

August 15, 2006

MEMORANDUM TO: Timothy J. Kobetz, Chief  
Technical Specifications Branch  
Division of Inspection and Regional Support  
Office of Nuclear Reactor Regulation

FROM: T. R. Tjader, Sr. Reactor Engineer */RA/*  
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SUBJECT: SUMMARY OF JULY 12, 2006, MEETING WITH THE TECHNICAL  
SPECIFICATIONS TASK FORCE (TSTF) TO DISCUSS TSTF-360,  
REVISION 1, "DC ELECTRICAL REWRITE"

On July 12, 2006, a public meeting was held between the U.S. Nuclear Regulatory Commission (NRC) and representatives of the Technical Specifications Task Force (TSTF) in Rockville, Maryland. The purpose of the meeting was to discuss the industry's response to the staff's concerns regarding TSTF-360, revision 1, "DC Electrical Rewrite." On December 18, 2000, TSTF-360 was approved by the NRC staff for incorporation into the Standard Technical Specifications (STS). The TSTF provides guidance for the rewrite of the technical specifications (TS) requirements for Class 1E DC power supply systems as referenced in the STS NUREGs (NUREG-1430 through NUREG-1434). Enclosure 1 is a list of attendees, Enclosure 2 is a copy of the staff's concerns, Enclosure 3 is industry draft response, Enclosure 4 is a copy of the TSTF meeting slides, and Enclosure 5 is a copy of the staff's proposed Path Forward.

The following is a brief summary of the generic issues identified in Enclosure 2 and the proposed resolutions offered by the staff and industry representatives.

Staff Concern 1 - Provide a specific ACTION & increased Allowed Outage time (AOT) for an inoperable battery charger:

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TSTF-360 proposed that the battery charger allowed outage time (AOT) be increased from 2 hours to 7 days provided that the licensee is able to restore battery terminal voltage to \$ minimum float voltage within 2 hours, and verify battery float current is # 2 amps once each 12 hours. Industry representatives responded that a single failure need not be considered when not meeting Limiting Conditions of Operations and being in an action statement. It was further noted that for the 7-day AOT, the battery must remain capable of performing its required design basis duty cycle which does not necessitate that there be any capability for the "alternate means" to be backed up by an onsite AC power source.

The staff believes the increased AOT is risk significant due to grid reliability concerns. Decreased grid reliability increases the potential for loss of offsite power and station blackout.

The staff agreed that the alternate batter charger could be non-Class 1E but must have the capability to:

- 1) restore battery voltage to the minimum acceptable limits
- 2) carry house loads
- 3) maintain the battery in a fully charged condition

In addition, the staff will require that a risk informed evaluation be performed in accordance with RG 1.174 and 1.177 to support extending the battery charger AOT beyond 72 hours when using a non-Class 1E battery charger. Industry responded that they intend to provide a risk-informed evaluation to justify a 7 day AOT.

Staff Concern 2 - Replace battery specific gravity monitoring with float current (FC) monitoring.

TSTF-360 proposed that specific gravity (SG) monitoring not be included in the TS for the following reasons:

- float current monitoring provides an accurate indication of state of charge (SOC) after discharge as well during steady-state operations.
- specific gravity at one point in the bulk electrolyte is a secondary indicator.
- multiple specific gravity readings for each cell must be taken to get representative average.
- specific gravity readings must be temperature corrected to determine true state of charge.

The staff agreed FC monitoring could be used to determine the SOC provided:

- Industry obtain manufacturer agreement that FC monitoring provides an indication of SOC during steady state operations and after a discharge.
- License amendment applications address the capability/sensitivity of instruments used to measure FC.
- TSTF Traveler clarify that FC monitoring does not eliminate SG monitoring. The staff's position is that SG monitoring is appropriate for troubleshooting activities and periodic trending and, therefore, should be included in the Battery Monitoring and Maintenance Program.

- Current license amendment applications and TSTF supporting documentation will address the effect aging has on FC monitoring.

Staff Concern 3 - Provide specific ACTIONS and increased Completion Times for out-of-limit conditions for battery cell voltage, electrolyte level, and electrolyte temperature.

TSTF-360 proposed that:

- a. TS voltage limit for the pilot cell be reduced from 2.13 volts to 2.07 volts.
- b. Electrolyte temperature measurements be limited to the battery pilot cell.

Industry justification and the staff position is given below.

#### Battery Cell Voltage

The TSs use 2.07 volts as the operability limit. The 2.13 volt limit is a maintenance limit for taking corrective action. TSTF-360 continues to require actions to be taken when below 2.13 volts per the Battery Maintenance and Monitoring Program. In addition, the weekly surveillance requirements to verify battery terminal voltage is \$ to the minimum established float voltage assures that multiple cells are not below 2.13 volts.

The staff agreed 2.07 volts is the operability limit. However, if pilot cell is < 2.13 volts, additional corrective action other than just restoring pilot cell voltage is necessary.

Industry agreed that the Battery Maintenance and Monitoring Program should address this issue.

#### Electrolyte Temperature

The industry believed the impact of a single cell temperature being above or below the average does not in itself affect the battery's ability to perform its design function. Just as a cell below the average is reduced in its output ability, those above the average temperature are increased. For this reason the average temperature is used for sizing and not the lowest individual cell temperature.

While battery capacity is degraded by low temperature, the change is small even in a worst case scenario. In risk space, a loss of 5% capacity for a single cold battery train is not significant because the battery is sized with margins for temperature, aging and load growth. In addition, the 12-hour CT provides a reasonable time to restore the electrolyte temperature within established limits and is a reasonable trade off in risk compared with a plant shutdown.

The staff response was that licensees must provide verification that the pilot cell temperature is representative of the entire battery. It also stated that it will accept surveillance or historical data that shows plants meet the 5° F Bounding Analysis.

### Electrolyte Level

The staff asked industry to define "minimum design electrolyte level." Industry agreed to clarify definition in the TS Bases and/or Battery Maintenance and Monitoring Program.

Staff Concern 4 - Create a licensee-controlled program based on the Institute of Electrical and Electronics Engineers (IEEE) Standard 450-1995 or 2002, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," and/or the improved TS Bases to reference actions for cell voltage and electrolyte level.

Consistency with IEEE Standard 450-1995 was used throughout TSTF-360 as the justification for approval, however, the NRC has yet to endorse this version of IEEE Standard 450. The most recent version of IEEE Standard 450 that has been endorsed by the NRC through Regulatory Guides (RGs) is IEEE Standard 450-1975.

The industry agreed that references to IEEE 450-1995 or 2002 should be moved to the TS Bases until endorsed by the NRC.

The staff concurred with industry's response.

### Staff Concern 5a - Battery Monitoring and Maintenance Program

Licensees seeking to create a new battery monitoring and maintenance program need to provide assurance that the relocated battery parameter values will continue to be controlled at their current level and actions will be implemented in accordance with the licensee's corrective action program.

In adopting TSTF-360, licensees must include a regulatory commitment to relocate certain attributes of battery maintenance and monitoring to a plant program/procedure. This provides reasonable assurance that the program will be in place and appropriately controlled.

The staff concurred with industry's response.

### Staff Concern 5b - Minimum Established Design Limits

The values represented by the phrases 'minimum established design limits' must be consistent with the battery manufacturer recommendations.

Minimum established float voltage is currently tied to the manufacturer's recommendations in the Bases for SR 3.8.4.1. The minimum established design limit for temperature is based on the battery sizing calculations and is site specific.

The staff concurred with industry's response.

Staff Concern 5c - Minimum Established Float Voltage Should be Specified in TS Bases

The minimum established float voltage needs to be identified in the TS Bases.

Industry agreed to incorporate minimum established float voltage in TS Bases.

Staff Concern 5d - Alternate Acceptance Criteria

Licensees that propose adding the following alternate acceptance criteria to the plant TSs for the battery chargers need to ensure that the time to return the battery to the fully charged state accurately reflects the battery charger design capacity as it is detailed in the plant's UFSAR:

Verify each battery charger can recharge the battery to fully charged state within [24] hours while supplying the largest combined demands of various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.

Industry agreed that alternate acceptance criteria must agree with the plant's design basis.

Staff Concern 5e - Site Specific Data

Each change that is requested by the licensee, including those changes identified in TSTF-360, needs to be supported by site specific data.

Industry agree that any bracketed values as well as any other site-specific changes requested should be adequately supported in the license amendment application.

At the conclusion of the meeting, industry and the NRC staff agreed to work closely to resolve generic issues as discussed above and to maintain consistency of plant specific license amendment requests currently under NRC review.

Enclosures: As stated

cc: P. Infanger, BWOOG  
B Woods, CEOG  
M. Crowthers, BWROG  
W. Sparkman, WOG  
D. Hoffman, EXCEL  
B. Mann, EXCEL

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**MEETING BETWEEN NRC AND**  
**TECHNICAL SPECIFICATION TASK FORCE REPRESENTATIVES**

**ATTENDANCE LIST**

**July 12, 2006**

**NRC**

Bob Tjader, NRR  
Ravi Grover, NRR  
Rich Guzman, NRR  
George Wilson, NRR  
Mohan Thadani, NRR  
Pat Hiland, NRR  
Bill Raughtey, NRR  
Tania Martinez Navedo, NRR  
Matt M<sup>c</sup>Connell, NRR  
George Morris, NRR

**INDUSTRY**

Leonard Casella, Susquehanna  
Duane Filchner, Susquehanna  
Surendra Salgia, Exelon Corp  
Brian Wood, SONGS  
Erwin Hatzler, SONGS  
John Gagge, ENERSYS  
Don Hoffman, TSTF  
Kyle Floyd, TSTF  
Steve Clark, TSTF  
Dan Williamson, TSTF

**ELECTRICAL ENGINEERING BRANCH CONCERNS WITH TSTF- 360, REVISION 1, "DC  
ELECTRICAL REWRITE"**

SEE ADAMS: ML060810618



**DRAFT RESPONSES TO NRC ELECTRICAL BRANCH CONCERNS WITH TSTF- 360,  
REVISION 1, "DC ELECTRICAL REWRITE"**

SEE ADAMS: ML062060212

**TSTF MEETING SLIDES**

SEE ADAMS: ML062060216

**NRC MEETING SLIDE**

SEE ADAMS: ML062130154