

## **Burkhardt, Janet**

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**From:** Kalyanam, Kaly  
**Sent:** Tuesday, August 06, 2013 11:22 AM  
**To:** BICE, DAVID B (ANO) (DBICE@entergy.com)  
**Cc:** Burkhardt, Janet  
**Subject:** Request for Additional Information Re. Entergy LAR dated January 18, 2012, to adopt TSTF-500, Revision 2 (TAC No. MF0595)  
**Attachments:** RAI alone from STSB&EEEB.docx

Dave,

By letter dated January 28, 2013 (Agencywide Documents Access and Management System Accession Number ML13029A770), Entergy Operations, Inc. (Entergy, the licensee) submitted a license amendment request (LAR) for Arkansas Nuclear One, Unit 2 (ANO-2) to adopt Nuclear Regulatory Commission (NRC)-approved Technical Specifications Task Force (TSTF)-500, Revision 2, "DC (direct current) Electrical Rewrite – Update to TSTF – 360." The proposed amendment would revise Technical Specification (TS) 3.8.2.3, "D.C. Distribution – Operating," TS 3.8.2.4, "D.C. Distribution – Shutdown," create a new TS 3.8.3, "Battery Parameters," add a new program, "Battery Monitoring and Maintenance Program" to TS Section 6.5, and relocate Surveillance Requirements (SRs) in Table 4.8-2 to the new program.

The NRC staff has reviewed the information provided and in order to complete our review, please find attached to this email a request for additional information regarding the adoption of TSTF-500, Revision 2. Please provide a written response within 45 days upon the issuance date of this request. If you cannot meet this schedule, please let us know in a timely manner so that our resources can be effectively used.

Please contact me at 301-415-1480 if you have any questions.

Thanks.

Kaly N. Kalyanam

### **SUNSI Information:**

Plant: Arkansas Nuclear One, Unit 2  
Docket No.: 50/368  
TAC No.: MF0595  
From: Dave Bice  
To: N. Kalyanam  
Subject: Request for Additional Information Re. Entergy LAR dated January 18, 2012, to adopt TSTF-500, Revision 2  
SUNSI Review Done: Yes. *Publicly Available, Normal Release, Non-sensitive.*

**REQUEST FOR ADDITIONAL INFORMATION**  
**REGARDING ARKANSAS NUCLEAR ONE, UNIT 2 LICENSE AMENDMENT REQUEST**  
**FOR ADOPTION OF TECHNICAL SPECIFICATIONS TASK FORCE (TSTF) TRAVELER**  
**TSTF-500, REVISION 2, DC ELECTRICAL REWRITE – UPDATE TO TSTF - 360**  
**DOCKET NO. 50-368**

The NRC staff has determined that the following additional information is needed to complete its review:

**ELECTRICAL ENGINEERING:**

- E1. In Attachment 1, Section 1 of the license amendment request (LAR) dated January 28, 2013, the licensee proposed relocating the requirements of Technical Specification (TS) Table 4.8-2, "Battery Surveillance Requirements," to the new TS 6.5.15, "Battery Monitoring and Maintenance Program."
- Please confirm that the Table 4.8-2 Categories A and B values (electrolyte level, float voltage, specific gravity) that will be relocated to TS 6.5.15 will continue to be controlled at their current levels in the Battery Monitoring and Maintenance Program and that action to restore deficient values will be implemented in accordance with the licensee's corrective action program.
- E2. In Attachment 1, Section 2.2 of the LAR, the licensee commits to revise the ANO-2 Safety Analysis Report (SAR) to include how a 2 percent design margin for the batteries corresponds to a 2 amperes (amps) float current value indicating that the battery is 98 percent charged.
- a) Please provide the bases for the 2-amp float current at which ANO-2 batteries are capable of performing its design function.
- b) Please explain how maintaining a "2 percent design margin indicating that the battery is 98 percent charge" will ensure that the ANO-2 safety-related batteries are fully charged (i.e., capable of performing their design function).
- E3. In Attachment 4 of the LAR, the licensee proposed TS LCO 3.8.2.3, new Action "a", which would require restoring the battery terminal voltage to greater than or equal to the minimum established float voltage within 2 hours when one of the required full capacity chargers is inoperable.

a) Please explain how the licensee would ensure that the battery was returned to its fully charged state, from any discharge that might have occurred due to the charger inoperability, without verifying battery float current. ANO-2 TS LCO 3.8.2.3 existing Action "b" requires the performance of SR 4.8.2.3.a.1 within 1 hour and at least once per 8 hours thereafter when one of the required full capacity chargers is inoperable. Please provide the basis for changing the Completion Time (CT) from 1 hour to 2 hours.

E4. In Attachment 4 of the LAR, the licensee proposed TS LCO 3.8.2.3, new Actions "b" and "c" with requirements which are to be completed within 2 hours. In TSTF-500, both Conditions B and C are to be included in TS 3.8.4 if the plant design supports different CTs when a battery is inoperable but the charger is operable. Otherwise, only Condition C is used in the TS.

Please provide justification for including both Actions "b" and "c" in TS 3.8.2.3.

E5. In Attachment 4 of the LAR, the licensee proposed TS LCO 3.8.2.3, new Action "c" to essentially match TSTF-500, TS 3.8.4 Condition C with 2 hours completion time (CT). The licensee stated that the 2-hour allowed outage time (AOT) is based on Regulatory Guide (RG) 1.93. The staff notes that the licensee omitted RG 1.93 from the Bases for TS LCO 3.8.2.3.

Please clarify whether ANO-2 is committed to RG 1.93 and provide the basis for the 2-hr AOT.

E6. In Attachment 4 of the LAR, the licensee proposed an alternative criterion for new SR 4.8.2.3.2 which states, "by verifying that each battery charger can recharge the battery to the fully charged state within 24 hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state." 24 hours is bracketed in TSTF-500.

Please explain how 24 hours is applicable to ANO-2.

E7. In Attachment 4 of the LAR, the licensee proposed SR 4.8.2.3.3 to essentially match TSTF-500 TS SR 3.8.4.3. The proposed SR 4.8.2.3.3 allows the battery performance discharge test required by SR 3.8.3.6 to be performed in lieu of the battery service test once per 60 months.

a) The licensee did not include TS SR 3.8.3.6 in the LAR. Please provide TS SR 3.8.3.6.

b) TSTF-500 TS SR 3.8.4.3 Note 1 allows the modified performance discharge test, not the performance discharge test, to be performed in lieu of the service test. Please provide the technical basis for substituting the battery performance discharge test for the service test.

- E8. In Attachment 4 of the LAR, the licensee proposed a battery performance discharge test SR 4.8.3.6 with test interval of 60 months, 12 months and 24 months consistent with TSTF-500 TS SR 3.8.6.6. These test intervals are based on guidance provided in the Institute of Electrical and Electronics Engineers (IEEE) Standard (Std.) 450-2002.
- a) Please confirm whether ANO-2 is committed to IEEE Std. 450-2002.
  - b) SR 4.8.3.6.b proposed a 24-month test interval when the battery shows degradation. However, IEEE Std. 450-2002, Section 6.3.c recommends a 24-month test interval when the battery has reached 85 percent of service life with a capacity  $\geq$  100 percent of manufacture's rating, and has shown no signs of degradation. Please provide justification for the deviation from IEEE Std. 450-2002 recommendation and from TSTF-500.
- E9. In Attachment 4 of the LAR, the licensee proposed TS LCO 3.8.2.4 Action "a" which applies when the required battery charger is inoperable to adopt the 2 hours completion time of TSTF-500 TS 3.8.5, Condition A, Required Action (RA) A.1. The licensee stated that the 2-hour period would provide time for the standby charger to be placed in service before more restrictive actions would be required to be implemented. TSTF-500 TS 3.8.5, Condition A applies to redundant subsystems and is included only when the plant-specific implementation of TS 3.8.5 may require both subsystems of the DC electrical power system to be operable.
- a) ANO-2 TS LCO 3.8.2.4 requires only one DC electrical power subsystem to be operable in Modes 5 and 6. Please provide justification for adopting new LCO 3.8.2.4 Action "a".
  - b) ANO-2 TS LCO 3.8.2.4, Action "a" requires restoring the battery terminal voltage to greater than or equal to the minimum established float voltage within 2 hours when the required battery charger is inoperable. Please explain how the licensee would ensure that the battery was returned to its fully charged state from any discharge that might have occurred due to the charger inoperability.
- E10. In Attachment 4 of the LAR, the licensee proposed adding new Action "d" to TS 3.8.3 which would apply to a battery found with a pilot cell electrolyte temperature less than the minimum established design limits. The requirements associated with new Action "d" would require the licensee to restore the pilot cell electrolyte temperature to greater than or equal to minimum established design limits within 12 hours.
- a) Please discuss how the battery room temperature is periodically monitored at ANO-2 and provide the minimum frequency at which the temperature of the battery room is monitored.
  - b) Please explain how the licensee would restore battery room temperature if it was outside the temperature design limits.
  - c) Provide the method of selection of pilot cells at ANO-2

- E11. In Attachment 4 of the LAR, the licensee proposed TS 3.8.2.4, Action 'b' that does not include the required actions (RAs) B.1 to declare affected required feature(s) inoperable immediately and B.2.4 to initiate action to restore required DC electrical power subsystems to operable status immediately of TSTF-500 TS 3.8.5.

Provide justification for the deviation from TSTF-500 TS 3.8.5.

### **TECHNICAL SPECIFICATIONS**

There were numerous instances of deviations and omissions in the licensee's application to adopt TSTF-500 found without adequate justification provided by the licensee. It is recommended that the licensee re-evaluate this LAR to be sure all deviations have been identified and justified or corrected. Based on the deviations identified in the review so far, the staff has the following questions:

- TS1. The battery manufacturer letter does not refer specifically to either ANO Unit 1 or 2. Please provide the basis for applying this letter to ANO-2?
- TS2. There are two unexplained references to ANO-1 in the Assessment section of the LAR. Please clarify their purpose.
- a. Paragraph "LCO 3.8.5 – RAs A.2 and A.3" (page 4 of Attachment 1)
  - b. Last paragraph on page 5 in Attachment 1, along with reference to an ANO-1 LCO number.
- TS3. The proposed SR 4.8.2.3.3 last sentence states, "The battery performance discharge test required by Surveillance Requirement 3.8.3.6 may be performed in lieu of the battery service test once per 60 months." Since ANO-2 Surveillance Requirements all begin with "4," is "3.8.6.3" a typographical error? If not, please explain.
- TS4. TSTF-500 removed the performance discharge test frequency "once per 60 months" from SR 3.8.4.3. Please explain the basis for its inclusion in proposed SR 4.8.2.3.3.
- TS5. The approved TSTF-500 TS 3.8.6 Actions note states, "Separate Condition entry is allowed for each battery." Please provide the basis for not including it in the proposed TS 3.8.3.
- TS6. TSTF-500 Conditions 3.8.6.A, 3.8.6.B, and 3.8.6.C each have "and" between all of the Required Action statements explicitly indicating that each sub-action is required. Proposed Actions 3.8.3.a, 3.8.3.b, and 3.8.3.c do not have "and" linking the respective sub-action statements. Please explain the purpose of and basis for this deviation.

- TS7. Proposed Action 3.8.3.e contains the phrase, "With both batteries with battery parameters not within limits..." TSTF-500 Condition 3.8.6E uses, "One or more batteries in redundant subsystems with battery parameters not within limits." Please explain this deviation and provide the basis for it, since "one or more" is not equivalent to "both." (Note: in submitted Bases 3/4.8 changes, the first paragraph on page B 3/4 8-13 also begins, "With both batteries...")
- TS8. TSTF-500 TS SR 3.8.6.6 states, in part: "...24 months when battery has reached [85] percent of the expected life with capacity  $\geq$  100 percent of manufacturer's rating." Proposed SR 4.8.3.6.b states, "At least once per 24 months when battery shows degradation, or has reached 85 percent of the expected life with capacity  $\geq$  100 percent of manufacturer's rating." Please explain the basis for this deviation. (Note: the proposed SR conflicts with the submitted Bases changes in the last paragraph on page B 3/4 8-14.)