery charger to 7 days. This action is 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. balance of plant non-Class 1E battery charger). The 7-day Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status.

ACTIONS D.1, E.1 and F.1 2

Condition D, E or F represents one division with one battery inoperable. With one battery inoperable, the DC bus is being supplied by the OPERABLE battery charger(s). Any event that results in a loss of the AC bus supporting the battery charger(s) will also result in loss of DC to that division. Recovery of the AC bus, especially if it is due to a loss of offsite power, will be hampered by the fact that many of the components necessary for the recovery (e.g. diesel generator control and field flash, AC load shed and diesel generator output circuit breakers, etc.) likely rely upon the battery. In addition, the energization transients of any DC loads that are beyond the capability of the battery charger(s) and normally require the assistance of the battery will not be able to be brought online. The 2 hour limit allows sufficient time to effect restoration of an inoperable battery given that the majority of the conditions that lead to battery inoperability (e.g. loss of battery charger, battery cell voltage less than 2.07 V, etc.) are identified in Specifications 3.8.4, 3.8.5, and 3.8.6 together with additional specific completion times.

BASES

ACTIONS

G ~~F~~.1 (continued)

subsystems, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 10) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and, if the DC electrical power subsystem is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown. 3

H ~~G~~.1 If the Required Actions and associated Completion Times of Condition B or E are not met, ~~With~~ for reasons other than Condition B or E, or any combination of these conditions exists the Division 3 DC electrical power subsystem is inoperable~~,~~ the HPCS System may be incapable of performing its intended function and must be immediately declared inoperable. This declaration also requires entry into applicable Conditions and Required Actions of LCO 3.5.1, "ECCS—Operating." 3

I ~~H~~.1 If the Required Actions and associated Completion Times of Condition C or F are not met, ~~With~~ for reasons other than Condition C or F, or any combination of these conditions exists the Division 1 250 VDC electrical power subsystem is inoperable~~,~~ the RCIC and other associated supported features may be incapable of performing their intended functions and must be immediately declared inoperable. This declaration also requires entry into applicable Conditions and Required Actions for the associated supported features.

J ~~I~~.1 and J ~~I~~.2

If the inoperable Division 1 or Division 2 125V DC electrical power subsystem cannot be restored to OPERABLE status within the associated Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 12 hours and to MODE 4 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. The Completion Time to bring the unit to MODE 4 is consistent with the time specified in Regulatory Guide 1.93 (Ref. 10). 3

(continued)

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

Verifying battery terminal voltage while on float charge helps to ensure the effectiveness of the ~~charging system and~~ battery chargers, which support the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state. ~~The voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations.~~ The 7 day Frequency is conservative when compared with the manufacturers recommendations and IEEE-450 (Ref. 11).

Insert B SR 3.8.4.1

SR 3.8.4.2

Visual inspection to detect corrosion of the battery cells and connections, or measurement of the resistance of each inter-cell, inter-rack, and inter-tier connection, provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance.

For inter-cell connectors, the limits are ≤ 24.4 E-6 ohms for the Division 1 and 2 batteries and ≤ 169 E-6 ohms for the Division 3 battery. For inter-tier and inter-rack connectors, the limits are ≤ 20% above the resistance as measured during installation.

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

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

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Inserts to Page B 3.8.4-6

INSERT: SR 3.8.4.1 Bases

..., while supplying the continuous steady state loads of the associated DC subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer 2.17 Vpc or 126.0 V for the 125 V batteries and 252.0 V for the 250V battery at the battery terminals). This voltage maintains the battery plates in a condition that supports maintaining the grid life (expected to be approximately 20 years).

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.3 (continued)

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).

The 12 month Frequency of this SR is consistent with IEEE-450 (Ref. 11), which recommends detailed visual inspection of cell condition on a yearly basis.

SR 3.8.4.4 and SR 3.8.4.5

Visual inspection and resistance measurements of inter-cell, inter-rack, and inter-tier connections provides an indication of physical damage or abnormal deterioration that could indicate degraded battery condition. The anti-corrosion material is used to 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 this Surveillance.

For inter-cell connectors, the limits are ≤ 24.4 E-6 ohms for the Division 1 and 2 batteries and ≤ 169 E-6 ohms for the Division 3 battery. For inter-tier and inter-rack connectors, the limits are ≤ 20% above the resistance as measured during installation.

The 12 month Frequency of these SRs is consistent with IEEE-450 (Ref. 11), which recommends detailed visual inspection of cell condition and inspection of cell to cell and terminal connection resistance on a yearly basis.

SR 3.8.4.~~6~~2

4

Battery charger capability requirements are based on the design capacity of the chargers (Ref. 4). According to Regulatory Guide 1.32 (Ref. 12), the battery charger supply is required to be based on the largest combined demands of

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.~~8~~2 (continued)

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 ensure that these requirements can be satisfied. The charger shall be loaded, to a minimum, at three separate and sequential load ratings, 50%, 75%, and 100%, for ≥ 30 minutes at each load rating. The 100% load rating for the Divisions 1 and 2 125 V battery chargers is 200 amps, for the Division 3 125 V battery charger is 50 amps, and for the Division 1 250 V battery charger is 400 amps.

4 →

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 24 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

~~This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required DC electrical power subsystem from service, perturb the electrical distribution system, and challenge safety systems. Credit may be taken for unplanned events that satisfy the Surveillance.~~

SR 3.8.4.~~1~~3

A battery service test is a special test of the battery's capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency of 24 months is acceptable, given unit conditions required to perform the test and the other requirements existing to ensure adequate battery performance during these 24 month intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

(continued)

Either the battery performance discharge test or the modified performance discharge test is acceptable for satisfying SR 3.8.6.6; however, only the modified performance discharge test may be used to satisfy the battery service test requirements of SR 3.8.4.3.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.4.~~1~~3 (continued)

This SR is modified by two Notes. Note 1 allows the performance of a modified performance discharge test in lieu of a service test ~~once per 60 months~~. This substitution is acceptable because a modified performance discharge test represents a more severe test of battery capacity than SR 3.8.4.~~3~~3. The reason for Note 2 is that performing the Surveillance would remove a required DC electrical power subsystem from service, perturb the electrical distribution system, and challenge safety systems. Credit may be taken for unplanned events that satisfy the Surveillance.

4

Bases Insert 2B

SR 3.8.~~4.8~~6.6

A battery performance discharge test is a test of constant current capacity of a battery, normally done in the as found condition, after having been in service, to detect any change in the capacity determined by the acceptance test. The test is intended to determine overall battery degradation due to age and usage.

Move to SR 3.8.6.6 Bases

A battery normally modified performance discharge test is a simulated duty cycle consisting of just two rates; the one minute rate published for the battery or the largest current load of the duty cycle, followed by the test rate employed for the performance discharge test, both of which envelope the duty cycle of the service test. Since the ampere-hours removed at a rated one minute discharge represents a very small portion of the battery capacity, the test rate can be changed to that for the performance test without compromising the results of the performance discharge test. The battery terminal voltage for the modified performance discharge test ~~should~~ must remain above the minimum battery terminal voltage specified in the battery ~~performance discharge~~ service test for the duration of time equal to that of the ~~battery performance discharge test.~~ service test.

Move below next paragraph

A modified performance discharge test is a test of the battery capacity and its ability to provide a high rate, short duration load (usually the highest rate of the duty cycle). This will often confirm the battery's ability to

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Insert to Page B 3.8.1-27, B 3.8.1-35, B 3.8.4-9, B 3.8.4-11

BASES INSERT 2B

This restriction from normally performing the Surveillance in MODE 1, 2 or 3 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed 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, 2 or 3. Risk insights or deterministic methods may be used for this assessment.

BASES

<< Insert from previous page >>

SURVEILLANCE REQUIREMENTS

SR 3.8.~~6.8~~ 6.6 (continued)

meet the critical period of the load duty cycle, in addition to determining its percentage of rated capacity. Initial conditions for the modified performance discharge test should be identical to those specified for a ~~performance discharge~~ service test when the modified performance discharge test is performed in lieu of a service test. ~~Either the battery performance discharge test or the modified performance discharge test is acceptable for satisfying SR 3.8.4.8; however, only the modified performance discharge test may be used to satisfy SR 3.8.4.8 while satisfying the requirements of SR 3.8.4.7 at the same time.~~

<< Move to SR 3.8.6.6 Bases >>

The acceptance criteria for this Surveillance is consistent with IEEE-450 (Ref. ~~5~~11) and IEEE-485 (Ref. ~~6~~13) for the 125 V batteries. These references recommend that the battery be replaced if its capacity is below 80% of the manufacturer's rating, since IEEE-485 (Ref. ~~6~~13) recommends using an aging factor of 125% in the battery sizing calculations. The acceptance criteria for this Surveillance for the 250 V battery is consistent with Reference 5. This reference recommended that the battery be replaced if its capacity is below 83.4% of the manufacturer's rating in lieu of References 11 and 13 recommendation of 80%, since the battery sizing calculation in Reference 5 uses an aging factor of 120%. A capacity of 80% for the 125 V battery and 83.4% for the 250 V battery shows that the battery ~~is~~ rate of deterioration is increasing ~~getting old and capacity will decrease more rapidly,~~ even if there is ample capacity to meet the load requirements. Furthermore, the battery is sized to meet the assumed duty cycle loads when the battery design capacity reaches this 80% limit.

The Surveillance Frequency for this test is normally 60 months. If the battery shows degradation, or if the battery has reached 85% of its expected life and capacity is < 100% of the manufacturer's rating, the Surveillance Frequency is reduced to 12 ~~18~~ months. However, if the battery shows no degradation but has reached 85% of its expected life, the Surveillance Frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturer's rating. Degradation is indicated, according to IEEE-450, 2002 ~~1975~~ (Ref. ~~5~~14), when the battery capacity drops by more than 10% relative to its average on previous performance tests or when it is below 90% of the

(continued)

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.~~4.8~~ 6.6 (continued)

manufacturer's rating. For the 250 V battery, degradation is indicated when it is below 93.4% of the manufacturer's rating in lieu of 90%. This ensures the accelerated testing schedule is implemented when the 250 V battery capacity decreases to 10% above the capacity at which the battery must be replaced (consistent with the 125 V batteries), since the 250 V battery must be replaced when the capacity falls to 83.4%. The 12 month and 60 month Frequencies are consistent with the recommendations in IEEE-450 (Ref.~~5~~11). The 24 month Frequency is derived from the recommendations in IEEE-450 (Ref.~~5~~11).

Move to SR 3.8.6.6 Bases

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would remove a required DC electrical power subsystem from service, perturb the electrical distribution system, and challenge safety systems. Credit may be taken for unplanned events that satisfy the Surveillance.

Bases Insert 2B

REFERENCES

1. 10 CFR 50, Appendix A, GDC 17.

2. Regulatory Guide 1.6, Revision 0, March 10, 1971.

3. IEEE Standard 308, 1974.

4. FSAR, Chapter 8 ~~Section 8.3.2~~.

5. Columbia Generating Station Calculation 2.05.01, Rev. 8, February 1990.

6. Columbia Generating Station Calculation E/I 02-85-02, Rev. 1, April 1989.

7. FSAR, Chapter 6.

8. FSAR, Chapters 15 ~~and 15.F~~.

9. 10 CFR 50.36(c)(2)(ii).

10. Regulatory Guide 1.93, December 1974.

11. IEEE Standard 450, 2002 ~~1987~~. 9

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Insert to Page B 3.8.1-27, B 3.8.1-35, B 3.8.4-9, B 3.8.4-11

BASES INSERT 2B

This restriction from normally performing the Surveillance in MODE 1, 2 or 3 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g. post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed 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, 2 or 3. Risk insights or deterministic methods may be used for this assessment.

BASES

REFERENCES (continued)

12. Regulatory Guide 1.32, February 1977.

~~13. IEEE Standard 485, 1983.~~

~~14. IEEE Standard 450, 1975.~~

BASES

APPLICABLE SAFETY ANALYSES (continued)

c. Adequate DC electrical power is provided to mitigate events postulated during shutdown, such as an inadvertent draindown of the vessel or a fuel handling accident.

The DC sources satisfy Criterion 3 of Reference 3.

6

LCO

The DC electrical power subsystems, each consisting of one required battery, one battery charger, and the corresponding control equipment and interconnecting cabling supplying power to the associated bus within the division, are required to be OPERABLE to support required Distribution System divisions required OPERABLE by LCO 3.8.8, "Distribution Systems — Shutdown." This ensures the availability of sufficient DC electrical power sources to operate the unit in a safe manner and to mitigate the consequences of postulated events during shutdown (e.g., fuel handling accidents and inadvertent reactor vessel draindown).

APPLICABILITY

The DC electrical power sources required to be OPERABLE in MODES 4 and 5 and during movement of irradiated fuel assemblies in the secondary containment provide assurance that:

a. Required features to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies in the core in case of an inadvertent draindown of the reactor vessel;

b. Required features needed to mitigate a fuel handling accident are available;

c. Required features necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

The DC electrical power requirements for MODES 1, 2, and 3 are covered in LCO 3.8.4.

(continued)

BASES (continued)

ACTIONS

LCO 3.0.3 is not applicable while in MODE 4 or 5. However, since irradiated fuel assembly movement can occur in MODE 1, 2, or 3, the ACTIONS have been modified by a Note stating that LCO 3.0.3 is not applicable. If moving irradiated fuel assemblies while in MODE 4 or 5, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, or 3, the fuel movement is independent of reactor operations. Therefore, in either case, inability to suspend movement of irradiated fuel assemblies would not be sufficient reason to require a reactor shutdown.

Insert 3.8.5 Action Bases

B ~~A~~.1, B ~~A~~.2.1, B ~~A~~.2.2, B ~~A~~.2.3, and B ~~A~~.2.4

If more than one DC distribution subsystem is required according to LCO 3.8.8, the DC electrical power subsystems remaining OPERABLE with one or more DC electrical power subsystems inoperable may be capable of supporting sufficient required features to allow continuation of CORE ALTERATIONS, fuel movement, and operations with a potential for draining the reactor vessel. By allowing the option to declare required features inoperable with associated DC electrical power subsystem(s) inoperable, appropriate restrictions are implemented in accordance with the affected system LCOs' ACTIONS. However, in many instances this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of irradiated fuel assemblies in the secondary containment, and any activities that could result in inadvertent draining of the reactor vessel).

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the 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 plant 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

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Inserts to Page B 3.8.5-3

INSERT: 3.8.5 ACTION Bases

ACTIONS A.1, A.2, and A.3

6

Condition A represents one required division with one required battery charger inoperable (e.g., the voltage limit of SR 3.8.4.1 is not maintained). This condition is only entered under plant conditions in which LCO 3.8.8, "Distribution Systems – Shutdown," requires more than one division of class 1E DC Electrical Power Distribution (e.g., during CORE ALTERATIONS, LCO 3.8.8 requires the operability of necessary portions of Division 1, Division 2, and Division 3 electrical power distribution subsystems). Although the High Pressure Core Spray (HPCS) System is typically considered a single division system, for this condition, Division 3 (HPCS System) is considered redundant to Division 1 and 2 Emergency Core Cooling Systems. If the redundant required division(s) battery or battery charger is inoperable, or LCO 3.8.8 does not require a redundant DC electrical power distribution subsystem, then Condition B must be entered. The ACTIONS provide a tiered response that focuses on returning the battery to the fully charged state and restoring a fully qualified charger to OPERABLE status in a reasonable time period. Required Action A.1 requires that the battery terminal voltage be restored to greater than or equal to the minimum established float voltage within 2 hours. This time provides for retuning the inoperable charger to OPERABLE status or providing an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage. Restoring the battery terminal voltage to greater than or equal to the minimum established float voltage provides good assurance that, within 12 hours, the battery will be restored to its fully charged condition (Required Action A.2) 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 (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus, there is good assurance of fully recharging the battery within 12 hours, avoiding a premature shutdown with its own attendant risk.

7

If battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within 2 hours, and the charger is not operating in the current-limiting mode, a faulty charger is indicated. A faulty charger that is incapable of maintaining established battery terminal float voltage does not provide assurance that it can revert to and operate properly in the current limit mode that is necessary during the recovery period following a battery discharge event that the DC system is designed for.

Inserts to Page B 3.8.5-3 (continued)

INSERT: 3.8.5 ACTION Bases (continued)

ACTIONS A.1, A.2, and A.3 (continued)

If the charger is operating in the current limit mode after 2 hours, this is an indication the battery is partially discharged and its capacity margins will be reduced. The time to return the battery to its fully charged condition in this case is a function of the battery charger capacity, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristic of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within 12 hours (Required Action A.2).

Required Action A.2 requires that the battery float current be verified as 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 recharged. If, at the expiration of the initial 12 hour period the battery float current is not less than or equal to 2 amps, this indicates there may be additional battery problems and the battery must be declared inoperable.

Required Action A.3 limits the restoration time for the inoperable battery charger to 7 days. This action is 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. balance of plant non-Class 1E battery charger). The 7 day completion time reflects a reasonable time to effect restoration of the qualified battery charger to operable status.

BASES

ACTIONS

B.1, B.2.1, B.2.2, B.2.3, and B.2.4 (continued)

should be completed as quickly as possible in order to minimize the time during which the plant 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 through SR 3.8.4.3. 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 OPERABLE DC sources from being discharged below their capability to provide the required power supply or otherwise rendered inoperable during 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. FSAR, Chapter 6.
2. FSAR, Chapters 15 ~~and 15.F~~.
3. 10 CFR 50.36(c)(2)(ii).

B 3.8 ELECTRICAL POWER SYSTEMS

B 3.8.6 Battery ~~Cell~~ Parameters

BASES

BACKGROUND

This LCO delineates the limits on battery float current as well as electrolyte temperature, level, float voltage, and ~~specific gravity~~ 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."

Insert 3.8.6 Background Bases

APPLICABLE SAFETY ANALYSES

The initial conditions of Design Basis Accident (DBA) and transient analyses in FSAR, Chapter 6 (Ref. 1) and Chapters 15 ~~and 15.F~~ (Ref. ~~3~~2), 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.

The OPERABILITY of the DC subsystems is consistent with the initial assumptions of the accident analyses and is based upon meeting the design basis of the unit as discussed in the Bases for LCO 3.8.4, "DC Sources–Operating," and LCO 3.8.5, "DC Sources–Shutdown."

Since battery ~~cell~~ parameters support the operation of the DC power sources, they satisfy Criterion 3 of Reference ~~2~~ 4.

LCO

Battery ~~cell~~ parameters must remain within acceptable limits to ensure availability of the required DC power to shut down the reactor and maintain it in a safe condition after an anticipated operational occurrence or a postulated DBA. Battery parameter ~~Electrolyte~~ limits are conservatively established, allowing continued DC electrical system function even with limits not met.

Insert 3.8.6 LCO Bases

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Inserts to Page B 3.8.6-1

INSERT: 3.8.6 Background Bases

...In addition to the limitations of this Specification, the Battery Monitoring and Maintenance Program also implements the program specified in Specification 5.5.13 for monitoring various battery parameters that is based on the recommendations of IEEE Standard 450-2002, "IEEE Recommended Practice For Maintenance, Testing, And Replacement of Vented Lead-Acid Batteries for Stationary Applications" (Ref. 5).

8

The battery cells are 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 58 cell battery and 240 V for a 116 cell battery (i.e., cell voltage of 2.06 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 ≥ 2.06 Vpc, the battery cell will maintain its capacity for 30 days without further charging per manufacturer's instructions. Optimal long-term performance, however, is obtained by maintaining a float voltage 2.17 to 2.26 Vpc. This provides adequate over-potential which limits the formation of lead sulfate and self discharge. The nominal float voltage of 2.25 Vpc corresponds to a total float voltage output of 130.5 V for 58 cell battery and 261 V for a 116 cell battery as discussed in the FSAR, Chapter 8 (Ref.2).

INSERT: 3.8.6 Bases

...Additional preventative maintenance, testing, and monitoring performed in accordance with the Battery Monitoring and Maintenance Program is conducted as specified in Specification 5.5.13.

BASES (continued)

APPLICABILITY

The battery ~~cell~~ battery parameters are required solely for the support of the associated DC electrical power subsystem. Therefore, ~~these cell~~ parameter limits are only required when the associated DC electrical power subsystem is required to be OPERABLE. Refer to the Applicability discussion in Bases for LCO 3.8.4 and LCO 3.8.5.

ACTIONS

A.1, A.2, and A.3

With parameters of one or more cells in one or more batteries not within limits (i.e., Category A limits not met, Category B limits not met, or Category A and B limits not met) but within the Category C limits specified in Table 3.8.6-1, the battery is degraded but there is still sufficient capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of Category A or B limits not met, and continued operation is permitted for a limited period.

Insert 3.8.6 Action Bases

The pilot cell(s) electrolyte level and float voltage are required to be verified to meet Category C limits within 1 hour (Required Action A.1). This check provides a quick indication of the status of the remainder of the battery cells. One hour provides time to inspect the electrolyte level and to confirm the float voltage of the pilot cell(s). One hour is considered a reasonable amount of time to perform the required verification.

Verification that the Category C limits are met (Required Action A.2) provides assurance that, during the time needed to restore the parameters to the Category A and B limits, the battery is still capable of performing its intended function. A period of 24 hours is allowed to complete the initial verification because specific gravity measurements must be obtained for each connected cell. Taking into consideration both the time required to perform the required verification and the assurance that the battery cell parameters are not severely degraded, this time is considered reasonable. The verification is repeated at 7 day intervals until the parameters are restored to Category A and B limits. This periodic verification is consistent with the normal Frequency of pilot cell Surveillances.

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Inserts to Page B 3.8.6-2

INSERT: 3.8.6 ACTION Bases

ACTIONS A.1, A.2, and A.3

With one or more cells of a battery < 2.07 V, the battery cell is degraded. Within 2 hours, verification of the required battery charger OPERABILITY is made by monitoring the battery terminal voltage (SR 3.8.4.1) and the overall battery state of charge by monitoring the battery float charge current (SR 3.8.6.1). This assures 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 < 2.07 V, and continued operation is permitted for a limited period up to 24 hours.

Since the Required Actions only specify "perform," a failure of SR 3.8.4.1 or SR 3.8.6.1 acceptance criteria does not result in this Required Action not met. However, if one of the SRs is failed, the appropriate Condition(s), depending on the cause of the failure, is entered.

If SR 3.8.6.1 is failed, then there is not assurance that there is still sufficient battery capacity to perform the intended function and the battery must be declared inoperable immediately as specified in Condition F.

ACTIONS B.1 and B.2

One or more batteries with float current > 2 amps indicates that a partial discharge of the battery capacity has occurred. This may be due to a temporary loss of 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. 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 B of LCO 3.8.4 and Condition A of LCO 3.8.5 address charger inoperability. If the charger is operating in the current limit mode after 2 hours, that is an indication 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, the amount of loads on the associated DC system, the amount of the previous discharge, and the recharge characteristics of the battery. The charge time can be extensive, and there is not adequate assurance that it can be recharged within 12 hours (Required Action B.2). The battery must therefore be declared inoperable as specified in Condition F.

Inserts to Page B 3.8.6-2 (continued)

INSERT: 3.8.6 ACTION Bases (continued)

ACTIONS B.1 and B.2 (continued)

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, the associated "OR" statement in Condition F 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 good 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. A discharged battery with float voltage (the charger setpoint) across its terminals indicates the battery is on the exponential charging current portion (the second part) of its recharge cycle. The time to return a battery to its fully charged state under this condition is simply a function of the amount of the previous discharge and the recharge characteristic of the battery. Thus, there is good assurance of fully recharging the battery within 12 hours, avoiding a premature 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 indication of a substantially discharged battery and 12 hours is a reasonable time prior to declaring the battery inoperable.

Since Required Action B.1 only specifies "perform," a failure of SR 3.8.4.1 acceptance criteria does not result in the Required Action not met. However, if SR 3.8.4.1 is failed, the appropriate Condition(s), depending on the cause of the failure is entered.

ACTIONS C.1, C.2, and C.3

With one ore more batteries with one or more cells electrolyte level 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 electrolyte level not met. Within 31 days, the minimum established design limits for electrolyte level must be re-established.

Inserts to Page B 3.8.6-2 (continued)

INSERT: 3.8.6 ACTION Bases (continued)

ACTIONS C.1, C.2, and C.3 (continued)

With electrolyte level below the top of the plates, there is a potential for dryout and plate degradation. Required Actions C.1 and C.2 address this potential (as well as provisions in Specification 5.5.13 "Battery Monitoring and Maintenance Program"). They are modified by a Note that indicates they are only applicable if electrolyte level is below the top of the plates. Within 8 hours, level is required to be restored to above the top of the plates. The required Action C.2 requirement to verify that there is no leakage by visual inspection and the Specification 5.5.13.b item to initiate action to equalize and test in accordance with manufacturer's recommendation are taken from Annex D of IEEE Standard 450-2002. They are performed following the restoration of the electrolyte level to above the top of the plates. Based on the results of the manufacturer's recommended testing, the battery may have to be declared inoperable and the affected cell(s) replaced.

D.1

With one or more batteries with pilot cell temperature less than the minimum established design limits, 12 hours is allowed to restore the temperature to within limits. A low electrolyte temperature limits the current and power available. Since the battery is sized with margin, while battery capacity is degraded, sufficient capacity exists to perform the intended function and the affected battery is not required to be considered inoperable solely as a result of the pilot cell temperature not met.

E.1

7

Given that redundant batteries are involved, the longer completion times specified for battery parameters on non-redundant batteries not within limits are not appropriate, and the parameters must be restored to within limits on at lest one train within 2 hours. Although the High Pressure Core Spray (HPCS) System is typically considered a single division system, for this condition, the Division 3 (HPCS System) battery is considered redundant to Division 1 and 2 batteries for the Emergency Core Cooling function.

7

BASES

ACTIONS

A.1, A.2, and A.3 (continued)

Continued operation is only permitted for 31 days before battery cell parameters must be restored to within Category A and B limits. Taking into consideration that while battery capacity is degraded, sufficient capacity exists to perform the intended function and to allow time to fully restore the battery cell parameters to normal limits, this time is acceptable for operation prior to declaring the DC batteries inoperable.

F~~B~~.1

allowance of the Required Actions for Conditions A, B, C, D or E

When any battery parameter is outside the ~~Category C limit for any connected cell~~, sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding ~~DC electrical power subsystem~~ battery must be declared inoperable. Additionally, ~~other potentially extreme conditions, such as any Required Action of Condition A and associated Completion Time not met or average electrolyte temperature of representative cells ≤ 60°F, also are cause for immediately declaring the associated DC electrical power subsystem inoperable.~~

Insert 3.8.6 F.1 Bases

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

The SR verifies that Category A battery cell parameters are consistent with IEEE-450 (Ref. 4), which recommends regular battery inspections (at least one per month) including voltage, specific gravity, and electrolyte temperature of pilot cells.

Insert 3.8.6 SR Bases

SR 3.8.6.2

The quarterly inspection of specific gravity and voltage is consistent with IEEE-450 (Ref. 4). In addition, within 24 hours of a battery discharge < 110 V for a 125 V battery and < 220 V for the 250 V battery, or a battery overcharge > 150 V for a 125 V battery and > 300 V for the 250 V battery, the battery must be demonstrated to meet Category B limits. Transients, such as motor starting transients,

Move SR 3.8.6.6 from SR 3.8.4.8

(continued)

ATTACHMENT 3
Markup of Technical Specification Bases Pages

Inserts to Page B 3.8.6-3

INSERT: 3.8.6F.1 Bases

7

When a TS LCO required Battery Parameter is not met for reasons other than Condition A, B, C, D or E, such as the performance discharge test described in SR 3.8.6.6, sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding battery must be declared inoperable. When any battery parameter is outside the allowance of the Required Actions for Conditions A, B, C, D or E, sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding battery must be declared inoperable. Additionally, discovering a battery with one or more battery cells float voltage less than 2.07 V and float current greater than 2 amps indicates that the battery capacity may not be sufficient to perform the intended functions. The battery must therefore be declared inoperable immediately.

7

INSERT: 3.8.6 SR Bases

SR 3.8.6.1

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 initial losses of a battery and maintain the battery in a charged state. The float current requirements are based on the float current indicative of a charged battery. Use of the float current to determine the state of charge of the battery is consistent with IEEE-450 (Ref. 4). The 7 day Frequency is consistent with IEEE-450 (Ref. 4).

This SR is modified by a Note that states the float current requirement is not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. When this float voltage is not maintained, the Required Action of LCO 3.8.4 ACTION A are being taken, which provide the necessary and appropriate verifications of the battery condition. Furthermore, the float current limit of 2 amps is established based on the nominal float voltage value and is not directly applicable when this voltage is not maintained.

Inserts to Page B 3.8.6-3 (continued)

INSERT: 3.8.6 SR Bases (continued)

SR 3.8.6.2 and SR 3.8.6.5

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 126.0 V for the 125 V batteries and 252.0 V for the 250 V battery at the battery terminals, or 2.17 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, are addressed in Specification 5.5.13. SRs 3.8.6.2 and 3.8.6.5 require verification that the cell float voltages are equal to or greater than the short term absolute minimum voltage of 2.07 V. The Frequency of cell voltage verification every 31 days for pilot cell and 92 days for each connected cell is consistent with IEEE-450 (Ref. 4).

SR 3.8.6.3

The limit specified for electrolyte level ensures that the plates suffer no physical damage and maintains adequate electron transfer capability. The Frequency is consistent with IEEE-450 (Ref. 4).

SR 3.8.6.4

This Surveillance verifies that the pilot cell temperature is greater than or equal to the minimum established design limit (i.e., 60^0 F). Pilot cell electrolyte temperature is maintained above this temperature to assure the battery can provide the required current and voltage to meet the design requirements. Temperatures lower than assumed in battery sizing calculations may act to inhibit or reduce battery capacity. The Frequency is consistent with IEEE-450 (Ref. 4).

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.6.2 (continued)

which may momentarily cause battery voltage to drop to < 110 V or < 220 V, as applicable, do not constitute a battery discharge provided the battery terminal voltage and float current return to pre-transient values. This inspection is also consistent with IEEE-450 (Ref. 4), which recommends special inspections following a severe discharge or overcharge, to ensure that no significant degradation of the battery occurs as a consequence of such discharge or overcharge.

SR 3.8.6.3

This Surveillance verification that the average temperature of representative cells is > 60°F is consistent with a recommendation of IEEE-450 (Ref. 4), which states that the temperature of electrolytes in representative cells (i.e., one-sixth of the cells) should be determined on a quarterly basis.

Lower than normal temperatures act to inhibit or reduce battery capacity. This SR ensures that the operating temperatures remain within an acceptable operating range. This limit is based on manufacturer's recommendations and battery sizing calculations.

Table 3.8.6-1

This Table delineates the limits on electrolyte level, float voltage, and specific gravity for three different categories. The meaning of each category is discussed below.

Category A defines the normal parameter limit for each designated pilot cell in each battery. The cells selected as pilot cells are those whose temperature, voltage, and electrolyte specific gravity approximate the state of charge of the entire battery.

The Category A limits specified for electrolyte level are based on manufacturer's recommendations and are consistent with the guidance in IEEE-450 (Ref. 4), with the extra ¼ inch allowance above the high water level indication for

(continued)

BASES

SURVEILLANCE REQUIREMENTS

Table 3.8.6-1 (continued)

operating margin to account for temperatures and charge effects. In addition to this allowance, footnote a to Table 3.8.6-1 permits the electrolyte level to be temporarily above the specified maximum level during and following an equalizing charge (i.e., for up to 3 days following the completion of an equalize charge), provided it is not overflowing. These limits ensure that the plates suffer no physical damage, and that adequate electron transfer capability is maintained in the event of transient conditions. IEEE-450 (Ref. 4) recommends that electrolyte level readings should be made only after the battery has been at float charge for at least 72 hours.

The Category A limit specified for float voltage is ≥ 2.13 V per cell. This value is based on manufacturer's recommendations, and on the recommendation of IEEE-450 (Ref. 4), which states that prolonged operation of cells below 2.13 V can reduce the life expectancy of cells.

The Category A limit specified for specific gravity for each pilot cell is ≥ 1.200 (0.015 below the manufacturer's fully charged nominal specific gravity or a battery charging current that had stabilized at a low value). This value is characteristic of a charged cell with adequate capacity. According to IEEE-450 (Ref. 4), the specific gravity readings are based on a temperature of 77°F (25°C).

The specific gravity readings are corrected for actual electrolyte temperature and level. For each 3°F (1.67°C) above 77°F (25°C), 1 point (0.001) is added to the reading; 1 point is subtracted for each 3°F below 77°F. The specific gravity of the electrolyte in a cell increases with a loss of water due to electrolysis or evaporation. Level correction will be in accordance with manufacturer's recommendations.

Category B defines the normal parameter limits for each connected cell. The term "connected cell" excludes any battery cell that may be jumpered out.

(continued)

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SURVEILLANCE REQUIREMENTS

Table 3.8.6-1 (continued)

The Category B limits specified for electrolyte level and float voltage are the same as those specified for Category A and have been discussed above. The Category B limit specified for specific gravity for each connected cell is ≥ 1.195 (0.020 below the manufacturer's fully charged, nominal specific gravity) with the average of all connected cells > 1.205 (0.010 below the manufacturer's fully charged, nominal specific gravity). These values are based on manufacturer's recommendations. The minimum specific gravity value required for each cell ensures that a cell with a marginal or unacceptable specific gravity is not masked by averaging with cells having higher specific gravities.

Category C defines the limit for each connected cell. These values, although reduced, provide assurance that sufficient capacity exists to perform the intended function and maintain a margin of safety. When any battery parameter is outside the Category C limit, the assurance of sufficient capacity described above no longer exists, and the battery must be declared inoperable.

The Category C limit specified for electrolyte level (above the top of the plates and not overflowing) ensure that the plates suffer no physical damage and maintain adequate electron transfer capability. The Category C limit for float voltage is based on IEEE-450, Appendix C (Ref. 4), which states that a cell voltage of 2.07 V or below, under float conditions and not caused by elevated temperature of the cell, indicates internal cell problems and may require cell replacement.

The Category C limit of average specific gravity (≥ 1.195), is based on manufacturer's recommendations (0.020 below the manufacturer's recommended fully charged, nominal specific gravity). In addition to that limit, it is required that the specific gravity for each connected cell must be no less than 0.020 below the average of all connected cells. This limit ensures that a cell with a marginal or unacceptable specific gravity is not masked by averaging with cells having higher specific gravities.

(continued)

BASES

SURVEILLANCE REQUIREMENTS

Table 3.8.6-1 (continued)

The footnotes to Table 3.8.6-1 that apply to specific gravity are applicable to Category A, B, and C specific gravity. Footnote b requires the above mentioned correction for electrolyte level and temperature, with the exception that level correction is not required when battery charging current is < 2 amps on float charge. This current provides, in general, an indication of acceptable overall battery condition.

Because of specific gravity gradients that are produced during the recharging process, delays of several days may occur while waiting for the specific gravity to stabilize. A stabilized charging current is an acceptable alternative to specific gravity measurement for determining the state of charge. This phenomenon is discussed in IEEE-450 (Ref. 4). Footnote c allows the float charge current to be used as an alternate to specific gravity for up to 7 days following a battery recharge. Within 7 days each connected cell's specific gravity must be measured to confirm the state of charge. Following a minor battery recharge (such as an equalizing charge that does not follow a deep discharge), specific gravity gradients are not significant, and confirming measurements may be made in less than 7 days.

REFERENCES

1. FSAR, Chapter 6.
2. FSAR, Chapter 8.
3 ~~2~~. FSAR, Chapter~~s~~ 15 ~~and 15.F~~.
4 ~~3~~. 10 CFR 50.36(c)(2)(ii).
5 ~~4~~. IEEE Standard 450, ~~1987~~ 2002. ← 8
6. IEEE Standard 485, 1983

ATTACHMENT 4
List of Regulatory Commitments

COLUMBIA GENERATING STATION

FACILITY OPERATING LICENSE NO NPF-21

Request for Amendment to Technical Specifications Associated With Direct Current Electrical Power

REGULATORY COMMITMENTS

The following table identifies those actions committed to by Energy Northwest in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments.

REGULATORY COMMITMENT	DUE DATE
Energy Northwest will relocate SRs that perform preventive maintenance on safety related batteries and TS Table 3.8.6-1 to a licensee-controlled program.	Upon implementation of this Amendment.
Energy Northwest will establish a licensee controlled program to perform maintenance and monitoring of station batteries based on the recommendations of IEEE-450, 2002.	Upon implementation of this Amendment.