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10 CFR 50.90

2130-04-20079
March 31, 2004

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

Subject: Oyster Creek Generating Station
Facility Operating License No. DPR-16
Docket No. 50-219

Supplement to Oyster Creek License Amendment Request No. 306 – DC Electrical Power Sources Based on TSTF-360 (TAC MB8481).

References:
1. AmerGen Letter No. 2130-03-20058, dated April 21, 2003, License Amendment Request No. 306 – DC Electrical Power Sources Based on TSTF-360 (TAC No. MB8481).
2. Technical Specification Task Force (TSTF) Traveler-360, "DC Electrical Rewrite", Revision 1.
3. Letter from NRC to C. M. Crane (AmerGen) dated March 24, 2004.

This letter is being sent to supplement License Amendment Request (LAR) No. 306 to modify Technical Specification (TS) requirements for direct current (DC) sources through revision of Specifications 3.7 and 4.7, and addition of new Specification 6.8.5 (Reference 1). The Reference 1 LAR proposed TS requirements that are consistent, except for format, with the requirements of Specifications 3.8.4, 3.8.6 and 5.5.14 described in NUREG-1433, "Standard Technical Specifications, General Electric Plants, BWR/4", Revision 2, which are based on the NRC approved industry/Technical Specification Task Force (TSTF) change TSTF-360, Revision 1 (Reference 2). This supplemental letter provides information in response to NRC request for additional information as discussed in a conference call on March 11, 2004, and documented in a letter from NRC to C. M. Crane (Reference 3) regarding the above mentioned LAR. The additional information is provided in Enclosure 1.

In Reference 1, AmerGen Energy Company, LLC, requested an implementation period of 60 days, after NRC approval of the license amendment request. This supplemental letter requests the implementation date be changed to plant restart after the 1R20 refueling outage, currently scheduled to begin in November 2004.

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During a recent four-hour full load test of the C1 Battery Charger, the 480VAC Motor Control Center (MCC) supply breaker to the charger tripped after 37 minutes at full load (500 amps). Evaluation of the cause of the breaker tripping determined that the breaker is not adequately sized to support a four-hour full load test, as will be required by proposed Surveillance Requirement (SR) 4.7.C.4.b(i). Operating history has shown that the breaker can still perform its safety function, which is to recharge a fully discharged battery while supplying normal steady state loads (i.e., could still meet the optional battery capacity test in proposed SR 4.7.C.4.b(ii)). Based on the schedule for replacing the C1 and the C2 Battery Charger AC supply breakers, AmerGen is requesting that the implementation of the license amendment for LAR-306 be deferred until plant restart from the 1R20 refueling outage to assure both optional surveillances are viable for satisfying the battery charger capacity test.

As a result of deferred implementation for this amendment until after restart from the 1R20 outage, the exemption from SR 4.7.C.5.b for the C Battery, as requested in Reference 1, is no longer required. The C Battery is being replaced in 1R20, and after replacement the C Battery will be subject to the SRs as stated in 4.7.C.5 without exception. Proposed TS page 4.7-3 has been revised to remove the exemption from SR 4.7.C.5.b for C Battery.

Additionally, a correction to SR 4.7.C.4.b(i) proposed in Reference 1 is included. The proposed SR requires that the B Battery Charger supply greater than or equal to 480 amps during the B Battery Charger capacity test. The B Battery Charger is rated for 429 amps, not the indicated 480 amps. As a result of this correction, TS page 4.7-3 has been revised to state the correct rating for the B Battery Charger. This change corrects an oversight and has no impact on the technical analysis or the No Significant Hazards Consideration Determination submitted in the Reference 1 letter. Enclosure 2 contains the marked-up Insert page, which supersedes the same Insert page submitted with the Reference 1 LAR. Enclosure 3 contains the retyped proposed TS page 4.7-3, which supersedes the typed proposed TS page 4.7-3 submitted with the Reference 1 LAR.

There are no additional regulatory commitments contained in this letter.

We are notifying the State of New Jersey of this supplement to the application for changes to the Technical Specifications by transmitting a copy of this letter and its attachment to the designated State Official.

If any additional information is needed, please contact Dave Robillard at (610) 765-5952.

I declare under penalty of perjury that the foregoing is true and correct.

Sincerely,

03-31-04
Executed On

Michael P. Gallagher
Director, Licensing & Regulatory Affairs
AmerGen Energy Company, LLC

Enclosures: (1) Response to Request for Additional Information
(2) Oyster Creek Technical Specification Change Request No. 306, Mark-up of Proposed Technical Specification Page 4.7-3
(3) Oyster Creek Technical Specification Change Request No. 306, Camera-ready Technical Specification Page 4.7.3

cc: H. J. Miller, Administrator, USNRC Region 1
P. S. Tam, USNRC Senior Project Manager, Oyster Creek
R. J. Summers, USNRC Senior Resident Inspector, Oyster Creek
File No. 03042

ENCLOSURE 1

OYSTER CREEK

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
LICENSE AMENDMENT REQUEST No. 306
DC ELECTRICAL POWER SOURCES BASED ON TSTF-360

The application stated that station batteries B and C each has two associated full-capacity chargers. One charger on each battery is in service at all times with the second charger available in the event of a charger failure.

1. **NRC Question**

Please explain the administrative control, if any, under which the plant operator would know which one of the two battery chargers is the one that is in service at all times to maintain the DC subsystem operable. Please provide information regarding AC power supply sources to the battery chargers during normal plant operation and during loss of offsite power sources.

Response

Operators can easily determine which chargers are in service from indicating lights and meters in the Control Room (see FSAR Section 8.3.2.1.1, 6th paragraph, and FSAR Section 8.3.2.1.1, 4th paragraph, for discussion of applicable Control Room indications).

Safety-Related 125 VDC Distribution System B is powered from either the A/B Static Charger or from Battery Charger M-G Set B. Both the static charger and M-G Set are Class 1E and powered from Class 1E buses, which are backed-up by the associated emergency DG (Reference drawing BR 3000).

Safety-Related 125 VDC Distribution System C is powered from either the C1 Battery Charger or the C2 Battery Charger. Both chargers are Class 1E and powered from Class 1E buses, which are backed-up by the associated emergency DG (Reference drawing BR 3000).

2. **NRC Question**

When the charger described as "in service at all times" is declared "inoperable" and the "second charger" is switched in to substitute for the inoperable charger, what maintenance actions, if any, and within what time frame, will be initiated for the inoperable charger while the completion time specified by Specifications 3.7.D.1 and 3.7.D.2 is in effect? What were the causes and length of outage time for each of the battery chargers that had been declared inoperable in the past 3 years?

Response

Should the in service charger for a battery become inoperable, then the requirements of Specification 3.7.D.1 apply. The actions applicable to supporting the battery associated with the inoperable charger would be per Specification 3.7.D.1.a, 3.7.D.1.b, and 3.7.D.1.c. The battery voltage would have to be

returned to the minimum established float voltage (i.e. 130.2 Vdc) within 2 hours. (Note: the Bases discussion SR 4.7.C.1.a describes that this float voltage provides adequate voltage for overcoming the internal losses of a battery such that it maintains the battery in a fully charged state while supplying the continuous steady state loads of the associated DC subsystem.) The charging current would have to be verified to be ≤ 2 amps every 12 hours. Additionally, one of the chargers would have to be returned to "operable" within 7 days. Actual maintenance actions on one or more battery charger(s) during these 7days would depend on the nature of the inoperability. However, maintenance would be expected to be performed only on the charger that is not in service. If the "second charger" was operable while in standby, then when it was switched in, the Action could be exited (assuming float voltage and current are within limits). In this case, no specific time limit would be imposed on restoration of the inoperable charger since an operable charger would be connected. (See TS 3.7.A.4)

During the past 3 years, the following charger events have occurred:

Battery Charger Inoperable Event #1:

At 0738 on 2-18-2001, with the C2 Battery Charger out of service for surveillance testing, the in-service C1 Battery Charger lost output voltage. The C1 Charger was taken out of service and the C2 Battery Charger was put in service. However, because the surveillance had not been completed on the C2 Battery Charger, the C2 Battery Charger was declared inoperable. Although the C2 Battery Charger was inoperable, it was able to maintain normal float voltage while supplying the normal loads on the bus.

Because the C1 Battery Charger had failed and the C2 Battery Charger was inoperable, a 30-hour shutdown Action was entered. Based on an Engineering operability determination, the C2 Battery Charger was declared operable 8.45 hours into the Action and the Action exited (1615 on 2-18-2001).

The C1 Battery Charger was repaired and returned to service at 2213 on 2-18-2001. The cause of the failure was determined to be high resistance contacts on the Float/Equalize switch.

Battery Charger Inoperable Event #2:

At 1041 on 09-28-2003, the in-service C1 Battery Charger failed to maintain bus voltage. A 30-hour shutdown Action was entered. At about 1106, the C2 Battery Charger was placed in service. At 1109, 28 minutes into the 30 hour Action, the Action was exited.

The C1 Battery Charger was repaired and returned to service at 0900 on 10-03-2003. The cause of the event was determined to be high resistance contacts on the Float/Equalize switch.

Battery Charger Inoperable Event #3:

At 1108 on 10-31-2003, the in-service C1 Battery Charger failed to maintain bus voltage. A 30-hour shutdown Action was entered. The C2 Battery Charger was placed in service and the Action exited at 1123 on 10-31-2003, 15 minutes into the 30 hour Action.

The C1 Battery Charger was repaired and returned to service at 1718 on 11-04-2003. The cause of the event was determined to be high resistance within the connector to the "Sensing & Current Limit" circuit board.

There have been a number of times in the last three years that one of the four safety related battery chargers have been out-of-service due to scheduled surveillance testing or preventative maintenance. However, during each of these times, the other charger for the bus was in service while the work was being performed; therefore, no Actions were entered.

3. **NRC Question**

Please identify and justify compensatory measures that will be implemented during the proposed 7-day allowed outage time for one inoperable battery charger, and then two inoperable chargers for station batteries B and C. In your discussion, please explain the differences between a "functional" and an "inoperable" charger; these terms are currently included in your plant procedures.

Response

If the in-service charger for a bus is operable and the other charger for the bus is not operable, then no Actions are entered. The requirement to have an operable charger on the bus is satisfied.

The response to question 2 above describes the actions that are required should the in-service charger become inoperable. Compliance with the Actions (as described above) assumes that the other charger (whether considered operable or inoperable) can supply the necessary voltage to recharge and maintain the battery operable. If this "second" charger is considered operable, the Actions can be exited when charging current is $\leq$ 2 amps. In the event the "second" charger is considered inoperable, but continues to satisfy the functional requirements of the Actions, the time to restore at least one charger to operable status is 7 days.

An "inoperable" charger is one that does not meet one or more of its SRs.

The term "functional" charger is not used in Oyster Creek Generating Station (OCGS) procedures and is not defined. This term arose during verbal communications, while attempting to clarify that a charger could be declared "inoperable" (i.e., not meeting all applicable SRs), but might still be able to supply the minimum established float voltage required by Action 3.7.D.1, while supplying normal steady state loads. OCGS is not proposing to introduce the term "functional" in any formal fashion. The intent was to describe the 'functional' requirements necessary to meet the proposed Actions.

The existing design of the battery charger supply breaker (discussed in the cover letter) is a prime example of a condition that would result in the associated charger being declared inoperable (i.e., incapable of meeting the newly proposed SR 4.7.C.4.b). However, this charger would continue to be capable of supplying the minimum established float voltage, while also 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. If the proposed Specifications were approved, this charger would satisfy the condition of being "inoperable" but capable of functional support required by the Actions.

The application stated that each station battery has two associated full capacity chargers. For Modes 1, 2, and 3, one charger for each battery is in service and the other is kept as a "second charger."

4. **NRC Question**

Please define "full capacity charger," and state if each of the chargers was designed to be capable of handling transient loading demand requirements for all initiating events if the associated battery is out of service for any reason. This includes the adequacy of the battery charger to handle transient loading requirements caused by the re-alignment of the AC sources following a reactor trip including their design margins.

Response

A full capacity charger is one that is capable of recharging a fully discharged battery while maintaining the normal loads on the system, as described in FSAR Sections 8.3.2.1.1 and 8.3.2.1.2, and that would meet proposed SR 4.7.C.b(i) or (ii).

An Oyster Creek Generating Station calculation, using the methodology of IEEE 946-1992, IEEE Recommended Practice for the Design of DC Auxiliary Power Systems for Generating Station, determined the minimum battery charger sizes.

The ratings of the B Battery Chargers are required to be a minimum of 279 amps. The B M-G Set is rated at 429 amps and the A/B Static Charger is rated at 600 amps. Both are more than adequately designed.

The ratings of the C Battery Chargers are required to be a minimum of 153 amps. Both C Battery Chargers are rated at 500 amps. They are also more than adequately designed.

It is not a design parameter of the chargers to be able to handle "transient loading demand requirements for all initiating events if the associated battery is out of service for any reason." If a battery were out of service for any reason, plant operation would be limited by Action 3.7.D.3 to 2 hours restoration time followed by plant shutdown.

5. **NRC Question**

The application stated that the battery is estimated to be 98% charged when its stable charging current measurement is less than or equal to 2 amps for the station batteries. Assuming that the battery is 98% charged and the battery has reached 85% of its aging capacity some time after its previous discharge 24-month test cycle and before the next 24 month cycle test, please provide justification that the battery is still capable of handling transient loading demand requirements for all initiating events if both of the associated battery chargers are out of service for any reason during this time frame.

Response

The battery sizing calculation for both the B and the C Station Batteries includes an aging margin (this allows the battery to be acceptable down to 80% capacity). The calculation also includes a 20% load margin to handle any additional loads that might be added in the future (each would have to be evaluated for affect on the calculation and the calculation revised). An additional 3% design margin factor was used to conservatively account for the 98% charged criteria associated with 2-amp operability criterion (i.e., the issue described in the question). With these margins in place, B Battery was sized with another 1.18% margin, and C Battery with another 3.76% margin. Therefore, even at 80% capacity, B Battery has 24.18% margin built in and C Battery has 26.76% margin built in.

ENCLOSURE 2

Oyster Creek License Amendment Request No. 306
Corrected Marked-up Pages

TS PAGES

Insert Page

TECHNICAL SPECIFICATIONS SURVEILLANCE INSERTS

INSERT 4.7.C.1 *(page 4.7-3a)*

a. ... the minimum established float voltage.

b. Each station battery float current is ≤ 2 amps when battery terminal voltage is greater than or equal to the minimum established float voltage of 4.7.C.1.a.

INSERT 4.7.C.2.a *(page 4.7-3b)*

a. The electrolyte level in each station battery is greater than or equal to minimum established design limits.

INSERT 4.7.C.2.c *(page 4.7-3b)*

c. The electrolyte temperature of each station battery pilot cell is greater than or equal to minimum established design limits.

INSERT 4.7.C.4 *(page 4.7-3b)*

a. ... The modified performance discharge test may be substituted for the service test.

b. (i) Verify required station battery charger supplies ≥ 400 amps for the B MG Set charger, ≥ 600 amps for the A/B static charger, and ≥ 500 amps for the C charger, for ≥ 4 hours at greater than or equal to the minimum established float voltage, or
(ii) Verify each required battery charger can recharge the battery to the fully charged state while supplying the normal steady state DC loads during station operation, after a battery discharge to the bounding design basis event discharge state.

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INSERT 4.7.C.5.b & c *(page 4.7-3c)*

b. Performance discharge tests or modified performance discharge tests of station battery capacity shall be given at least once per 12 months ~~(*)~~ when:
DELETE
(i) The station battery shows degradation, or
(ii) The station battery has reached 85% of expected life with battery capacity < 100% of manufacturer's rating.

c. Performance discharge tests or modified performance discharge tests of station battery capacity shall be given at least once per 24 months when the battery has reached 85% of expected life with battery capacity ≥ 100% of manufacturer's rating.

DELETE →

~~(*) For the C station battery, applicability of the 12-month Surveillance commences upon startup from refueling outage 1R20.~~

ENCLOSURE 3

Oyster Creek License Amendment Request No. 306
Corrected Pages

TS PAGES

4.7-3

4. At least once per 24 months:

   a. The station battery capacity shall be demonstrated to be able to supply the design duty cycle loads during a battery service test. The modified performance discharge test may be substituted for the service test.

   b. (i) Verify required station battery charger supplies ≥ 429 amps for the B MG Set charger, ≥ 600 amps for the A/B static charger, and ≥ 500 amps for the C charger, for ≥ 4 hours at greater than or equal to the minimum established float voltage, or

      (ii) Verify each required battery charger can recharge the battery to the fully charged state while supplying the normal steady state DC loads during station operation, after a battery discharge to the bounding design basis event discharge state.

5. The following tests will be performed to verify battery capacity (perform during plant shutdowns for Station Batteries B and C):

   a. At least once per 60 months, battery capacity shall be demonstrated to be at least 80% of the manufacturers' rating when subjected to a performance discharge test or a modified performance discharge test.

   b. Performance discharge tests or modified performance discharge tests of station battery capacity shall be given at least once per 12 months when:

      (i) The station battery shows degradation, or

      (ii) The station battery has reached 85% of expected life with battery capacity < 100% of manufacturer's rating.

   c. Performance discharge tests or modified performance discharge tests of station battery capacity shall be given at least once per 24 months when the battery has reached 85% of expected life with battery capacity ≥ 100% of manufacturer's rating.