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July 24, 2013

U. S. Nuclear Regulatory Commission
Washington, DC 20555

Attention: Document Control Desk

Subject: Duke Energy Carolinas, LLC
Oconee Nuclear Station
Docket Numbers 50-269, 50-270, and 50-287
Technical Specification Bases (TSB) Change

On May 5, 2013, Station Management approved a revision to TSB 3.10.2, SSF Battery Cell Parameters to clarify Station Blackout (SBO) is a 4 hour coping duration. Additionally, UFSAR Section 8.3.2.2.4, Station Blackout Analysis, is added to the reference section and the date of Reference 6, NRC Letter "Supplemental Safety Evaluation for Station Blackout (10 CFR 50.63)," is corrected.

Attachment 1 contains the new TSB pages. Attachment 2 contains the marked up version of the TSB pages.

If additional information is needed, please contact Sandra Severance at (864)873-3466.

Sincerely,

Scott L. Batson

Scott L. Batson.
Vice President
Oconee Nuclear Station

RGJ/rgj
Attachments

A001
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Attachment #1

Proposed TSB revision

Remove Page	Insert Page
B 3.10.2-1	B 3.10.2-1
B 3.10.2-2	B 3.10.2-2
B 3.10.2-3	B 3.10.2-3
B 3.10.2-4	B 3.10.2-4
B 3.10.2-5	B 3.10.2-5
B 3.10.2-6	B 3.10.2-6

B 3.10 STANDBY SHUTDOWN FACILITY

B 3.10.2 Standby Shutdown Facility (SSF) Battery Cell Parameters

BASES

BACKGROUND	This LCO delineates the limits on electrolyte temperature level, float voltage, and specific gravity for the SSF Power System batteries. A discussion of these batteries and their OPERABILITY requirements is provided in the Bases for LCO 3.10.1, "Standby Shutdown Facility (SSF)."
APPLICABLE SAFETY ANALYSES	The SSF serves as a backup for existing safety systems to provide an alternate and independent means to achieve and maintain one, two, or three Oconee units in MODE 3 with average RCS temperature ≥ 525°F (unless the initiating event causes the unit to be driven to a lower temperature) for up to 72 hours following a fire event, a turbine building flood, sabotage, or tornado missile events. The SSF is also credited for station blackout (SBO) coping, which has a 4-hour coping duration. (Refs. 1, 5, 6, 7, and 8) The OPERABILITY of the SSF DC system is consistent with the assumptions of the Oconee Probabilistic Risk Assessment (Ref. 2). Therefore, the SSF battery cell parameters satisfy Criterion 4 of 10 CFR 50.36 (Ref. 3).
LCO	The SSF Battery cell parameters must remain within acceptable limits to ensure availability of the required SSF Power System DC power to shut down the reactor and maintain it in a safe condition after a fire, turbine building flood, sabotage, SBO, or tornado missile events. Electrolyte limits are conservatively established, allowing continued DC electrical system function even with Category A and B limits not met.
APPLICABILITY	The SSF battery cell parameters are required solely for the support of the associated SSF power system battery. Therefore, battery cell parameters are only required to be met when the SSF DC power source is required to be OPERABLE. Refer to the Applicability discussion in Bases for LCO 3.10.1.

BASES (continued)

ACTIONS

The ACTIONS Table is modified by a Note which indicates that LCO 3.0.4 is not applicable. This is acceptable since a battery remains OPERABLE when one or more cells does not meet Category A or B limits but continues to meet Category C limits. Failure to meet Category C limits requires declaring the SSF battery inoperable.

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

With one or more cells in a required SSF battery not within limits (i.e., Category A limits not met or Category B limits not met or Category A and B limits not met) but within the Category C limits specified in Table 3.10.2-1 in the accompanying LCO, 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.

The pilot cell electrolyte level and float voltage are required to be verified to meet the Category C limits within 1 hour (Required Action A.1). This check will provide 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 cells. 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 will still be 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 operation is only permitted for 90 days before battery cell parameters must be restored to within Category A and B limits. With the 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 prior to declaring the battery inoperable.

BASES

ACTIONS (continued)

B.1

With the Required Action and associated Completion Time not met, or with the required SSF battery with one or more battery cell parameters outside the Category C limit for any connected cell, or with the average electrolyte temperature of representative cells falling below 60°F, sufficient capacity to supply the maximum expected load requirement is not assured and the SSF Power System must be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

SR 3.10.2.1

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

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.10.2.2

The periodic inspection of specific gravity and voltage is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.10.2.3

This Surveillance verification that the average temperature of representative cells is ≥ 60°F is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

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 plant specific calculations.

Table 3.10.2-1

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.

BASES

SURVEILLANCE REQUIREMENTS

Table 3.10.2-1 (continued)

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 are considered to approximate the state of charge of the entire battery.

The Category A limits specified for electrolyte level are based on manufacturer recommendations and are consistent with the guidance in IEEE-450 (Ref. 4), with the extra 1/4 inch allowance above the high water level indication for operating margin to account for temperatures and charge effects. In addition to this allowance, footnote (a) to Table 3.10.2-1 permits the electrolyte level to be above the specified maximum level during equalizing 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 a recommendation of IEEE-450 (Ref. 4), which states that prolonged operation of cells < 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 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.

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

The Category B limits specified for electrolyte level, float voltage, and specific gravity are the same as those specified for Category A and have been discussed above. In addition, it is required that the specific gravity for each connected cell must be no less than 0.010 below the average of all

BASES

SURVEILLANCE REQUIREMENTS

TABLE 3.10.2-1 (continued)

connected cells. This limit ensures that the effect of a highly charged or new cell does not mask overall degradation of the battery.

Category C defines the limits 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 limits, the assurance of sufficient capacity described above no longer exists and the battery must be declared inoperable.

The Category C limits 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 limits for float voltage is based on IEEE-450 (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 for specific gravity is the same as that specified for Category A and has been discussed above.

The footnotes to Table 3.10.2-1 are applicable to Category A, B, and C specific gravity. Footnote (b) to Table 3.10.2-1 requires the above mentioned correction for electrolyte level and temperature, with the exception that level correction is not required when battery float current is < 2 amps on float charge. This current provides, in general, an indication of 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 charger 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) to Table 3.10.2-1 allows the float (charger) current to be used as an alternate to specific gravity for up to 7 days following a battery recharge. When battery float current is verified in lieu of specific gravity, the specific gravity of each connected cell shall be measured prior to expiration of the 7 day allowance. 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 equalizing charge that does not follow a deep discharge) specific gravity gradients are not significant, and confirming measurements may be made in less that 7 days.

BASES (continued)

REFERENCES

1. UFSAR, Section 9.6.

2. Oconee Probabilistic Risk Assessment.

3. 10 CFR 50.36.

4. IEEE-450-1980.

5. NRC Letter from L. A. Wiens to J. W. Hampton, "Safety Evaluation for Station Blackout (10 CFR 50.63) - Oconee Nuclear Station, Units 1, 2, and 3," dated March 10, 1992.

6. NRC Letter from L. A. Wiens to J. W. Hampton, "Supplemental Safety Evaluation for Station Blackout (10 CFR 50.63) - Oconee Nuclear Station, Units 1, 2, and 3," dated December 3, 1992.

7. NRC Letter from L. A. Wiens to H. B. Tucker, "Safety Evaluation Report on Effect of Tornado Missiles on Oconee Emergency Feedwater System," dated July 28, 1989.

8. UFSAR Section 8.3.2.2.4.

Attachment #2

Markup of current TSB

B 3.10 STANDBY SHUTDOWN FACILITY

B 3.10.2 Standby Shutdown Facility (SSF) Battery Cell Parameters

BASES

BACKGROUND

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APPLICABLE SAFETY ANALYSES

The SSF serves as a backup for existing safety systems to provide an alternate and independent means to achieve and maintain one, two, or three Oconee units in MODE 3 with average RCS temperature ≥ 525°F (unless the initiating event causes the unit to be driven to a lower temperature) for up to 72 hours following a fire event, a turbine building flood, sabotage, ~~SBO~~, or tornado missile events (Refs. 1, 5, 6, ~~and~~ 7).

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. The SSF is also credited for station blackout (SBO) coping, which has a 4-hour coping duration.

The OPERABILITY of the SSF DC system is consistent with the assumptions of the Oconee Probabilistic Risk Assessment (Ref. 2). Therefore, the SSF battery cell parameters satisfy Criterion 4 of 10 CFR 50.36 (Ref. 3).

LCO

The SSF Battery cell parameters must remain within acceptable limits to ensure availability of the required SSF Power System DC power to shut down the reactor and maintain it in a safe condition after a fire, turbine building flood, sabotage, SBO, or tornado missile events. Electrolyte limits are conservatively established, allowing continued DC electrical system function even with Category A and B limits not met.

APPLICABILITY

The SSF battery cell parameters are required solely for the support of the associated SSF power system battery. Therefore, battery cell parameters are only required to be met when the SSF DC power source is required to be OPERABLE. Refer to the Applicability discussion in Bases for LCO 3.10.1.

BASES (continued)

REFERENCES

1. UFSAR, Section 9.6.

2. Oconee Probabilistic Risk Assessment.

3. 10 CFR 50.36.

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6. NRC Letter from L. A. Wiens to J. W. Hampton, "Supplemental Safety Evaluation for Station Blackout (10 CFR 50.63) - Oconee Nuclear Station, Units 1, 2, and 3," dated December ~~10,~~ 1992. 3

7. NRC Letter from L. A. Wiens to H. B. Tucker, "Safety Evaluation Report on Effect of Tornado Missiles on Oconee Emergency ~~Feedwater System," dated July~~ 28, 1989.

8. UFSAR Section 8.3.2.2.4.