

June 7, 2019

10 CFR 50.90

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

Peach Bottom Atomic Power Station, Units 2 and 3  
Renewed Facility Operating License Nos. DPR-44 and DPR-56  
NRC Docket Nos. 50-277 and 50-278

Subject: License Amendment Request to Revise Technical Specifications 3.8.4, DC Sources - Operating

Reference 1: Peach Bottom Atomic Power Station, Units 2 and 3 – Issuance of Amendment Nos. 320 and 323 regarding the Adoption of TSTF-500, "DC Electrical Rewrite-Update to TSTF-360," dated September 28, 2018 (ML18249A240)

In accordance with 10 CFR 50.90, "Application for amendment of license, construction permit, or early site permit," Exelon Generation Company, LLC (Exelon) requests an amendment to the Technical Specifications (TS) for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3.

The proposed changes modify the wording in TS Limiting Condition for Operation (LCO) 3.8.4, DC Sources – Operating to add an additional LCO for the opposite Unit's inoperable battery charger condition. The proposed changes are required to address simultaneous conflicting LCO Required Action Completion Times of 72 hours for one Unit and 12 hours for the other Unit for a single inoperable battery charger on one Unit. The current conflicting concurrent 12-hour and 72-hour Completion Times for Unit 2 and Unit 3 for one Unit's inoperable battery charger was an unidentified imbedded oversight incorporated under TS Amendments 320 and 323, which adopted TSTF-500 (Reference 1).

Exelon has concluded that the proposed changes present no significant hazards consideration under the standards set forth in 10 CFR 50.92.

The proposed changes have been reviewed by the PBAPS Plant Operations Review Committee in accordance with the requirements of the Exelon Quality Assurance Program.

This amendment request contains no regulatory commitments.

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Attachment 1 provides an evaluation of the proposed changes. Attachment 2 provides the existing TS pages marked up to show the proposed changes. Attachment 3 provides the existing TS Bases pages marked up to show the proposed changes (for information only). Attachment 4 provides a simplified block diagram of the 125 VDC Control Power to the Emergency Diesel Generators (EDGs) and 4 kV Buses.

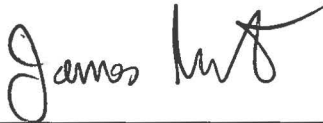
Exelon requests approval of the proposed amendments as soon as possible but no later than December 31, 2019. Once approved, the amendments shall be implemented within 30 days.

In accordance with 10 CFR 50.91, "Notice for public comment; State consultation," paragraph (b), Exelon is notifying the Commonwealth of Pennsylvania of this application for license amendment by transmitting a copy of this letter and its attachments to the designated State Official.

If you have any questions or require additional information, please contact Frank J. Mascitelli at (610) 765-5512.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 7<sup>th</sup> day of June 2019.

Respectfully,



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James Barstow  
Director - Licensing and Regulatory Affairs  
Exelon Generation Company, LLC

- Attachments:
1. Evaluation of Proposed Changes
  2. Markup of Technical Specifications Pages
  3. Markup of Technical Specifications Bases Pages (For Information Only)
  4. 125 VDC Control Power to EDGs & 4KV Buses

cc: USNRC Region I, Regional Administrator w/ attachments  
USNRC Senior Resident Inspector, PBAPS "  
USNRC Project Manager, PBAPS "  
R. R. Janati, Pennsylvania Bureau of Radiation Protection "  
D. Tancabel, State of Maryland "

# **ATTACHMENT 1**

## **License Amendment Request**

**Peach Bottom Atomic Power Station, Units 2 and 3  
Docket Nos. 50-277 and 50-278**

### **EVALUATION OF PROPOSED CHANGES**

**Subject: License Amendment Request to Revise Technical Specification 3.8.4,  
DC Sources - Operating**

- 1.0 SUMMARY DESCRIPTION**
- 2.0 DETAILED DESCRIPTION**
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  - 4.1 Applicable Regulatory Requirements/Criteria**
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**1.0 SUMMARY DESCRIPTION**

Exelon Generation Company, LLC (Exelon), proposes changes to the Technical Specifications (TS), Appendix A of Renewed Facility Operating License Nos. DPR-44 and DPR-56 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, respectively.

The proposed changes modify the wording in TS Limiting Condition for Operation (LCO) 3.8.4, DC Sources – Operating to add an additional LCO for the opposite Unit’s inoperable battery charger condition. The proposed changes are required to address simultaneous conflicting LCO Required Action Completion Times of 72 hours for one Unit and 12 hours for the other Unit for a single inoperable battery charger on one Unit. The current conflicting concurrent 12-hour and 72-hour Completion Times for Unit 2 and Unit 3 for one Unit’s inoperable battery charger was an unidentified imbedded oversight incorporated under TS Amendments 320 and 323, which adopted TSTF-500 (Reference 1).

**2.0 DETAILED DESCRIPTION**

The proposed changes will add a new LCO for the opposite Unit’s required battery charger. New LCO 3.8.4.B contains the opposite Unit’s inoperable battery charger condition. Renumbered LCO 3.8.4.C will be modified to include new Condition B, in addition to A. Renumbered LCO 3.8.4.D will be modified with the word “Unit 2 [Unit 3]” before battery charger. The subsequent LCOs will be renumbered accordingly as marked up in Attachment 2:

The new wording (underlined and italicized) proposed for LCO 3.8.4.B, C and D (Example Unit 2) is:

<u><i>B. One required Unit 3 battery charger on one subsystem inoperable.</i></u>	<u><i>B.1 Restore Unit 3 battery terminal voltage to greater than or equal to the minimum established float voltage.</i></u>	<u><i>12 hours</i></u>
	<u><i>AND</i></u>	
	<u><i>B.2 Verify battery float current ≤ 2 amps.</i></u>	<u><i>Once per 12 hours</i></u>
	<u><i>AND</i></u>	
	<u><i>B.3 Restore battery charger to OPERABLE status.</i></u>	<u><i>72 hours</i></u>

<p>C. One Unit 3 DC electrical power subsystem inoperable for reasons other than Condition A <u>or B</u>.</p>	<p>-----NOTE-----          Enter applicable Conditions and Required Actions of LCO 3.8.7, "Distribution Systems-Operating," when Condition <u>C</u> results in de-energization of a Unit 2 4kV emergency bus.          -----</p> <p>C.1 Restore Unit 3 DC electrical power subsystem to OPERABLE status.</p>	<p>12 hours</p>
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<p>D. One <u>Unit 2</u> battery charger on one subsystem inoperable.</p>	<p>D.1 Restore <u>Unit 2</u> battery terminal voltage to greater than or equal to the minimum established float voltage.</p> <p><u>AND</u></p> <p>D.2 Verify battery float current <math>\leq</math> 2 amps.</p> <p><u>AND</u></p> <p>D.3 Restore battery charger to OPERABLE status.</p>	<p>2 hours</p> <p>Once per 12 hours</p> <p>72 hours</p>
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### 3.0 TECHNICAL EVALUATION

#### 3.1 System Description

The DC electrical power system provides the AC emergency power system with control power. It also provides a source of reliable, uninterruptible 125/250 VDC power and 125 VDC control power and instrument power to Class 1E and non-Class 1E loads during normal operation and for safe shutdown of the plant following any plant design basis event or accident. The DC electrical power system is designed to have sufficient independence,

redundancy, and testability to perform its safety functions, assuming a single failure. The DC power sources provide both motive and control power, and instrument power, to selected safety related equipment, as well as to non safety-related equipment. There are two independent divisions per Unit, designated Division I and Division II. Each division consists of two 125 VDC batteries. The two 125 VDC batteries in each division are connected in series. Each 125 VDC battery has two chargers (one normally inservice charger and one standby charger) that are exclusively associated with that battery and cannot be interconnected with any other 125 VDC battery. The chargers are supplied from separate 480 V motor control centers (MCCs). Each of these MCCs is connected to an independent emergency AC bus.

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 powered from the batteries.

Each of the Unit's two DC electrical power divisions, consisting of two 125 V batteries in series, four battery chargers (two normally inservice chargers and two standby chargers), and the corresponding control equipment and interconnecting cabling, is separately housed in a ventilated room apart from its chargers and distribution centers. Each division is separated electrically from the other division to ensure that a single failure in one division does not cause a failure in a redundant division. There is no sharing between redundant Class 1E divisions such as batteries, battery chargers, or distribution panels.

Each safety related 125 V battery (i.e., 2A, 2B, 2C, 2D for Unit 2 and 3A, 3B, 3C, 3D for Unit 3) is of the lead-calcium type and consists of 58 shock absorbent, clear plastic cells. The chargers are full wave, silicon-controlled rectifiers. The housings are freestanding, NEMA Type I and are ventilated.

During implementation of TS Amendments 320 and 323, two permanently installed non safety-related alternate battery chargers (one per Unit) are being provided to ensure the battery can be restored to its minimum established float voltage within the required Completion Time when the operating and standby safety-related battery chargers have become inoperable.

### **3.2 Conflicting Unit 2 and Unit 3 battery charger LCOs**

There is a concurrent and conflicting 12-hour and 72-hour Required Action Completion Times for Unit 2 and Unit 3 for one Unit's inoperable battery charger condition. The concurrent and conflicting LCO Required Action Completion Times condition was an unidentified imbedded oversight incorporated under TS Amendments 320 and 323 (Reference1), which adopted TSTF-500, "DC Electrical Rewrite-Update to TSTF-360." Inter-unit DC electrical power subsystem battery charger LCOs were not included in the scope of TSTF-500 and no additional guidance was provided to address the PBAPS specific licensing design basis. A verbatim interpretation of the two existing LCOs, as incorporated under TS Amendments 320 and 323 requires concurrent entry into both LCO 3.8.4.B on one Unit and LCO 3.8.4.C on the other Unit. For example, consider the loss of the 3A battery charger (both operating and standby safety related chargers become inoperable). Unit 2 would enter LCO 3.8.4.B for an inoperable DC electrical subsystem with a Required Action Completion time of 12 hours to restore, and Unit 3 would enter LCO 3.8.4.C for an inoperable battery charger with three Required Actions, one of which has a Completion

Time of 72 hours to restore the battery charger. Thus, one Unit would have a completion time of 12 hours while the other Unit would have a concurrent Completion Time of 72 hours to restore the same battery charger, thus significantly curtailing the benefits afforded by adoption of TSTF-500 (Reference 1).

### **3.3 Basis for Inter-unit LCOs**

The Unit 2 Division I (consisting of the 2A and 2C batteries) and Division II (consisting of the 2B and 2D batteries) DC electrical power subsystems, with each DC subsystem consisting of two 125 V station batteries in series, two battery chargers (one per battery), and the corresponding control equipment and interconnecting cabling supplying power to the associated bus, 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 abnormal operational transient or a postulated Design Basis Accident (DBA). In addition, DC control power (which provides control power for the 4 kV load circuit breakers and the feeder breakers to the 4 kV emergency buses) for two of the four 4 kV emergency buses, as well as control power for two of the four emergency diesel generators, is provided by the Unit 3 DC electrical power subsystems. Therefore, Unit 3 Division I and Division II DC electrical power subsystems are also required to be OPERABLE to support the operation of Unit 2.

Similarly, the Unit 3 Division I (consisting of the 3A and 3C batteries) and Division II (consisting of the 3B and 3D batteries) DC electrical power subsystems, with each DC subsystem consisting of two 125 V station batteries in series, two battery chargers (one per battery), and the corresponding control equipment and interconnecting cabling supplying power to the associated bus, 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 abnormal operational transient or a postulated DBA. In addition, DC control power (which provides control power for the 4 kV load circuit breakers and the feeder breakers to the 4 kV emergency bus) for two of the four 4 kV emergency buses, as well as control power for two of the four emergency diesel generators, is provided by the Unit 2 DC electrical power subsystems. Therefore, Unit 2 Division I and Division II DC electrical power subsystems are also required to be OPERABLE to support the operation of Unit 3.

The above inter-unit DC electrical power subsystem relationships are illustrated, at a simple block diagram level, in Attachment 4, “125 VDC Control Power to EDGs & 4KV Buses,” which helps to clarify and provide the bases for why inter-unit LCOs are required at PBAPS.

### **3.4 Discussion of proposed TS changes**

A new LCO is proposed (LCO 3.8.4.B) for the opposite Unit consistent with TSTF-500. The word “required” denotes that only specific batteries from the opposite Unit are required to support operation of the Unit for particular plant configurations.

For Unit 2, the required Unit 3 DC subsystems are allowed to consist of only the following: 1) Division I DC electrical power subsystem is allowed to be only the 125 V battery C, an associated battery charger, and the corresponding control equipment and interconnecting cabling supplying 125 V power to the associated bus; and 2) Division II DC electrical power subsystem is allowed to be only the 125 V battery D, an associated battery charger, and the corresponding control equipment and interconnecting cabling supplying 125 V power to the associated bus. This exception is allowed only if all Unit 3 250 VDC loads are removed from

the associated bus. This is acceptable because the Unit 3 C and D batteries support 4KV bus operations and EDG operations for both Units.

Similarly, for Unit 3, the required Unit 2 DC subsystems are allowed to consist of only the following: 1) Division I DC electrical power subsystem is allowed to be only the 125 V battery A, an associated battery charger, and the corresponding control equipment and interconnecting cabling supplying 125 V power to the associated bus; and 2) Division II DC electrical power subsystem is allowed to be only the 125 V battery B, an associated battery charger, and the corresponding control equipment and interconnecting cabling supplying 125 V power to the associated bus. This exception is allowed only if all Unit 2 250 VDC loads are removed from the associated bus. This is acceptable because the Unit 2 A and B batteries support 4KV bus operations and EDG operations for both Units.

For Unit 2 [or Unit 3] if one of the required Unit 3 [or Unit 2] battery chargers on a DC electrical subsystem is inoperable as identified in new proposed LCO 3.8.4. Condition B, the remaining DC 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 a loss of minimum necessary DC electrical subsystems to mitigate a worst-case accident, continued power operation should not exceed 12 hours to restore the battery terminal voltage to greater than or equal to the minimum established float voltage, 12 hours to verify the battery float current is less than or equal to 2 amps, and 72 hours to restore the battery charger to operable status. The 12-hour Completion Time for verifying the battery float current is less than 2 amps and 72-hour Completion Time to restore the inoperable battery charger are consistent with TSTF-500 requirements. The 12-hour Completion Time to restore the affected battery to its minimum established float voltage (123.5 V) is different than the TSTF-500 requirements but consistent with current PBAPS licensing design basis and takes into consideration the current inter-unit margin of 10 hours between the Units (i.e., 2 hours for Unit that has the inoperable battery charger and 12 hours for the opposite Unit for any condition that causes an inoperable DC electrical subsystem). This inter-unit margin difference of 10 hours was preserved by adding 10 hours to the Required Action Completion Time established in TSTF-500 for restoring the battery minimum established float voltage.

Adding the exception of Condition B, in addition to Condition A for LCO 3.8.4.C preserves the existing LCO Condition and Required Action Completion Time of 12 hours to restore operability of the DC electrical power subsystem for any other condition than the performance of the SR 3.8.4.7 or SR 3.8.6.6 or an inoperable battery charger. It also ensures no conflict with the new 72-hour battery charger Completion Time in LCO 3.8.4.B.

## **4.0 REGULATORY EVALUATION**

### **4.1 Applicable Regulatory Requirements / Criteria**

The following NRC requirements and guidance document are applicable to the review of the proposed change.

The proposed changes have been evaluated to determine whether applicable regulations and requirements continue to be met. Exelon has determined that the proposed changes do not require any exemptions or relief from the applicable regulatory requirements listed



below. Note that PBAPS was designed and constructed taking into consideration the general design criteria for nuclear power plant construction permits as listed in the proposed AEC General Design Criteria, dated July 1967. The following current applicable regulations and regulatory requirements were reviewed in making this determination:

Title 10 of the Code of Federal Regulations (10 CFR) Part 50 Appendix A, General Design Criterion (GDC) 17, "Electric power systems," requires, in part, that nuclear power plants have onsite and offsite electric power systems to permit the functioning of structures, systems, and components (SSCs) that are important to safety. The onsite system is required to have sufficient independence, redundancy, and testability to perform its safety function, assuming a single failure. The offsite power system is required to be supplied by two physically independent circuits that are designed and located so as to minimize, to the extent practical, the likelihood of their simultaneous failure under operating and postulated accident and environmental conditions. In addition, this criterion requires provisions to minimize the probability of losing electric power from the remaining electric power supplies because of loss of power from the Unit, the offsite transmission network, or the onsite power supplies.

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

10 CFR 50.36, "Technical specifications," requires a licensee's TSs to establish limiting conditions for operation (LCOs), which include completion times (CTs) for equipment that is required for safe operation of the facility.

10 CFR 50.63, "Loss of all alternating current power," requires that each light-water cooled nuclear power plant licensed to operate must be able to withstand for a specified duration and recover from a station blackout (SBO).

10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," requires that preventive maintenance activities must not reduce the overall availability of the SSCs.

Regulatory Guide (RG) 1.75, Revision 3, "Criteria for Independence of Electrical Safety Systems," February 2005, provides guidance with respect to the physical independence requirements of the circuits and electrical equipment that comprise or are associated with safety related systems (ML043630448).

RG 1.129, Revision 2, "Maintenance, Testing, and Replacement of Vented Lead-Acid Storage Batteries for Nuclear Power Plants," February 2007, provides guidance with respect to the maintenance, testing, and replacement of vented lead-acid storage batteries in nuclear power plants. This RG endorses, in part, the 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" (ML063490110).

TSTF-500, Revision 2, "DC Electrical Rewrite – Update to TSTF-360," dated September 22, 2009 (ML092670242). The proposed amendment provides a longer completion time (12 hours versus 2 hours) for one of the required actions to restore a battery terminal voltage to

greater than or equal to the minimum established float voltage for an inoperable battery charger condition on the opposite Unit. The 12-hour Completion Time is consistent with existing PBAPS licensing bases that supports a 12-hour Completion Time for *any* DC subsystem inoperability condition on the opposite Unit.

#### 4.2 Precedent

The proposed amendment is consistent with TSTF-500 in that it provides an additional opposite Unit inoperable battery charger LCO, which corrects an oversight previously incorporated when adopting TSTF-500. TSTF-500 did not contain provisions for inter-unit DC electric subsystem interdependent LCOs.

#### 4.3 No Significant Hazards Consideration

Exelon Generation Company, LLC (Exelon), proposes changes to the Technical Specifications (TS), Appendix A of Renewed Facility Operating License Nos. DPR-44 and DPR-56 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, respectively.

The proposed changes will remedy an oversight that was incorporated into TS when adopting TSTF-500 (Reference 1). The proposed changes will ensure that both Units are in the same LCO Required Actions and Completion times for an inoperable battery charger on one Unit.

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

Response: No.

The proposed changes clarify Required Actions and Completion Times for both Units when a battery charger is inoperable on one Unit. The DC electrical power system, including associated battery chargers, is not an initiator of any accident sequence analyzed in the Updated Final Safety Analysis Report (UFSAR). Operation in accordance with the proposed TS ensures that the DC electrical power system is capable of performing its function as described in the UFSAR. Therefore, the mitigative functions supported by the DC electrical power system will continue to provide the protection assumed by the analysis, and the probability of previously analyzed accidents will not increase by implementing these changes. The proposed changes permit both Units to implement TSTF-500, "DC Electrical Rewrite-Update to TSTF-360," as fully intended.

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

The proposed changes do not require any plant modifications which affect the performance capability of the structures, systems and components relied upon to mitigate the consequences of postulated accidents; therefore, there is no impact to the probability or consequences of an accident previously evaluated.

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

2. Does the proposed changes 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 UFSAR. The DC electrical power system provides power to equipment used to mitigate an accident.

The proposed changes do not require any plant modifications which affect the performance capability of the structures, systems and components relied upon to mitigate the consequences of postulated accidents; therefore, it does not create the possibility of a new or different accident previously evaluated.

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

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

Response: No.

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. The proposed changes will not result in a change to the setpoints at which protective actions are initiated. Sufficient DC power and capacity to support operation of mitigation equipment is ensured. The DC electrical power subsystems will continue to provide adequate power to safety related equipment in accordance with safety analysis assumptions.

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

Based on the above, Exelon concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

#### 4.4 Conclusions

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 approval of the proposed change will not be inimical to the common defense and security or to the health and safety of the public.

## **5.0 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, 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(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

## **5.0 REFERENCES**

1. Peach Bottom Atomic Power Station, Units 2 and 3 – Issuance of Amendment Nos. 320 and 323 regarding the Adoption of TSTF-500, “DC Electrical Rewrite-Update to TSTF-360,” dated September 28, 2018 (ML18249A240)
2. Federal Register (76 FR 54510): Notice of Availability of Proposed Models for Plant Specific Adoption of Technical Specifications Task Force Traveler TSTF-500, Revision 2, “DC Electrical Rewrite-Update to TSTF-360,” dated September 1, 2011.

**ATTACHMENT 2**

**License Amendment Request**

**Peach Bottom Atomic Power Station, Units 2 and 3  
Docket Nos. 50-277 and 50-278**

**Markup of Technical Specification Pages**

**Unit 2 pages**

**3.8-28 (no proposed changes, included for completeness)**

**3.8-28a**

**3.8-29**

**3.8-29a**

**Unit 3 pages**

**3.8-28 (no proposed changes, included for completeness)**

**3.8-28a**

**3.8-29**

**3.8-29a**

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources—Operating

- LCO 3.8.4 The following DC electrical power subsystems shall be OPERABLE:
- a. Unit 2 Division I and Division II DC electrical power subsystems; and
  - b. Unit 3 Division I and Division II DC electrical power subsystems.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One Unit 3 DC electrical power subsystem inoperable due to performance of SR 3.8.4.7 or SR 3.8.6.6.</p>	<p>-----NOTE-----            Enter applicable Conditions and Required Actions of LCO 3.8.7, "Distribution Systems—Operating," when Condition A results in de-energization of a Unit 2 4 kV emergency bus or de-energization of a Unit 3 DC bus.            -----</p> <p>A.1 Restore Unit 3 DC electrical power subsystem to OPERABLE status.</p>	<p>7 days</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<u>B. One required Unit 3 battery charger on one subsystem inoperable.</u>	<u>B.1 Restore Unit 3 battery terminal voltage to greater than or equal to the minimum established float voltage.</u>	<u>12 hours</u>
	<u>AND</u> <u>B.2 Verify battery float current <math>\leq</math> 2 amps.</u>	<u>Once per 12 hours</u>
	<u>AND</u> <u>B.3 Restore battery charger to OPERABLE status.</u>	<u>72 hours</u>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p><del>B</del>C. One Unit 3 DC electrical power subsystem inoperable for reasons other than Condition A <u>or</u> B.</p>	<p>-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.7, "Distribution Systems—Operating," when Condition <u>C</u> results in de-energization of a Unit 2 4 kV emergency bus. -----</p> <p><del>B</del>C.1 Restore Unit 3 DC electrical power subsystem to OPERABLE status.</p>	<p>12 hours</p>
<p><del>C</del>D. One <u>Unit 2</u> battery charger on one subsystem inoperable.</p>	<p><del>C</del>D.1 Restore <u>Unit 2</u> battery terminal voltage to greater than or equal to the minimum established float voltage.</p> <p>AND</p> <p><del>C</del>D.2 Verify battery float current <math>\leq</math> 2 amps.</p> <p>AND</p> <p><del>C</del>D.3 Restore battery charger to OPERABLE status.</p>	<p>2 hours</p> <p>Once per 12 hours</p> <p>72 hours</p>

(continued)



ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>DE. One Unit 2 DC electrical power subsystem inoperable for reasons other than Condition CD.</p>	<p>DE.1 Restore Unit 2 DC electrical power subsystem to OPERABLE status.</p>	<p>2 hours</p>
<p>EE. Required Action and Associated Completion Time of Condition A, B, C, D, <u>or</u> E not met.</p>	<p>EE.1 Be in MODE 3. <u>AND</u> EE.2 Be in MODE 4.</p>	<p>12 hours  36 hours</p>
<p>EG. Two or more inoperable DC electrical power subsystems.</p>	<p>EG.1 Enter LCO 3.0.3.</p>	<p>Immediately</p>

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources—Operating

- LCO 3.8.4 The following DC electrical power subsystems shall be OPERABLE:
- a. Unit 3 Division I and Division II DC electrical power subsystems; and
  - b. Unit 2 Division I and Division II DC electrical power subsystems.

APPLICABILITY: MODES 1, 2, and 3.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p>A. One Unit 2 DC electrical power subsystem inoperable due to performance of SR 3.8.4.7 or SR 3.8.6.6.</p>	<p>-----NOTE-----  Enter applicable Conditions and Required Actions of LCO 3.8.7, "Distribution Systems—Operating," when Condition A results in de-energization of a Unit 3 4 kV emergency bus or de-energization of a Unit 2 DC bus.  -----</p> <p>A.1 Restore Unit 2 DC electrical power subsystem to OPERABLE status.</p>	<p>7 days</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<u>B. One required Unit 2 battery charger on one subsystem inoperable.</u>	<u>B.1 Restore Unit 2 battery terminal voltage to greater than or equal to the minimum established float voltage.</u> AND <u>B.2 Verify battery float current <math>\leq</math> 2 amps.</u> AND <u>B.3 Restore battery charger to OPERABLE status.</u>	<u>12 hours</u>  <u>Once per 12 hours</u>  <u>72 hours</u>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p><del>BC</del>. One Unit 2 DC electrical power subsystem inoperable for reasons other than Condition A <u>or B</u>.</p>	<p>-----NOTE----- Enter applicable Conditions and Required Actions of LCO 3.8.7, "Distribution Systems—Operating," when Condition <u>C</u> results in de-energization of a Unit 3 4 kV emergency bus. -----</p> <p><del>BC</del>.1 Restore Unit 2 DC electrical power subsystem to OPERABLE status.</p>	<p>12 hours</p>
<p><del>CD</del>. One <u>Unit 3</u> battery charger on one subsystem inoperable.</p>	<p><del>CD</del>.1 Restore <u>Unit 3</u> battery terminal voltage to greater than or equal to the minimum established float voltage.</p> <p><u>AND</u></p> <p><del>CD</del>.2 Verify battery float current <math>\leq</math> 2 amps.</p> <p><u>AND</u></p> <p><del>CD</del>.3 Restore battery charger to OPERABLE status.</p>	<p>2 hours</p> <p>Once per 12 hours</p> <p>72 hours</p>

(continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
<p><u>DE</u>. One Unit 3 DC electrical power subsystem inoperable for reasons other than Condition <u>CD</u>.</p>	<p><u>DE</u>.1 Restore Unit 3 DC electrical power subsystem to OPERABLE status.</p>	<p>2 hours</p>
<p><u>EF</u>. Required Action and Associated Completion Time of Condition A, B, C, D, <u>or E</u> not met.</p>	<p><u>EF</u>.1 Be in MODE 3. <u>AND</u> <u>EF</u>.2 Be in MODE 4.</p>	<p>12 hours  36 hours</p>
<p><u>EG</u>. Two or more inoperable DC electrical power subsystems.</p>	<p><u>EG</u>.1 Enter LCO 3.0.3.</p>	<p>Immediately</p>

**ATTACHMENT 3**

**License Amendment Request**

**Peach Bottom Atomic Power Station, Units 2 and 3  
Docket Nos. 50-277 and 50-278**

**Markup of Technical Specification Bases Pages**

**Unit 2**

**B 3.8-62  
B 3.8-63  
B 3.8-63a  
B 3.8-63b  
B 3.8-64**

**Unit 3**

**B 3.8-62  
B 3.8-63  
B 3.8-63a  
B 3.8-63b  
B 3.8-64**

BASES

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ACTIONS

A.1 (continued)

results in de-energization of a Unit 2 4 kV emergency bus or a Unit 3 DC bus, Actions for LCO 3.8.7 must be immediately entered. This allows Condition A to provide requirements for the loss of a Unit 3 DC electrical power subsystem (due to performance of SR 3.8.4.7 or SR 3.8.4.8) without regard to whether a bus is de-energized. LCO 3.8.7 provides the appropriate restriction for a de-energized bus.

If one Unit 3 DC electrical power subsystem is inoperable due to performance of SR 3.8.4.7 or SR 3.8.4.8, the remaining DC electrical power subsystems have the capacity to support a safe shutdown and to mitigate an accident condition. In the case of an inoperable Unit 3 DC electrical power subsystem, since a subsequent postulated worst case single failure could result in the loss of safety function, continued power operation should not exceed 7 days. The 7 day Completion Time is based upon the Unit 3 DC electrical power subsystem being inoperable due to performance of SR 3.8.4.7 or SR 3.8.4.8. Performance of these two SRs will result in inoperability of the Unit 3 DC divisional batteries since these batteries are needed for Unit 2 operation, more time is provided to restore the batteries, if the batteries are inoperable for performance of required Surveillances, to preclude the need for a dual unit shutdown to perform these Surveillances. The Unit 3 DC electrical power subsystems also do not provide power to the same type of equipment as the Unit 2 DC sources. The Completion Time also takes into account the capacity and capability of the remaining DC sources.

INSERT 1 → C 3.1

Pursuant to LCO 3.0.6, the Distribution Systems—Operating ACTIONS would not be entered even if the DC electrical power subsystem inoperability resulted in de-energization of an AC bus. Therefore, the Required Actions of Condition A are modified by a Note to indicate that when Condition A results in de-energization of a Unit 2 4 kV emergency bus, Actions for LCO 3.8.7 must be immediately entered. This allows Condition A to provide requirements for the loss of a Unit 3 DC electrical power subsystem without regard to whether a bus is de-energized. LCO 3.8.7 provides the appropriate restriction for a de-energized bus.

(continued)

## Insert 1

### B.1

Condition B represents one subsystem with one required Unit 3 battery charger inoperable. Condition B is exited when the standby battery charger is placed in service. However, if both the operating and standby battery chargers are inoperable, the ACTIONS must be completed while the alternate battery charger is in service. The ACTIONS provide a 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 B.1 requires the battery terminal voltage be restored to greater than or equal to the minimum established float voltage within 12 hours. Required Action B.2 requires the battery float current to be restored to less than or equal to 2 amps within 12 hours and requires it to be checked once per 12 hours until Condition B is exited. This time provides for returning the inoperable charger to OPERABLE status or providing an alternate means of restoring the battery to a 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 (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 established battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within 12 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.

Required Action B.2 requires that the battery float current be verified as less than or equal to 2 amps within 12 hours and checked once per 12 hours until Condition B is exited. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it is now fully capable of supplying the maximum expected load requirement. The 2-amp value is based on returning the battery to 98% charge and assumes a 5% design margin for the battery. 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 the battery has not been returned to a fully charged condition to support a safe shutdown and mitigate an accident condition.

Required Action B.3 limits the restoration time for the inoperable battery charger to 72 hours. This action is applicable if an alternate means of restoring the battery to a fully charged condition has been used (e.g., balance of plant non-Class 1E battery charger). The 72-hour Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status.

Condition A contains the Required Actions and associated Completion Times for a Unit 3 DC electrical power subsystem inoperability due to the performance of SR 3.8.4.7 or SR 3.8.6.6. Even though the associated battery charger is disconnected from the battery during the performance of SR 3.8.4.7 or SR 3.8.6.6, Condition B is not also entered when Condition A is entered.



BASES

ACTIONS

C ~~B.1~~ (continued)

OR B

If one of the Unit 3 DC electrical power subsystems is inoperable for reasons other than Condition A, the remaining DC 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 a loss of minimum necessary DC electrical subsystems to mitigate a worst case accident, continued power operation should not exceed 12 hours. The 12 hour Completion Time reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and takes into consideration the importance of the Unit 3 DC electrical power subsystem.

D D D  
~~1.1, 1.2, and 1.3~~

D Condition C represents one subsystem with one battery charger inoperable (e.g., the voltage limit of SR 3.8.4.1 is not maintained). Condition C is exited when the standby battery charger is placed in service within two hours. However, if both the operating and standby battery chargers are inoperable, the ACTIONS must be completed while the alternate battery charger is in service. 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 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 2.2) 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.

(continued)

BASES

ACTIONS

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

If established 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.

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 C.2).

Required Action 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 is now fully capable of supplying the maximum expected load requirement. The 2 amp value is based on returning the battery to 98% charge and assumes a 5% design margin for the battery. 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 C.3 limits the restoration time for the inoperable battery charger to 72 hours. 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 72 hour Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status.

(continued)

BASES

ACTIONS

E

D.1 (continued)

E

Condition D represents one Unit 2 DC Electrical Power subsystem 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 DC power to the affected subsystem. The 2 hour limit is consistent with the allowed time for an inoperable DC Distribution System Subsystem.

If one of the Unit 2 DC electrical power subsystems is inoperable for reasons other than conditions C (e.g., battery charger and associated inoperable battery), the remaining DC 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 result in the loss of minimum necessary DC electrical subsystems to mitigate a worst case accident, continued power operation should not exceed 2 hours. The 2 hour Completion Time is consistent with Regulatory Guide 1.93 (Ref. 4) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power division and, if the Unit 2 DC electrical power division is not restored to OPERABLE status, to prepare to initiate an orderly and safe unit shutdown. The 2 hour limit is also consistent with the allowed time for an inoperable Unit 2 DC Distribution System Subsystem..

(continued)

BASES

ACTIONS  
(continued)

F  
E.1

If the DC electrical power subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours. Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 6) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state. The allowed Completion Time is 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 required in Regulatory Guide 1.93 (Ref. 4).

G  
E.1

G

Condition F corresponds to a level of degradation in the DC electrical power subsystems that causes a required safety function to be lost. When more than one DC source is lost, this results in a loss of a required function, thus the plant is in a condition outside the accident analysis. Therefore, no additional time is justified for continued operation. LCO 3.0.3 must be entered immediately to commence a controlled shutdown.

SURVEILLANCE  
REQUIREMENTS

As Noted at the beginning of the SRs, SR 3.8.4.1 through SR 3.8.4.8 are applicable only to the Unit 2 DC electrical power subsystems and SR 3.8.4.9 is applicable only to the Unit 3 DC electrical power subsystems.

SR 3.8.4.1

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the 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 while supplying the continuous steady state loads of the associated DC subsystem. On float charge, battery cells

(continued)

BASES

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ACTIONS

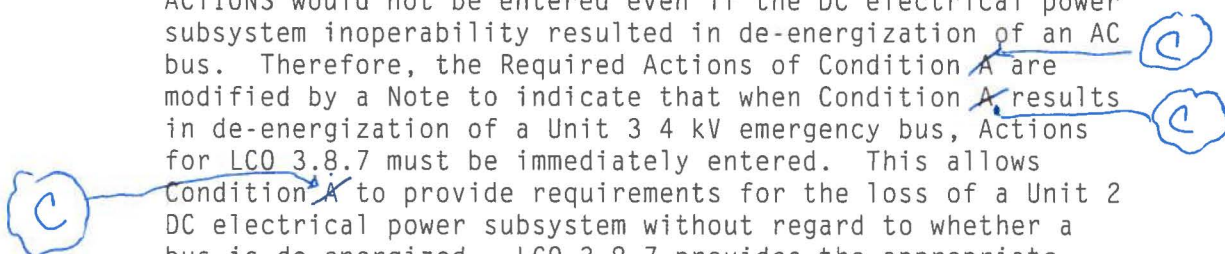
A.1 (continued)

results in de-energization of a Unit 3 4 kV emergency bus or a Unit 2 DC bus, Actions for LCO 3.8.7 must be immediately entered. This allows Condition A to provide requirements for the loss of a Unit 2 DC electrical power subsystem (due to performance of SR 3.8.4.7 or SR 3.8.4.8) without regard to whether a bus is de-energized. LCO 3.8.7 provides the appropriate restriction for a de-energized bus.

If one Unit 2 DC electrical power subsystem is inoperable due to performance of SR 3.8.4.7 or SR 3.8.4.8, the remaining DC electrical power subsystems have the capacity to support a safe shutdown and to mitigate an accident condition. In the case of an inoperable Unit 2 DC electrical power subsystem, since a subsequent postulated worst case single failure could result in the loss of safety function, continued power operation should not exceed 7 days. The 7 day Completion Time is based upon the Unit 2 DC electrical power subsystem being inoperable due to performance of SR 3.8.4.7 or SR 3.8.4.8. Performance of these two SRs will result in inoperability of the Unit 2 DC divisional batteries since these batteries are needed for Unit 3 operation, more time is provided to restore the batteries, if the batteries are inoperable for performance of required Surveillances, to preclude the need for a dual unit shutdown to perform these Surveillances. The Unit 2 DC electrical power subsystems also do not provide power to the same type of equipment as the Unit 3 DC sources. The Completion Time also takes into account the capacity and capability of the remaining DC sources.



Pursuant to LCO 3.0.6, the Distribution Systems—Operating ACTIONS would not be entered even if the DC electrical power subsystem inoperability resulted in de-energization of an AC bus. Therefore, the Required Actions of Condition A are modified by a Note to indicate that when Condition A results in de-energization of a Unit 3 4 kV emergency bus, Actions for LCO 3.8.7 must be immediately entered. This allows Condition A to provide requirements for the loss of a Unit 2 DC electrical power subsystem without regard to whether a bus is de-energized. LCO 3.8.7 provides the appropriate restriction for a de-energized bus.



(continued)

## Insert 2

### B.1

Condition B represents one subsystem with one required Unit 2 battery charger inoperable. Condition B is exited when the standby battery charger is placed in service. However, if both the operating and standby battery chargers are inoperable, the ACTIONS must be completed while the alternate battery charger is in service. The ACTIONS provide a 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 B.1 requires the battery terminal voltage be restored to greater than or equal to the minimum established float voltage within 12 hours. Required Action B.2 requires the battery float current to be restored to less than or equal to 2 amps within 12 hours and requires it to be checked once per 12 hours until Condition B is exited. This time provides for returning the inoperable charger to OPERABLE status or providing an alternate means of restoring the battery to a 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 (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 established battery terminal float voltage cannot be restored to greater than or equal to the minimum established float voltage within 12 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.

Required Action B.2 requires that the battery float current be verified as less than or equal to 2 amps within 12 hours and checked once per 12 hours until Condition B is exited. This indicates that, if the battery had been discharged as the result of the inoperable battery charger, it is now fully capable of supplying the maximum expected load requirement. The 2-amp value is based on returning the battery to 98% charge and assumes a 5% design margin for the battery. 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 the battery has not been returned to a fully charged condition to support a safe shutdown and mitigate an accident condition.

Required Action B.3 limits the restoration time for the inoperable battery charger to 72 hours. This action is applicable if an alternate means of restoring the battery to a fully charged condition has been used (e.g., balance of plant non-Class 1E battery charger). The 72-hour Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status.

Condition A contains the Required Actions and associated Completion Times for a Unit 2 DC electrical power subsystem inoperability due to the performance of SR 3.8.4.7 or SR 3.8.6.6. Even though the associated battery charger is disconnected from the battery during the performance of SR 3.8.4.7 or SR 3.8.6.6, Condition B is not also entered when Condition A is entered.

BASES

ACTIONS

C.1 (continued)

OR B

If one of the Unit 2 DC electrical power subsystems is inoperable for reasons other than Condition A, the remaining DC electrical power subsystems have the capacity to support a safe shutdown and to mitigate the accident condition. Since a subsequent worst case single failure could, however, result in a loss of minimum necessary DC electrical subsystems to mitigate a worst case accident, continued power operation should not exceed 12 hours. The 12 hour Completion Time reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and takes into consideration the importance of the Unit 2 DC electrical power subsystem.

D.1, D.2, and D.3

D

Condition C represents one subsystem with one battery charger inoperable (e.g., the voltage limit of SR 3.8.4.1 is not maintained). Condition C is exited when the standby battery charger is placed in service within two hours. However, if both the operating and standby battery chargers are inoperable, the ACTIONS must be completed while the alternate battery charger is in service. 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 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 C.2) from any discharge that might have occurred due to the charger inoperability.

D

D

D

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.

(continued)

BASES

ACTIONS

D D D  
C.1. C.2 and C.3 (continued)

If established 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.

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 C.2).

Required Action 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 is now fully capable of supplying the maximum expected load requirement.

The 2 amp value is based on returning the battery to 98% charge and assumes a 5% design margin for the battery. 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 C.3 limits the restoration time for the inoperable battery charger to 72 hours. 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 72 hour Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status.

(continued)



BASES

E

ACTIONS

D.1 (continued)

E

Condition D represents one Unit 2 subsystem 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 DC power to the affected subsystem. The 2 hour limit is consistent with the allowed time for an inoperable DC Distribution System Subsystem.

D

If one of the Unit 2 DC electrical power subsystems is inoperable for reasons other than conditions E (e.g., battery charger and associated inoperable battery), the remaining DC 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 result in the loss of minimum necessary DC electrical subsystems to mitigate a worst case accident, continued power operation should not exceed 2 hours. The 2 hour Completion Time is consistent with Regulatory Guide 1.93 (Ref. 4) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power division and, if the Unit 2 DC electrical power division is not restored to OPERABLE status, to prepare to initiate an orderly and safe unit shutdown. The 2 hour limit is also consistent with the allowed time for an inoperable Unit 2 DC Distribution System Subsystem.

(continued)

BASES

ACTIONS  
(continued)

F

F.1

If the DC electrical power subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the overall plant risk is minimized. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours. Remaining in the Applicability of the LCO is acceptable because the plant risk in MODE 3 is similar to or lower than the risk in MODE 4 (Ref. 6) and because the time spent in MODE 3 to perform the necessary repairs to restore the system to OPERABLE status will be short. However, voluntary entry into MODE 4 may be made as it is also an acceptable low-risk state. The allowed Completion Time is 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 required in Regulatory Guide 1.93 (Ref. 4).

G  
F.1

G

Condition F corresponds to a level of degradation in the DC electrical power subsystems that causes a required safety function to be lost. When more than one DC source is lost, this results in a loss of a required function, thus the plant is in a condition outside the accident analysis. Therefore, no additional time is justified for continued operation. LCO 3.0.3 must be entered immediately to commence a controlled shutdown.

SURVEILLANCE  
REQUIREMENTS

As Noted at the beginning of the SRs, SR 3.8.4.1 through SR 3.8.4.8 are applicable only to the Unit 3 DC electrical power subsystems and SR 3.8.4.9 is applicable only to the Unit 2 DC electrical power subsystems.

SR 3.8.4.1

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the 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 while supplying the continuous steady state loads of the associated DC subsystem. On float charge, battery cells

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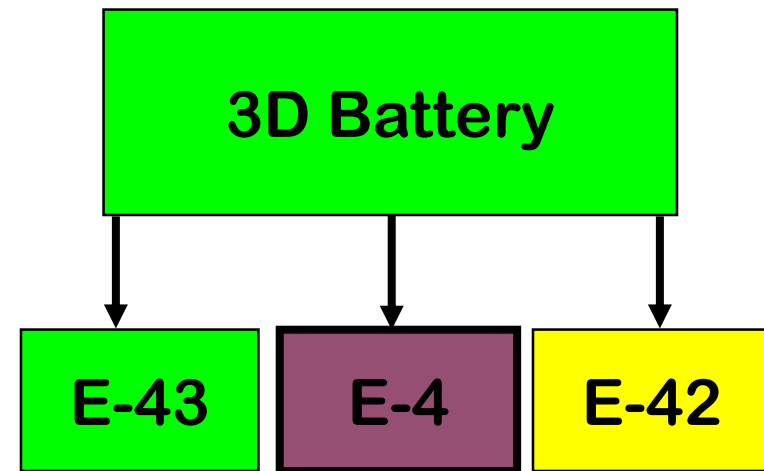
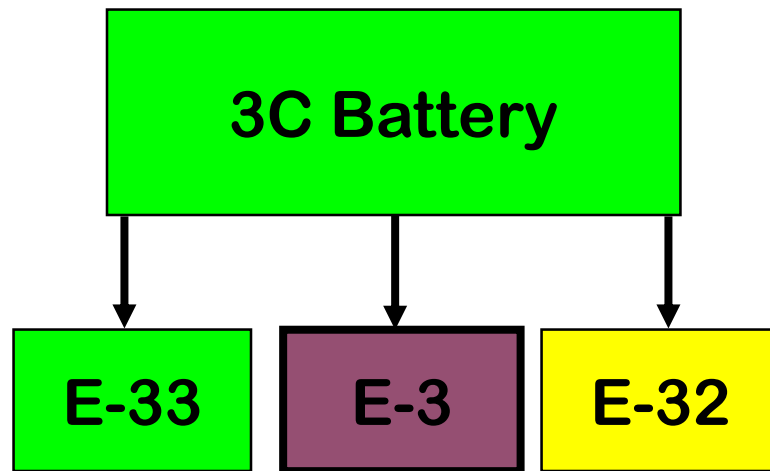
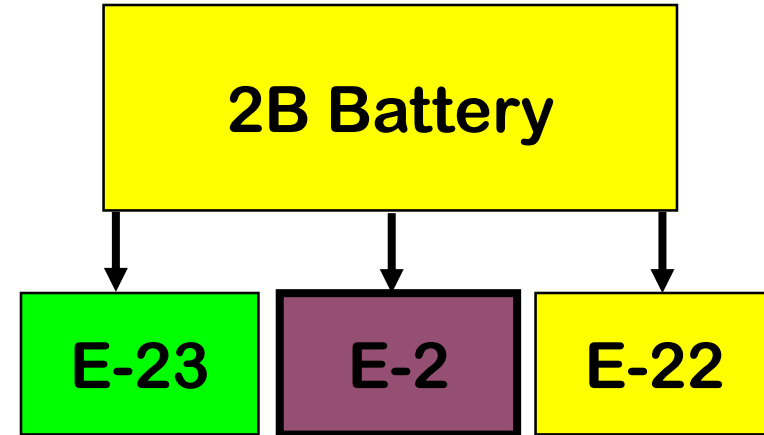
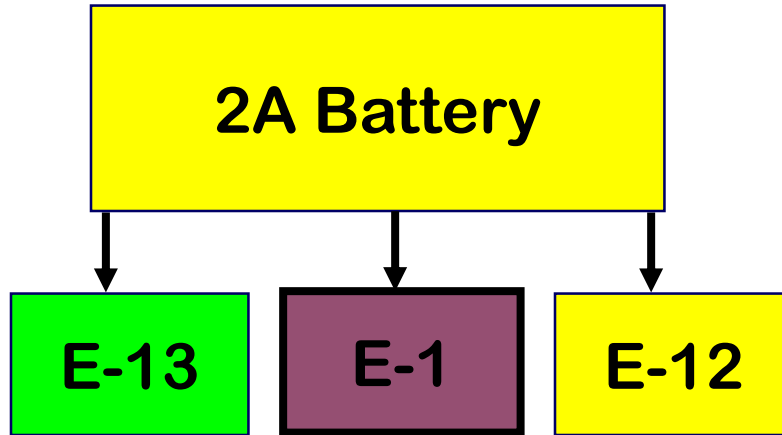
**ATTACHMENT 4**

**License Amendment Request**

**Peach Bottom Atomic Power Station, Units 2 and 3  
Docket Nos. 50-277 and 50-278**

**125 VDC Control Power to EDGs & 4KV Buses**

# 125 VDC Control Power to EDGs & 4KV Buses



- E-1 is Emergency Diesel Generator (EDG), E-13 is the Unit 3 4kV Emergency Bus fed from E-1. Total of 4 EDGs for station and 8 total Emergency Buses, 4 per Unit

Yellow is Unit 2, Green is Unit 3