

BellBendCOLPEm Resource

From: Bhatia, Bhupendra
Sent: Saturday, February 27, 2010 12:21 PM
To: BellBendCOL Resource
Cc: Johnson, Robert
Subject: FW: NUMARK Documents for the NRC Hearing File for TO # 49, Bell Bend, Chapter #8.
Attachments: Response to PQOG_comments_on_8.2_Callaway_NMP_BB[1].doc

From: Bhatia, Bhupendra
Sent: Thursday, December 31, 2009 1:32 PM
To: Steckel, James
Cc: Jenkins, Ronaldo; Kang, Peter
Subject: FW: NUMARK Documents for the NRC Hearing File for TO # 49, Bell Bend, Chapter #8.

Jim,

Attached please find information received from Numark Associates pertaining to TO #49, Bell Bend, Chapter 8 for inclusion in the NRC Hearing File.

Bhupendra

From: Shaareem Wall [<mailto:SWall@numarkassoc.com>]
Sent: Monday, December 28, 2009 10:24 AM
To: Bhatia, Bhupendra
Subject: NUMARK Documents for the NRC Hearing File 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
Tel: 202-466-2700
Fax: 202-466-3669
Web: www.numarkassoc.com

This e-mail message and any attached files may contain confidential or proprietary information intended only for the addressee named above. If you are not the intended recipient, please note that any use, copying, disclosure or distribution is strictly prohibited. If you have received this message in error, please notify the sender immediately and delete this message from your computer. Thank you.

From: Shaareem Wall
Sent: Monday, December 07, 2009 10:01 AM
To: 'swagata.som@nrc.gov'; 'james.steckel@nrc.gov'
Cc: 'sally.adams@nrc.gov'
Subject: NUMARK Documents for the NRC Hearing File for TO #49, Bell Bend Chapter #8.

From: Shaareem Wall
Sent: Tuesday, November 17, 2009 1:09 PM
To: 'swagata.som@nrc.gov'; 'james.steckel@nrc.gov'
Cc: 'sally.adams@nrc.gov'
Subject: NUMARK Documents for the NRC Hearing File 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
Tel: 202-466-2700
Fax: 202-466-3669
Web: www.numarkassoc.com

This e-mail message and any attached files may contain confidential or proprietary information intended only for the addressee named above. If you are not the intended recipient, please note that any use, copying, disclosure or distribution is strictly prohibited. If you have received this message in error, please notify the sender immediately and delete this message from your computer. Thank you.

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

From: George Morris
Sent: Sunday, March 01, 2009 9:47 PM
To: Marty Bowling
Cc: Brian Grimes; Stan Kobylarz; Hearing File
Subject: Incorporation of PQOG comments into TER 8.2 for TO 47, 48 and 49

Marty,

Attached are the revised files for TER 8.2 for TOs 47, 48 and 49 and the Form 3 addressing the PQOG comments.

George Morris

Hearing Identifier: BellBend_COL_Public
Email Number: 500

Mail Envelope Properties (87B1F1BDFE5A554CA9DC5EAA75EB6D0D1BFBBA7B06)

Subject: FW: NUMARK Documents for the NRC Hearing File for TO # 49, Bell Bend, Chapter #8.
Sent Date: 2/27/2010 12:20:44 PM
Received Date: 2/27/2010 12:20:45 PM
From: Bhatia, Bhupendra

Created By: bhfyasp.bhfyasp@nrc.gov

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

Post Office: HQCLSTR01.nrc.gov

Files	Size	Date & Time	
MESSAGE	3306	2/27/2010 12:20:45 PM	
Response to PQOG_comments_on_8.2_Callaway_NMP_BB[1].doc			330746

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

**NUMARK FORM-3
DOCUMENT TRANSMISSION RECORD FORM**

**DOCUMENT TITLE/NUMBER
Draft TER for SCOL Section 8.2 – Offsite Power System
(Callaway, NMP, Bell Bend)**

NRC Task Order #	47, 48, 49
NRC Task #	4
NRC JCN #	Q-4159

DOCUMENT RECEIVED BY TM FROM AUTHOR	DATE
DOCUMENT SENT TO PQOG	2/7/09
DOCUMENT SENT TO TD	NA
DOCUMENT SENT TO TM FROM PQOG	2/12/09
DOCUMENT SENT TO TM FROM TD	NA
ALL COMMENTS RESOLVED BY TM	
FINAL DRAFT SENT TO PM	
FINAL DOCUMENT SENT TO NRC	

**NUMARK FORM F-2
COMMENT AND DISPOSITION RECORD FORM**

DOCUMENT TITLE/NUMBER

**Draft TER for SCOL Section 8.2 – Offsite Power System
(Callaway, NMP, Bell Bend)**

NRC Task Order # 47, 48, 49

NRC Task # 4

NRC JCN # Q-4159

PQOG COMMENTS/RESOLUTIONS

REVIEWER NAME / ORGANIZATION: Brian Grimes/PQOG

**Steve Lewis: Regulatory Review; George Skinner: Technical Review; Brian Grimes:
template subsections review**

Regulatory Review Comments: See attached checklist.

Technical Review Comments: See attached checklist.

Template Subsections Comments: See three attached checklists.

Brian Grimes, Chair, PQOG

**PQOG Regulatory Review of TERs for Callaway2, NMP3, and BBNPP SCOLs Section 8.2
Technical Evaluation, Conclusions, RAI**

PQOG Reviewer: Stephen Lewis Date: 02/12/09

Formatted: Left: 0.5", Right: 0.5", Top: 0.5", Bottom: 0.9"

Checklist Item	PQOG Review Comments	Disposition
Technical Evaluation	Note: comments to all three Applications, unless otherwise indicated	
Sections incorporated by reference (IBR) use the standard wording in the NUMARK COL Guidance Document. Outstanding DC RAI or Open Items for the corresponding DC section are noted.	Yes, as to wording. Cannot answer further because the writers of the TERs did not state whether the Section 8.2 TERs address all outstanding DC RAIs and Open Items within the scope of 8.2. Such an affirmative statement is required.	
For sections not entirely IBR, system/program description is provided for the scope of COL information being reviewed (synopsis)	Yes.	
For sections not entirely IBR, a general description of the review process is provided including any confirmatory analyses, site visits, or audits.	Yes.	
Material is not copied from the FSAR	This reviewer did not identify any material in Section 8.2 of these TERs as being copied from the FSARs	
For sections that are not entirely IBR, the following subheadings are used in the Technical Evaluation section (only if applicable to this TER section):		
Tier 1 Departures	Done correctly	
Tier 2 Departures	With respect to the matter to be further addressed by NMP3 <u>Callaway2</u> regarding different voltages (345kV and 500kV), the Departure process (similar to the 10 CFR 50.59 process) needs to be followed. See Revision 3 (February 7, 2009) to "COL FSAR GUIDANCE DOCUMENT FOR NUMARK TEMPLATE WRITERS AND TECHNICAL REVIEWERS [for] THE U.S. EPR" page 7. The NRC staff does not consider <u>The reviewer needs to state whether this matter is considered</u> , to require prior NRC approval. Nevertheless, the Applicant will have to undertake a review to verify	This is not a 50.59 type departure and the RAI is sufficient to identify this difference.

	that this matter can be properly handled under the “change” process	
Interfaces Requirements (Plant or Site Parameter) COL Table 1.8-1	Cannot answer because writer did not affirmatively state in the Technical Evaluation that all of the Interface Requirements within 8.2 scope have been addressed, as required per NUREG 0800, Section 1, pp1.03-1.04.	
Combined License Information Items The adequacy of the COL disposition of the U.S. EPR COL Information Items is addressed. Deferral of information or actions to the post-COL stage is determined appropriate and the need for any additional items is addressed. A positive statement confirming this is required.	Cannot answer because the writers of the TER did not affirmatively state in the Technical Evaluation that all of the Combined Information Items have been addressed. NUREG 0800, Section 1, pp. 1.03-1.04. As an example, for Callaway2, the sequence of numbering of the Combined License Information indicates that some of the Information Items are not addressed.	See Section 8.2.2 Interface Requirements
Site-specific information replacing Conceptual Design Information An assessment is made as to the adequacy of the information, (whether included or IBR) and the FSAR content. A positive statement confirming this is required. Statements are consistent with any review of this information in the U.S. EPR SER.	N/A because there was no Conceptual Design Information provided in the U.S.EPR FSAR Section 8.2.	
Supplemental Information	N/A	
License Conditions	No license conditions are proposed by the Applicant or considered by the NRC.	
Initial Test Program Adequacy of applicable initial testing requirements applicable to the COL scope of review is addressed. A positive statement confirming this is required.	Cannot answer because the writers of the TER have not stated whether Offsite Power is covered within the Initial Test Program.	Initial Test Program addressed in TER 14.2
Technical Specifications Adequacy of Technical Specifications applicable to the COL scope of review is addressed. A positive statement confirming this is required.	All three TERs appropriately acknowledge the relevance of TS. In all three TERs the technical reviewer correctly addresses where the reader should look for the TS. There is (properly) no issue raised with respect to the TS.	
ITAAC	All three Applicants have handled this item correctly	

Adequate additional COL ITAAC are proposed, if appropriate. A positive statement confirming this is required.		
Cross-cutting requirements (TMI, USI/GSI, Op Experience)	N/A.	
Evaluation elements for each applicable review area:		
GDC/Regulations that apply to the COL information being reviewed are stated	Yes.	
What reviewer did to evaluate the submittal is stated and related to the SRP section Review Procedures	Yes.	
There are placeholders in bold type for any related section reviews that need to be done before the conclusions stated in the TER are valid	N/A. The NRC staff NUMARK PQOG believes that the reference to Chapter 16 as underlying an RAI is not appropriate and that the RAI should, instead, reference section 8.2	RAI number changed to refer to Section 8.2.
How the acceptance criterion is met is stated (e.g., followed regulatory guidance)	Yes.	
A conclusion is reached on each GDC/regulation applicable to the COL information being reviewed. A positive statement confirming this is required.	Yes.	
If TER is not comparable to another COL or ESP SER level of detail there is a reason (not to be stated in the TER). Note: only if such becomes available.	N/A.	
If the COL FSAR incorporates by reference U.S. EPR conceptual design information rather than replacing it, the SER for the US EPR adequately evaluates the information.	N/A, in that the equivalent section of the U.S. EPR does not include any conceptual design criteria.	
Conclusions		
Applicable standard wording in the NUMARK COL Guidance	Yes.	

Document is used. SRP section Evaluation Findings wording applicable to the COL scope of review is generally followed: Length is typically one paragraph for a mostly IBR section.		
Brief statements are added on the bases for each conclusion that a GDC/regulation is met.	Yes.	
Conclusions are consistent with Technical Evaluation section and supported by a discussion in the technical evaluation section.	Yes.	
RAI		
Reason for RAI is briefly addressed in Technical Evaluation section of draft TER	Yes.	
RAI number is inserted in Technical Evaluation section text and bolded .	Yes.	
Additional post-Combined License activities proposed in the TER have an RAI to determine whether applicant will add to their list in the FSAR.	All three Applicants should review their FSARs to determine that all such activities are covered by an RAI be requested by RAIs to include the proposed Post Combined License Activities in their <u>FSAR</u> .	New RAIs prepared to address the potential Post COL activities.
The regulatory basis is provided at the beginning of each RAI (or RAI cluster). This includes the applicable GDC or reg. and may also refer to acceptance criteria.	All three Applicants-reviewers have stated the regulatory basis in an acceptable manner in their RAIs, which is not always at the beginning of the RAI. No corrective actions needed.	
RAI is within the scope of the COL information reviewed in the section.	All three Applicants-TERs meet this item.	
RAI is phrased as a question or questions.	No, but the RAIs are clear. In these RAIs, regulatory reviewer suggests that the wording be left as is.	
RAIs noting inconsistencies are generated (but the regulatory basis is to “assure completeness and accuracy of the plant design and licensing basis.”). These should be collected into one RAI if possible.	N/A.	

**PQOG Template Subsections Review for Callaway, NMP, Bell Bend SCOL Section 8.2 – Offsite Power System
Introduction, Summary of Application, Regulatory Basis, COL Information Items**

PQOG Reviewer: Brian Grimes Date: 9 February 2009

Checklist Item	PQOG Review Comments	Disposition
Title	Note: Comments apply to all three SCOL TERS unless otherwise indicated.	
The FSAR title, rather than the NUREG-0800 section title is used	OK	
For the first template in a chapter, the Chapter title and a short summary paragraph are inserted. If there are additional sections without templates after the Chapter title (typically an X.1 section), the title for these should also be listed and a short summary paragraph inserted.	N/A	
Sections incorporated by reference (IBR) use the standard wording in the NUMARK COL Guidance Document. Outstanding DC RAI or Open Items for the corresponding DC section are noted.	OK. Conclusion section has an adequate general statement on the ongoing review. Perhaps the Phase 2 SER (after review of the EPR RAI responses) should flag any specific open items.	Open Items will be identified in Phase 2
Where multiple sections in the same chapter are incorporated by reference, summarization at a higher level is acceptable.	N/A	
Note: the following is for sections IBR with departures, additional information, or that are primarily COL-specific.		
Introduction		
Length: one or two paragraphs	OK	
Description: generic summary of section topic, not FSAR wording. Can use SRP wording. Can use DC section Introduction if applicable.	Could shorten the second sentence to leave out the GDC citations, since they are not completely consistent with those given in the Regulatory Basis or Conclusions sections.	GDCs 2,4 and 5 removed.
Summary of Application		
Length: Up to one page. Roadmap provided to FSAR information for following subtitles.	Length is on the order of 7 pages. Far too long. For this section (with 8 COL items), less than three pages should be the target. See individual comments below.	Shortened by only including a pointer to the section that addresses the COL items.
Information not quoted from the FSAR.	Callaway: literal use of text from the FSAR is extensive. Should be summarized in our own words. NMP: literal use of text from the FSAR is extensive. Should	Revised wording

	be summarized in our own words. Bell Bend: some FSAR words, but probably OK., except bullets could be summarized.	
Roadmap references correct and complete.	See comments below.	
Uses the standard wording in the NUMARK COL Guidance Document for partial IBR. For no IBR, describes the system or program for the section that is proposed in the COL FSAR.	OK	
Note: list and provide a brief description only for the following headings that are applicable.		
FSAR Tier 1 Departures (Exemptions): (The small number of Calvert Cliffs COL departures from U.S. EPR Tier 1 with related exemption requests are listed in Part 7 of the application. Additional exemption requests are also listed. The departures are also listed in COL FSAR section 1.8.2.)	N/A	
FSAR Tier 2 Departures: (Departures from U.S. EPR Tier 2, from the COL FSAR section text.)	N/A	
Interface Requirements: This should include information related to plant and site parameter interfaces (COL FSAR Table 1.8-1)	At the end of the first bullet add : “also Tier 2, Table 1.8-1, item 8-1)” At the end of the second bullet add: “also Tier 2, Table 1.8-1, item 8-3)” Eliminate the third bullet, as it is evaluated in section 8.3.	Added references to Table 1.8-1 Moved third bullet to 8.3
Combined License Information Items: (From COL FSAR Table 1.8-2. The wording of these may be different than in the US EPR FSAR.)	OK. Should be shortened to a paragraph or two under each item (eliminating FSAR literal wording). If details are needed, these should appear in the Technical Evaluation section in support of our evaluation.	Shortened items.
Replacement of Conceptual Design Information: (Or incorporation by reference of conceptual information in the U.S. EPR Tier 2 section.)	N/A	
Supplemental Information:	N/A	
License Conditions:	N/A	
Initial Test Program:	No site-specific items proposed in the FSAR. The items proposed in the TER for Post-COL activities may fall in this category.	These items may windup in ITAAC following response to RAIs
Technical Specifications:	OK.	
ITAAC:	OK	
Cross Cutting Requirements (TMI, USI/GSI,	N/A	

Operating Experience):		
Regulatory Basis		
Length: Up to one page.	OK	
The applicable standard introductory wording used from the NUMARK COL Guidance Document followed by list of requirements, followed by acceptance criteria wording, followed by brief paragraph summarizing acceptance criteria (e.g., listing R.G.)	Introductory wording is OK.	
Words from NUREG-0800 may be used without quotes	OK	
The 52.80(a) requirement should not be listed as it is the same for all sections (will be covered in COL SER Chapter 1)	OK	
GDC 5 should not be listed (will be covered in COL SER Chapter 1)	OK	
Requirements may be abbreviated from those listed in NUREG-0800, but all requirements relevant to the COL scope of review (and only those requirements) should be listed.	NUREG-0800, Section 8.2 also lists GDC-2, GDC-4, and 50.65(a)(4). These should be listed. An interface with the Chapter 3 reviews of GDC 2 and 4 could be inserted (and bolded). This would also eliminate the need to discuss these in the Technical Evaluation section. 50.65(a)(4) is mentioned in the Conclusion section, but not in the Technical Evaluation section.	GDC 2 & 4 IBR Added discussion to Tech Eval
Requirements and Acceptance Criteria are those found in the relevant NUREG-0800 section.	R.G. 1.160 and R.G. 1.182 are included in the SER and could be listed. (R.G. 1.160 is mentioned in the Conclusion section, but not in the Technical Evaluation section.)	Removed from conclusions
Post Combined License Activities		
Those U.S. EPR Combined License Information Items that will continue beyond granting the Combined License are correctly extracted and listed from COL FSAR Table 1.8-2. (These are the items with a "Y" in the COL Holder column of U.S. EPR FSAR Tier 2 Table 1.8-2.)	(Note: different Post COL items are listed in the three TERs, but the same comment applies. See p. 8 of the NUMARK COL Guidance, Rev.3.) The items listed in the Table do not appear in COL FSAR Table 1.8-2. There are no corresponding items in the USEPR marked as a COL Holder responsibility. If the TER developer believes that these items should be a COL holder responsibility, then an RAI should be developed, with corresponding rationale in the Technical Evaluation section. Delete these Table items until the applicant has agreed to include them in the FSAR.	Changed the Post COL Activity Items into RAIs.
Standard language from the NUMARK COL Guidance Document is Used	OK	

PQOG Technical Review for TER of NMP3NPP COL Section 8.2 - Technical Evaluation, Conclusions, RAI

PQOG Reviewer: George Skinner Date: 2/12/09

Checklist Item	PQOG Review Comments	Disposition
Technical Evaluation		
Assumptions and logic of the FSAR safety evaluation are addressed and TER evaluation appears technically correct and is logically supported in each of the following areas. System information needed to reach a conclusion is included. Applicable Generic Letters and NRC Knowledge Transfer Guides are considered (if listed in the SRP (NUREG-0800)).	See individual items.	
List and evaluate specific Areas of Review (from SRP _____ Section I) and additional items from Review Procedures (from SRP _____ Section III) <i>Note: only those that are applicable to the COL scope of review for this section.</i>	See individual items.	
COL Information Items		
Site-specific information regarding transmission system and its connection to switchyard reviewed.	OK	
Site-specific information on switchyard layout design reviewed.	OK	
Site-specific information on actions to restore offsite power and use nearby sources reviewed.	OK	
Site-specific grid stability analysis reviewed.	OK	
Site-specific information on switchyard breaker protective devices and controls reviewed.	OK	
Site-specific information on switchyard inspection and testing reviewed.	OK	
Site-specific information on communication protocols between the station and the TSO reviewed.	See comment for RAI 8.2-3	
Site-specific information on analysis tool used to determine real time condition of the transmission system reviewed.	OK	
Site-specific information on indication and control of switchyard component indications and controls reviewed.	OK	
SRP 8.2, Section I, Areas of Review		
Preferred power system arrangement reviewed.	OK	
The independence of the preferred power system is evaluated with respect to the onsite power system and any AAC power source provided for station blackout.	OK (Referred to 8.4 Review)	
Design information and analyses demonstrating the suitability of the power sources from the grid, including transmission lines, breakers, and transformers used for supplying preferred power from distant sources, are reviewed to ensure that each path has sufficient capacity	OK	

and capability to perform its intended function.		
Effect of environmental conditions on preferred power reviewed.	This does not appear to be addressed in any detail in the DC or COL FSAR. Should RAI be issued?	All three plants address environmental condition withstand capability in 8.2.1.1
SRP 8.2, Section III, Review Procedures		
Review determined that at least two separate circuits from the transmission network to the onsite power distribution system buses are provided	This attribute was not mentioned in the Technical Evaluation or Conclusions sections.	Added pointer to attribute
Routing of transmission lines was examined on the station layout drawings to ensure that at least two circuits from the offsite grid to the onsite distribution buses are physically separate and independent.	This attribute was not mentioned in the Technical Evaluation or Conclusions sections.	Added reference to the transmission layout drawing
The electrical schematics of the switchyard breaker control system, its power supply and the breaker arrangement itself were examined for the possibility of simultaneous failure of both circuits from single events	OK	
Loads for normal or abnormal operating conditions, accident conditions, or plant shutdown conditions were examine to ensure circuits from the offsite system to the onsite distribution buses have sufficient capacity and capability.	I did not see where the capacity and capability of the offsite power supplies was compared with plant loads. This appears to have been addressed by the reviewer in Post COL items 8.2-1 and 8.2-3, but an RAI should be issued.	Added RAI
The results of the grid stability analysis reviewed.	OK	
Verified that provisions are included in the design to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electric power supplies.	OK	
Verified that adequate procedures, administrative controls, and protocols are in place to ensure that no modifications to the offsite power system circuits credited for satisfying GDC 17 are implemented by offsite transmission system operating authorities, responsible for maintenance, modification, and operation of the offsite transmission grid, without the performance of a proper safety evaluation	This topic does not appear to have been addressed as part of the review of COL Information Item 8.2-7.	See RAI 8.2-1 reference to NUC-001-1
Underground or inaccessible power cables connecting offsite power to safety buses or power and control cables to equipment with accident mitigating functions reviewed.	N/A	Add RAI to describe the 5 secondary connections from the EAT/NATs to the plant in 8.3
The plant's offsite communications equipment and protocols, communication contingency procedures, communications circuit routing, and telemetry links used to monitor the power grid and to verify and maintain grid stability and operability were reviewed to determine that they are secure and will continue to function during	This topic does not appear to have been addressed as part of the review of COL information item 8.2-7.	See RAI 8.2-1 reference to NUC-001-1

severe weather events causing regional effects.		
To ensure that the requirements of GDC 5 are satisfied, the structures, systems, and components of the preferred power systems were examined to identify any that are shared between units of a multi-unit station.	U.S. EPR FSAR 8.2.2.3 discussed GDC 5 as relating only to <u>safety related</u> SSCs, and the COL FSARs IBR'd it, but SRP 8.2 appears to include the preferred power system in its scope. This may be due to a difference in interpretation of the terms "important to safety" used in the GDC and "safety related" used in the U.S. EPR FSAR. The offsite power system may be considered important to safety because it is the preferred source of power for ESF buses to mitigate an accident. Suggest writing an RAI to clarify this point. A similar question relates to compliance with GDCs 2 and 4.	The EPR design is a single unit design and GDC 5 does not apply
Review determined that grid reliability evaluations are performed, as part of the maintenance risk assessment required by 10 CFR 50.65 before performing "grid-risk-sensitive" maintenance activities.	Addressed in Conclusions, but not addressed in Technical Evaluation of COL Information item 8.2-7. Suggest providing discussion.	Added discussion in the Tech Eval to refer to NUC-001-1
ITAAC	OK	
CH 16, 3.8 Technical Specifications	OK	
Conclusion		
List and evaluate EVALUATION FINDINGS (from SRP 8.2 Section IV – also include any important Technical Rationale items in the SRP that bear on the conclusions). Note: only those that are applicable to the COL scope of review for this section.	See individual items.	
Statement describing basis for conclusions provided.	Statement prescribed in SRP 8.2, IV not provided. See SRP 8.2, IV, first indented paragraph	Added SRP wording
Compliance with GDC 2.	Not provided (see comment for GDC 5)	IBR
Compliance with GDC 4.	Not provided (see comment for GDC 5)	IBR
Compliance with GDC 17.	Statement not as completed as the one in SRP 8.2, IV 4, especially with regards to environmental conditions.	Added SRP wording
Compliance with GDC 18.	OK	
Compliance with 10 CFR 50.63	OK	
Compliance with 10 CFR 50.65(a)(4)	OK (SRP 8.2, IV 7 inexplicably refers to the onsite dc power system. The TER discusses correct scope.)	
RAI		
Technical adequacy of each RAI proposed (list RAIs)	See individual items.	

RAI 8.2-1	OK	
RAI 8.2-2	OK	
RAI 8.2-3	Reliability Standard NUC-001-1 is not identified SRP 8.2 as providing acceptance criteria for compliance with GDC-17 and GDC-18. Reference to this standard should be removed from the RAI. Similarly, Post COL item 8.2-4 should be deleted.	NO, NRC, NERC, FERC and industry worked together to develop this Reliability Standard to ensure adequate interface between the nuclear generator and the transmission system.
RAI 16.3.8.1-1	OK	
Other RAI that should be considered, including additional COL holder Action Items	RAI needed for additional COL Holder Activities 8.2-1, 8.2-2, and 8.2-3 to address capacity and capability of offsite power supply for voltage.	Added RAI

PQOG Technical Review for TER of BBNPP COL Section 8.2 - Technical Evaluation, Conclusions, RAI
PQOG Reviewer: George Skinner Date: 2/12/09

Checklist Item	PQOG Review Comments	Disposition
Technical Evaluation		
Assumptions and logic of the FSAR safety evaluation are addressed and TER evaluation appears technically correct and is logically supported in each of the following areas. System information needed to reach a conclusion is included. Applicable Generic Letters and NRC Knowledge Transfer Guides are considered (if listed in the SRP (NUREG-0800)).	See individual items.	
List and evaluate specific Areas of Review (from SRP ____ Section I) and additional items from Review Procedures (from SRP ____ Section III) <i>Note: only those that are applicable to the COL scope of review for this section.</i>	See individual items	
COL Information Items		
Site-specific information regarding transmission system and its connection to switchyard reviewed.	OK	
Site-specific information on switchyard layout design reviewed.	OK	
Site-specific information on actions to restore offsite power and use nearby sources reviewed.	OK	
Site-specific grid stability analysis reviewed.	A Post COL item was listed that was not in Table 1.8-2. If additional information is required to evaluate this item, an RAI should be used.	Added RAI
Site-specific information on switchyard breaker protective devices	OK	

and controls reviewed.		
Site-specific information on switchyard inspection and testing reviewed.	A Post COL item was listed that was not in Table 1.8-2. If additional information is required to evaluate this item, an RAI should be used.	Added RAI
Site-specific information on communication protocols between the station and the TSO reviewed.	Reliability Standard NUC-001-1 is not identified SRP 8.2 as providing acceptance criteria for compliance with GDC-17 and GDC-18. Reference to this standard should be removed. Similarly, Post COL item 8.2-3 should be deleted.	NO, NRC, NERC, FERC and industry worked together to develop this Reliability Standard to ensure adequate interface between the nuclear generator and the transmission system.
Site-specific information on analysis tool used to determine real time condition of the transmission system reviewed.	OK	
Site-specific information on indication and control of switchyard component indications and controls reviewed.	OK	
SRP 8.2, Section I, Areas of Review		
Preferred power system arrangement reviewed.	OK	
The independence of the preferred power system is evaluated with respect to the onsite power system and any AAC power source provided for station blackout.	OK (Referred to 8.4 Review)	
Design information and analyses demonstrating the suitability of the power sources from the grid, including transmission lines, breakers, and transformers used for supplying preferred power from distant sources, are reviewed to ensure that each path has sufficient capacity and capability to perform its intended function.	OK	
Effect of environmental conditions on preferred power reviewed.	This does not appear to be addressed in any detail in the DC or COL FSAR. Should RAI be issued?	Addresses in 8.2.1.1
SRP 8.2, Section III, Review Procedures		
Review determined that at least two separate circuits from the transmission network to the onsite power distribution system buses are provided	This attribute was not mentioned in the Technical Evaluation or Conclusions sections.	Added attribute with reference to the switchyard layout drawing
Routing of transmission lines was examined on the station layout drawings to ensure that at least two circuits from the offsite grid to the onsite distribution buses are physically separate and independent.	This attribute was not mentioned in the Technical Evaluation or Conclusions sections.	Added discussion on transmission line routing
The electrical schematics of the switchyard breaker control system, its power supply and the breaker arrangement itself were examined for the possibility of simultaneous failure of both circuits from single events	OK	

<p>Loads for normal or abnormal operating conditions, accident conditions, or plant shutdown conditions were examined to ensure circuits from the offsite system to the onsite distribution buses have sufficient capacity and capability.</p>	<p>I did not see where the capacity and capability of the offsite power supplies was compared with plant loads. BBNPP FSAR 8.2.2.4 indicated that a site specific calculation would be done later to demonstrate capability for a -5%, +10% transmission system operating voltage in lieu of the $\pm 10\%$ range stated in the U.S. EPR FSAR. This appears to have been addressed by the reviewer in Post COL items 8.2-4 and 8.2-5, but an RAI should be issued.</p>	<p>See discussion in 8.3</p> <p>Replaced Poat COL Items with RAIs</p>
<p>The results of the grid stability analysis reviewed.</p>	<p>OK</p>	
<p>Verified that provisions are included in the design to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electric power supplies.</p>	<p>OK</p>	
<p>Verified that adequate procedures, administrative controls, and protocols are in place to ensure that no modifications to the offsite power system circuits credited for satisfying GDC 17 are implemented by offsite transmission system operating authorities, responsible for maintenance, modification, and operation of the offsite transmission grid, without the performance of a proper safety evaluation</p>	<p>This topic does not appear to have been addressed as part of the review of COL information item 8.2-7.</p>	<p>See discussion in RAI for NERC Reliability Standard NUC-001-1</p>
<p>Underground or inaccessible power cables connecting offsite power to safety buses or power and control cables to equipment with accident mitigating functions reviewed.</p>	<p>N/A</p>	
<p>The plant's offsite communications equipment and protocols, communication contingency procedures, communications circuit routing, and telemetry links used to monitor the power grid and to verify and maintain grid stability and operability were reviewed to determine that they are secure and will continue to function during severe weather events causing regional effects.</p>	<p>This topic does not appear to have been addressed as part of the review of COL information item 8.2-7.</p>	<p>See discussion in RAI for NERC Reliability Standard NUC-001-1</p>
<p>To ensure that the requirements of GDC 5 are satisfied, the structures, systems, and components of the preferred power systems were examined to identify any that are shared between units of a multi-unit station.</p>	<p>N/A</p>	
<p>Review determined that grid reliability evaluations are performed, as part of the maintenance risk assessment required by 10 CFR 50.65 before performing "grid-risk-sensitive" maintenance activities.</p>	<p>This topic does not appear to have been addressed as part of the review of COL information item 8.2-7.</p>	<p>See discussion in RAI for NERC Reliability Standard NUC-001-1</p>
<p>ITAAC</p>	<p>OK</p>	

CH 16, 3.8 Technical Specifications	OK	
Conclusion		
List and evaluate EVALUATION FINDINGS (from SRP 8.2 Section IV – also include any important Technical Rationale items in the SRP that bear on the conclusions). Note: only those that are applicable to the COL scope of review for this section.	See individual items.	
Statement describing basis for conclusions provided.	Statement prescribed in SRP 8.2, IV not provided. See SRP 8.2, IV, first indented paragraph	Added wording from SRP
Compliance with GDC 2.	Not provided.	
Compliance with GDC 4.	Not provided.	
Compliance with GDC 17.	Statement not as completed as the one in SRP 8.2, IV 4, especially with regards to environmental conditions.	Added wording from SRP
Compliance with GDC 18.	OK	
Compliance with 10 CFR 50.63	OK	
Compliance with 10 CFR 50.65(a)(4)	OK (SRP 8.2, IV 7 inexplicably refers to the onsite dc power system. The TER discusses correct scope.)	
RAI		
Technical adequacy of each RAI proposed (list RAIs)	See individual items	
RAI 8.2-1	Reliability Standard NUC-001-1 is not identified SRP 8.2 as providing acceptance criteria for compliance with GDC-17 and GDC-18. Reference to this standard should be removed.	See discussion in RAI for NERC Reliability Standard NUC-001-1
RAI 16.3.8-1	OK	
Other RAI that should be considered, including additional COL holder Action Items	RAI needed for additional COL Holder Activities 8.2-4 and 8.2-5 to address capacity and capability of offsite power supply for a -5%, +10% voltage range.	Added RAIs
	RAIs needed for Post COL Activities 8.2-1, 8.2-2, and 8.2-6	Added RAIs

PQOG Technical Review for TER of Callaway COL Section 8.2 - Technical Evaluation, Conclusions, RAI

PQOG Reviewer: George Skinner Date: 2/12/09

Checklist Item	PQOG Review Comments	Disposition
Technical Evaluation		
Assumptions and logic of the FSAR safety evaluation are addressed and TER evaluation appears technically correct and is logically supported in each of the following areas. System information needed	See individual items.	

to reach a conclusion is included. Applicable Generic Letters and NRC Knowledge Transfer Guides are considered (if listed in the SRP (NUREG-0800)).		
List and evaluate specific Areas of Review (from SRP ____ Section I) and additional items from Review Procedures (from SRP ____ Section III) Note: only those that are applicable to the COL scope of review for this section.	See individual items	
COL Information Items		
Site-specific information regarding transmission system and its connection to switchyard reviewed.	OK	
Site-specific information on switchyard layout design reviewed.	OK	
Site-specific information on actions to restore offsite power and use nearby sources reviewed.	OK	
Site-specific grid stability analysis reviewed.	This item was not discussed in the Technical Evaluation section. Please revise.	Tech Eval Revised
Site-specific information on switchyard breaker protective devices and controls reviewed.	OK	
Site-specific information on switchyard inspection and testing reviewed.	This item was not discussed in the Technical Evaluation section. Please revise.	See discussion in RAI for NERC Reliability Standard NUC-001-1
Site-specific information on communication protocols between the station and the TSO reviewed.	Reliability Standard NUC-001-1 is not identified SRP 8.2 as providing acceptance criteria for compliance with GDC-17 and GDC-18. Reference to this standard should be removed.	See discussion in RAI for NERC Reliability Standard NUC-001-1
Site-specific information on analysis tool used to determine real time condition of the transmission system reviewed.	OK	
Site-specific information on indication and control of switchyard component indications and controls reviewed.	OK	
SRP 8.2, Section I, Areas of Review		
Preferred power system arrangement reviewed.	OK	
The independence of the preferred power system is evaluated with respect to the onsite power system and any AAC power source provided for station blackout.	OK (Referred to 8.4 Review)	
Design information and analyses demonstrating the suitability of the power sources from the grid, including transmission lines, breakers, and transformers used for supplying preferred power from distant sources, are reviewed to ensure that each path has sufficient capacity and capability to perform its intended function.	OK	
Effect of environmental conditions on preferred power reviewed.	This does not appear to be addressed in	Adequately addressed in 8.2.1.1

	any detail in the DC or COL FSAR. Should RAI be issued?	
SRP 8.2, Section III, Review Procedures		
Review determined that at least two separate circuits from the transmission network to the onsite power distribution system buses are provided	This attribute was not mentioned in the Technical Evaluation or Conclusions sections.	Added discussion to Tech Evaluation
Routing of transmission lines was examined on the station layout drawings to ensure that at least two circuits from the offsite grid to the onsite distribution buses are physically separate and independent.	This attribute was not mentioned in the Technical Evaluation or Conclusions sections.	Added discussion to Tech Evaluation
The electrical schematics of the switchyard breaker control system, its power supply and the breaker arrangement itself were examined for the possibility of simultaneous failure of both circuits from single events	OK	
Loads for normal or abnormal operating conditions, accident conditions, or plant shutdown conditions were examined to ensure circuits from the offsite system to the onsite distribution buses have sufficient capacity and capability.	I did not see where the capacity and capability of the offsite power supplies was compared with plant loads. Callaway Unit 2 FSAR 8.2.2.4 indicated that a site specific calculation had been done to demonstrate capability for a -5%, +10% transmission system operating voltage in lieu of the $\pm 10\%$ range stated in the U.S EPR FSAR. This appears to have been addressed by the reviewer in Post COL items 8.2-1 and 8.2-2, but an RAI should be issued.	Replaced Post COL Item with RAI
The results of the grid stability analysis reviewed.	This attribute was not mentioned in the Technical Evaluation section.	Added discussion to Tech Evaluation
Verified that provisions are included in the design to minimize the probability of losing electric power from any of the remaining supplies as a result of, or coincident with, the loss of power generated by the nuclear power unit, the loss of power from the transmission network, or the loss of power from the onsite electric power supplies.	OK	
Verified that adequate procedures, administrative controls, and protocols are in place to ensure that no modifications to the offsite power system circuits credited for satisfying GDC 17 are implemented by offsite transmission system operating authorities, responsible for maintenance, modification, and operation of the offsite transmission grid, without the performance of a proper safety evaluation	This topic does not appear to have been addressed as part of the review of COL Information Item 8.2-7.	See discussion in RAI for NERC Reliability Standard NUC-001-1
Underground or inaccessible power cables connecting offsite power to safety buses or power and control cables to equipment with accident mitigating functions reviewed.	N/A	

The plant's offsite communications equipment and protocols, communication contingency procedures, communications circuit routing, and telemetry links used to monitor the power grid and to verify and maintain grid stability and operability were reviewed to determine that they are secure and will continue to function during severe weather events causing regional effects.	This topic does not appear to have been addressed as part of the review of COL information item 8.2-7.	See discussion in RAI for NERC Reliability Standard NUC-001-1
To ensure that the requirements of GDC 5 are satisfied, the structures, systems, and components of the preferred power systems were examined to identify any that are shared between units of a multi-unit station.	U.S. EPR FSAR 8.2.2.3 discussed GDC 5 as relating only to safety related SSCs, and the COL FSARs IBR'd it, but SRP 8.2 appears to include the preferred power system in its scope. This may be due to a difference in interpretation of the terms "important to safety" used in the GDC and "safety related" used in the U.S. EPR FSAR. The offsite power system may be considered important to safety because it is the preferred source of power for ESF buses to mitigate an accident. Suggest writing an RAI to clarify this point. A similar question relates to compliance with GDCs 2 and 4.	These GDCs are IBR. The EPR design is a single unit design
Review determined that grid reliability evaluations are performed, as part of the maintenance risk assessment required by 10 CFR 50.65 before performing "grid-risk-sensitive" maintenance activities.	This topic does not appear to have been addressed as part of the review of COL information item 8.2-7.	See discussion in RAI for NERC Reliability Standard NUC-001-1
ITAAC	OK	
CH 16, 3.8 Technical Specifications	OK	
Conclusion		
List and evaluate EVALUATION FINDINGS (from SRP 8.2 Section IV – also include any important Technical Rationale items in the SRP that bear on the conclusions). Note: only those that are applicable to the COL scope of review for this section.	See individual items.	
Statement describing basis for conclusions provided.	Statement prescribed in SRP 8.2, IV not provided. See SRP 8.2, IV, first indented paragraph	Added SRP wording
Compliance with GDC 2.	Not provided (see comment for GDC 5)	
Compliance with GDC 4.	Not provided (see comment for GDC 5)	
Compliance with GDC 17.	Statement not as completed as the one in SRP 8.2, IV 4, especially with regards to environmental conditions.	Revised wording
Compliance with GDC 18.	OK	
Compliance with 10 CFR 50.63	OK	
RAI		

Technical adequacy of each RAI proposed (list RAIs)	See individual items	
RAI 8.2-1	OK	
RAI 8.2-2	Reliability Standard NUC-001-1 is not identified SRP 8.2 as providing acceptance criteria for compliance with GDC-17 and GDC-18. Reference to this standard should be removed.	See discussion in RAI for NERC Reliability Standard NUC-001-1
RAI 16.3.8.1-1	OK	
Other RAI that should be considered, including additional COL holder Action Items	RAI needed for additional COL Holder Activities 8.2-1 and 8.2-2 to address capacity and capability of offsite power supply for a -5%, +10% voltage range.	Replaced Post COL Item with RAI