



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 139 TO FACILITY OPERATING LICENSE NO. NPF-2  
AND AMENDMENT NO. 131 TO FACILITY OPERATING LICENSE NO. NPF-8  
SOUTHERN NUCLEAR OPERATING COMPANY, INC., ET AL.  
JOSEPH M. FARLEY NUCLEAR PLANT, UNITS 1 AND 2  
DOCKET NOS. 50-348 AND 50-364

1.0 INTRODUCTION

By letter dated December 30, 1997, as supplemented by letter dated April 9, 1998, the Southern Nuclear Operating Company, Inc. (SNC, the licensee) et al., submitted a request for changes to the Joseph M. Farley Nuclear Plant (FNP), Units 1 and 2, Technical Specifications (TSs). The requested changes revise the surveillance requirements (SRs) for the Auxiliary Building and Service Water Building batteries to remove the existing 1.75 volt minimum individual cell voltage associated with the "service test" acceptance criterion and replace it with a reference to the battery load profile specified in the Final Safety Analysis Report (FSAR), Section 8.3.2. The April 9, 1998, letter provided clarifying information that did not change December 30, 1997, application and the initial proposed no significant hazards consideration determination.

2.0 BACKGROUND

FNP, Units 1 and 2, TS SR 4.8.2.3.2.c.5 requires service tests on the auxiliary building batteries at 18-month intervals to demonstrate their capability to provide electrical power to required loads. For this surveillance, the TSs specify that individual cell voltages (ICVs) of batteries must be greater than or equal to 1.75 volts. This ICV criterion is in the FNP surveillance test procedures. The FNP procedures also list an engineering acceptance criterion of 110 or 111 volts (depending on the specific battery) for overall terminal voltage. These minimum voltages were based upon the voltage required to ensure operation of loss-of-offsite power (LOSP) or LOSP/loss-of-coolant accident loads after the battery has been subjected to the 120-minute load profile.

During the FNP 1997 audit, the staff identified an issue pertaining to the FNP auxiliary building battery testing (reference NRC Design Inspection Report Nos. 50-348/97-201 and 50-364/97-201, dated May 13, 1997, URI 201-19). Specifically, the staff noted that SNC's engineering acceptance criterion of 110- and 111-volt terminal voltage for the 60-cell batteries equated to ICVs of 1.83 and 1.85 volts, respectively. These values were 0.08 and 0.10 of a volt above the TS ICV criterion of 1.75 volts. The present TS requirement was considered to be less conservative than the design requirement; therefore, a battery could be declared operable

if post-test ICVs were acceptable, although overall terminal voltage was less than the voltage required to assure the operability of safety-related equipment. To resolve this issue, SNC proposed to change the FNP TS.

### 3.0 DISCUSSION

By letter dated December 30, 1997, SNC proposed to revise Unit 1 and Unit 2 TS SR 4.8.2.3.2.c.5 for the auxiliary building batteries by replacing the battery ICV with a reference to a load profile described in the FSAR. The load profile will include the specific minimum battery terminal voltages and the ICV criterion. In conjunction with the change to the auxiliary building battery surveillance as previously discussed, SNC also proposed to change TS SR 4.8.2.5.2.c.5 for the service water building batteries. These surveillance requirements will also be revised by replacing the ICV criterion of 1.75 volts with a reference to the FSAR that will include a minimum terminal voltage and minimum ICV criterion. The proposed changes will make the surveillance requirements for the service water building batteries consistent with those for the auxiliary building batteries.

### 4.0 EVALUATION

#### 4.1 Auxiliary Building Battery Surveillance Change

SNC has proposed the following specific changes to FNP's TS:

Under TS SR 4.8.2.3.2.c.5, delete:

...2 hours when the battery is subjected to a battery service test or the individual cell voltage does not decrease below 1.75 volts when the battery is subjected to the equivalent load profile based on anticipated breaker operations required during loss-of-offsite power (LOSP) and loss-of-coolant accident (LOCA) conditions as described in the Final Safety Analysis Report.

and substitute with "the design load profile described in the Final Safety Analysis Report, Section 8.3.2, by subjecting the battery to a service test."

In order to consolidate the acceptance criterion in one location directly referenced by TS SR 4.8.2.3.2.c.5, SNC revises the FSAR Section 8.3.2 as follows:

<u>Time</u>	<u>Load</u>
0 to 1 min.	500A
1 to 120 min.	350A

The service test for the batteries will be performed using the load profile above and test voltages below which envelope both the normal and design basis accident load profiles.

To assure the minimum voltage requirement for each of the connected emergency loads is satisfied, the battery terminal voltage at the end of each load profile test interval shall be greater than or equal to the following.

<u>Battery</u>	<u>1st Minute</u>	<u>120th Minute</u>
1A	112V	111V
1B	114V	111V
2A	113.4V	110V
2B	113.4V	110V

Test voltage limits listed above are greater than the minimum required design voltage and provide acceptable margin to support future design load addition or variations. In the event post-test terminal voltages are lower, comparison of actual values to minimum acceptable design voltages is required to determine whether the battery is capable of satisfactorily supplying design loads. In addition, all Individual Cell Voltage (ICVs) at the end of the test should be greater than or equal to 1.75 volts. While overall battery terminal voltage may be acceptable, single (or multiple) ICVs of less than 1.75 volts are indicative of degraded cell(s) that must be evaluated for corrective action or potential replacement.

The proposed change to auxiliary building battery surveillance, TS SR 4.8.2.3.2.c.5, addressed and resolved the issue regarding minimum voltage requirements identified by the staff. The proposed change removes the single-battery ICV acceptance criterion of 1.75 volts and replaces it with a reference to the battery load profile in FSAR Section 8.3.2. The supporting FSAR revision incorporates the minimum battery terminal voltages for testing purposes to ensure equipment operation. The FSAR revisions also incorporate the ICV criterion of 1.75 volts to preclude placing a battery back in service with a degraded cell without evaluating overall battery capacity or replacing the cell. These changes are consistent with TS SR 3.8.4.7 in the Improved Standard TS (NUREG-1431, Revision 1), which requires a service test to a load profile and does not specify a required terminal voltage or ICV. This will prevent the possibility that a battery could be declared operable because post-test ICVs are acceptable when overall terminal voltage is less than the required voltage to assure the operability of safety-related equipment. Therefore, the staff finds the proposed TS change acceptable.

#### 4.2 Service Water Building Battery Surveillance Change

SNC has proposed the following specific changes to FNP's TS:

Under TS SR 4.8.2.5.2.c.5 delete:

...2 hours when the battery is subjected to a battery service test or the individual cell voltage does not decrease below 1.75 volts when the battery is subjected to the equivalent load profile based on anticipated breaker operating required during

loss-of-offsite power (LOSP) and loss-of-coolant accident (LOCA) conditions as described in the Final Safety Analysis Report.

and substitute "the design load profile described in the Final Safety Analysis Report, Section 8.3.2, by subjecting the battery to a service test."

In order to consolidate the acceptance criterion in one location directly referenced by TS SR 4.8.2.5.2.c.5, the licensee proposed to revise FSAR Section 8.3.2 as follows:

8.3.2.1.1.2 Service Water Building - The Service Water Building safety-related station batteries are sized in accordance with Section 6 of IEEE-485-1983 for operation at a minimum electrolyte temperature of 35°F and including an aging factor of 25 percent. The batteries have a capacity of 75 amp-hours based on an 8-hour discharge rate to 1.75 volts per cell. The battery load primarily includes switchgear controls and indication. Each battery has adequate storage capacity to carry its load without charger support for a period of at least 2 hours.

Battery terminal voltage shall remain greater than or equal to 105 volts and ICVs should remain greater or equal to 1.75 volts when the batteries are subjected to a service test with the load profile below which envelops the load requirements under all conditions.

<u>Time</u>	<u>Load</u>
0 to 1 minute	30 Amps
1 to 120 minutes	3 Amps

Test voltage limits listed above are greater than the minimum required design voltage and provide acceptable margin to support future design load additions or variations. In the event post-test terminal voltages are lower, comparison of actual values to minimum acceptable design voltages is required to determine whether the battery is capable of satisfactorily supplying design loads. In addition, all Individual Cell Voltages (ICVs) at the end of the test should be greater than or equal to 1.75 volts. While overall battery terminal voltage may be acceptable, single (or multiple) ICVs of less than 1.75 volts are indicative of degraded cell(s) that must be evaluated for corrective action or potential replacement.

The change to TS SR 4.8.2.5.2.c.5 removes the single-battery ICV acceptance criterion of 1.75 volts and replaces it with a reference to the battery load profile in FSAR Section 8.3.2. The supporting FSAR revision incorporates the minimum battery terminal voltage for testing purposes to ensure equipment operation. The FSAR revision also incorporates the ICV criterion of 1.75 volts to preclude placing a battery back in service with a potentially degraded cell without evaluating overall battery capacity and taking corrective action. The proposed change to the service water building battery surveillance, TS SR 4.8.2.5.2.c.5, makes it consistent with TS SR 4.8.2.3.2.c.5 of auxiliary building batteries. The proposed TS change is also consistent with TS SR 3.8.4.7 in the Improved Standard TS (NUREG-1431, Revision 1), which specifies a service test to a load profile and does not specify a required terminal voltage or ICV. Therefore, the staff finds the proposed TS change acceptable.

In addition, two footnotes on Unit 1 TS page 3/4 8-13, associated with TS surveillance requirement 4.8.2.5.2 include typographical errors that are being corrected. Specifically, the footnotes on page 3/4 8-13 are revised by changing "greater that" to read "greater than." These are editorial changes and the staff finds the proposed changes acceptable.

#### 5.0 STAFF CONCLUSION

Based on the preceding evaluation, the staff finds the proposed TS changes and FSAR revisions acceptable.

#### 6.0 STATE CONSULTATION

In accordance with the Commission's regulations, the State of Alabama official was notified of the proposed issuance of the amendments. The State official had no comments.

#### 7.0 ENVIRONMENTAL CONSIDERATION

The amendments change surveillance requirements. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (63 FR 17234, April 8, 1998). Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

#### 8.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or to the health and safety of the public.

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Date: November 3, 1998