

## BellBendCOLPEm Resource

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**From:** Bhatia, Bhupendra  
**Sent:** Tuesday, March 16, 2010 12:37 PM  
**To:** BellBendCOL Resource  
**Cc:** Johnson, Robert; Kang, Peter  
**Subject:** FW: NUMARK Documents for the NRC Hearing Files for TO #49, Bell Bend, Chapter #8-NON PUBLIC  
**Attachments:** BBNPP\_ 8.4\_ Final R1 w no Open Items[1]12-17-09.doc

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**From:** Hearing File [mailto:HearingFile@numarkassoc.com]  
**Sent:** Monday, March 15, 2010 10:18 AM  
**To:** Bhatia, Bhupendra  
**Subject:** NUMARK Documents for the NRC Hearing Files for TO #49, Bell Bend, Chapter #8

The attached information is being provided to you from Numark Associates, Inc pursuant to 10 CFR 2.1203(b) for inclusion in the NRC Hearing File.

Please contact Ms Karen Hall if you have any questions.

Shaareem Wall, Administrative Assistant  
Numark Associates, Inc.  
1220 19th St. NW, Suite 500  
Washington, DC 20036  
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**From:** George Morris  
**Sent:** Friday, January 15, 2010 2:37 PM  
**To:** Marty Bowling; Hearing File  
**Cc:** gwm2@msn.com; Stan Kobylarz  
**Subject:** RE: TO 4149, BBNPP, TER for Section 8.4

Marty,

Bell Bend Section 8.4 attached.

George

George W. Morris, Senior Executive Consultant  
Numark Associates, Inc.  
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**From:** Martin Bowling [mbowling@numarkassoc.com]  
**Sent:** Wednesday, January 13, 2010 3:36 PM  
**To:** George Morris  
**Subject:** Re: TO 4149, BBNPP, TERs for Chapter 8

George - I want to send the completed Chapter 8 with recently received RAI responses evaluated as soon as possible. The TM had requested by 1/15.

I have only received a final 8.1 from you. Your email below indicates that 8.4 is also complete. Can you send me your final 8.4?

Thanks,  
Marty

----- Original Message -----

**From:** [George Morris](#)  
**To:** [Marty Bowling](#)  
**Cc:** [Stan Kobylarz](#)  
**Sent:** Wednesday, January 13, 2010 4:47 PM  
**Subject:** RE: TO 4149, BBNPP, TERs for Chapter 8

Marty,

Sections 8.1 and 8.4 are complete. Sections 8.2 and 8.3 remain. I just talked to Stan Kobylarz about Bell Bend. He has looked at the responses we received from the Applicant for 8.2 and 8.3 and indicated that there is sufficient information to complete Sections 8.2 and 8.3 TERs by the end of the month. This will complete all Chapter 8 TERs for this round. The revisions to the Applicant's design for the relocation of the Bell Bend plant and the redesign of the switchyard will be forthcoming over the next year. Do you want to send the NRC the completed Chapter 8 at the end of the month or wait until the application is updated for the relocated site?

George

George W. Morris, Senior Executive Consultant  
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**From:** Marty Bowling  
**Sent:** Tuesday, January 12, 2010 5:12 PM  
**To:** George Morris  
**Subject:** Re: TO 4149, BBNPP, Revision 4 to TER Section 8.1

George - what TERs do you still now have to do in order to complete Chapter 8?

Marty

----- Original Message -----

**From:** [George Morris](#)  
**To:** [Marty Bowling](#) ; [Hearing File](#)  
**Cc:** [Stan Kobylarz](#) ; [gwm2@msn.com](mailto:gwm2@msn.com)  
**Sent:** Tuesday, January 12, 2010 6:49 PM  
**Subject:** TO 4149, BBNPP, Revision 4 to TER Section 8.1

Marty,

Attached is Revision 4 to TER Section 8.1 which incorporates the Applicants response to RAI 36, Question 08.02-1, as it relates to the schedule for completion of the transmission system modification required to support BBNPP. This response resolves our original RAI 08.01-1 which requested a schedule for the required transmission system modifications. This now becomes a Confirmatory Item.

George

George W. Morris, Senior Executive Consultant  
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**Hearing Identifier:** BellBend\_COL\_Public  
**Email Number:** 503

**Mail Envelope Properties** (87B1F1BDFE5A554CA9DC5EAA75EB6D0D1C9364C9B4)

**Subject:** FW: NUMARK Documents for the NRC Hearing Files for TO #49, Bell Bend, Chapter #8-NON PUBLIC  
**Sent Date:** 3/16/2010 12:36:54 PM  
**Received Date:** 3/16/2010 12:36:56 PM  
**From:** Bhatia, Bhupendra

**Created By:** bhfysp.bhfysp@nrc.gov

**Recipients:**

"Johnson, Robert" <Robert.Johnson@nrc.gov>  
Tracking Status: None  
"Kang, Peter" <Peter.Kang@nrc.gov>  
Tracking Status: None  
"BellBendCOL Resource" <BellBendCOL.Resource@nrc.gov>  
Tracking Status: None

**Post Office:** HQCLSTR01.nrc.gov

<b>Files</b>	<b>Size</b>	<b>Date &amp; Time</b>
MESSAGE	5940	3/16/2010 12:36:56 PM
BBNPP_ 8.4_ Final R1 w no Open Items[1]12-17-09.doc		52290

**Options**

**Priority:** Standard  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**  
**Recipients Received:**

## **8.4 Station Blackout**

### **8.4.1 Introduction**

The term station blackout (SBO) refers to a complete loss of alternating current (ac) electric power to the non-safety-related and safety-related switchgear buses. An SBO involves a loss of the offsite electric power system (preferred power system) occurring at the same time the emergency diesel generators (EDG) are unavailable. An SBO does not include loss of available ac power to buses fed by station batteries through inverters or by alternate alternating current (AAC) sources specifically provided for SBO mitigation.

### **8.4.2 Summary of Application**

Section 8.4 of the BBNPP FSAR incorporates by reference Section 8.4 of the U.S. EPR FSAR.

In addition, in Sections 8.4.1.3, 8.4.2.6.1, and 8.4.2.6.4, the applicant provided the following:

#### **Combined License Information Items:**

The applicant provided additional information in Section 8.4.1.3 to address COL Information Item 8.4-1 from U.S. EPR FSAR Tier 2, Table 1.8-2 included under Section 8.1.1 from U.S. EPR FSAR Tier 2, Table 1.8-2 as follows:

A COL applicant that references the U.S. EPR design certification will provide site-specific information that identifies any additional local power sources and transmission paths that could be made available to re-supply the power plant following a LOOP.

The applicant provided additional information in Section 8.4.2.6.4 to address COL Information Item 8.4-2 from U.S. EPR FSAR Tier 2, Table 1.8-2 included under Section 8.1.1 from U.S. EPR FSAR Tier 2, Table 1.8-2 as follows:

A COL applicant that references the U.S. EPR design certification will address the RG 1.155 position C.3.4 related to procedures and training to cope with SBO.

#### **Supplementary Information:**

The applicant provided information in FSAR Section 8.4.2.6.1, based on the option in U.S. EPR FSAR Section 8.4.2.6.1 that a COL applicant based on site-specific coping durations may propose coping durations less than eight hours. The applicant stated in FSAR Section 8.4.2.6.1 that PPL Bell Bend, LLC utilizes the coping analysis described in Section 8.4.2.6 of the U.S. EPR FSAR.

#### **Technical Specifications:**

There are no technical specifications associated with SBO.

#### **ITAAC:**

None of the site-specific inspections, tests, analyses, and acceptance criteria (ITAACs) addressed in Part 10 of the application are applicable to SBO. Refer to the U. S. EPR Tier 1 application, Table 2.5.3-2, Station Blackout Alternate AC Source Inspections, Tests, Analyses, and Acceptance Criteria, which is incorporated by reference.

### **8.4.3 Regulatory Basis**

The regulatory basis of the information incorporated by reference is addressed in the NRC staff safety evaluation related to the U.S. EPR FSAR (see Section 1.1 of this SER). The relevant requirements of the Commission's regulations for the additional information provided for this area of review, and the associated acceptance criteria, are given in Section 8.4 of NUREG-0800 and are summarized below. Review interfaces with other NUREG-0800 sections also can be found in Section 8.4 of NUREG-0800.

1. 10 CFR 50.63, as it relates to the capability to withstand and recover from an SBO.

Acceptance criteria adequate to meet the above requirements include:

1. The guidelines of RG 1.155, as they relate to compliance to 10 CFR 50.63. NUMARC-8700, Revision 0, also provides guidance acceptable to the staff for meeting these requirements. Table 1 of RG 1.155 provides a cross-reference to NUMARC-8700, Revision 0, and notes when the RG takes precedence.
2. The guidelines of RGs 1.9 (Ref. 6) and 1.155, as they relate to the reliability program implemented to ensure that the target reliability goals for onsite EDG power sources are adequately maintained.

### **8.4.4 Technical Evaluation**

The NRC staff reviewed Section 8.4 of the BBNPP FSAR and checked the referenced U.S. EPR FSAR to ensure that the combination of the information in the U.S. EPR FSAR and the information in the BBNPP FSAR represent the complete scope of information relating to this review topic. The NRC staff's review confirmed that the information contained in the application and incorporated by reference addresses the required information related to this section. Section 8.4 of the U.S.EPR FSAR is being reviewed by the staff under docket number 52-020. The NRC staff's technical evaluation of the information incorporated by reference related to electric power will be documented in the staff safety evaluation report on the design certification application for the U.S. EPR.

The staff reviewed the information contained in Sections 8.4.1.3, 8.4.2.6.1, and 8.4.2.6.4, of the BBNPP FSAR. With respect to the supplemental information contained in the BBNPP application, the staff determined:

#### **Combined License Information Items:**

The applicant provided additional information in Section 8.1.1 to address FSAR Table 1.8-2, COL Information Item 8.4-1. The staff confirmed the COL applicant provided sufficient information for satisfying the guidelines of RG 1.155, as they relate to compliance to 10 CFR 50.63 with respect to available alternate power to resupply BBNPP following a LOOP. In FSAR Section 8.3.1.1.5, the applicant committed to maintain the EDG reliability to a minimum of 0.95. In addition, the applicant stated in FSAR Section 8.4.1.3 there are no special local sources that can be made available to resupply power to the plant following a loss of a grid or an SBO.

However, the BBNPP is located adjacent to the existing Susquehanna Steam Electric Station and the BBNPP switchyard is located less than [1 mi (1.6 km)] from the existing Susquehanna 500 kV switchyard. The normal connections to BBNPP will include one 500 kV connection to the existing Susquehanna 500 kV switchyard and one connection to the new Susquehanna 500 kV Yard 2.

The applicant provided additional information in Section 8.4.2.6.4 to address FSAR Table 1.8-2, COL Information Item 8.4-2. The staff confirmed the COL applicant provided sufficient information for satisfying the guidelines of RG 1.155, as they relate to compliance to 10 CFR 50.63 with respect to procedures and training that will identify the operator actions which need to be performed to cope with a station blackout for at least as long as is determined in accordance with Regulatory Guide 1.155 Regulatory Position C.3.1, and shall include the operator actions necessary to restore normal decay heat removal, once ac power is restored.

The applicant adequately described the proposed use of procedures and training that will include the operator actions necessary to cope with a station blackout including the operator actions necessary to restore normal decay heat removal once ac power is restored. The applicant stated that these procedures will be integrated with the plant-specific technical guidelines and emergency operating procedure program. The task analysis portion of the emergency operating procedure program will include an analysis of instrumentation adequacy required during a station blackout.

The staff determined the BBNPP proposed design, as briefly described in Section 8.4, provides adequate information to address coping with and the recovery from a station blackout following loss of all offsite power and the loss of the on-site emergency ac power supplies as required by 10 CFR 50.63 and RG 1.155.

### **Supplementary Information:**

The applicant stated that they took no departure from the coping analysis in the EPR FSAR Section 8.4.2.6.1. That section of the EPR FSAR stated that a COL applicant could utilize a coping duration less than eight hours based on a site-specific coping analysis. It was not clear from the BBNPP FSAR Section 8.4.2.6 if they would use a coping analysis of eight hours or use a shorter duration based on site-specific factors such as EDG reliability or enhanced restoration procedures. In RAI 41, Question 08.04-1, the staff asked the applicant to describe the site specific coping duration. On September 3, 2009, the applicant responded that the BBNPP coping duration following the guidance of the EPR FSAR SBO capability analysis and would use an 8 hour coping duration. Accordingly, the staff finds that the applicant adequately addressed the issue and the guidance found in RG 1.155. The staff considers this issue resolved.

#### **8.4.5 Post Combined License Activities**

There are no post COL activities related to this section.

#### **8.4.6 Conclusions**

The NRC staff reviewed the application and checked the referenced U.S. EPR FSAR. The NRC staff's review confirmed that the applicant addressed the required information relating to station blackout, and there is no outstanding information expected to be addressed in the COL FSAR related to this section.

The NRC staff is reviewing the information in the U.S. EPR FSAR on Docket No. 52-020. The results of the NRC staff's technical evaluation of the information related to station blackout incorporated by reference in the BBNPP COL FSAR will be documented in the staff safety evaluation report on the design certification application for the U.S. EPR. The SER on the U.S. EPR is not yet complete, and this is being tracked as part of Open Item [1-1]. The staff will update this SER to reflect the final disposition of the design certification application.

As the bases for evaluating the adequacy of the design to cope with and recover from a station blackout as presented in the U.S. EPR FSAR Tier 2, Chapter 8, "Electric Power," the U.S. Nuclear Regulatory Commission (the NRC or staff) used the acceptance criteria and guidelines for electric power systems contained in Chapter 8 of NUREG-0800 and Regulatory Guide (RG) 1.155, "Station Blackout;" and Section 50.63 of Title 10 of the Code of Federal Regulations (CFR), "Loss of All Alternating Current Power."