



Michael J. Annacone
Vice President
Brunswick Nuclear Plant
P.O. Box 10429
Southport, NC 28461
910-457-3698

April 15, 2013

Serial: BSEP 13-0045

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

Subject: Brunswick Steam Electric Plant, Unit No. 1
Docket No. 50-325
Request for Notice of Enforcement Discretion (NOED)
Technical Specification 3.7.3, "Control Room Emergency Ventilation (CREV) System,"
Technical Specification 3.8.1, "AC Sources – Operating,"
Technical Specification 3.8.4, "DC Sources – Operating," and
Technical Specification 3.8.7, "Distribution Systems – Operating"

Ladies and Gentlemen:

Carolina Power & Light Company (CP&L) is requesting a Notice of Enforcement Discretion (NOED) associated with Technical Specification (TS) 3.7.3, "Control Room Emergency Ventilation (CREV) System;" TS 3.8.1, "AC Sources – Operating;" TS 3.8.4, "DC Sources – Operating;" and TS 3.8.7, "Distribution Systems – Operating;" for the Brunswick Steam Electric Plant (BSEP), Unit No. 1. Enforcement discretion is requested to avoid an unnecessary Unit 1 shutdown without a commensurate benefit in nuclear safety.

Unit 2 is in a refueling outage and, on April 8, 2013, at 1740 hours, began planned maintenance activities on Division II emergency buses E4/E8. Due to the shared configuration of the electrical distribution system at BSEP, Unit 1 is also impacted.

In preparation for the Division II emergency buses E4/E8 outage, the following Limiting Condition of Operations (LCO) were entered for Unit 1.

TS 3.8.7, Condition C, was entered at 0715 hours on April 8, 2013, when DC control power supplies were re-aligned.

TS 3.7.3, Condition A, was entered at 1530 hours on April 8, 2013, when the 2A train of the Control Room Emergency Ventilation System was manually placed in the Radiation/Smoke protection mode.

TS 3.8.4, Condition A, was entered at 1645 hours on April 8, 2013, when the Division II battery chargers, 2B-1 and 2B-2, were de-energized to install temporary power for the E4/E8 bus outage.

Subsequently, to begin the Division II emergency buses E4/E8 work window, the following LCOs were entered for Unit 1.

A001
uik

TS 3.8.1, Condition B, and TS 3.8.7, Condition A, were entered at 1740 hours on April 8, 2013, when the Division II emergency buses E4/E8 were removed from service.

The following Completion Times apply to the above LCOs for Unit 1:

TS 3.8.7, Condition C, Required Action C.4, includes both a 7 day Completion Time, as well as a 176 hour Completion Time from discovery of failure to meet the LCO. If the DC electrical power distribution subsystem is not restored to operable status by 0715 hours on April 15, 2013, Unit 1 will enter Condition E of TS 3.8.7 (i.e., the 7 day Completion time). The Required Action of Condition E places Unit 1 in Mode 3 with a Completion Time of 12 hours (i.e., by 1915 hours on April 15, 2013).

TS 3.7.3, Condition A, Required Action A.1, has a Completion Time of 7 days. If the CREV subsystem is not restored to operable status by 1530 hours on April 15, 2013, Unit 1 will enter Condition C of TS 3.7.3. The Required Action of Condition C places Unit 1 in Mode 3 with a Completion Time of 12 hours (i.e., by 0330 hours on April 16, 2013).

TS 3.8.4, Condition A, Required Action A.1, has a Completion Time of 7 days. If the DC electrical power subsystem is not restored to operable status by 1645 hours on April 15, 2013, Unit 1 will enter Condition B of TS 3.8.4. The Required Action of Condition B places Unit 1 in Mode 3 with a Completion Time of 12 hours (i.e., by 0445 hours on April 16, 2013).

TS 3.8.1, Condition B, Required Action B.3, has a Completion Time of 7 days, as well as 10 days from discovery of failure to meet the LCO. If the two Unit 2 offsite circuits and associated Emergency Diesel Generator are not restored to operable by 1740 hours on April 15, 2013, Unit 1 will enter Condition H of TS 3.8.1 (i.e., the 7 day Completion Time). The Required Action of Condition H places Unit 1 in Mode 3 with a Completion Time of 12 hours (i.e., by 0540 hours on April 16, 2013).

TS 3.8.7, Condition A, Required Action A.1, includes both a 7 day Completion Time, as well as a 176 hour Completion Time from discovery of failure to meet the LCO. As a result, Unit 1 is limited by the 176 hour Completion Time, based on the entry into TS 3.8.7, Condition C on April 8, 2013, at 0715 hours. Thus, if the emergency bus outage is not completed and the affected load group buses are not restored to operable status by 1515 hours on April 15, 2013, Unit 1 will enter Condition E of TS 3.8.7. The Required Action of Condition E places Unit 1 in Mode 3 with a Completion Time of 12 hours (i.e., by 0315 hours on April 16, 2013).

DC control power was restored to the normal source and the subsystem was declared operable at 1316 hours on April 14, 2013, and TS 3.8.7, Condition C, was exited. Thus, the limiting condition of the remaining LCOs is TS 3.8.7, Condition A. If the emergency bus outage is not completed and the affected load group buses are not restored to operable status by 1515 hours on April 15, 2013, Unit 1 will enter Condition E of TS 3.8.7. The Required Action of Condition E places Unit 1 in Mode 3 with a Completion Time of 12 hours (i.e., by 0315 hours on April 16, 2013).

On April 11, 2013, at approximately 0430 hours, a degraded condition was identified on the E8 power transformer from E4. During preventive maintenance, the E8 transformer core was megger tested and a reading of 0.21 MΩ was obtained. The desired value is greater than or

equal to 100 MΩ. A visual inspection of the transformer core indicates that the transformer may have been overheated. The decision has been made to replace the transformer.

The necessary replacement parts are available onsite. However, replacement and testing to restore operability will result in exceeding the 7-day Completion Time of TS 3.7.3, Required Action A.1; TS 3.8.1, Required Action B.3; TS 3.8.4, Required Action A.1; and TS 3.8.7, Required Action A.1. The requested enforcement discretion extends the TS Completion Times by an additional 36 hours.

BSEP concludes that granting of discretionary enforcement in this case is in the best interest of nuclear safety. Conclusions of the risk-informed analysis are included in the enclosure as the safety basis for the request, which includes an evaluation of the safety significance and potential consequences of the proposed course of action.

This enforcement discretion request was reviewed and approved by the Brunswick Plant Nuclear Safety Committee (PNSC) on April 15, 2013.

This document contains no regulatory commitments.

Please refer any questions regarding this submittal to Mr. Lee Grzeck, Manager – Regulatory Affairs, at (910) 457-2487.

I declare, under penalty of perjury, that the foregoing is true and correct. Executed on April 15, 2013.

Sincerely,

A handwritten signature in black ink, appearing to read 'M. Annacone', with a long horizontal flourish extending to the right.

Michael J. Annacone

MAT/mat

Enclosure:

Request for Notice of Enforcement Discretion (NOED), Technical Specification 3.7.3, "Control Room Emergency Ventilation (CREV) System," Technical Specification 3.8.1, "AC Sources – Operating," Technical Specification 3.8.4, "DC Sources – Operating," and Technical Specification 3.8.7, "Distribution Systems – Operating"

cc (with enclosure):

U. S. Nuclear Regulatory Commission, Region II
ATTN: Mr. Victor M. McCree, Regional Administrator
245 Peachtree Center Ave, NE, Suite 1200
Atlanta, GA 30303-1257

U. S. Nuclear Regulatory Commission, Region II
ATTN: Mr. Richard P. Croteau, Director Division of Reactor Projects
245 Peachtree Center Ave, NE, Suite 1200
Atlanta, GA 30303-1257

U. S. Nuclear Regulatory Commission
ATTN: Mr. Jessie F. Quichocho, Chief (Mail Stop OWFN 8G9A)
Plant Licensing Branch II-2
11555 Rockville Pike
Rockville, MD 20852-2738

U. S. Nuclear Regulatory Commission
ATTN: Mr. Christopher Gratton (Mail Stop OWFN 8G9A)
11555 Rockville Pike
Rockville, MD 20852-2738

U. S. Nuclear Regulatory Commission
ATTN: Ms. Michelle P. Catts, NRC Senior Resident Inspector
8470 River Road
Southport, NC 28461-8869

Chair - North Carolina Utilities Commission
P.O. Box 29510
Raleigh, NC 27626-0510

Mr. W. Lee Cox, III, Section Chief **(Electronic Copy Only)**
Radiation Protection Section
North Carolina Department of Health and Human Services
1645 Mail Service Center
Raleigh, NC 27699-1645
lee.cox@dhhs.nc.gov

Request for Notice of Enforcement Discretion (NOED), Technical Specification 3.7.3, "Control Room Emergency Ventilation (CREV) System," Technical Specification 3.8.1, "AC Sources – Operating," Technical Specification 3.8.4, "DC Sources – Operating," and Technical Specification 3.8.7, "Distribution Systems – Operating,"

Background Information

Brunswick Steam Electric Plant (BSEP), Unit 2 is in a refueling outage (RFO) and, on April 8, 2013, at 1740 hours, began planned maintenance activities on Division II emergency buses E4/E8. Due to the shared configuration of the electrical distribution system at BSEP, Unit 1 is also impacted.

In preparation for the Division II emergency buses E4/E8 outage, DC control power supplies were re-aligned and, as a result, TS 3.8.7, Condition C, was entered at 0715 hours on April 8, 2013, for Unit 1. At 1740 hours on April 8, 2013, Unit 1 entered TS 3.8.7, Condition A, when the Division II emergency buses E4/E8 were removed from service. DC control power was restored to the normal source at 1316 hours on April 14, 2013, and TS 3.8.7, Condition C was exited. Unit 1 remains in TS 3.8.7, Condition A. Since TS 3.8.7, Condition A includes both a 7 day Completion Time, as well as a 176 hour Completion Time from discovery of failure to meet the LCO. As a result, Unit 1 is limited by the 176 hour Completion Time, based on the entry into TS 3.8.7, Condition C on April 8, 2013, at 0715 hours. Thus, if the emergency bus outage is not completed by 1515 hours on April 15, 2013, Unit 1 will enter Condition E of TS 3.8.7. The Required Action of Condition E places Unit 1 in Mode 3 with a Completion Time of 12 hours (i.e., by 0315 hours on April 16, 2013).

In preparation for the Division II emergency buses E4/E8 outage, the 2A train of the Control Room Emergency Ventilation System was manually placed in the Radiation/Smoke protection mode and, as a result, TS 3.7.3, Condition A was entered at 1530 hours on April 8, 2013. The Completion Time for TS 3.7.3, Required Action A.1 is 7 days. Therefore, if the emergency bus outage is not completed and the 2B train of the Control Room Emergency Ventilation System is not restored to operable status by 1530 hours on April 15, 2013, Unit 1 will enter Condition C of TS 3.7.3. The Required Action of Condition C places Unit 1 in Mode 3 with a Completion Time of 12 hours (i.e., by 0330 hours on April 16, 2013).

At 1645 hours on April 8, 2013, Unit 1 entered TS 3.8.4, Condition A, when the Division II battery chargers were de-energized to install temporary power. The Completion Time for TS 3.8.4, Required Action A is 7 days. If the emergency bus outage is not completed by 1645 hours on April 15, 2013, Unit 1 will enter Condition B of TS 3.8.4. The Required Action of Condition B places Unit 1 in Mode 3 with a Completion Time of 12 hours (i.e., by 0445 hours on April 16, 2013).

At 1740 hours on April 8, 2013, Unit 1 entered TS 3.8.1, Condition B, when the Division II emergency buses E4/E8 were removed from service. The Completion Time for TS 3.8.1, Required Action B.3 is 7 days. If the emergency bus outage is not completed by 1740 hours on April 15, 2013, Unit 1 will enter Condition H of TS 3.8.1. The Required Action of Condition H places Unit 1 in Mode 3 with a Completion Time of 12 hours (i.e., by 0540 hours on April 16, 2013).

On April 11, 2013, at approximately 0430 hours, a degraded condition was identified on the E8 power transformer from E4. During preventive maintenance, the E8 transformer core was megger tested and a reading of 0.21 MΩ was obtained. The desired value is greater than or

equal to 100 MΩ. A visual inspection of the transformer core indicates that the transformer may have been overheated. The decision has been made to replace the transformer.

The necessary replacement parts are available onsite. However, replacement and testing to restore operability will result in exceeding the 7-day Completion Times of TS 3.7.3, Required Action A.1; TS 3.8.1, Required Action B.3; TS 3.8.4, Required Action A.1; and TS 3.8.7, Required Action A.1.

The requested enforcement discretion extends the TS Completion Times by an additional 36 hours.

Need for Enforcement Discretion

Enforcement discretion is needed to avoid an unnecessary Unit 1 shutdown without a commensurate benefit in nuclear safety. NRC Inspection Manual Chapter 0410, "Notices of Enforcement Discretion," indicates that, whenever possible, licensees should request an emergency license amendment in accordance with 10 CFR 50.91 rather than enforcement discretion. The guidance also indicates that the NRC will consider enforcement discretion requests on a case-by-case basis.

On April 11, 2013, at approximately 0430 hours, a degraded condition was identified on the E8 power transformer from E4 and the decision has been made to replace the transformer. However, replacement and testing to restore operability will result in exceeding the 7-day Completion Times of TS 3.7.3, Required Action A.1; TS 3.8.1, Required Action B.3; TS 3.8.4, required Action A.1; and TS 3.8.7, Required Action A.1. The requested enforcement discretion extends the TS Completion Times by an additional 36 hours.

Basis for Enforcement Discretion

Carolina Power & Light Company (CP&L) performed a risk-informed evaluation demonstrating the risk associated with continued operation for an additional 36 hours is within the plants normal risk management controls. There is a very small increase in radiological risk to the public or adverse impact on the environment associated with a Completion Time extension of 36 hours. Normal work control risk management impact, expressed in terms of incremental core damage probability and large early release probability, are specified in industry and NRC guidance on configuration risk management. Conclusions of the risk-informed analysis are included below as the safety basis for the request, which includes an evaluation of the safety significance and potential consequences of the proposed course of action.

The following provides the information, described in NRC Inspection Manual Chapter (IMC) 0410, required to be included in requests for enforcement discretion.

1. Type of NOED being requested, which of the NOED criteria is satisfied, and how it satisfied those criteria. (IMC 0410, Attachment 1, 07a)

The requested enforcement discretion is not associated with a natural event. It is requested to avoid an unnecessary Unit 1 shutdown. The proposed enforcement discretion request meets the first NOED criteria in Section 03.03 of IMC 0410 by avoiding an unnecessary transient and, thus, minimizes potential safety consequences and operational risks as a result of compliance with TS 3.7.3, Required Action A.1; TS 3.8.1, Required Action B.3; TS 3.8.4, Required Action A.1; and TS 3.8.7, Required Action A.1.

2. TS or license condition that will be violated. (IMC 0410, Attachment 1, 07b)

The following TS Completions Times will be violated.

Unit 1 entered TS 3.7.3, Condition A, at 1530 hours on April 8, 2013. Unit 1 will enter Condition C of TS 3.7.3 at 1530 hours on April 15, 2013. The request for enforcement discretion extends the Completion Time for TS 3.7.3, Condition A, from 7 days (i.e., 168 hours) to 203 hours, 45 minutes. This will delay entry into Condition C of TS 3.7.3 to 0315 hours on April 17, 2013.

Unit 1 entered TS 3.8.4, Condition A, at 1645 hours on April 8, 2013. Unit 1 will enter Condition B of TS 3.8.4 at 1645 hours on April 15, 2013. The request for enforcement discretion extends the Completion Time for TS 3.8.4, Condition A, from 7 days (i.e., 168 hours) to 202 hours, 30 minutes. This will delay entry into Condition B of TS 3.8.4 to 0315 hours on April 17, 2013.

Unit 1 entered TS 3.8.1, Condition B, at 1740 hours on April 8, 2013. Unit 1 will enter Condition H of TS 3.8.1 at 1740 hours on April 15, 2013. The request for enforcement discretion extends the Completion Time for TS 3.8.1, Condition B, from 7 days (i.e., 168 hours) to 201 hours, 35 minutes. This will delay entry into Condition H of TS 3.8.1 to 0315 hours on April 17, 2013.

Unit 1 entered TS 3.8.7, Condition C, was entered at 0715 hours on April 8, 2013, for Unit 1. At 1740 hours on April 8, 2013, Unit 1 entered TS 3.8.7, Condition A, when the Division II emergency buses E4/E8 were removed from service. TS 3.8.7, Condition C was exited at 1316 hours on April 14, 2013, when DC control power was restored to the normal source. Unit 1 remains in TS 3.8.7, Condition A. TS 3.8.7, Condition A includes both a 7 day Completion Time, as well as a 176 hour Completion Time from discovery of failure to meet the LCO. As a result, Unit 1 is limited by the 176 hour Completion Time, based on the entry into TS 3.8.7, Condition C on April 8, 2013, at 0715 hours. Thus, Unit 1 will enter Condition E of TS 3.8.7 at 1515 hours on April 15, 2013. The request for enforcement discretion extends the Completion Time for TS 3.8.7, Condition A, from 7 days (i.e., 168 hours) to 204 hours. This will delay entry into Condition E of TS 3.8.7 to 0315 hours on April 17, 2013.

3. Description of the circumstances, including: likely causes; the need for prompt action; the action taken to avoid the need for a NOED; and any relevant historical events. (IMC 0410, Attachment 1, 07c)

On April 11, 2013, at approximately 0430 hours, a degraded condition was identified on the E8 transformer. During preventive maintenance, the E8 transformer core was megger tested and a reading of 0.21 MΩ was obtained. The desired value is greater than or equal to 100 MΩ. A visual inspection of the transformer core indicates that the transformer may have been overheated. The decision has been made to replace the transformer. This determination was completed after vendor recommended re-testing confirmed that the transformer was degraded versus a testing issue.

An event occurred on the Unit 1 Common C balance of plant (BOP) bus transformer in 2012. This condition is documented in Condition Report 519193 and Licensee Event Report 1-2012-001. The direct cause of the loss of the Common C BOP bus was failure of its 4160/480 V transformer. Investigation of the failed transformer identified that the X2 winding

(i.e., center phase, low voltage) was faulted on the innermost windings against the core. Heat damage and degradation were found throughout the windings and core of the transformer, including the non-faulted phases. The cause of the transformer failure was found to be an unintentional core ground due to aging/service which resulted in excess heating and insulation deterioration, leading to sparking between the low voltage winding and the core legs and clamping plates. The E8 transformer test revealed an unintentional core ground that is a potential precursor to the failure mode described above.

There are a total of 16 transformers (i.e., including E8) of similar design to the E8 transformer. As part of the corrective actions for the 2012 event, two transformers were scheduled for testing during the current Unit 2 refueling outage (i.e., 2F and E8). It was as a result of these inspections that the E8 transformer degradation was discovered. The 2F transformer also had a lower than expected core-to-ground reading of 0.09 MΩ.

Other actions resulting from the 2012 event include installation of infrared (IR) windows to allow condition monitoring of the transformers. Rescanning is performed on a semi-annual frequency. IR windows were installed on E5, E6, 1E, 1F, 2F, and Common C. BSEP plans to install IR windows on 2E, E7, E8, and Common D. Core ground testing was added to the transformer maintenance procedure. The E7 transformer will be tested during the current refueling outage and, if necessary, replaced. Planning is currently in progress to shut down Unit 1 in May 2013 for a mid-cycle maintenance outage. During that outage, the E5 and E6 transformers will be tested and, if necessary, replaced. The following table provides an overview of the corrective action status for the subject transformers.

Transformers within the Extent of Condition				
Transformer	Safety Related Yes/No	Ground Tested	IR Window	Status
Unit 1 Transformers				
Common C	No	No - Failed in Service	Yes	Replaced
1E	No	Yes - SAT	Yes	Acceptable (Replaced in 1983)
1F	No	No	Yes	No known issue
E5	Yes	Planned to be completed in May 2013	Yes	No known issue
E6	Yes	Planned to be completed in May 2013	Yes	No known issue
Unit 2 Transformers				
Common D	No	No	To be installed during the current RFO	No known issue
2E	No	No	To be installed during the current RFO	No known issue
2F	No	Yes Lower than expected core-to-ground reading, 0.09 MΩ	To be installed during the current RFO	Condition monitoring
E7	Yes	To be completed during current RFO	To be installed during the current RFO	No known issue
E8	Yes	Yes - UNSAT	To be installed during the current RFO	Being replaced

In addition, there are four transformers for plant lighting. These have minimal significance and will be addressed at a later time. There are two transformers that support the ocean discharge pumps at Caswell Beach. The Caswell Beach electrical system can be cross-tied, if necessary. Therefore, these transformers will also be addressed later.

At the time the degraded condition was identified, Unit 1 was approximately three days into the 7-day Completion Time. The bus outage includes a large scope of inspections, preventive maintenance, and improvement modifications. The inspection of the E8 transformer was scheduled in accordance with the perceived risk to the Completion Time (i.e., longer duration tasks were scheduled earlier in the bus outage). As a result of this unplanned finding, there is insufficient time to complete the emergent transformer replacement and complete testing required to restore bus E8 to operable status. Given this sequence of events, the need for this enforcement discretion could not have reasonably been anticipated or avoided. Prompt action is needed to avoid an unnecessary Unit 1 shutdown.

4. Cause of the situation that has led to the NOED request. (IMC 0410, Attachment 1, 07d)

As discussed in response to Item 3, an unexpected degraded condition was identified on the E8 transformer which requires transformer replacement. The likely cause of the transformer's condition is overheating. At the time the degraded condition was identified, Unit 1 was approximately 3 days into the 7-day Completion Time. Due to sequencing of work activities it was not feasible to inspect the transformer earlier in the 7-day Completion Time. Activities began with work on the 4160 V E4 bus, then on the 480 V E8 bus, and finally on the E8 transformer. As a result, there is insufficient time remaining in the 7-day Completion Time to complete the emergent transformer replacement and testing required to restore bus E8 to operable status. Given this sequence of events, the need for this enforcement discretion could not have reasonably been anticipated or avoided. The cause of the overheated E8 transformer is under investigation and will be resolved through the corrective action program (i.e., Condition Report 600805).

5. Course of action to resolve the situation until the situation no longer warrants a NOED. (IMC 0410, Attachment 1, 07e)

A detailed work plan was developed to return the Division II emergency bus E8 to operable status. This work is being performed around the clock and controlled through the outage control center which is also staffed around the clock. This will ensure that that appropriate focus is placed on scheduling, prioritization, contingencies, and relief turnover. Senior Corporate and Site Management personnel will continue to closely monitor the work activities to assure prompt completion.

6. Demonstrate that the resolution itself does not result in a different, unnecessary transient. (IMC 410, Attachment 1, 07f)

The planned resolution is to replace the degraded E8 transformer and re-energize bus E8. No lifting activities over safety-related equipment are required. These activities will not result in a different, unnecessary transient.

7. Demonstration that there was insufficient time to process an emergency TS or license amendment or that a license amendment is not needed. (IMC 0410, Attachment 1, 07g)

As discussed in response to Item 3, an unexpected degraded condition was identified on the E8 transformer which requires transformer replacement. This determination was completed after vendor-recommended re-testing confirmed that the transformer was degraded versus a testing issue. Discovery, evaluation, and review of the as-found condition of the transformer combined with the time necessary to prepare justification for the requested extension has resulted in the need to pursue enforcement discretion versus an emergency amendment.

8. Condition and operational status of the plant, including safety-related equipment out of service or otherwise inoperable, and nonsafety-related equipment that is degraded or out of service that may have risk significance and that may increase the probability of a plant transient or may complicate the recovery from a transient or may be used to mitigate the condition. (IMC 0410, Attachment 1, 07h)

Each unit's Class 1E AC Electrical Power Distribution System AC sources consist of the offsite power sources (i.e., preferred and alternate power sources), and the onsite standby power sources Emergency Diesel Generators (EDGs) 1, 2, 3, and 4. EDGs 1 and 2 primarily supply Unit 1 and EDGs 3 and 4 primarily supply Unit 2. The design of the AC electrical power system provides independence and redundancy to ensure an available source of power to the Engineered Safety Feature (ESF) systems. The Class 1E AC distribution system is divided into redundant load groups, so loss of any one group does not prevent the minimum safety functions from being performed. Each load group has access to two offsite power supplies (i.e., one preferred and one alternate) via a BOP circuit path. Each load group can also be connected to a single EDG. The availability of offsite power, coupled with the availability of the remaining operable EDGs, continues to provide adequate assurance of the capability to provide power to the ESF systems for Unit 1 under postulated accident conditions.

During the period of the proposed enforcement discretion, Unit 1 will be in Mode 1. EDG 1, EDG 2, and EDG 3 and offsite power sources are not affected by the Division II emergency bus E8 maintenance and are operable. EDG 4 is not operable with E8 inoperable. Emergency bus E4 has been restored to operable status. Emergency Core Cooling systems not affected by the buses are operable.

The following 480 V components are powered from E8:

- 1-E11-F015B/1-E11-F017B (RHR Inboard/Outboard Injection Valves)
- 1-E11-F028B (RHR Torus Spray Valve)
- 1-B32-F031B/1-B32-F032B (Reactor Recirculation Pump 1B Discharge/ Discharge Bypass Valves).

Low Pressure Coolant Injection (LPCI) is an operating mode of the RHR system. There are two LPCI subsystems (i.e., A Loop and B Loop), each consisting of two motor-driven pumps and required piping and valves to transfer water from the suppression pool to the reactor pressure vessel (RPV) via the corresponding recirculation loop. With a loss of power to E8, the normally closed RPV injection valve would not operate. Furthermore, the normally open Recirculation Discharge Valves would not automatically close on a loss of power to E8.

Shutdown Cooling (SDC) is a non-safety-related operating mode of the RHR System. There are two SDC subsystems (i.e., A Loop and B Loop), each consisting of two motor driven pumps,

a heat exchanger, and associated piping and valves. With a loss of power to E8, the normally closed RPV injection valve would not operate. Furthermore, the normally open Recirculation Discharge Valves could not be closed.

Suppression Pool Cooling (SPC) is an operating mode of the RHR system. Each RHR subsystem (i.e., A Loop / B Loop) contains two pumps and one heat exchanger and is manually initiated and independently controlled. The two subsystems perform the suppression pool cooling function by circulating water from the suppression pool through the RHR heat exchangers and returning it to the suppression pool. A loss of power to E8 would prevent return to the suppression pool via normally closed E11-F028B.

The 1-E11-F015B and 1-E11-F017B RHR inboard and outboard injection valves and 1-E11-F028B suppression pool spray isolation valve are Primary Containment Isolation Valves (PCIVs). With loss of power to E8, these PCIVs are inoperable. In accordance with Conditions A and B of TS 3.6.1.3, "Primary Containment Isolation Valves (PCIVs)," these penetrations have been isolated within 2 hours by isolating and de-energizing the 1-E11-F015B and 1-E11-F028B valves. As discussed in Section 10, temporary power is being provided to the 1-E11-F015B, 1-E11-F017B, 1-E11-F028B, 1-B32-F031B, and 1-B32-F032B valves.

9. Period for the NOED, including a justification for the duration of the noncompliance.
(IMC 0410, Attachment 1, 07i)

Unit 1 entered TS 3.7.3, Condition A, at 1530 hours on April 8, 2013. Unit 1 will enter Condition C of TS 3.7.3 at 1530 hours on April 15, 2013. The request for enforcement discretion extends the Completion Time for TS 3.7.3, Condition A, from 7 days (i.e., 168 hours) to 203 hours, 45 minutes. This will delay entry into Condition C of TS 3.7.3 to 0315 hours on April 17, 2013.

Unit 1 entered TS 3.8.4, Condition A, at 1645 hours on April 8, 2013. Unit 1 will enter Condition B of TS 3.8.4 at 1645 hours on April 15, 2013. The request for enforcement discretion extends the Completion Time for TS 3.8.4, Condition A, from 7 days (i.e., 168 hours) to 202 hours, 30 minutes. This will delay entry into Condition B of TS 3.8.4 to 0315 hours on April 17, 2013.

Unit 1 entered TS 3.8.1, Condition B, at 1740 hours on April 8, 2013. Unit 1 will enter Condition H of TS 3.8.1 at 1740 hours on April 15, 2013. The request for enforcement discretion extends the Completion Time for TS 3.8.1, Condition B, from 7 days (i.e., 168 hours) to 201 hours, 35 minutes. This will delay entry into Condition H of TS 3.8.1 to 0315 hours on April 17, 2013.

Unit 1 entered TS 3.8.7, Condition C, at 0715 hours on April 8, 2013, for Unit 1. At 1740 hours on April 8, 2013, Unit 1 entered TS 3.8.7, Condition A, when the Division II emergency buses E4/E8 were removed from service. TS 3.8.7, Condition C was exited at 1316 hours on April 14, 2013, when DC control power was restored to the normal source. Unit 1 remains in TS 3.8.7, Condition A. TS 3.8.7, Condition A includes both a 7 day Completion Time, as well as a 176 hour Completion Time from discovery of failure to meet the LCO. As a result, Unit 1 is limited by the 176 hour Completion Time, based on the entry into TS 3.8.7, Condition C on April 8, 2013, at 0715 hours. Thus, Unit 1 will enter Condition E of TS 3.8.7 at 1515 hours on April 15, 2013. The request for enforcement discretion extends the Completion Time for TS 3.8.7, Condition A, from 7 days (i.e., 168 hours) to 204 hours. This will delay entry into Condition E of TS 3.8.7 to 0315 hours on April 17, 2013.

As demonstrated in Item 13, the requested enforcement discretion will not result in more than a minimal increase in risk. In addition to the risk insights, sufficient onsite emergency AC power and offsite power supplies remain operable to complete their intended safety function. Appropriate plant redundant and support systems (i.e., including non-TS equipment) will be considered as protected systems to ensure there is no undue risk of redundant or support equipment inoperability during the proposed enforcement discretion time frame.

There is no significant difference in nuclear safety risk by extending the Completion Time to accomplish required repairs and testing. The change in risk is consistent with the normal work control practices. Additionally, there is an inherent safety benefit of restoring bus E8 without shutting Unit 1 down when compared to shutting Unit 1 down without the bus available. Therefore, requiring this repair to be performed with Unit 1 shut down would result in additional plant equipment and personnel challenges without any significant benefit to the safety of the plant or the health and safety of the public.

A detailed work plan was developed and this work is being performed around the clock in order to restore the Division II emergency bus E8 to operable status as soon as possible.

10. Compensatory measures the plant has both taken and will take to reduce the risk associated with the specified configuration. (IMC 0410, Attachment 1, 07j)

The following compensatory measures will be implemented during the period of enforcement discretion.

- No other Unit 1 discretionary maintenance activity is in progress. This is an assumption of the PSA Analysis.
- Unit 1 Nuclear Service Water Pumps 1A and 1B will be running. This is an assumption of the PSA Analysis.
- Temporary Power will be provided to the following valves. This temporary power is being supplied from the Southport feeder, and as such, is not sensitive to switchyard or plant-centered events. Cables associated with the temporary power are routed away from ignition sources such that the risk associated with failure of the cables due to fire is minimized. This is an assumption of the PSA Analysis.
 - 1-E11-F015B, LPCI B Inboard Injection Valve
 - 1-E11-F017B, LPCI B Outboard Injection Valve
 - 1-E11-F028B, Suppression Pool Spray B Isolation Valve
- Temporary Power will be provided to the following valves. This temporary power is being supplied from the Southport feeder, and as such, is not sensitive to switchyard or plant-centered events. This is not an assumption of the PSA Analysis.
 - 1-B32-F031B Reactor Recirculation Pump 1B Discharge Valve
 - 1-B32-F032B Reactor Recirculation Pump 1B Discharge Bypass Valve
- The following equipment will be protected.
 - Offsite Sources
 - EDGs 1, 2, and 3
 - High Pressure Coolant Injection
 - Reactor Core Isolation Cooling
 - 1A RHR and RHR Service Water
 - 1A and 1B Core Spray
 - 1A and 1B Nuclear Service Water Pumps
 - The temporary power cables to the 1-E11-F015B, 1-E11-F017B, 1-E11-F028B, 1-B32-F031B, and 1-B32-F032B valves

- 1-E11-F015B, 1-E11-F017B, 1-E11-F028B, 1-B32-F031B, and 1-B32-F032B valves
 - SAMA 1 diesel generator
 - A dedicated operator will be stationed on the 20 foot elevation of the Unit 1 Reactor Building to re-energize 1-E11-F015B and 1-E11-F028B, if needed for accident conditions.
 - Minimize transmission activity that could impact offsite power and notify the Energy Control Center of the plant's condition. Communicate the need for timely notification of any grid issues.
 - A fire watch will be maintained in the cable spread room during the period of enforcement discretion.
11. Status and potential challenges to offsite and onsite power sources, including any current or planned maintenance in the distribution system and any current or planned maintenance to the emergency diesel generators. (IMC 0410, Attachment 1, 07k)

EDG 1, EDG 2, and EDG 3 and offsite power sources are not affected by the Division II emergency bus E8 maintenance and are operable. EDG 4 is not operable with E8 inoperable. There are no foreseen challenges to the offsite and onsite power sources. Measures will be implemented to prevent any maintenance activities on systems in the plant that could impact the AC power system. The load dispatcher confirmed that there are no operations on the grid that would present a challenge to the offsite power system to the BSEP site. Compensatory measures have been implemented to prevent any work activities in the plant that could challenge the availability and reliability of redundant systems.

12. Safety basis for the request and an evaluation of the safety significance and potential consequences of the proposed course of action. (IMC 0410, Attachment 1, 07l)

The planned resolution is to replace the E8 transformer and re-energize bus E8. This will be accomplished via existing plant procedures, which have been successfully implemented in the past. This action will not result in a different, unnecessary transient.

As demonstrated in Item 13, the requested enforcement discretion will not result in more than a minimal increase in risk. There are no foreseen challenges to the offsite and onsite power sources. Measures have been implemented to prevent any maintenance activities on systems in the plant that could impact the AC power system. Compensatory measures have been implemented to prevent any work activities in the plant that could challenge the availability and reliability of redundant systems. There is no significant difference in nuclear safety risk by extending the Completion Time to accomplish required repairs and testing. Additionally, there is an inherent safety benefit of restoring bus E8 without shutting Unit 1 down when compared to shutting Unit 1 down without the buses available.

In addition to the risk insights, sufficient onsite emergency AC power and offsite power supplies remain operable to complete their intended safety function. Appropriate plant redundant and support systems (i.e., including non-TS equipment) will be considered as protected systems to ensure there is no undue risk of redundant or support equipment inoperability during the proposed enforcement discretion time frame.

Based on the above, granting the proposed enforcement discretion will not adversely impact plant nuclear safety.

13. Demonstration that the NOED condition, along with any compensatory measures, will not result in more than a minimal increase in radiological risk, either in a quantitative assessment that risk will be within the normal work control levels (ICCDP less than or equal to $5E-7$ and/or ICLERP less than or equal to $5E-8$) or defensible qualitative evaluation. (IMC 0410, Attachment 1, 07m)

The following evaluation demonstrates that the proposed duration of the enforcement discretion will not result in more than a minimal increase in radiological risk, either in a quantitative assessment that risk will be within the normal work control levels (i.e., Incremental Conditional Core Damage Probability (ICCDP) less than or equal to $5E-7$ and/or Incremental Conditional Large Early Release Probability (ICLERP) less than or equal to $5E-8$).

Assumptions

- No other Unit 1 discretionary maintenance activity is in progress.
- Bus E8 will only be out-of-service for any given reactor year for the allowed outage time (AOT) plus the extension period.
- Temporary power to the RHR valves 1-E11-F015B, 1-E11-F028B, and 1-E11-F017B will be provided. This temporary power is being supplied from the Southport feeder, and as such, is not sensitive to switchyard or plant-centered events. Cables associated with the temporary power are routed away from ignition sources such that the risk associated with failure of the cables due to fire is minimized.
- Unit 1 Nuclear Service Water Pumps 1A and 1B are running for the duration of the exposure period.

Determination of Risk

Risk is addressed in a mixed approach, both qualitatively and quantitatively.

To determine the ICCDP and the ICLERP for a particular hazard, the following equation(s) were used:

$$\Delta CDP_{(Hazard)} = \text{Conditional CDF}_{(Hazard)} - \text{Base CDF}$$

$$\Delta LERF_{(Hazard)} = \text{Conditional LERF}_{(Hazard)} - \text{Base LERF}$$

$$ICCDP_{(Hazard)} = \Delta CDP_{(Hazard)} * \text{Exposure Time (in hours)} / 8760 \text{ hours per year}$$

$$ICLERP_{(Hazard)} = \Delta LERF_{(Hazard)} * \text{Exposure Time (in hours)} / 8760 \text{ hours per year}$$

Where:

- Base Core Damage Frequency (CDF) and Large Early Release Frequency (LERF) are the CDF and LERF calculated in the BSEP PRA model of record (MOR) with all maintenance ("TM") events set to zero. Regulatory Issue Summary (RIS) 2005-01 requires zero maintenance models for NOEDs.
- Conditional CDF (LERF) is the CDF (LERF) resulting from quantification with the E8 'failed' (Basic Event ACP0BAC-LP-2E8 set to 1.0) and other TMs set to zero in the model.
- Exposure Time is the time beyond the AOT which the 2-E8 is assumed to be unavailable.

Table 1 in the Conclusion Section of this discussion summarizes the Δ CDF and Δ LERF results.

Internal Events

The BSEP Quantification calculation was used to assess the internal events risk impact, including internal flooding. By failing the E8 bus, power to the Unit 1 B RHR injection and suppression pool cooling lines are rendered remotely inoperable. The use of temporary power allows the operators to quickly and remotely open and shut the outboard RHR B low pressure coolant injection (LPCI) (i.e., 1-E11-F017B) and Suppression Pool Spray B isolation valves without recourse to manual operator action. A dedicated operator will be stationed on the 20 foot elevation of the Unit 1 Reactor Building to re-energize the inboard RHR B LPCI valve (i.e., 1-E11-F015B) and the Suppression Pool spray isolation valve (i.e., 1-E11-F028B), which have been closed to comply with TS 3.6.1.3, Conditions A and B, if needed for accident conditions. This will allow for the valve to be opened automatically or by the control room Reactor Operator. The internal events risk includes impacts from the combination of temporary power failure and operator error.

By adding temporary power, the increased importance of electrical failures in the Probabilistic Safety Analysis (PSA) model from failing E8 are drastically reduced. Failure of Low Pressure Injection (LPI) and High Pressure Injection (HPI) cooling will then require the failure of both the internal bus E8 and the loss of temporary power to RHR valves 1-E11-F015B, 1-E11-F017B, and 1-E11-F028B. The 1-E11-F015B and 1-E11-F028B valves will be capable of performing their function from the normal control stations, i.e. from the control room. Internal events was further reduced by noting good weather during the exposure time. This was qualitatively considered to halve the site weather-centered loss of offsite power (LOSP). With the dedicated operator stationed on the 20 foot elevation of the Unit 1 Reactor Building, the 1-E11-F015B inboard LPCI injection valve, and the 1-E11-F028B Suppression Pool spray isolation valve, will be capable of being re-energized and opened by either an automatic signal or by the control room Reactor Operator. The risk impact from the combination of temporary power failure, operator error, and reduction of weather-centered site LOSP is reflected below.

$$\begin{array}{ll} \text{Conditional CDF}_{(\text{Internal Events})} = 4.69\text{E-}05/\text{yr} & \text{Base CDF}_{(\text{Internal Events})} = 7.18\text{E-}06/\text{yr} \\ \text{Conditional LERF}_{(\text{Internal Events})} = 5.99\text{E-}07/\text{yr} & \text{Base LERF}_{(\text{Internal Events})} = 5.54\text{E-}07/\text{yr} \end{array}$$

From these, for internal events:

$$\begin{array}{ll} \Delta\text{CDF}_{(\text{Internal Events})} & = 3.97\text{E-}05 / \text{yr} \\ \Delta\text{LERF}_{(\text{Internal Events})} & = 4.50\text{E-}08 / \text{yr} \end{array}$$

External Events

Further evaluation was performed to consider external events. Of those external hazards, fire events were found to be the most pertinent to evaluating the risk increase of having the E8 bus unavailable.

The evaluation of the potential risk increase from these external events is as follows:

Fire Events

The potential increase in risk from internal plant fires with the E8 bus out of service was evaluated using the BSEP Fire PRA model that was developed in support of the National Fire Protection Association (NFPA) 805 program.

Scenarios for the main control board in the control room were not quantified, as these were analyzed through separate methods in the baseline Fire PRA.

The initial quantifications of fire were dominated by failures of injection and suppression pool cooling due to the RHR valves not performing their function. Options for temporary power were found to be available for the three valves and were given credit in the PRA, reducing the impact.

$$\text{Conditional CDF}_{(\text{Fire})} = 7.07\text{E-}05 \text{ /yr} \quad \text{Base CDF}_{(\text{Fire})} = 1.31\text{E-}05\text{/yr}$$

$$\text{Conditional LERF}_{(\text{Fire})} = 5.08\text{E-}06 \text{ /yr} \quad \text{Base LERF}_{(\text{Fire})} = 3.96\text{E-}06\text{/yr}$$

From these, for fire:

$$\Delta\text{CDF}_{(\text{Fire})} = 5.76\text{E-}05 \text{ /yr}$$

$$\Delta\text{LERF}_{(\text{Fire})} = 1.12\text{E-}06 \text{ /yr}$$

Seismic

Contributions to the ΔCDF from seismic events were considered. The risk is not increased during the extended Completion Time period because the complimentary electrical buses in service have the same fragilities as E8. In a base case seismic scenario, all of the emergency electrical equipment would be failed at the same level of severity. Therefore, there is no additional failure to be added to the faulted case to cause a delta risk. The delta risk associated with seismic activity is negligible.

External Flooding

The potential increase in risk from external flooding while E8 is unavailable is considered negligible due to the plant's design and surrounding topography. For BSEP, the evaluated causes of external flooding are hurricanes. The exposure period is outside of the normal hurricane season for the mid-Atlantic. Additionally, the weather is monitored frequently given the emergency bus outage. If there were a threat of inclement weather, the E8 would be evaluated by the BSEP program for compliance with 10 CFR 50.65(a)(4).

High Winds

The potential increase in risk from High Winds during the exposure period is considered negligible due to the plant's design and the weather during the exposure period. The exposure period is outside of normal hurricane season for the mid-Atlantic. Additionally, the weather is monitored frequently given the emergency bus outage. If there were a threat of inclement weather, the E8 would be evaluated by the BSEP program for compliance with 10 CFR 50.65(a)(4). Further, the initiators in the internal event model for weather centered loss of offsite power (%TE_S_WC) encompass the effect of power loss due to weather-related issues.

Transportation/Nearby Facility Accidents

The potential increase in risk from transportation accidents or nearby facility accidents due to having the E8 unavailable, was qualitatively considered and determined to be negligible.

Risk Insights

For the internal events, the primary sequences of the faulted case are dominated by internal flood scenarios in the Reactor Building. These lead to loss of Emergency Core Cooling Systems (ECCS). Other scenarios include turbine trips or loss of condenser vacuum with failures of feeder breakers from UAT #1 to 1C and 1D or the Unit Auxiliary Transformer (UAT), and turbine trips with failures that involve operators not providing suppression pool cooling or vessel depressurization. The important sequences contributing to increased ICCDP and ICLERP results for the exposure duration include Loss of Turbine Building Component Cooling Water (TBCCW) with failures that include operators not providing suppression pool cooling and not depressurizing the reactor vessel when required.

The overall fire sequences of the faulted case are dominated by fires in the cable spreading room which fail feeder breakers from UAT #1 to 1C and 1D or the UAT. These failures are included in the fire-induced loss of offsite power accident sequences. The important sequences contributing to increased ICCDP and ICLERP include failures that involve operators not providing suppression pool cooling, and equipment (i.e., Motor Operated Valve) failures related to suppression pool cooling.

Conservatisms

A number of conservatisms are present in this risk evaluation. The identified conservatisms are:

- The BSEP Fire PRA model does not quantify the effects of compensatory fire watches. The fire watches would provide prompt detection and suppression beyond that of the installed detection and suppression systems. Fire watches used in this way is considered defense in depth and would reduce the final Fire CDF and LERF.
- No credit is taken for the increased readiness of equipment due to the enacted compensatory actions.
- No credit is taken for the increased readiness of operators due to the enacted compensatory actions (i.e., pre-job briefs, walk-downs, and reviews of procedures).
- No credit is taken for the restrictions placed on switchyard activities.

Conclusions

To maintain an overall risk increase from the extended Completion Time below the acceptable thresholds of 5E-07 for ICCDP and 5E-08 for ICLERP, the threshold values are divided by the total risk results to determine the maximum allowed outage time.

Table 1 - Results

Parameter	Internal Events	Fire	Seismic	Ext. Flood	High Winds	Total /yr
Δ CDF	3.97E-05	5.76E-05	~0	~0	~0	9.7E-05

Table 1 - Results

Parameter	Internal Events	Fire	Seismic	Ext. Flood	High Winds	Total /yr
Δ LERF	4.50E-08	1.12E-06	~0	~0	~0	1.2E-06

The following ICCDP and ICLERP are calculated by dividing the Δ CDF and Δ LERF by 8760 hours in a year and multiplying by the time step. These can be compared against the NOED Thresholds.

Table 2: ICCDP and ICLERP at reference exposure intervals

Parameter	12 Hour CT Extension	24 Hour CT Extension	36 Hour CT Extension	48 Hour CT Extension	NOED Threshold
ICCDP	1.3E-07	2.7E-07	4.0E-07	5.3E-07	5.00E-07
ICLERP	1.6E-09	3.3E-09	4.9E-09	6.6E-09	5.00E-08

14. Forecasted weather and pandemic conditions for the NOED period and any plant vulnerabilities related to weather or pandemic conditions. (IMC 0410, Attachment 1, 07n)

There is no severe weather in the current 7-day forecast for Southport, NC. The National Weather Service forecast for the area is:

- Monday (April 15), mostly cloudy, with a low around 60. East wind 10 to 14 mph.
- Monday night (April 15), mostly cloudy, with a low around 62. Northeast wind 13 to 15 mph.
- Tuesday (April 16), mostly cloudy, with a high near 71. Northeast wind around 11 mph.
- Tuesday night (April 16), mostly cloudy, with a low around 64. East wind 6 to 8 mph.
- Wednesday (April 17), mostly sunny, with a high near 71. Northeast wind 5 to 7 mph.
- Wednesday night (April 17), partly cloudy, with a low around 64.
- Thursday (April 18), partly sunny, with a high near 72.

There is no threat of pandemic conditions during the proposed duration of the enforcement discretion.

15. Basis for the conclusion that the noncompliance will not create undue risk to public health and safety. (IMC 0410, Attachment 1, 07o)

The planned resolution is to replace the E8 transformer and re-energize bus E8. This will be accomplished via existing plant procedures, which have been successfully implemented in the past. No lifting activities over safety-related equipment are required. This action will not result in a different, unnecessary transient.

As demonstrated in Item 13, the requested enforcement discretion will not result in more than a minimal increase in risk. There are no foreseen challenges to the offsite and onsite power sources. Measures will be implemented to prevent any maintenance activities on systems in the plant that could impact the AC power system. Compensatory measures will be implemented to prevent any work activities in the plant that could challenge the availability and reliability of redundant systems. There is no significant difference in nuclear safety risk by extending the Completion Time to accomplish required repairs and testing. Additionally, there is an inherent

safety benefit of restoring bus E8 without shutting Unit 1 down when compared to shutting Unit 1 down without the bus available.

In addition to the risk insights, sufficient onsite emergency AC power and offsite power supplies remain operable to complete their intended safety function. Appropriate plant redundant and support systems (i.e., including non-TS equipment) will be considered as protected systems to ensure there is no undue risk of redundant or support equipment inoperability during the proposed enforcement discretion time frame.

Based on the above, the extended Completion Time will not create undue risk to public health and safety.

16. Basis for the conclusion that the noncompliance will not involve adverse consequences to the environment. (IMC 0410, Attachment 1, 07p)

This request for enforcement discretion does not result in any significant changes in the types, or significant increase in the amounts, of any effluents that may be released offsite. In addition, no significant increase in individual or cumulative occupational radiation exposures is involved as a result of the request. Therefore, it can be concluded that the NRC's granting of this request for enforcement discretion does not involve any adverse consequences to the environment.

17. Approval by the facility organization that normally reviews safety issues. (IMC 0410, Attachment 1, 07q)

The requested NOED was reviewed by the Brunswick Plant Nuclear Safety Committee and approved by the Plant General Manager at 0736 hours on April 15, 2013.

18. Commitment to a written NOED request within two working days and a follow-up license amendment request following the staff's verbal granting of the NOED. (IMC 0410, Attachment 1, 07r)

This letter fulfills the requirement to submit a written NOED request within two working days.

Based on the short duration of the requested non-compliance, a follow-up license amendment request is not warranted. At present, there are no plans to extend the current 7-day Completion time for TS 3.7.3, Required Action A.1; TS 3.8.1, Required Action B.3; TS 3.8.4, Required Action A.1; and TS 3.8.7, Required Action A.1; on a permanent basis. IMC 0410 states that a follow-up amendment is not required if the NRC agrees before granting the NOED.