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December 7, 2006
L-06-162

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Subject: Beaver Valley Power Station, Unit Nos. 1 and 2
BV-1 Docket No. 50-334, License No. DPR-66
BV-2 Docket No. 50-412, License No. NPF-73
Supplement to License Amendment Request Nos. 296 and 169,
Improved Standard Technical Specification Conversion

This letter provides updated pages (Revision 5) to the FirstEnergy Nuclear Operating Company (FENOC) License Amendment Request (LAR) Nos. 296 and 169 to convert the Beaver Valley Power Station (BVPS) Unit Nos. 1 and 2 Technical Specifications to the Improved Technical Specifications (ITS) for Westinghouse Plants, NUREG-1431. The BVPS ITS conversion LAR was originally submitted by FENOC letter L-05-027 dated February 25, 2005.

The purpose of this supplement is to update the BVPS ITS conversion documentation contained in LAR Nos. 296 and 169 (ITS conversion) to incorporate the resolution of NRC comments.

One NRC comment resolution revises proposed ITS Surveillance Requirement (SR) 3.8.1.10, applicable to the Emergency Diesel Generators (EDG). This revision extends the duration of the BVPS specific ITS EDG runtime from $\geq$ 2 hours to $\geq$ 8 hours to be consistent with the recommendations of IEEE Standard 387-1995. The required EDG loading values for testing beyond the initial 2 hour period have also been added to this SR. Attachment 1 of this submittal contains the revised pages that address the NRC comment involving ITS SR 3.8.1.10.

Another NRC comment resulted in a revision to the Bases of ITS 3.4.20, Steam Generator Tube Integrity. In this ITS Bases, a discussion of the Main Steam Line Break accident was revised to clarify the applicable leak rate limits. Attachment 2 of this submittal contains the revised ITS 3.4.20 Bases page that addresses this NRC comment.

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In addition, this submittal contains the revised pages that address the NRC comments on BVPS ITS Sections 3.8 and 5.5.13 based on the pending rewrite of Technical Specification Task Force (TSTF) 360. This TSTF is incorporated into NUREG-1431, Revision 3.1. The resolution of these NRC comments incorporates changes to ITS 5.5.13, Battery Monitoring and Maintenance Program, that include changes to the Bases of ITS 3.8.4 DC Sources - Operating, and ITS 3.8.6, Battery Parameters, as well as revising the Completion Time specified in ITS 3.8.4 for inoperable battery chargers from 7 days to 72 hours. Attachment 3 of this submittal contains the revised ITS conversion documentation pages that address the NRC comments related to TSTF-360.

In addition to the comments addressed in Attachments 1 through 3 described above, this letter addresses another NRC comment related to the pending rewrite of TSTF-360 and resulting changes to NUREG-1431. The NRC requested that BVPS submit a letter from the battery manufacturer(s) that provides confirmation that float current is an acceptable method to determine the state of charge of the battery and that the float current value specified in the ITS ($\leq$ 2 amps) is adequate to assure a fully charged battery. Attachment 4 of this submittal contains the battery manufacturers (i.e., C & D Technologies, Inc. and EnerSys) letters that address these issues. The C & D Technologies letter confirms that float current is an acceptable method for determining the state of charge of the battery and that $\leq$ 2 amps float current is an accurate indication of a fully charged battery. The EnerSys letter also confirms that the use of float current is an acceptable method for determining the state of charge of the battery, but states that the float current value of $\leq$ 2 amps indicates 95% available capacity for the 2GN-13 model battery used at BVPS and a 98% available capacity for the 2GN-21 model battery used at BVPS.

In accordance with previous discussions with the NRC, the use of the ITS float current value of $\leq$ 2 amps to determine a fully charged battery is dependent on concurrence from the battery manufacturer and that a commitment to maintain battery capacity design margin would be necessary if $\leq$ 2 amps was not indicative of a fully charged battery. Therefore, in order to use a consistent value of float current in the ITS ($\leq$ 2 amps) for all batteries, FENOC is making a regulatory commitment to reserve a 5% design margin for the EnerSys model 2GN-13 batteries (Unit 2 Batteries 2-3 and 2-4) and a 2% design margin for the EnerSys model 2GN-21 batteries (Unit 1 Batteries 1-1 and 1-2 and Unit 2 Batteries 2-1 and 2-2). The requirement to maintain the specified margins will be documented in the Technical Specification Bases of ITS 3.8.4, DC Sources – Operating along with a reference to this letter (see pages 115 and 123 of Attachment 3).

The regulatory commitment contained in this letter is listed in Attachment 5.

The information provided with this submittal does not change the evaluations or conclusions of the No Significant Hazards Consideration provided with the ITS conversion LAR.

If there are any questions or if additional information is required, please contact Mr. Gregory A. Dunn, Manager, FENOC Fleet Licensing, at (330) 315-7243.

I declare under penalty of perjury that the foregoing is true and correct. Executed on December 7, 2006.

Sincerely,

James H. Lash

Attachments:

1. BVPS ITS Conversion (LARs 296 and 169) Revision 5 pages for revision of Emergency Diesel Generator run time.
2. BVPS ITS Conversion (LARs 296 and 169) Revision 5 pages for revision of ITS Bases 3.4.20.
3. BVPS ITS Conversion (LARs 296 and 169) Revision 5 pages for revision of Battery Charger and Battery Monitoring and Maintenance Program Requirements.
4. Letters from battery manufacturers.
5. Commitment list.

c: Mr. T. G. Colburn, NRR Senior Project Manager (2)
Mr. P. C. Cataldo, NRC Senior Resident Inspector
Mr. S. J. Collins, NRC Region I Administrator
Mr. D. A. Allard, Director BRP/DEP
Mr. L. E. Ryan (BRP/DEP)

BVPS UNITS 1 & 2
ITS CONVERSION LICENSE AMENDMENT REQUEST (LAR)
NOS. 296 (UNIT 1) & 169 (UNIT 2)

ATTACHMENT 1
(to L-06-162)

REVISION 5 CHANGES
Revision of Emergency Diesel Generator Run Time
(ITS Surveillance Requirement 3.8.1.10)

The pages affected by Revision 5 are presented in the following order; ITS markups and associated Justifications for Deviation (JFDs), ITS Bases Markups, Current Technical Specification (CTS) markups and associated Discussion of Change (DOC).

Each affected page is identified as a Revision 5 page. The Revision 5 changes made to each page are further identified by revision bars.

The BVPS ITS Conversion documentation can be updated to Revision 5 by simply replacing the existing page with the corresponding attached Revision 5 page.

The page numbers referenced in the page number index below are the ITS section specific sequential numbers added to the bottom right hand corner of each page.

ITS SECTION 3.8 (ELECTRICAL POWER SYSTEMS) INDEX OF AFFECTED PAGES	
ITS MARKUPS	**PAGES: 15**
ITS JFDS	**PAGES: 47, 48**
ITS BASES MARKUPS	**PAGES: 90, 97**
ITS BASES JFDS	**NONE**
CTS MARKUPS	**PAGES: 179 (information only), 187**
CTS DOCS	**PAGES: 219, 226**

REVISION 5

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE	FREQUENCY
SR 3.8.1.~~14~~ 10 13	
- NOTES - 1. Momentary transients outside the load and power factor ranges do not invalidate this test. 2. This Surveillance shall not normally be performed in MODE 1 or 2. However, this Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. 3. If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ ~~[0.9]~~. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as practicable. 22 0.89	NUREG-1431, Rev. 3 Credit may be taken for unplanned events that satisfy this SR.
Verify each DG ~~operating at a power factor ≤ [0.9]~~ operates for ≥ ~~24~~ hours: 8 a. For ≥ ~~[2]~~ hours loaded ~~≥ [5250] kW and ≤ [5500] kW and~~ 14 b. For the remaining hours of the test loaded ~~≥ [4500] kW and ≤ [5000] kW~~	NUREG-1431, Rev. 3 [18] months ≥ 2750 kW and ≤ 2850 kW (Unit 1) ≥ 4238 kW and ≤ 4535 kW (Unit 2), and 1 ≥ 2340 kW and ≤ 2600 kW (Unit 1) ≥ 3814 kW and ≤ 4238 kW (Unit 2).

SR that states "Only applicable to Unit 1." ITS SR 3.8.1.5.2 states "Check for and remove accumulated water from each day tank." A Note modifies the SR that states "Only applicable to Unit 2." These changes to the SRs are acceptable because only the Unit 1 DGs have both day and engine mounted tanks that must be checked for water. For Unit 2, the day tank is the appropriate tank to verify because Unit 2 does not have an engine mounted tank.

11. ISTS SR 3.8.1.7 requires the fast start of each DG to rated voltage and frequency every 184 days. This requirement is not added because the units are licensed in accordance with applicable Safety Guide or Regulatory Guide and does not require the performance of this test and a fast start is performed once every 18 months. The Unit 1 DGs will not field flash on fast start unless an undervoltage signal is present. The Unit 1 DGs can not be emergency started from the control room. This change will minimize the fast starts for the DGs. The ISTS SRs that follow are re-numbered to reflect this SR deletion.

12. ISTS SR 3.8.1.11 requires the fast start of each DG to rated voltage and frequency on an actual or simulated loss of offsite power every 18 months. This requirement is not added because the units are licensed in accordance with applicable Safety Guide or Regulatory Guide and do not require the performance of this test and a fast start is performed on a loss of offsite power concurrent with an ESF signal once every 18 months. The loss of offsite power concurrent with an ESF signal performs some of the technical requirements listed in this SR. The ISTS SRs that follow are re-numbered to reflect this SR deletion.

13. ISTS SR 3.8.1.12 requires the fast start of each DG to rated voltage and frequency on an actual or simulated ESF actuation (SI) signal every 18 months. This requirement is not added because the units are licensed in accordance with applicable Safety Guide or Regulatory Guide and do not require the performance of this test and a fast start is performed on a loss of offsite power in conjunction with an ESF signal once every 18 months. This is another fast start of the DG with the machine not loading and the emergency buses continued to be powered from the offsite source. The ISTS SRs that follow are re-numbered to reflect this SR deletion.

14. ISTS SR 3.8.1.14 requires the performance of ≥ 24-hour run for each DG every 18 months. This requires a minimum 2-hour run at 105 % to 110 % of rated load and the remaining time of 90 % to 100 % of rated load. Proposed ITS SR 3.8.1.10 requires ≥ 8-hour DG run for each DG every 18 months. For ≥ the first 2 hours, ITS SR 3.8.1.10 requires the DGs be run at a load of ≥ 2750 kW for Unit 1 and ≥ 4238 kW for Unit 2 up to the 2000 hour load limit for each DG (Unit 1 2850 kW and Unit 2 4535 kW). For the remaining hours of the test, ITS SR 3.8.1.10 requires the DGs be run at a load equivalent to the continuous duty rating of the DG (i.e., ≥ 2340 kW and ≤ 2600 kW for Unit 1 and ≥ 3814 kW and ≤ 4238 kW for Unit 2).

    The proposed change revising the duration of the required DG run time from 24-hours to 8-hours is acceptable because the 8 hour duration is considered sufficient to demonstrate DG operability. This change is based on the requirements of IEEE Standard 387-1995, "IEEE Standard Criteria for Diesel Generator Units Applied as Standby Power Supplies for Nuclear Power Generating Stations. The specified DG loading for the 2-hour requirement in ITS SR 3.8.1.10 ensures the capability of the DGs to sustain the full emergency loading requirements without excessive loading. The DG

loading specified for the remainder of the 8-hour run is consistent with the continuous duty rating of the DGs for each unit.

15. ISTS SR 3.8.1.15 requires the hot fast re-start of each DG to rated voltage and frequency after operating for at least 2 hours every 18 months. This test is normally associated with the requirement to perform a 24-hour run (to establish the required "hot" conditions). This surveillance requirement is not added to the BVPS ITS because current licensing basis does not require the performance of this test. This is acceptable for Unit 1 because Safety Guide 9, the Unit's current licensing basis, did not require the performance of this surveillance. For Unit 2 this is acceptable because it is the current licensing basis described by the NRC's initial SER and the Unit 2 UFSAR which took exception to such testing requirements as explained in JFD 14 above. The ISTS SRs that follow are re-numbered to reflect this SR deletion.

16. ISTS SR 3.8.1.20 requires the verification that each DG when started simultaneously from a standby condition can achieve rated voltage and frequency within 10 seconds. ITS SR 3.8.1.15 requires the performance of the test for Unit 2 only. A Note is added to SR to specify that it is applicable to Unit 2 only. This is acceptable because the current licensing basis does not require the SR for Unit 1 and not required by Safety Guide 9, the Unit's current licensing basis.

17. Not used.

18. ISTS LCO 3.8.1 states "The following AC electrical sources shall be OPERABLE: Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System, b. Two diesel generators (DGs) capable of supplying the onsite Class 1E power distribution subsystem(s), and c. Automatic load sequencers for Train A and Train B." ITS LCO 3.8.1 states "The following AC electrical sources and sequencer timer(s)shall be OPERABLE: Two qualified circuits between the offsite transmission network and the onsite Class 1E AC Electrical Power Distribution System, b. Two diesel generators (DGs) capable of supplying the onsite Class 1E power distribution subsystem(s), and c. Automatic load sequencer timer(s) for each required

REVISION 5

BASES

SURVEILLANCE REQUIREMENTS (continued)

- REVIEWER'S NOTE -

The above MODE restrictions may be deleted if it can be demonstrated to the staff, on a plant specific basis, that performing the SR with the reactor in any of the restricted MODES can satisfy the following criteria, as applicable:

a. Performance of the SR will not render any safety system or component inoperable,

b. Performance of the SR will not cause perturbations to any of the electrical distribution systems that could result in a challenge to steady state operation or to plant safety systems, and

c. Performance of the SR, or failure of the SR, will not cause, or result in, an AOO with attendant challenge to plant safety systems.

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SR 3.8.1.~~14~~

This Surveillance demonstrates that the DGs can start and run continuously at or near full load conditions for not less than 8 hours. The Surveillance requires that each DG be run for ≥ 2 hours loaded from a minimum of the calculated accident load for Unit 1, and the continuous duty rating of the DG for Unit 2, up to a *maximum loading* of the 2000 hour rating for each DG. Additionally, the Surveillance requires that each DG be run for the remainder of the 8-hour requirement loaded to the equivalent of the continuous duty rating of the DG. The required run duration of 8 hours is consistent with the recommendations of IEEE Standard 387-1995 (Ref. 14).

~~Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(3), requires demonstration once per 18 months that the DGs can start and run continuously at full load capability for an interval of not less than 24 hours, ≥ [2] hours of which is at a load equivalent to 110% of the continuous duty rating and the remainder of the time at a load equivalent to the continuous duty rating of the DG.~~ The DG starts for this Surveillance can be performed either from standby or hot conditions. The provisions for prelubricating and warmup, discussed in SR 3.8.1.2, and for gradual loading, discussed in SR 3.8.1.3, are applicable to this SR.

The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

2

provides an allowance such

The [18-month] Frequency is consistent with the recommendations of Regulatory Guide 1.108 (Ref. 9), paragraph 2.a.(3), takes into consideration unit conditions required to perform the Surveillance, and is intended to be consistent with expected fuel cycle lengths.

This Surveillance is modified by three Notes. Note 1 ~~states~~ that momentary transients due to changing bus loads do not invalidate this test. Similarly, momentary power factor transients ~~above~~ the power factor ~~limit~~ will not invalidate the test. The reason for Note 2 is that during

outside of

9

required range

9

2

The allowance provided by Note 1 includes the transition between the required load ranges specified in SR 3.8.1.10 part a and part b.

13. License Amendment Nos. 268 (Unit 1) and 150 (Unit 2) and associated NRC Safety Evaluation Report issued September 29, 2005.
14. IEEE Standard 387-1995

REFERENCES (continued)

Insert For Action Section of Bases. This text is from the CTS Bases as revised by Amendments Nos. 268 (Unit 1) and 150 (Unit 2) issued 9/29/05 for the 14-day DG AOT. TAC Nos. MC3331 & MC3332.

10. Regulatory Guide 1.137, Rev. [1], [~~date~~] October 1979 (Unit 2).
11. ASME, ~~Boiler and Pressure Vessel Code, Section XI~~. code for Operation and Maintenance of Nuclear Power Plants
12. IEEE Standard 308-~~1978~~ Unit 1-1971 and Unit 2-1974. 6

Requirements for applying the 14-day DG Completion Time

The ACTION Conditions for inoperable AC sources provide a 14-day Completion Time when one DG is inoperable. The 14 day Completion Time includes the normal 72 hour Completion Time which is not risk informed, followed by an 11 day extension period that is based on a plant specific risk analysis performed to establish the overall Completion Time (Ref 13).

As a defense in depth measure, when the option of an extended Completion Time (i.e., a time beyond the normal 72 hours) for a DG is exercised, alternate AC (AAC) power will be provided with capability of supplying safe shutdown loads during a station blackout without the need for rescheduling of safety system operation in the unaffected unit. For unplanned DG outages, capability to supply AAC power will be available upon entering the Completion Time extension (i.e. by 72 hours into the Completion Time). For outages planned to exceed an initial 72-hour Completion Time, AAC power will be provided within one hour of entering the Action Condition for an inoperable DG. In any event, if AAC power of the required capacity is not available after entering the extended Completion Time (after 72 hours into the Completion Time), the Required Actions of Action Condition G become applicable (i.e., Be in MODE 3 in 6 hours and Be in MODE 5 in 36 hours).

The following criteria would apply to any AAC source used as a defense in depth measure:

1. An AAC power source may be of a temporary or permanent nature and would not be required to satisfy Class 1E requirements.

2. Dynamic effects of an AAC power source failure (GDC-4 events) would not adversely affect safety related plant equipment.

3. An AAC power source would not be required to be protected against natural phenomena (GDC-2 events) or abnormal environmental or dynamic effects (GDC-4 events).

4. An AAC power source would be capable of starting and carrying designated loads required for safe shutdown, including maintaining adequate voltage and frequency such that performance of powered equipment is acceptable.

Prior to relying on its availability, a temporary AAC power source would be determined to be available by: (1) starting the AAC source and verifying proper operation; (2) verifying that sufficient fuel is available onsite to support 24 hours of operation; and (3) ensuring that the AAC source is in the correct electrical alignment to supply power to designated safe shutdown loads. Subsequently, when not in operation, a status check for availability will also be performed once every 72 hours. This check consists of (1) verifying the AAC source is mechanically and electrically ready for operation; (2) verifying that sufficient fuel is available onsite to support 24 hours of operation; and (3) ensuring that the AAC source is in the correct electrical alignment to supply power to designated safe shutdown loads.

Prior to relying on its availability, a permanent AAC power source would be determined to be available by starting the AAC source and verifying proper operation. In addition, initial and periodic testing, surveillance, and maintenance conform to NUMARC 87-00, Revision 1, Appendix B, "Alternate AC Power Criteria" guidelines. The guidelines include provisions for quarterly functional testing, timed starts and load capacity testing on a fuel cycle basis, surveillance and maintenance consistent with manufacturer's recommendations, and initial testing of capability to power required shutdown equipment within the necessary time.

ITS 3.8.1 & 3.8.3

Included For Completeness Only. Revision 5 Changes Are Referenced From This Page. See Marked SR Below (ITS SR 3.8.10).

ELECTRICAL POWER SYSTEMS

SURVEILLANCE REQUIREMENTS (Continued)

actual or simulated — L7 — Insert SR note — L13

3. ~~Simulating~~ a loss of offsite power in conjunction with a safety injection signal, and: — SR 3.8.1.14

   a) Verifying de-energization of the emergency busses and load shedding from the emergency busses.

   b) Verifying the diesel starts from standby conditions[6] on the auto-start signal, energizes the emergency busses with permanently connected loads in ≤ 10 seconds, energizes the auto-connected emergency loads through the load sequencer and operates for ≥ 5 minutes while its generator is loaded with the emergency loads. After energization of these loads, the steady state voltage[3] and frequency[3] shall be maintained at ≥ 3994 volts and ≤ 4368 volts, and ≥ 59.9 Hz and ≤ 60.3 Hz.

L12 — Insert SR note

voltage

4. Verifying that on a loss of ~~power~~ to the emergency busses, all ~~diesel~~ generator trips, except engine ~~overspeed~~, backup phase fault detection, generator ~~differential~~ current, and generator overexcitation are automatically disabled, — SR 3.8.1.9 — L11

L7 — an actual or simulated — M4

5. Verifying the diesel generator operates ~~for ≥ 60 minutes while loaded to ≥ 4,238 kw~~ — SR 3.8.1.10 — Insert times, loads, & notes

6. ~~Verifying that the auto connected loads to each diesel generator do not exceed the 2000 hour rating of 4,535 kw, and~~ — LA8 — Insert SR note — L10

7. Verifying that the automatic load sequence timer is OPERABLE with each load sequence time within ±10% of its required value. — SR 3.8.1.13

c. Check for and remove accumulated water:

1. From the day tank, at least once per 31 days ~~and after each operation of the diesel where the period of operation was greater than 1 hour, and~~ — SR 3.8.1.5.2 — L9

2. From the fuel oil storage tank, at least once per 92 days. — SR 3.8.3.5

LA6 — (3) ~~The values for voltage and frequency are analysis values. These value bands shall be appropriately reduced to account for measurement uncertainties.~~

A17 — (6) All diesel generator starts may be preceded by an engine prelube period.

REVISION 5

Inserts 3.8.1 (continued)

Load limits for SR 3.8.1.3

at a load ≥ 2340 kW and ≤ 2600 kW (Unit 1),

at a load ≥ 3814 kW and ≤ 4238 kW (Unit 2).

Time, load, and Note requirements for SR 3.8.1.10

for ≥ 8 hours:

a. For ≥ 2 hours loaded
≥ 2750 kW and ≤ 2850 kW (Unit 1)
≥ 4238 kW and ≤ 4535 kW (Unit 2), and

b. For the remaining hours of the test loaded
≥ 2340 kW and ≤ 2600 kW (Unit 1)
≥ 3814 kW and ≤ 4238 kW (Unit 2).

Note 1 Momentary transients outside the load and power factor ranges do not invalidate the test.

Note 2 This surveillance shall not normally be performed in MODE 1 or 2. However, the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

Note 3 If performed with DG synchronized with offsite power, it shall be performed at a power factor ≤ 0.89. However, if grid conditions do not permit, the power factor limit is not required to be met. Under this condition the power factor shall be maintained as close to the limit as possible.

SR 3.8.1.9 surveillance note

SR 3.8.1.9----------

- NOTE -

This surveillance shall not normally be performed in MODE 1 or 2. However, portion of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced. Credit may be taken for unplanned events that satisfy this SR.

L.11 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS surveillance requirement 4.8.1.1.2.b.5 requires each diesel to be tested every 18 months during shutdown to a specific kW load for ≥ 60 minutes. ITS SR 3.8.1.10 states that each DG is run loaded for ≥ 8 hours. The ITS SR specifies a kW load band that must be met for ≥ 2 hours and a different kW load band that must be met for the remainder of the 8 hours. Three notes modify the SR. Note 3 is addressed by more restrictive change. Note 1 states "Momentary transients outside the load and power factor ranges do not invalidate this test. Note 2 allows the performance of the SR in MODE 1 or 2 to reestablish OPERABILITY for the DG provided an assessment can determine that the safety of the plant is maintained or enhanced. The effective changes addressed by this DOC are the new allowances provided by Notes 1 and 2. Note 2 changes the CTS by allowing this SR to be performed in Modes 1 or 2 (with the appropriate assessment) and Note 1 provides the allowance for momentary transients outside the required load band to not invalidate the SR.

The purpose of ITS SR Note 2 is to allow the SR to be conducted if it does not reduce plant safety by its performance. This change is acceptable because the relaxed Surveillance Requirement acceptance criteria are adequate to verify that the equipment used to meet the LCO can perform its required functions. The allowance to perform the SR in Modes 1 and 2 requires an assessment prior to performing the SR in these Modes to ensure the plant continues to be operated in a safe manner. The purpose of Note 1 is to allow short-term transients of load or power factor to not invalidate the test. This allowance for these parameters is acceptable because the majority of the SR is performed within the stated limits. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L.12 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS surveillance requirement 4.8.1.1.2.b.4 requires each diesel to be tested every 18 months during shutdown to verify specific non-vital trips are bypassed on an emergency start of the diesel. ITS SR 3.8.1.9 states that each DG automatic trips are bypassed on an actual or simulated loss of voltage signal on the emergency bus. A note modifies the SR. The note allows the performance of portions of the SR in MODE 1, 2, 3, or 4 to reestablish OPERABILITY for the DG provides an assessment can determine that the safety of the plant can be maintained or enhanced. This changes the CTS by allowing portions of the SR to be performed in MODE 1, 2, 3 or 4 if an assessment evaluates that the performance of the SR does not reduce plant safety.

The purpose of ITS SR note is to allow the SR to be conducted if it does not reduce plant safety by its performance. This change is acceptable because the relaxed Surveillance Requirement acceptance criteria are adequate to verify that the equipment used to meet the LCO can perform its required functions. The allowance to perform the SR in MODE 1, 2, 3, or 4 will be evaluated prior to its performance and the evaluation will ensure plant safety will not be decreased. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L.13 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS surveillance requirement 4.8.1.1.2.b.3 requires each diesel to be tested every 18 months during shutdown to verify operation of the diesel with a start on a simulated signal a loss of offsite power in conjunction with a safety injection signal. ITS SR 3.8.1.14 requires the DG start with specific actions to be performed on an actual or simulated loss of offsite

M.3 Not Used.

M.4 CTS surveillance requirement 4.8.1.1.2.b.5 requires each diesel to be tested every 18 months during shutdown to a specific kW load for ≥ 60 minutes. The required loading for Unit 1 is 2750 kW and for Unit 2 the load is 4238 kW. ITS SR 3.8.1.10 requires that each DG be run for ≥ 8 hours loaded to within specific kW load bands. Unit 1 is required to run for ≥ 2 hours at a load of ≥ 2750 kW and ≤ 2850 kW. Unit 2 is required to run for ≥ 2 hours at a load of ≥ 4238 kW and ≤ 4535 kW. The ITS SR requires the DGs of both units to be run for the remainder of the 8 hour requirement within a load band equivalent to the continuous duty rating of the DGs (≥ 2340 kW and ≤ 2600 kW for Unit 1 and ≥ 3814 kW and ≤ 4238 kW for Unit 2). Three notes modify the SR. Notes 1 and 2 are addressed by a less restrictive discussion of change. Note 3 states if the SR is performed with the DG synchronized with offsite power, it shall be performed at a power factor of ≤ 0.89. Additionally, the note states that if grid conditions do not permit, the power factor limit is not required to be met. The note goes on to state that under this condition, the power factor shall be maintained as close to the limit as possible. This DOC addresses the changes to the CTS of the 8 hour run time with specific loading bands, and the specification of a power factor limit for each DG.

The change extending the required DG run time is acceptable because the test requires the DGs to start and load to required values and run for an additional 7 hours beyond the CTS 1 hour requirement consistent with the recommendations of IEEE Standard 387-1995 for periodic endurance and load testing of DGs. For the 2 hour requirement, the minimum of 2750 kW is the assumed accident loading value for Unit 1 and the maximum of 2850 kW is the 2000-hour limit for Unit 1. The 2750 kW value is greater than the continuous duty rating and is specified by the CTS requirement. The Unit 2 kW load band for the required 2 hours is from a minimum of the continuous duty rating to a maximum of the 2000-hour limit (which encompasses the accident loading of the DG). Additionally, the ITS SR requires each DG to be run for the remainder of the 8 hour requirement within a load band equivalent to the continuous duty rating of the DGs (≥ 2340 kW and ≤ 2600 kW for Unit 1 and ≥ 3814 kW and ≤ 4238 kW for Unit 2). A load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY. The addition of a power factor limit is acceptable because the load on the DG with a loss of offsite power is inductive and creates volt-amp reactive loading of the DG. This is represented in the limit of the power factor requirement. Therefore, the testing of the DG at this rating is only required every 18 months. These changes are designated more restrictive because additional test conditions are required in the ITS that are not required by the CTS.

M.5 – M.8 Not used.

M.9 CTS surveillance requirements for LCO 3.8.1.1 do not require a test of the diesel generator capability to carry emergency loads, transfer those loads to offsite source upon a simulated restoration of the offsite power, transfer loads to offsite power source, and return to the specified position. ITS SR 3.8.1.11 requires verification for each DG that it is capable of synchronizing with the offsite power source while carrying emergency loads. Upon a simulated restoration of offsite power, the emergency loads would be transferred to the offsite source and the DG would return to a specified condition. The Unit 2 DGs would return to a ready-to-load position and the Unit 1 DGs would be required to proceed through the shutdown sequence. The surveillance is required to be performed every 18 months. A note modify the SR. The note states this surveillance shall not normally be performed in MODE 1, 2, 3, and 4. The note allows the performance of the SR in MODES 1, 2, 3, and 4 to reestablish OPERABILITY for the DG provides an assessment can determine that the safety of the plant can be maintained or enhanced. This changes the CTS by requiring each DG demonstrate the described requirements every 18 months.

The purpose for the SR is to ensure the DG is capable of performing the required operations. This change is acceptable because the SR ensures that the manual synchronization load transfer from the DG to the offsite source can be made and the DG

BVPS UNITS 1 & 2
ITS CONVERSION LICENSE AMENDMENT REQUEST (LAR)
NOS. 296 (UNIT 1) & 169 (UNIT 2)

ATTACHMENT 2
(to L-06-162)

REVISION 5 CHANGES
Revision of ITS 3.4.20 Bases

The pages for each ITS Section affected by Revision 5 are presented in the following order; ITS markups and associated Justifications for Deviation (JFDs), ITS Bases Markups, Current Technical Specification (CTS) markups and associated Discussion of Change (DOC).

Each affected page is identified as a Revision 5 page. The Revision 5 changes made to each page are further identified by revision bars.

The BVPS ITS Conversion documentation can be updated to Revision 5 by simply replacing the existing page with the corresponding attached Revision 5 page.

The page numbers referenced in the page number indexes below are the ITS section specific sequential numbers added to the bottom right hand corner of each page.

ITS SECTION 3.4 (REACTOR COOLANT SYSTEM) INDEX OF AFFECTED PAGES	
ITS MARKUPS	**NONE**
ITS JFDS	**NONE**
ITS BASES MARKUPS	**PAGES: 196H**
ITS BASES JFDS	**NONE**
CTS MARKUPS	**NONE**
CTS DOCS	**NONE**

REVSION 5

BASES INSERTS FOR ITS 3.4.20

1. For accidents that do not involve fuel damage, the primary coolant activity level of DOSE EQUIVALENT I-131 is assumed to be equal to the LCO 3.4.16, "RCS Specific Activity," limits. Pre-accident and concurrent iodine spikes are assumed in accordance with applicable regulatory guidance. For accidents that assume fuel damage, the primary coolant activity is a function of the amount of activity released from the damaged fuel. The dose consequences of these events are within the limits of 10 CFR 50.67 (Ref. 2) as supplemented by Regulatory Guide 1.183 (Ref. 3) and within GDC-19 (Ref. 4) values.

Unit 1:

The analysis for design basis accidents and transients other than a SGTR assume the SG tubes retain their structural integrity (i.e., they are assumed not to rupture.) In these analyses, the steam discharge to the atmosphere is conservatively assumed to include the total primary to secondary LEAKAGE from all SGs of 450 gpd (i.e., 150 gpd per steam generator) or is assumed to increase to 450 gpd as a result of accident induced conditions. Currently, the Unit 1 safety analyses do not specifically assume additional primary to secondary LEAKAGE due to accident induced conditions.

Unit 2:

The analysis for design basis accidents and transients other than a SGTR assume the SG tubes retain their structural integrity (i.e., they are assumed not to rupture). In these analyses, the steam discharge to the atmosphere is conservatively assumed to include the total primary to secondary LEAKAGE from all SGs of 450 gpd (i.e., 150 gpd per steam generator) or is assumed to increase to 450 gpd as a result of accident induced conditions for all accidents other than the Unit 2 main steam line break (MSLB). Currently, the Unit 2 MSLB safety analysis is the only analysis that specifically assumes additional primary to secondary LEAKAGE due to accident induced conditions.

For the Unit 2 main steam line break (MSLB) analysis, an increased leakage assumption is applied. In support of voltage based repair criteria pursuant to Generic Letter 95-05 (Ref. 5) analyses were performed to determine the maximum MSLB induced primary to secondary leak rate that could occur without offsite doses exceeding the limits of 10 CFR 50.67 (Ref. 2) as supplemented by Regulatory Guide 1.183 (Ref. 3) and without control room doses exceeding GDC-19 (Ref. 4). An additional 2.1 gpm leakage is assumed in the Unit 2 MSLB analysis resulting from accident conditions. Therefore, in the MSLB analysis, the steam discharge to the atmosphere includes primary to secondary LEAKAGE equivalent to the operational leakage limit of 150 gpd per SG and an additional 2.1 gpm which results in a total assumed accident induced leakage of 2.4 gpm.

The combined projected leak rate from all sources (i.e., voltage based repair criteria, application of F*, freespan crack, leaking plug, leakage past sleeves, etc.) for each SG must be less than the maximum allowable steam line break leak rate limit in any one steam generator (i.e., 2.2 gpm) in order to maintain a total assumed accident induced leakage of $\leq$ 2.4 gpm as explained above. Maintaining the total assumed accident induced leakage to $\leq$ 2.4 gpm limits the resulting dose to within the requirements of 10 CFR 50.67 (Ref. 2) as supplemented by Regulatory Guide 1.183 (Ref. 3) and within GDC-19 (Ref. 4) values during a postulated steam line break event.

BVPS UNITS 1 & 2
ITS CONVERSION LICENSE AMENDMENT REQUEST (LAR)
NOS. 296 (UNIT 1) & 169 (UNIT 2)

ATTACHMENT 3
(to L-06-162)

REVISION 5 CHANGES
Revision of Battery Charger and Battery Monitoring and Maintenance Program Requirements
(ITS 3.8.4, 3.8.6, and 5.5.13)

The pages for each ITS Section affected by Revision 5 are presented in the following order; ITS markups and associated Justifications for Deviation (JFDs), ITS Bases Markups, Current Technical Specification (CTS) markups and associated Discussion of Change (DOC).

Each affected page is identified as a Revision 5 page. The Revision 5 changes made to each page are further identified by revision bars.

The BVPS ITS Conversion documentation can be updated to Revision 5 by simply replacing the existing page with the corresponding attached Revision 5 page.

The page numbers referenced in the page number indexes below are the ITS section specific sequential numbers added to the bottom right hand corner of each page.

ITS SECTION 3.8 (ELECTRICAL POWER SYSTEMS) INDEX OF AFFECTED PAGES	
ITS MARKUPS	**PAGES: 27, 28, 35**
ITS JFDS	**PAGES: 57**
ITS BASES MARKUPS	**PAGES: 115, 119, 120, 121, 122, 123, 134, 135, 136, 138**
ITS BASES JFDS	**PAGES: 166**
CTS MARKUPS	**PAGES: 207**
CTS DOCS	**PAGES: 264, 265, 266, 267, 273, 274**

ITS SECTION 5.0 (ADMINISTRATIVE CONTROLS) INDEX OF AFFECTED PAGES	
ITS MARKUPS	**PAGES: 23**
ITS JFDS	**PAGES: 63**
ITS BASES MARKUPS	**NONE**
ITS BASES JFDS	**NONE**
CTS MARKUPS	**PAGES: 123**
CTS DOCS	**NONE**

3.8 ELECTRICAL POWER SYSTEMS

3.8.4 DC Sources - Operating

LCO 3.8.4 The Train A and Train B DC electrical power subsystems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One [or two] battery charger[s on one train] inoperable.	A.1 Restore battery terminal voltage to greater than or equal to the minimum established float voltage. AND	2 hours
	A.2 Verify battery float current ≤ [2] amps. AND	Once per [12] hours
	A.3 Restore battery charger[~~s~~] to OPERABLE status.	~~7 days~~
[B. One [or two] batter[~~y~~][ies on one train] inoperable.	B.1 Restore batter[~~y~~][ies] to OPERABLE status.	[2] hours]
C. One DC electrical power subsystem inoperable for reasons other than Condition A [or B].	C.1 Restore DC electrical power subsystem to OPERABLE status.	[2] hours
D. Required Action and Associated Completion Time not met.	D.1 Be in MODE 3. AND	6 hours
	D.2 Be in MODE 5.	36 hours

(S)

1

72 hours

REVISION 5

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.4.1	Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	7 days
SR 3.8.4.2	Verify each battery charger supplies ≥ [~~400~~] 100 amps at greater than or equal to the minimum established float voltage for ≥ [~~8~~] 4 hours. OR Verify 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.	[18] months
SR 3.8.4.3	--- **- NOTES -** 1. The modified performance discharge test in SR 3.8.6.6 may be performed in lieu of SR 3.8.4.3. (1) 2. This Surveillance shall not ~~normally~~ be performed in MODE 1, 2, 3, or 4. ~~However, portions of the Surveillance may be performed to reestablish OPERABILITY provided an assessment determines the safety of the plant is maintained or enhanced.~~ --- Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	[18] months

CTS values from 4.8.2.3.2.c.4

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Credit may be taken for unplanned events that satisfy this SR.

REVISION 5

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.6.5	Verify each battery connected cell voltage is ≥ [2.07] V.	92 days
SR 3.8.6.6	---------- - NOTE - This Surveillance shall not be performed in MODE 1, 2, 3, or 4. ~~However,~~ credit may be taken for unplanned events that satisfy this SR. ----------	
	Verify battery capacity is ≥ [80%] of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	60 months AND ~~12~~ months when battery shows degradation, or has reached [85]% of the expected life ~~with capacity < 100% of manufacturer's rating~~ AND ~~24 months when battery has reached [85]% of the expected life with capacity ≥ 100% of manufacturer's rating~~

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18

2

ITS 3.8.4 DC Sources - Operating

JUSTIFICATION FOR DEVIATION (JFD)

1. ITS 3.8.4, DC Sources - Operating, is revised to incorporate changes related to the proposed changes to TSTF-360. The proposed changes to TSTF-360 are planned to be incorporated into the ISTS (i.e., NUREG-1431) in the near future. As such, this change to the BVPS ITS is necessary to maintain consistency with NUREG-1431.

REVISION 5

BASES

BACKGROUND (continued)

Each 125/~~250~~ VDC battery is separately housed in a ventilated room apart from its charger and distribution centers. Each subsystem is located in an area separated physically and electrically from the other subsystem to ensure that a single failure in one subsystem does not cause a failure in a redundant subsystem. There is no sharing between redundant Class 1E subsystems, such as batteries, battery chargers, or distribution panels.

Reference 1

Each battery has adequate storage capacity to meet the duty cycle(s) discussed in ~~the FSAR, Chapter [8] (Ref~~ 4~~)~~. The battery is designed with additional capacity above that required by the design duty cycle to allow for temperature variations and other factors.

The batteries for Train A and Train B DC electrical power subsystems are sized to produce required capacity at 80% of nameplate rating, corresponding to warranted capacity at end of life cycles and the 100% design demand. The minimum design voltage limit is 105/~~210~~ V.

Based on battery sizing calculations, a 5% design margin is maintained for the Enersys 2GN-13 model batteries (2-3 and 2-4) and a 2% design margin is maintained for the Enersys 2GN-21 model batteries (1-1, 1-2, 2-1, and 2-2). This margin is reserved for the batteries listed above in accordance with the battery vendor recommendations and NRC commitment in order to use the value of ≤ 2 amps float current to determine a fully charged battery (Ref. 11).

The battery cells are of flooded lead acid construction with a nominal specific gravity of [1.215]. This specific gravity corresponds to an open circuit battery voltage of approximately ~~120~~ V for a [~~58~~] cell battery (i.e., cell voltage of [~~2.065~~] volts per cell (Vpc)). The open circuit voltage is the voltage maintained when there is no charging or discharging. ~~Once fully charged with its open circuit voltage ≥ [2.0654] Vpc, the battery cell will maintain its capacity for [30] days without further charging per manufacturer's instructions.~~ Optimal long term performance however, is obtained by maintaining a float voltage [~~2.20 to~~ 2.25] Vpc. This provides adequate over-potential, which limits the formation of lead sulfate and self discharge. ~~The~~ nominal float voltage of [~~2.22~~] Vpc corresponds to a total float voltage output of [~~128.8~~] V for a [~~58~~] cell battery as discussed in ~~the FSAR, Chapter [8] (Ref.~~ 4~~)~~.

124

60 1

2.07

1 5

2.25

135

Reference 1

60

Each Train A and Train B DC electrical power subsystem battery charger has ample power output capacity for the steady state operation of connected loads required during normal operation, while at the same time maintaining its battery bank fully charged. Each battery charger also has sufficient excess capacity to restore the battery from the design minimum charge to its fully charged state within 24 hours while supplying normal steady state loads discussed in ~~the FSAR, Chapter [8] (Ref.~~ 4~~)~~.

1

Reference

The battery charger is normally in the float-charge mode. Float-charge is the condition in which the charger is supplying the connected loads and the battery cells are receiving adequate current to optimally charge the

REVISION 5

BASES

ACTIONS (continued)

72 hours

72-hour

Required Action A.3 limits the restoration time for the inoperable battery charger to ~~7 days~~. This action is applicable if an alternate means of restoring battery terminal voltage to greater than or equal to the minimum established float voltage has been used (e.g., balance of plant non-Class 1E battery charger). The ~~7 day~~ Completion Time reflects a reasonable time to effect restoration of the qualified battery charger to OPERABLE status.

9

B.1

In addition, the 72 hour Completion Time takes into account the capacity and capability of the remaining DC sources, and the low probability of a DBA occurring during this period.

- REVIEWER'S NOTE -

The 2 hour Completion Times of Required Actions B.1 and C.1 are in brackets. Any licensee wishing to request a longer Completion Time will need to demonstrate that the longer Completion Time is appropriate for the plant in accordance with the guidance in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications."

8

Condition B represents one train with one [or two] batter[y][ies] inoperable. With one [or two] batter[y][ies] inoperable, the DC bus is being supplied by the OPERABLE battery charger[s]. Any event that results in a loss of the AC bus supporting the battery charger[s] will also result in loss of DC to that train. Recovery of the AC bus, especially if it is due to a loss of offsite power, will be hampered by the fact that many of the components necessary for the recovery (e.g., diesel generator control and field flash, AC load shed and diesel generator output circuit breakers, etc.) likely rely upon the batter[y][ies]. In addition the energization transients of any DC loads that are beyond the capability of the battery charger[s] and normally require the assistance of the batter[y][ies] will not be able to be brought online. The [2] hour limit allows sufficient time to effect restoration of an inoperable battery given that the majority of the conditions that lead to battery inoperability (e.g., loss of battery charger, battery cell voltage less than [2.07] V, etc.) are identified in Specifications 3.8.4, 3.8.5, and 3.8.6 together with additional specific Completion Times.

C.1

Condition C represents one train with a loss of ability to completely respond to an event, and a potential loss of ability to remain energized during normal operation. It is therefore, imperative that the operator's attention focus on stabilizing the unit, minimizing the potential for complete loss of DC power to the affected train. The 2 hour limit is

REVISION 5

BASES

ACTIONS (continued)

consistent with the allowed time for an inoperable DC distribution system train.

If one of the required DC electrical power subsystems is inoperable for reasons other than Condition A or B (e.g., inoperable battery charger and associated inoperable battery), the remaining DC electrical power subsystem has the capacity to support a safe shutdown and to mitigate an accident condition. Since a subsequent worst- case single failure could, however, result in the loss of minimum necessary DC electrical subsystems to mitigate a worst case accident, continued power operation should not exceed 2 hours. The 2 hour Completion Time is based on Regulatory Guide 1.93 (Ref. 7) and reflects a reasonable time to assess unit status as a function of the inoperable DC electrical power subsystem and, if the DC electrical power subsystem is not restored to OPERABLE status, to prepare to effect an orderly and safe unit shutdown.

D.1 and D.2

If the inoperable DC electrical power subsystem cannot be restored to OPERABLE status within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 6 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems. The Completion Time to bring the unit to MODE 5 is consistent with the time ~~required~~ in Regulatory Guide 1.93 (Ref. 8).

CTS Values

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SURVEILLANCE REQUIREMENTS

SR 3.8.4.1

recommended (1) 7

Verifying battery terminal voltage while on float charge ~~for the batteries~~ helps to ensure the effectiveness of the battery chargers, which support the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a fully charged state while supplying the continuous steady state loads of the associated DC subsystem. On float charge, battery cells will receive adequate current to optimally charge the battery. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the minimum float voltage established by the battery manufacturer ~~([2.20] Vpc or [127.6] V at the battery terminals)~~. This voltage maintains the battery plates in a condition that supports maintaining the grid life (expected to be approximately 20 years). The

(7) , measured at the battery terminals,

(i.e., 2.13 Vpc or ≥ 127.8 volts for 60 cell batteries 1-1 and 1-2, and ≥ 125.67 volts for 59 cell batteries 1-3 and 1-4 for Unit 1 batteries and for Unit 2 ≥ 127.8 volts is required for each battery).

(7)

BASES

REVISION 5

SURVEILLANCE REQUIREMENTS (continued)

7 day Frequency is consistent with ~~manufacturer recommendations and~~ IEEE-450 (Ref. 8).

SR 3.8.4.2

This SR verifies the design capacity of the battery chargers. According to Regulatory Guide 1.32 (Ref. 9), the battery charger supply is recommended to be based on the largest combined demands of the various steady state loads and the charging capacity to restore the battery from the design minimum charge state to the fully charged state, irrespective of the status of the unit during these demand occurrences. The ~~minimum~~ required amperes and duration ensure that these requirements can be satisfied.

CTS Values

4

100

1

4-hour time period is

7

The charger voltage requires a minimum output of 140 volts.

This SR provides two options. One option requires that each battery charger be capable of supplying [~~400~~] amps at the minimum established float voltage for [~~8~~] hours. The ampere requirements are based on the output rating of the chargers. The voltage requirements are based on the charger voltage level after a response to a loss of AC power. The ~~time period if~~ sufficient for the charger temperature to have stabilized ~~and to have been maintained for at lease [2] hours.~~

The other option requires that each battery charger be capable of recharging the battery after a service test coincident with supplying the largest ~~coincident~~ demands of the various continuous steady state loads (irrespective of the status of the plant during which these demands occur). This level of loading may not normally be available following the battery service test and will need to be supplemented with additional loads. The duration for this test may be longer than the charger sizing criteria since the battery recharge is affected by float voltage, temperature, ~~an~~ the exponential decay in charging current. The battery is recharged when the measured charging current is ≤ [2] amps.

combined

TSTF-451

1

and

The minimum established float voltage for Unit 1 is ≥ 127.8 volts at the battery terminals for 60 cell batteries 1-1 and 1-2, and 125.67 volts at the battery terminals for 59 cell batteries 1-3 and 1-4. The minimum established float voltage for Unit 2 is ≥ 127.8 volts at the battery terminals.

The Surveillance Frequency is acceptable, given the unit conditions required to perform the test and the other administrative controls existing to ensure adequate charger performance during these [18 month] intervals. In addition, this Frequency is intended to be consistent with expected fuel cycle lengths.

SR 3.8.4.3

A battery service test is a special test of the battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical

REVISION 5

BASES

SURVEILLANCE REQUIREMENTS (continued)

7

of 2 hours, using actual or simulated emergency loads

power system. The discharge rate and test length should correspond to the design duty cycle ~~requirements~~ as specified in Reference 4.

The Surveillance Frequency of [18 months] is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 9) and Regulatory Guide 1.129 (Ref. 10), which state that the battery service test should be performed during refueling operations, or at some other outage, with intervals between tests not to exceed ~~[18 months]~~.

1

the SR Frequency plus any allowed extension.

This SR is modified by two Notes. Note 1 allows the performance of a modified performance discharge test in lieu of a service test.

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Credit may be taken for unplanned events that satisfy this SR.

The reason for Note 2 is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems. ~~This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.~~

2

REFERENCES

Safety Guide 6 (Unit 1) and

1. ~~10 CFR 50, Appendix A, GDC 17.~~
2. Regulatory Guide 1.6, March 10, 1971.
3. IEEE-308 ~~[1978]~~.
4. FSAR, Chapter [8].
5. FSAR, Chapter [6].
6. FSAR, Chapter ~~[15]~~.

Unit 1 UFSAR Appendix 1A, "1971 AEC General Design Criteria Conformance" and Unit 2 UFSAR Section 3.1, "Conformance with U. S. Nuclear Regulatory Commission General Design Criteria."

(Unit 2).

1971 for Unit 1 and 1974 for Unit 2.

3

3

U

14 for Unit 1 and Chapter 15 for Unit 2.

6

BASES

REFERENCES (continued)

7. Regulatory Guide 1.93, December 1974.
8. IEEE-450-[1995].
9. Regulatory Guide 1.32, February 1977.
10. Regulatory Guide 1.129, December 1974.

3

11. NRC Regulatory Commitment documented in FENOC Letter L-06-162, "Supplement to License Amendment Request Nos. 296 and 169, Improved Standard Technical Specification Conversion," dated 12/07/06.

REVISION 5

BASES

ACTIONS (continued)

reasonable (5)

of the amount of the previous discharge and the recharge characteristic of the battery. Thus there is ~~good~~ assurance of fully recharging the battery within [12] hours, avoiding a premature shutdown with its own attendant risk.

If the condition is due to one or more cells in a low voltage condition but still greater than [2.07] V and float voltage is found to be satisfactory, this is not indication of a substantially discharged battery and [12] hours is a reasonable time prior to declaring the battery inoperable.

Since Required Action B.1 only specifies "perform," a failure of SR 3.8.4.1 acceptance criteria does not result in the Required Action not met. However, if SR 3.8.4.1 is failed, the appropriate Condition(s), depending on the cause of the failure, is entered.

C.1, C.2, and C.3

(i.e., ≥ minimum level indication mark)

5 In accordance with Required Action C.3

Within 31 days.

With one or more batteries in one train with one or more cells electrolyte level above the top of the plates, but below the minimum established design limits, the battery still retains sufficient capacity to perform the intended function. Therefore, the affected battery is not required to be considered inoperable solely as a result of electrolyte level not met. ~~Within 31 days~~ the minimum established design limits for electrolyte level must be re-established.

13

Condition C is modified by a Note that requires the completion of Required Action C.2 if the electrolyte level was found below the top of the plates. In this case, the visual inspection for leakage specified in Required Action C.2 must be performed prior to exiting Condition C even if the electrolyte level is restored to greater than or equal to the minimum established design limit.

With electrolyte level below the top of the plates there is a potential for dryout and plate degradation. Required Actions C.1 and C.2 address this potential (as well as provisions in Specification 5.5.~~17~~, Battery Monitoring and Maintenance Program). They are modified by a Note that indicates they are only applicable if electrolyte level is below the top of the plates. Within 8 hours level is required to be restored to above the top of the plates. The Required Action C.2 requirement to verify that there is no leakage by visual inspection and the Specification 5.5.~~17~~.b item to initiate action to equalize and test in accordance with manufacturer's recommendation are taken from Annex D of IEEE Standard 450-1995. ~~They~~ are performed following the restoration of the electrolyte level to above the top of the plates. Based on the results of the manufacturer's recommended testing the batter[y][ies] may have to be declared inoperable and the affected cell[s] replaced.

The visual inspection and requirements of Specification 5.5.13.b

typically

4

BASES

ACTIONS (continued)

of 50 °F

D.1

With one or more batteries in one train with pilot cell temperature less than the minimum established design limits, 12 hours is allowed to restore the temperature to within limits. A low electrolyte temperature limits the current and power available. Since the battery is sized with margin, while battery capacity is degraded, sufficient capacity exists to perform the intended function and the affected battery is not required to be considered inoperable solely as a result of the pilot cell temperature not met.

E.1

With one or more batteries in redundant trains with battery parameters not within limits there is not sufficient assurance that battery capacity has not been affected to the degree that the batteries can still perform their required function, given that redundant batteries are involved. With redundant batteries involved this potential could result in a total loss of function on multiple systems that rely upon the batteries. The longer Completion Times specified for battery parameters on non-redundant batteries not within limits are therefore not appropriate, and the parameters must be restored to within limits on at least one train within 2 hours.

F.1

With one or more batteries with any battery parameter outside the allowances of the Required Actions for Condition A, B, C, D, or E, sufficient capacity to supply the maximum expected load requirement is not assured and the corresponding battery must be declared inoperable. Additionally, discovering one or more batteries in one train with one or more battery cells float voltage less than [2.07] V and float current greater than [2] amps indicates that the battery capacity may not be sufficient to perform the intended functions. The battery must therefore be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

Verifying battery float current while on float charge is used to determine the state of charge of the battery. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery and maintain the battery in a charged state. The float current requirements are based on the float current indicative of

REVISION 5

BASES

SURVEILLANCE REQUIREMENTS (continued)

a charged battery. Use of float current to determine the state of charge of the battery is consistent with IEEE-450 (Ref. ~~1~~). The 7 day Frequency is consistent with IEEE-450 (Ref. ~~1~~). 3

This SR is modified by a Note that states the float current requirement is not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1. When this float voltage is not maintained the Required Actions of LCO 3.8.4 ACTION A are being taken, which provide the necessary and appropriate verifications of the battery condition. Furthermore, the float current limit of [2] amps is established based on the nominal float voltage value and is not directly applicable when this voltage is not maintained.

SR 3.8.6.2 and SR 3.8.6.5

The minimum established float voltage for Unit 1 is ≥ 127.8 volts at the battery terminals for 60 cell batteries 1-1 and 1-2, and 125.67 volts at the battery terminals for 59 cell batteries 1-3 and 1-4. The minimum established float voltage for Unit 2 is ≥ 127.8 volts at the battery terminals.

Optimal long term battery performance is obtained by maintaining a float voltage greater than or equal to the minimum established design limits provided by the battery manufacturer, ~~which corresponds to [130.5] V at the battery terminals, or [2.25] Vpc.~~ This provides adequate over-potential, which limits the formation of lead sulfate and self discharge, which could eventually render the battery inoperable. Float voltages in this range or less, but greater than [2.07] Vpc, are addressed in Specification 5.5.~~17~~. SRs 3.8.6.2 and 3.8.6.5 require verification that the cell float voltages are equal to or greater than the short term absolute minimum voltage of [2.07] V. The Frequency for cell voltage verification every 31 days for pilot cell and 92 days for each connected cell is consistent with IEEE-450 (Ref. ~~1~~) 3

5

13

SR 3.8.6.3

(i.e., ≥ minimum level indication mark)

The limit specified for electrolyte level ensures that the plates suffer no physical damage and maintains adequate electron transfer capability. The Frequency is consistent with IEEE-450 (Ref. ~~1~~).

SR 3.8.6.4

3

50

This Surveillance verifies that the pilot cell temperature is greater than or equal to the minimum established design limit (i.e., ~~[40]~~ °F). Pilot cell electrolyte temperature is maintained above this temperature to assure the battery can provided the required current and voltage to meet the design requirements. Temperatures lower than assumed in battery sizing calculations act to inhibit or reduce battery capacity. The Frequency is consistent with IEEE-450 (Ref. ~~1~~).

3

BASES

REVISION 5

SURVEILLANCE REQUIREMENTS (continued)

4

~~shows no degradation but has reached 85% of its expected life, the Surveillance Frequency is only reduced to 24 months for batteries that retain capacity ≥ 100% of the manufacturer's ratings.~~ Degradation is indicated, according to IEEE-450 (Ref. 3), when the battery capacity drops by more than 10% relative to its capacity on the previous performance test or when it is ≥ [10%] below the manufacturer's rating. These Frequencies are consistent with the recommendations in IEEE-450 (Ref. 3).

NUREG-1431, Rev. 3

Credit may be taken for unplanned events that satisfy this SR.

This SR is modified by a Note. The reason for the Note is that performing the Surveillance would perturb the electrical distribution system and challenge safety systems. ~~This restriction from normally performing the Surveillance in MODE 1 or 2 is further amplified to allow portions of the Surveillance to be performed for the purpose of reestablishing OPERABILITY (e.g., post work testing following corrective maintenance, corrective modification, deficient or incomplete surveillance testing, and other unanticipated OPERABILITY concerns) provided an assessment determines plant safety is maintained or enhanced. This assessment shall, as a minimum, consider the potential outcomes and transients associated with a failed partial Surveillance, a successful partial Surveillance, and a perturbation of the offsite or onsite system when they are tied together or operated independently for the partial Surveillance; as well as the operator procedures available to cope with these outcomes. These shall be measured against the avoided risk of a plant shutdown and startup to determine that plant safety is maintained or enhanced when portions of the Surveillance are performed in MODE 1 or 2. Risk insights or deterministic methods may be used for the assessment.~~

REFERENCES

1. FSAR, Chapter [6].
2. FSAR, Chapter [~~15~~]

2 U

14 for Unit 1 and Chapter 15 for Unit 2.

1

3. IEEE-450-[1995].
4. IEEE-485-[1983], June 1983

5. UFSAR, Chapter 8 (Unit 2).

ITS 3.8.4 DC Sources – Operating Bases

JUSTIFICATION FOR DEVIATION (JFD)

1. Editorial change made to be consistent with the ISTS writers' guide.
2. The BVPS Unit 1 and 2 UFSAR each contain a section that describes how the unit complies with the GDC. The ISTS Bases references to the GDC have been replaced with references to the appropriate section of each BVPS Unit's UFSAR that describes compliance with the GDC. Supplement each reference to the "10 CFR 50, Appendix A General Design Criteria" in the ISTS Bases with the phrase "as discussed in Reference 1".
3. Changes are made (additions, deletion, and or changes) to the ISTS, which reflect the plant specific nomenclature, number reference, system description, analysis, or licensing basis description.
4. Bracketed information is deleted because it is not applicable.
5. Details not required to understand operation of DC sources and is therefore deleted.
6. Section / Chapter references are changed to reflect a unit specific reference (i.e., Accident analysis for Unit1 is Chapter 14 and for Unit 2 is Chapter 15), if applicable.
7. The ITS Bases are modified by moving descriptive information moved from the CTS specifications.
8. Editorial change made with the removal of the Reviewer's Note to be consistent with the ISTS writers' guide.
9. Changes are made to the Bases to address changes made to the corresponding technical specification (ITS 3.8.4) and to make the Bases discussion regarding the Completion Time more consistent with other Completion Time discussions. The JFD for the change made to the ITS discusses the reasons for the change in Completion Time.

REVISION 5

Inserts LCOs 3.8.4, 3.8.6 and 3.8.9

LCO 3.8.9 Action C additional Completion Time

Completion Time
AND 16 hours from discovery of failure to meet LCO

SR 3.8.4.2 alternate test allowance

Surveillance Requirement	
SR 3.8.4.2	OR Verify 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.

SR 3.8.4.3 (second note) & SR 3.8.6.6 (only note)

- NOTES -

This Surveillance shall not be performed in MODE 1, 2, 3, or 4. Credit may be taken for unplanned events that satisfy this SR.

LCO 3.8.4 Action A Required Actions and Completion Times

Required Action		Completion Time
A.1	Restore battery terminal voltage to greater than or equal to the minimum established float voltage.	2 hours
AND		
A.2	Verify battery float current $\leq$ 2 amps.	Once per 12 hours
AND		
A.3	Restore battery charger(s) to OPERABLE status.	72 hours

CTS 3.8.2.3 DC Distribution – Operating
ITS 3.8.4 DC Sources – Operating
ITS 3.8.6 Battery Parameters
ITS 3.8.9 Distribution Systems - Operating
DISCUSSION OF CHANGE (DOC)

Less Restrictive Changes (L)

L.1 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS surveillance requirement 4.8.2.3.2.e and 4.8.2.3.2.f require the performance of a discharge tests verifying battery capacity at least every 18 months during shutdown. ITS SR 3.8.6.6 in part requires the verification of battery capacity when subjected to a performance discharge test. A Note modifies the ITS SR. The Note states "This Surveillance shall not be performed in MODE 1, 2, 3, or 4. Credit may be taken for unplanned events that satisfy this SR". This changes the CTS by allowing credit to be taken for unplanned events.

The purpose of ITS SR 3.8.6.6 Note is to allow credit to be taken for unplanned events that satisfy this SR. This change is acceptable because the relaxed SR requirements are adequate to verify that the equipment used to meet the LCO can perform its required functions. The change allows the results from an unplanned event to be used to satisfy the SR. The results of an unplanned event must still conform to the applicable required battery acceptance criteria in order for the results to be used to verify battery operability. Therefore, the battery would continue to be verified operable utilizing the appropriate SR acceptance criteria. The proposed allowance for credit to be taken for unplanned events is consistent with the ISTS wording. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L.2 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS surveillance requirement 4.8.2.3.2.c.4 states that the battery charger will supply at least 100 amps at 140 volts for at least 4 hours. ITS SR 3.8.4.2 requires a verification of each battery charger supplying ≥ 100 amps at greater than or equal to the minimum established float voltage for ≥ 4 hours. In addition, the SR provides an alternative test method that allows a verification of 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. This changes the CTS by allowing an alternate test that is not currently allowed.

The purpose of the ITS alternate test method is to provide a method that can demonstrate the charger capability to supply a recharge to a battery after a battery discharge test has been performed. This change is acceptable because the relaxed

Surveillance Requirement acceptance criteria are adequate to verify that the equipment used to meet the LCO can perform its required functions. The alternate test provides an acceptable method for determining charger capability by actually recharging a discharged battery within 24 hours while supplying required loads. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L.3 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS surveillance requirement 4.8.2.3.2.d states that battery capacity is verified by subjecting the battery to a service test every 18 months during shutdown. ITS SR 3.8.4.3 requires a service test to be performed to verify the battery capacity. The test must be performed every 18 months. A Note modifies the SR that states "This Surveillance shall not be performed in MODE 1, 2, 3, or 4. Credit may be taken for unplanned events that satisfy this SR." This revises the CTS by allowing credit for unplanned events.

The purpose of ITS SR 3.8.4.3 Note is to allow credit to be taken for unplanned events that satisfy this SR. This change is acceptable because the relaxed SR requirements are adequate to verify that the equipment used to meet the LCO can perform its required functions. The change allows the results from an unplanned event to be used to satisfy the SR. The results of an unplanned event must still conform to the applicable required battery acceptance criteria in order for the results to be used to verify battery operability. Therefore, the battery would continue to be verified operable utilizing the appropriate SR acceptance criteria. The proposed allowance for credit to be taken for unplanned events is consistent with the ISTS wording. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L.4 *(Category 4 – Relaxation of Required Action)* CTS LCO 3.8.2.3 Action a, in part states with one of the battery banks inoperable, restore the inoperable battery bank to OPERABLE status within 2 hours. ITS LCO 3.8.4 Required Action B requires with one or two batteries on one train inoperable restore the inoperable batteries to OPERABLE status in 2 hours. This changes the CTS by allowing more than one battery to be inoperable if the batteries are on the same train.

The purpose of ITS LCO Required Action B is to limit one train of batteries to be inoperable for only 2 hours. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a design basis accident occurring during the repair period. This change allows both batteries on the same train to be inoperable for up to two hours. The remaining train of batteries ensures accident analysis assumptions are met for the

limited time that the train of batteries is allowed to be inoperable. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.5 *(Category 4 – Relaxation of Required Action)* CTS LCO 3.8.2.3 Action b, in part states with one of the battery charger inoperable, restore the inoperable battery charger to OPERABLE status with specific limitations. ITS LCO 3.8.4 Required Action A requires with one or two battery chargers on one train inoperable restore the inoperable battery changers to OPERABLE status within specific limitations. This changes the CTS by allowing more than one battery charger to be inoperable if the battery chargers are on the same train.

The purpose of ITS LCO Required Action A is to limit one train of battery chargers to be inoperable. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. This includes the capacity and capability of remaining systems or features, a reasonable time for repairs or replacement, and the low probability of a design basis accident occurring during the repair period. This change allows both battery chargers on the same train to be inoperable with specific limitations. The remaining train of batteries and battery chargers ensure accident analysis assumptions are met for the limited time that the train of battery chargers is allowed to be inoperable. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.6 *(Category 4 – Relaxation of Required Action)* CTS 3.8.2.3 Action b in part states with one of the required full capacity chargers inoperable, demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.3.2.a.1 within one hour. The requirement goes on to state that the action requires the Surveillance Requirement of 4.8.2.3.2.a.1 to be continued for at least once per 8 hours thereafter and if any Category A limit in Table 3.8-1 is not met, declare the battery inoperable. ITS LCO 3.8.4 Condition A states with one or two battery chargers on one train inoperable, restore battery terminal voltage to greater than or equal to the minimum established float voltage with 2 hours (Required Action A.1). Required Action A.2 states a verification of float current of $\leq$ 2 amps is required once per 12 hours. Required Action A.3 specifies that the inoperable charger(s) must be restored to OPERABLE status within 72 hours. This changes the CTS by allowing the battery terminal voltage to be restored to the minimum established float voltage with float current to be $\leq$ 2 amps and restoring the charger(s) to OPERABLE status within 72 hours.

The purpose of ITS Required Actions A.1, A.2, and A.3 is to allow appropriate correct actions with appropriate time limitations to restore inoperable battery chargers to OPERABLE status. This change is acceptable because the Required Actions are used to establish remedial measures that must be taken in response to the degraded conditions in order to minimize risk associated with continued operation while providing time to repair inoperable features. The Required Actions are consistent with safe operation under the specified Condition, considering the OPERABLE status of the redundant systems or features. The allowed Completion Time of 72 hours to restore a

battery charger to operable status is acceptable considering the capacity and capability of the remaining train of operable DC Sources, the low probability of a design basis accident occurring during the 72 hour Completion Time, as well as the ability to maintain the affected battery operable during this time using non-Class 1E battery chargers. This change establishes the appropriate actions to be taken with inoperable battery charger(s). The current requirement specifies that all Category A parameters listed in Table 3.8-1 be within limits. The battery charger affect on the associated battery is directly related to the terminal voltage and the charging current in a float condition. With the charger supplying the minimum float voltage and ≤ 2 amps of charging current indicates the battery is capable of performing design requirements and should be considered OPERABLE. Twelve hours is acceptable for the verification of the charging current because it provides a limited time and the charger must be returned to OPERABLE within 72 hours. This change is designated as less restrictive because less stringent Required Actions are being applied in the ITS than were applied in the CTS.

L.7 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS surveillance requirement 4.8.2.3.2.b.3 states the average electrolyte temperature of every tenth cell of connected cells is above 60 °F. ITS SR 3.8.6.4 states "Verify each battery pilot cell temperature is greater than or equal to minimum established design limits." This changes the CTS by replacing the "average" temperature requirement of "every tenth connected cell" with the requirement that "each battery pilot cell temperature is greater than or equal to minimum established design limits." The change of 60 °F to minimum established design limits is discussed in a less restrictive change removal of details in these discussion of changes.

The purpose of ITS SR 3.8.6.4 is to ensure the temperature of the batteries is within design requirements. This change is acceptable because the relaxed Surveillance Requirement acceptance criteria are adequate to verify that the equipment used to meet the LCO can perform its required functions. The change allows pilot cells (representative cells) to accurately reflect the temperature of the battery as a whole. In addition, the ambient air temperature of the area where the battery rooms are located is monitored at least daily and actions are required to be taken if the ambient temperature reaches prescribed limits. Thus, sufficient controls exist to assure the ambient air temperature in the area of the battery rooms is maintained within acceptable limits. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

L.8 *(Category 6 – Relaxation Of Surveillance Requirement Acceptance Criteria)* CTS 4.8.2.3.2.b.1 states the battery cell parameters in Table 3.8-1 meet the Category B limits every 92 days and within 7 days after a battery discharge or overcharge condition. Category B parameters applies to each connected cell. The cell minimum voltage is stated as 2.13 volts with notation (c) listed. Notation (c) states "Corrected for average electrolyte temperature." ITS SR 3.8.6.2 states "Verify each battery pilot cell voltage is ≥ 2.07 V" and must be performed every 31 days. This changes the CTS surveillance requirement from each connected cell to the pilot cells. It also changes the voltage requirement from 2.13 to 2.07 V with no electrolyte temperature correction required. This change also eliminates the requirement to verify the Category B parameters within 7 days of a battery overcharge or discharge.

The purpose of ITS SR 3.8.6.2 is to ensure that the battery's cells are maintained above the minimum required cell voltage. The pilot cells are representative of all connected cells. This change is acceptable because the relaxed Surveillance Requirement acceptance criteria are adequate to verify that the equipment used to meet the LCO can perform its required functions. ITS SR 3.8.4.1 verifies the minimum battery terminal voltage is maintained. The terminal voltage represents the average cell's voltage times the number of cells. ITS SRs 3.8.6.2 and 3.8.4.1 provide assurance that the battery

the minimum established design temperature limit which is 50 °F. The specific temperature limit is decreased from 60 °F to 50 °F.

The purpose of ITS SR 3.8.6.4 minimum established design temperature limit is to ensure the battery can function as designed and required to mitigate the consequences of analyzed event. This change is acceptable because the relaxed Surveillance Requirement acceptance criteria are adequate to verify that the equipment used to meet the LCO can perform its required functions. The change from 60 °F to 50 °F is acceptable because the design temperature stated in the Unit 1's UFSAR for the cell's electrolyte temperature is 50 °F. For Unit 2 the proposed change is also aceptable because it is consistent with the design limits of the Unit 2 battery. The ITS requirement is consistent with the ISTS wording for this requirement. This change is designated as less restrictive because less stringent Surveillance Requirements are being applied in the ITS than were applied in the CTS.

More Restrictive Changes (M)

M.1 CTS LCO 3.8.2.3 Action a specifies with one of the required battery banks inoperable, restore the inoperable battery bank to OPERABLE status within 2 hours. ITS LCO 3.8.9 Condition C requires with one or more DC electrical power subsystems inoperable, *restore the DC electrical power subsystem to OPERABLE status within 2 hours.* ITS LCO 3.8.9 Condition C provides an additional limitation on the Completion Time. This specifies the two-hour requirement and 16 hours from discovery of failure to meet the LCO. This changes the CTS by requiring an additional limitation that is not currently required.

This purpose of the additional ITS Completion Time is to ensure the overall electrical distribution systems do not remain in a degraded state for more than 16 total hours. This change is acceptable because the additional requirement provides a reason limit for a degraded electrical distribution subsystem. The ITS requirements are consistent with the ISTS wording for this requirement. This change is designated as more restrictive because it adds additional surveillance requirement that the CTS does not require.

M.2 Unit 2 CTS LCO 3.8.2.3 Action b in part states with one of the required full capacity chargers inoperable, demonstrate the OPERABILITY of its associated battery bank by performing Surveillance Requirement 4.8.2.3.2.a.1 within one hour. The action allows with an inoperable charger in Unit 2, the spare charger to be substituted for an inoperable charger within 4 hours with no additional requirements specified. ITS LCO 3.8.4 Condition A states with one or two battery chargers on one train inoperable, restore battery terminal voltage to greater than or equal to the minimum established float voltage within 2 hours is specified by Required Action A.1. Required Action A.2 states a verification of float current of $\leq$ 2 amps is required once per 12 hours. Required Action A.3 specifies that the inoperable charger(s) must be restored to OPERABLE status within 72 hours. This changes the Unit 2 CTS by replacing the Action to substitute the spare charger within 4 hours with more specific restoration Actions for the battery and the battery charger.

The purpose of ITS 3.8.4 Required Actions A.1, A.2 and A.3 is to provide the appropriate actions to be taken when a charger becomes inoperable. This change is acceptable because the new ITS Actions require the restoration of the battery terminal voltage to $\geq$ the minimum established float voltage and the restoration of the battery charger to operable status. In addition, an inoperable charger may be replaced with an operable spare fully 1E qualified charger of equivalent or greater capacity at any time and the Action Condition for an inoperable charger would no longer be applicable and could be exited. The replacement of an inoperable charger with an operable

spare charger remains an option even if not specifically stated in the Actions. As such, the proposed change continues to provide adequate assurance the battery and charger are maintained operable. This change is designated as more restrictive because more specific restoration Actions are specified in the ITS than the CTS.

M.3 CTS surveillance requirement 4.8.2.3.2.a.1 requires once per 7 days that the battery bank be demonstrated OPERABLE by verifying all Category A parameters, listed in Table 3.8-1, are within specified limits for each pilot cell. The Category A parameters are electrolyte level, float voltage, and specific gravity. Two notes modify specific gravity requirements in CTS Table. Note (a) modifies the general requirement for specific gravity and states "Corrected for electrolyte temperature and level." Note (b) modifies the Category A and the allowable values of the Category B limits and states "Or battery charging current is less than (2) amps when on charge." The Category B limits apply to each connected cell. Corresponding ITS SR 3.8.6.1 requires that the float current for each battery is verified $\leq$ 2 amps every 7 days. A Note modifies the ITS SR. The Note states "Not required to be met when battery terminal voltage is less than the minimum established float voltage of SR 3.8.4.1" This changes the CTS by eliminating the option to use specific gravity measurements in the Technical Specifications and providing an exception for terminal voltage less than the minimum for the use of charging current.

The purpose of ITS SR 3.8.6.1 is to provide the method used to determine the state of charge of the battery provided the minimum battery voltage is met. The change to allow only charging current to be used is acceptable because charging current provides an adequate indication of the state of charge of the battery. Instrumentation with the appropriate accuracy and range for the expected current reading will be used to monitor the battery charging current. The use of instrumentation with the appropriate range and accuracy will assure a valid determination of the state of charge of the battery. In this way a relatively quick and accurate measure of the overall state of the battery is possible as opposed to the more lengthy and complex method of taking electrolyte from each required cell, measuring temperature and than correcting for both temperature and level. The addition of the Note to the SR is acceptable because if the minimum voltage is not met, and the charger is in service, the charging current will normally be greater than 2 amps in order to restore the voltage to the required minimum. Also, once the battery terminal voltage is less than the minimum established float voltage, Technical Specification Actions apply that provide the appropriate verification of the battery condition. In addition, if the battery voltage drops further (< 2.07VPC) the battery must be declared inoperable and only two hours are allowed to restore the battery to OPERABLE status. Therefore, the addition of the Note allowing an exception for when terminal voltage is below the minimum required is acceptable. This change is designated as overall more restrictive because it eliminates an SR option provided by the CTS (the use of specific gravity measurements) that is not included in the ITS.

M.4 CTS 4.8.2.3.2.b.1 states the parameters in Table 3.8-1 meet the Category B limits every 92 days and within 7 days after a battery discharge or overcharge condition. Category B parameters apply to each connected cell. ITS SR 3.8.6.3 states "Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits," every 31 days. This changes the CTS by requiring each connected cell electrolyte level be verified every 31 days instead of 92 days.

The purpose of ITS SR 3.8.6.3 is to periodically verify that each battery cell has sufficient electrolyte fluid to perform its required function. This change is acceptable because the limit specified for electrolyte level ensures that the plates suffer no physical damage and maintains adequate electron transfer capability. The frequency of the SR is consistent with the recommendations of the IEEE standard. The ITS requirements are consistent with the ISTS wording for this requirement. This change is designated as more restrictive because the surveillance requirement is more frequency in the ITS than in the CTS.

5.5 Programs and Manuals

5.5.16 Containment Leakage Rate Testing Program (continued)

e. The provisions of SR 3.0.3 are applicable to the Containment Leakage Rate Testing Program.

f. Nothing in these Technical Specifications shall be construed to modify the testing Frequencies required by 10 CFR 50, Appendix J.

22

5.5.~~17~~ Battery Monitoring and Maintenance Program

13

which includes

This Program provides for battery restoration and maintenance, ~~based on [the recommendations of IEEE Standard 450-1995, "IEEE Recommended Practice for Maintenance, Testing, and Replacement of Vented Lead-Acid Batteries for Stationary Applications," or of the battery manufacturer] including~~ the following:

36

a. Actions to restore battery cells with float voltage < [2.13] V, ~~and~~

b. Actions to equalize and test battery cells that had been discovered with electrolyte level below the ~~minimum established design limit.~~ top of the plates, and

c. Actions to verify the remaining cells are ≥ 2.07 V when a cell or cells have been found to be < 2.13 V.

The proposed change is based on approved TSTF-479 as modified by agreement with the NRC. The agreed change deviates from the approved TSTF-479 in that it restricts the test interval extension provided by SR 3.0.2 to inservice test intervals of 2 years or less. The change to TSTF-479 is based on the fact that the inservice test intervals > 2 years provide adequate time to schedule the required testing without the additional extension provided by SR 3.0.2.

35. This change revises the acceptance criteria for the containment Leakage Rate Testing Program (ITS 5.5.12.d.1). Currently the affected portion of the acceptance criteria (first sentence of part d.1) states the following: "Containment leakage rate acceptance criterion is 1.0 L_a." The BVPS CTS states this acceptance criteria as "≤ 1.0 L_a." In addition, this portion of NUREG-1431 was added by TSTF-52, Rev. 3. TSTF-52 introduced the "A & B Options" from 10 CFR 50 Appendix J into the Containment Leakage Rate Testing Program and was incorporated into Revision 2 of NUREG-1431. However, TSTF-52 also specifies the affected portion of the part d.1 acceptance criterion as "≤ 1.0 L_a." TSTF-52 introduced three options in the program, Option A, Option B, and Option A/B. Each of these options had a separate Acceptance criteria section (which contained part d.1 or c.1 in Option A). In TSTF-52, the affected sentence of Part d.1/c.1 for all options was stated as "Containment leakage rate acceptance criterion is ≤1.0 L_a." However, when TSTF-52 was incorporated into NUREG-1431 part d.1 of Option B was incorporated without the ≤ symbol. The other two options introduced by TSTF-52 were correctly incorporated into NUREG-1431 with the affected portion of the acceptance criteria being stated as: "Containment leakage rate acceptance criterion is ≤1.0 L_a." BVPS utilizes the Option B portion of the program which is missing the ≤ symbol. Therefore, this change is necessary to make the BVPS ITS consistent with the corresponding BVPS CTS requirement and with the original intent of TSTF-52.

36. ITS Section 5.5.13, Battery Monitoring Program, is revised to incorporate changes consistent with the proposed changes to TSTF-360. These proposed changes are planned to be incorporated into the ISTS (i.e., NUREG-1431) in the near future. As such, these changes to the BVPS ITS are necessary to maintain consistency with NUREG-1431.

REVISION 5

c. The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered. When a loss of safety function is caused by the inoperability of a single Technical Specification support system, the appropriate Conditions and Required Actions to enter are those of the support system.

INSERT 3

5.5.13 Battery Monitoring and Maintenance Program

This Program provides for battery restoration and maintenance, which includes the following:

a. Actions to restore battery cells with float voltage < 2.13 V,

b. Actions to equalize and test battery cells that had been discovered with electrolyte level below the top of the plates, and

c. Actions to verify the remaining cells are ≥ 2.07 V when a cell or cells have been found to be < 2.13 V.

INSERT 4

5.5.9 Diesel Fuel Oil Testing Program

A diesel fuel oil testing program to implement required testing of both new fuel oil and stored fuel oil shall be established. The program shall include sampling and testing requirements, and acceptance criteria, all in accordance with applicable ASTM Standards. The purpose of the program is to establish the following:

INSERT 5

5.6.5 Post Accident Monitoring Report

When a report is required by Condition B or F of LCO 3.3.3, "Post Accident Monitoring (PAM) Instrumentation," a report shall be submitted within the following 14 days. The report shall outline the preplanned alternate method of monitoring, the cause of the inoperability, and the plans and schedule for restoring the instrumentation channels of the Function to OPERABLE status.

BVPS UNITS 1 & 2
ITS CONVERSION LICENSE AMENDMENT REQUEST (LAR)
NOS. 296 (UNIT 1) & 169 (UNIT 2)

ATTACHMENT 4
(to L-06-162)

LETTERS FROM BATTERY MANUFACTURERS

C&D TECHNOLOGIES, INC.

Power Solutions

1400 Union Meeting Road
P.O. Box 3053
Blue Bell, PA 19422-0858
Telephone (215) 619-2700
Fax (215) 619-7840

November 17, 2006

Mr. Jeffrey Redmond
First Energy
Beaver Valley Nuclear Power Plant
Route 168
Shippingport, PA 15077

Subject: Float Current Used as an Indicator of Battery Charge State

Reference: Beaver Valley Nuclear Power Plant

Dear Mr. Redmond:

Confirming our telephone conversation of today, I wish to re-state C&D's concurrence that a float current value of ≤2.0 Amps is a both a reliable and an accurate parameter to use to ascertain a state of full charge for the 125-V dc Station Batteries installed at Beaver Valley Nuclear Power Plant. That is to say, a float current value of ≤2.0 Amps on these batteries is a reasonable indicator of a full state of charge. The accuracy and reliability of this reading will hold true over the expected life of these batteries (i.e. 20-years).

I trust this information addresses your concerns. Please contact me if you have any questions at telephone 215-619-2700 extension 365 or via e-mail at jhohenstein@cdtechno.com.

Very truly yours,

J. J. Hohenstein
Manager, Nuclear Applications Engineering

EnerSys
P.O. Box 14145
Reading, PA 19612-4145
800-538-3627 x 1680
Fax 610-208-1971
Email: jan.reber@enersys.com
www.enersys.com

Jan G. Reber
Director of Engineering
RP Flooded Products
Technology & Engineering

11/29/06

Jeff Redmond
Plant Engineering
Beaver Valley Power Station
Route 168
Shippingport, PA 15077

Mail Stop: BV-SOSB-6

Re: Stabilized Float Current for EnerSys GN Batteries

Dear Mr. Redmond,

EnerSys confirms that a stabilized float current is a necessary condition to determine if a battery has achieved a full state of charge. This value, however, is a variable of battery size and float voltage. It is also dependant on temperature and to a lesser degree on battery age and manufacturing process variation. Due to the asymptotic nature of the charge current to state of charge relationship, EnerSys states that there exists a float current value that can be selected for each battery type that, given no other extraneous conditions, can be used to justify that the monitored battery has achieved more than a particular state of charge. It would be ideal to develop this value for each individual battery specifically. However, given the limits of 2.25 VPC nominal string average cell voltage and an average 72-80°F battery temperature, a reasonable estimate of the capacity returned to the battery can be made based on a particular float current by battery type. This value is referenced to the full charge capacity that the battery is capable of at the time the measurement is taken. With the above stipulations as prerequisites, it can be reasonably assumed that when the float current is less than or equal to a 2 amp threshold the 125 VDC station batteries located at Beaver Valley NPS will have achieved a nominal returned capacity. The capacity values for the two types are as listed below. These values are expected to be valid for the service life of the batteries. Note: this evaluation requires that a positive float current is verified, i.e. that the battery has not been opened, resulting in zero float current.

Basic Battery Type	Percentage of Available Capacity Returned (Measured Float Current is < or = 2 amps)
2GN-13	95
2GN-21	98

If you have any questions regarding this letter, please contact me.

Sincerely,

Jan G. Reber
Cc: File 352, J. Gagge, S. Weik, B. Ross

BVPS UNITS 1 & 2
ITS CONVERSION LICENSE AMENDMENT REQUEST (LAR) NOS. 296 (UNIT 1) & 169 (UNIT 2)

ATTACHMENT 5
(to L-06-162)

Beaver Valley Power Station, Unit Nos. 1 and 2

Commitment Summary

Commitment List

The following identifies those actions committed to by FirstEnergy Nuclear Operating Company (FENOC) for Beaver Valley Power Station (BVPS) Unit Nos. 1 and 2 in this document. Any other actions discussed in the submittal represent intended or planned actions by FENOC. They are described only as information and are not regulatory commitments. Please notify Mr. Gregory A. Dunn, Manager – FENOC Fleet Licensing, at (330) 315-7243 of any questions regarding this document or associated regulatory commitments.

COMMITMENT	DUE DATE
Include in the Bases for ITS 3.8.4, DC Sources – Operating the requirement to maintain at least a 5% design margin for the EnerSys model 2GN-13 batteries (Unit 2 Batteries 2-3 and 2-4) and a least a 2% design margin for the EnerSys model 2GN-21 batteries (Unit 1 Batteries 1-1 and 1-2 and Unit 2 Batteries 2-1 and 2-2).	Upon Implementation of BVPS ITS Conversion License Amendment Request Nos. 296 (Unit 1) and 169 (Unit 2).