



1101 Market Street, Chattanooga, Tennessee 37402

CNL-21-052

July 21, 2021

10 CFR 50.90

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

Browns Ferry Nuclear Plant, Units 1, 2, and 3
Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68
NRC Docket Nos. 50-259, 50-260, and 50-296

Subject: **Browns Ferry Nuclear Plant, Units 1, 2, and 3 Response to Request for Additional Information Regarding License Amendment Request to Modify Technical Specification 3.8.6, “Battery Cell Parameters” (TS-531) (EPID L-2020-LLA-0177)**

References:

1. TVA Letter to NRC, CNL-20-013, “Application to Revise Browns Ferry Nuclear Plant, Units 1, 2, and 3, Technical Specification 3.8.6, ‘Battery Cell Parameters’ (TS-531),” dated August 6, 2020 (ML20219A762)
2. NRC Electronic Mail to TVA, “Browns Ferry Nuclear Plant, Units 1, 2, and 3 - Request for Additional Information Regarding Request to TS 3.8.6 (EPID L-2020-LLA-0177),” dated June 21, 2021 (ML21173A104)

In Reference 1, Tennessee Valley Authority (TVA) submitted a request for an amendment to Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68 for the Browns Ferry Nuclear Plant (BFN), Units 1, 2, and 3, respectively. The proposed amendment would modify BFN Technical Specification (TS) 3.8.6, “Battery Cell Parameters,” to clarify the operability requirements for the unit, shutdown board, and diesel generator batteries.

In Reference 2, the NRC issued a Request for Additional Information (RAI) and requested TVA respond by July 21, 2021. Enclosure 1 provides the TVA response to the RAI. Enclosure 2 provides the revised BFN Units 1, 2, and 3 TS pages marked up to show the revised proposed changes. Enclosure 2 supersedes the corresponding information provided in Attachments 1, 2, and 3 of the Enclosure to Reference 1.

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This letter does not change the no significant hazards considerations or the environmental considerations contained in Reference 1. Additionally, in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 50.91(b)(1), TVA is sending a copy of this letter and the enclosure to the Alabama Department of Public Health.

There are no new regulatory commitments contained in this letter. If you have any questions regarding this submittal, please contact Kimberly D. Hulvey, Senior Manager, Fleet Licensing at 423-751-3275.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 21st day of July 2021.

Respectfully,



James Barstow
Vice President, Nuclear Regulatory Affairs & Support Services

Enclosures:

1. Response to Request for Additional Information Regarding Technical Specification 3.8.6, "Battery Cell Parameters" (TS-531)
2. Revised Technical Specification Page Markups

CC:

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Browns Ferry Nuclear Plant
NRC Project Manager - Browns Ferry Nuclear Plant
State Health Officer, Alabama Department of Public Health

Enclosure 1

Browns Ferry Nuclear Plant, Units 1, 2, and 3

Response to Request for Additional Information Regarding
License Amendment Request to Modify
Technical Specification 3.8.6, "Battery Cell Parameters" (TS-531)
(EPID L-2020-LLA-0177)

Enclosure 1

Response to NRC Request for Additional Information

NRC Introduction

By application dated August 6, 2020 (Agencywide Documents Access and Management System Accession No. ML20219A762), the Tennessee Valley Authority (the licensee) requested amendments to Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68 for Browns Ferry Nuclear Plant (Browns Ferry), Units 1, 2, and 3, respectively. The proposed amendments would revise Technical Specification (TS) 3.8.6, "Battery Cell Parameters," to clarify the operability requirements for the Unit, Shutdown Board, and Diesel Generator batteries.

The U.S. Nuclear Regulatory Commission's Electrical Engineering Branch staff is reviewing the license amendment request and has identified where additional information is needed to complete its review. The NRC staff's request for additional information is below.

Regulatory Requirements

Part 50.36, "Technical Specifications," of Title 10 of the Code of Federal Regulations requires, in part, that the operating license of a nuclear production facility include TS. Paragraph 50.36(c)(2) of Title 10 of the Code of Federal Regulations requires, in part, that the TS include limiting conditions for operation (LCOs), which are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When an LCO of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TS, until the condition can be met.

EEEB RAI - 1

The licensee proposed to revise TS 3.8.6 by deleting the existing alternate condition "One or more batteries with one or more battery cell parameters not within Category C values," in Condition B and adding the proposed new Condition C:

Condition C	<i>"One or more batteries with one or more battery cell parameters not within Category B limits AND Any corresponding battery cell parameter for that battery not within its Category C limit."</i>
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Required Action C.1 Declare associated battery inoperable

Completion Time Immediately

The licensee also proposed to revise Table 3.8.6-1, Battery Cell Parameter Requirements, by adding Note (e):

(e) Category C battery cell parameters are not considered when the corresponding Category B cell parameters are met.

The Table 3.8.6-1 Category C allowable value for each connected cell specific gravity is: Not more than 0.020 below average of all connected cells AND average of all connected cells \geq 1.195.

The licensee provided the following basis for the proposed changes:

When the average specific gravity of all connected cells is near the nominal, fully charged value, this limit [i.e., not more than 0.020 below average of all connected cells] provides a valid indication of a cell that may not be able to meet its design basis requirements. When the average specific gravity is high, having one cell more than 0.020 below the average of all connected is not necessarily an indication of a problem and is an invalid basis on which to declare the battery inoperable when all other parameter limits are met. Likewise, because the acceptable range of specific gravity is wider than 0.020, the natural variance of specific gravity can cause a given cell to be lower than 0.020 below the average and still be acceptable, notwithstanding the LCO. The proposed change corrects this situation.

The licensee also stated:

This proposed change clarifies the usage of the Category C limits as allowable values that determine operability only if any of the corresponding Category B limits are not met.

In a case when a battery pilot cell specific gravity does not meet Categories A and C limits in Condition A, the TS requires the licensee to declare the battery inoperable in Condition B (Required Action and associated Completion of Condition A not met). In this case, Category C limits would determine the operability of the battery if Category A limits are not met. Thus, the situation that the licensee would correct with the proposed change remains in the TS when Categories A and C limits are not met.

1. *Provide a discussion of the TS requirements when Categories A and C are not met.*
2. *Clarify how the Category C limits would determine the operability of the battery when they “are not considered,” as stated in the proposed Note (e).*

TVA Response to EEEB RAI - 1

1. Revised TS page markups are provided in Enclosure 2. When Category A limits are not met, Condition A is entered. Action A.1 requires verification within 1 hour that electrolyte level and float voltage meet Category C limits. Action A.2 requires verification within 24 hours that the battery cell parameters meet the Category C limits. When performing these actions, the new Note (e) is used to first verify that the Category B limits are met. If the Category B limits are met, the corresponding Category C limits are met as well and Action A.3 controls at that point.

If the Category B limits are not met, the Category C limits are verified to be met. If the Category C limits are met, Action A.3 controls at this point. If the Category C limits are not met, then Condition B is entered with the Required Action A not met. Required Action B.1 requires the associated battery to be declared inoperable with an immediate Completion Time. Because not meeting the Category C limits is already managed by the first criterion of Condition B after not meeting the Required Actions of Condition A, the last criterion of Condition B regarding Category C limits is redundant and is being deleted as shown in Enclosure 2.

2. The wording of Note (e) has been revised as shown in Enclosure 2 to read:

Category C battery cell parameters are considered met when the corresponding Category B cell parameters are met.

Category C limits determine operability of the battery when the corresponding Category B limits are not met.

Enclosure 2

Revised Technical Specification Page Markups for
Browns Ferry Nuclear Plant, Units 1, 2, and 3

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3 Restore battery cell parameters to Category A and B limits of Table 3.8.6-1.	31 days
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> One or more batteries with average electrolyte temperature of the representative cells not within limits. <u>OR</u> One or more batteries with one or more battery cell parameters not within Category C values.	B.1 Declare associated battery inoperable.	Immediately.

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: ALLOWABLE VALUE FOR EACH CONNECTED CELL (e)
Electrolyte Level	> Minimum level indication mark, and $\leq \frac{1}{4}$ inch above maximum level indication mark(a)	> Minimum level indication mark, and $\leq \frac{1}{4}$ 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)(d)	≥ 1.20	≥ 1.195 <u>AND</u> Average of all connected cells > 1.205	Not more than 0.020 below average of all connected cells <u>AND</u> Average of all connected cells ≥ 1.195

- (a) It is acceptable for the electrolyte level to temporarily increase above the specified maximum level during equalizing charges provided it is not overflowing.
- (b) Corrected for electrolyte temperature.
- (c) As an alternative to the specific gravity measurements, a battery charging current of < 1 amp for Unit and Shutdown Board batteries and < 0.5 amp for DG batteries when on float charge is acceptable only during a maximum of 7 days following a battery recharge. 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.
- (d) Alternate values may be used for a limited number of cells provided demonstrated battery capacity at the last discharge test meets the minimum qualifying value.

BFN-UNIT 1

(e)

3.8-32

Amendment No. 234

Category C battery cell parameters are considered met when the corresponding Category B cell parameters are met.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3 Restore battery cell parameters to Category A and B limits of Table 3.8.6-1.	31 days
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> One or more batteries with average electrolyte temperature of the representative cells not within limits. <u>OR</u> One or more batteries with one or more battery cell parameters not within Category C values.	B.1 Declare associated battery inoperable.	Immediately

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: ALLOWABLE VALUE FOR EACH CONNECTED CELL (e)
Electrolyte Level	> Minimum level indication mark, and $\leq \frac{1}{4}$ inch above maximum level indication mark(a)	> Minimum level indication mark, and $\leq \frac{1}{4}$ 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)(d)	≥ 1.20	≥ 1.195 <u>AND</u> ≥ 1.195 <u>AND</u> ≥ 1.195	Not more than 0.020 below average of all connected cells Average of all connected cells > 1.205 Average of all connected cells ≥ 1.195

- (a) It is acceptable for the electrolyte level to temporarily increase above the specified maximum level during equalizing charges provided it is not overflowing.
- (b) Corrected for electrolyte temperature.
- (c) As an alternative to the specific gravity measurements, a battery charging current of < 1 amp for Unit and Shutdown Board batteries and < 0.5 amp for DG batteries when on float charge is acceptable only during a maximum of 7 days following a battery recharge. 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.
- (d) Alternate values may be used for a limited number of cells provided demonstrated battery capacity at the last discharge test meets the minimum qualifying value.

BFN-UNIT 2

3.8-32

Amendment No. ~~253~~

(e)

Category C battery cell parameters are considered met when the corresponding Category B cell parameters are met.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.3 Restore battery cell parameters to Category A and B limits of Table 3.8.6-1.	31 days
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> One or more batteries with average electrolyte temperature of the representative cells not within limits. <u>OR</u> One or more batteries with one or more battery cell parameters not within Category C values.	B.1 Declare associated battery inoperable.	Immediately

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: ALLOWABLE VALUE FOR EACH CONNECTED CELL (e)
Electrolyte Level	> Minimum level indication mark, and $\leq \frac{1}{4}$ inch above maximum level indication mark(a)	> Minimum level indication mark, and $\leq \frac{1}{4}$ inch above maximum level indication mark(a)	Above top of plates, and not overflowing
Float Voltage	$\geq 2.13\text{ V}$	$\geq 2.13\text{ V}$	$> 2.07\text{ V}$
Specific Gravity (b) (c)(d)	≥ 1.20	≥ 1.195 <u>AND</u> Average of all connected cells > 1.205	Not more than 0.020 below average of all connected cells <u>AND</u> Average of all connected cells ≥ 1.195

- (a) It is acceptable for the electrolyte level to temporarily increase above the specified maximum level during equalizing charges provided it is not overflowing.
- (b) Corrected for electrolyte temperature.
- (c) As an alternative to the specific gravity measurements, a battery charging current of < 1 amp for Unit and Shutdown Board batteries and < 0.5 amp for DG batteries when on float charge is acceptable only during a maximum of 7 days following a battery recharge. 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.
- (d) Alternate values may be used for a limited number of cells provided demonstrated battery capacity at the last discharge test meets the minimum qualifying value.

BFN-UNIT 3

3.8-32

Amendment No. 212

(e)

Category C battery cell parameters are considered met when the corresponding Category B cell parameters are met.