Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

September 23, 2010
U7-C-STP-NRC-100214

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Revised Response to Request for Additional Information

Reference: Letter, Mark McBurnett to Document Control Desk, "Revised Response to Request for Additional Information," dated April 19, 2010, U7-C-STP-NRC-100065

Attached is a revised response to an NRC staff question included in Request for Additional Information (RAI) letter number 254 related to Combined License Application (COLA) Part 2, Tier 2 Chapter 7, Instrumentation and Controls.

The attachment revises the response provided in the referenced letter to the RAI question listed below:

RAI 07.01-14

The COLA changes provided in this response will be incorporated in the next routine revision of the COLA following NRC acceptance of the RAI response.

There are no commitments in this letter.

If you have any questions regarding this response, please contact Scott Head at (361) 972-7136, or Bill Mookhoek at (361) 972-7274.

D091
NRO

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

Executed on 9/23/2010

MAMcBurnett

Mark McBurnett
Vice President, Oversight & Regulatory Affairs
South Texas Project Units 3 & 4

jwc

Attachment: RAI 07.01-14 Revision 2

cc: w/o attachment except*
(paper copy)

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RAI 07.01-14

QUESTION:

In the STPNOC letter U7-C-STP-NRC-090009, dated February 9, 2009, the applicant provided the conformance to the Regulatory Guides (RG), Codes and Standards, that are applicable to I&C platform departures. Enclosure 2b of this letter contains proposed revisions to COLA Tier 2 Table 1.9S-1, "Site-Specific Conformance with Regulatory Guides," and a new Table 1.9S-1a, "IEEE Standards Applicable to the STP 3&4 Platforms," which document the RG, Codes, and Standards applicable to the departed I&C design. Footnotes 1 and 2 to these tables refer to the proposed technologies for Reactor Trip & Isolation System (RTIS), Neutron Monitoring System (NMS), and ESF Logic & Control System (ELCS), i.e., Toshiba FPGA platform and Westinghouse Common Q platform. These footnotes make a distinction in the Rev. levels of RG and IEEE Std. applicable to the RTIS/NMS and the ELCS. The reason for this distinction is the bases of prior NRC generic approval of the Westinghouse Common Q platform. Subsequently, in the STPNOC letter U7-C-STP-NRC-090076, dated July 22, 2009, the applicant stated that the design approval approach for STP 3 & 4 safety-related digital I&C systems no longer relies on the approval of the Westinghouse and Toshiba topical reports referred to in the footnotes, which are no longer relevant to the information in the tables, and therefore these two footnotes will not be incorporated into the COLA. However, the applicant did not change the RG and IEEE Std. revision numbers associated with these footnotes. Please note that all departures form the referenced certified design in the COLA are required to meet the current regulations. Since the NRC approval of the ELCS design no longer relies on the pre-approved Westinghouse Common Q platform, the ELCS design should also conform to the current regulation and associated IEEE Std. and Regulatory Guides (similar to the RTIS and NMS design). Update FSAR Tables 1.9S-1, 1.9S-1a, and related sections of the COL application addressing the ELCS design compliance to the current regulations.

2nd REVISED RESPONSE:

STPNOC's Revision 1 response to RAI 07.01-14, STPNOC letter U7-C-STP-NRC-100065, dated April 19, 2010, provided STPNOC's position regarding the applicability of NRC Regulatory Guides and Industry Standards to the Common-Q platform used for the STP 3&4 Engineered Safety Features Logic and Control System (ELCS). In summary, that revised response stated that the STP 3&4 ELCS platform is based on the Common-Q topical report, WCAP-160097-P-A, Revision 0, and that platform was previously reviewed and approved by the NRC staff, as documented in the applicable SERs. Incorporation of the Common-Q platform for the STP 3&4 ELCS by reference to the NRC approved topical report and associated SERs is consistent with the intent of the NRC policy related to use of topical reports, the Common-Q SER approval letter, and SRP 7.3. All subsequent design to address the Common-Q Plant Specific Action Items (PSIAs) and plant specific design features will be in accordance with the current regulatory guides and codes and standards, and will be documented in technical reports that will be provided as part of the DAC closure process. As such, use of the NRC-approved Common-Q platform, including its applicable regulatory guides and codes and standards, is

acceptable and appropriate for the STP 3&4 COLA. STP COLA Revision 3 Tables 1.8-20 and 1.8-21 were revised to reflect this position.

STPNOC believes the initial position to use the Common Q topical report remains valid and supportable. However, the challenges and complexity of tracking exceptions to current NRC regulatory guides and industry standards for the ELCS specific design for STP 3&4 Common-Q platform warranted additional review of this approach. The results of this compliance review is applicable only to the ELCS specific design for STP 3&4 with no consideration given to any future revision of the Common-Q platform topical report or designs for other plants.

This revised response provides the results of STPNOC's further review and evaluation of the applicability of NRC Regulatory Guides and Industry Standards to the Common-Q platform used for ELCS. This revised response replaces the previous responses on the subject in their entirety.

The results of the STPNOC evaluation resulted in the following specific commitments for the STP 3&4 ELCS.

1. Regulatory Guide 1.53 Revision 2, "Application of the Single Failure Criterion to Nuclear Power Plant Protection Systems," and IEEE-Std-379-2000, "Standard Application of the Single-Failure Criterion to Nuclear Power Generation Station Safety Systems." STPNOC commits to this Regulatory Guide and Standard for ELCS.

2. STPNOC has committed to IEEE-Std-384 1992, "IEEE Standard Criteria for the Independence of Class 1E Equipment and Circuits." Regulatory Guide 1.75 Revision 3, "Criteria for Independence of Electrical Safety Systems" endorses this version of the industry standard with exceptions that are identified in the Regulatory Guide. STPNOC will commit the Common-Q portion of ELCS to the above version of the Regulatory Guide.

3. STPNOC has committed to IEEE-Std-338-1987, "IEEE Standard for the Periodic Surveillance Testing of Nuclear Power Generating Station Safety Systems." Regulatory Guide 1.118, Revision 3, "Periodic Testing of Electric Power and Protection Systems" endorses this version of the industry standard with exceptions that are identified in the Regulatory Guide. STPNOC commits to extend compliance of the Common-Q portion of ELCS to the above version of the Regulatory Guide.

4. Regulatory Guide, 1.168 Revision 1 "Verification, Validation, Reviews and Audits for Digital Computer Software Used in the Safety Systems of Nuclear Power Plants" endorses IEEE-Std-1012 1998, "IEEE Standard for Software Verification and Validation" and IEEE-Std-1028 1997, "IEEE Standard for Software Reviews and Audits," with clarification described in the Regulatory Guide. STPNOC commits to STP 3&4-specific compliance of ELCS to Regulatory Guide 1.168 Revision 1.

5. Regulatory Guide, 1.209 Revision 0, "Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants" provides clarification and modification of IEEE-Std-323-2003, "IEEE Standard

for Qualifying Class 1E Equipment for Nuclear Power Generating Stations." STPNOC commits to IEEE-Std-7.4.3-2-2003 "IEEE Standard Criteria for Digital Computers in Safety Systems of Nuclear Power Operating Stations" and the above Regulatory Guide.

6. Regulatory Guide, 1.152 Revision 2 "Criteria for the Use of Computers in Safety Systems of Nuclear Power Plants" has been analyzed. The Regulatory Guide adds cyber security requirements to supplement IEEE Standard 7.4.3-2-2003. STPNOC is aware that draft Revision 3 was developed where the previous cyber security guidelines are modified into computer security guidelines, now referred to as SDOE (Secure Development and Operational Environment). This revision is now out for public comment. Also, STPNOC has committed to NRC Regulatory Guide 5.71, "Cyber Security Programs for Nuclear Facilities." This requirement will be implemented in COLA Revision 4, Part 8, "Security Plans," which conforms to the requirements of RG 5.71. STPNOC commits to Regulatory Guide 1.152, Revision 2 with the clarifications as noted below.

   A note will be added to Table 1.8-20 that states "D&IC Systems will be evaluated for compliance with revised cyber security guidance being developed by the NRC and industry as computer security guidance to be issued as Secure Development and Operational Environment (SDOE) in the context of requirements in Revision 3 to Regulatory Guide 1.152 (DG-1249)."

7. STPNOC commits to STP 3&4-specific compliance of ELCS to Regulatory Guide 1.180 Revision 1, "Guidelines for Evaluating Electromagnetic and Radio-Frequency Interference in Safety-Related Instrumentation and Control Systems."

The updates to the Regulatory Guides and industry codes and standards applicable to the STP 3&4 I&C design (including all of SSLC, Safety Systems Logic and Control), which were originally proposed to be included in COLA Revision 3 Table 1.8-20 and Table 1.8-21 in STPNOC letter U7-C-STP-NRC-100065, are provided below. These changes will be incorporated into a future revision of the COLA. Changes from COLA Revision 3 are highlighted in gray shading.

Table 1.8-20 NRC Regulatory Guides Applicable to ABWR

RG No.	Regulatory Guide Title	Appl. Rev.	Issued Date	ABWR Applicable?	Comments
[*1.53*	*Application of the Single-Failure Criterion to Safety Systems*[12]	*0*	*6/73*	*Yes*]	
[*1.75*	*Physical Independence of Electrical Safety Systems*	~~*2*~~ *3*	~~*9/78*~~ *2/05*	*Yes*][4]	
1.118	*Periodic Testing of Electric Power and Protection System*[12]	*2*	*6/78*	*Yes*	
[*1.152*	*Criteria for Programmable Digital Computer System Software in Safety-Related Systems of Nuclear Power Plants*[10]	~~*0*~~ *2*	~~*11/85*~~ *1/06*	*Yes*]	
1.168	Verification, Validation, Reviews and Audits for Digital Computer Software Used in Safety Systems of Nuclear Power Plants	1	2004	Yes	
1.169	Configuration Management Plans for Digital Computer Software Used in Safety Systems of Nuclear Power Plants	0	9/97	Yes	
1.170	Software Test Documentation for Digital Computer Software Used in Safety Systems of Nuclear Power Plants	0	9/97	Yes	
1.171	Software Unit Testing for Digital Computer Software Used in Safety Systems of Nuclear Power Plants	0	9/97	Yes	
1.172	Software Requirements Specifications for Digital Computer Software Used in Safety Systems of Nuclear Power Plants	0	9/97	Yes	
1.173	Developing Software Life Cycle Process for Digital Computer Software Used in Safety Systems of Nuclear Power Plants	0	9/97	Yes	
1.180	Guidelines for Evaluating Electromagnetic and Radio- Frequency Interference in Safety-Related Instrumentation and Control Systems Instrumentation and Control Systems[11]	1	10/03	Yes	
1.209	Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants	0	03/07	Yes	

Table 1.8-21 Industrial Codes and Standards* Applicable to ABWR

Code or Standard Number	Year	Title
Institute of Electrical and Electronics Engineers (IEEE)		
7-4.3.2	~~*1982*~~ 2003	*Standard Criteria for Digital Computers Used in Safety Systems of Nuclear Power Generation Stations*
[~~*279*~~	~~*1971*~~	~~*Criteria for Protection Systems for NPGS*~~] (3)(4)
[*323*†	*1974*	*Qualifying Class IE Equipment for NPGS*] (3)(4)(12)
[*338*†	*1977*	*Criteria for the Periodic SurveillanceTesting of NPGS Safety Systems*] (3)(9)(12)
379†	*1977*	*Standard Application of the Single-Failure Criterion to NPGS Safety Systems*(12)
[*384*†	~~*1981*~~ 1992	*Criteria for Independence of Class 1E Equipment and Circuits*] (3)
[*603*†	~~*1980*~~ 1991	*IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations, including the corrective sheet dated January 30, 1995*] (3)/(4)
665	1995	IEEE Guide for Generating Station Grounding
[*828*†	~~*1983*~~ 1990	*Standard for Software Configuration Management Plans*] (3)(4)
[*830*†	~~*1984*~~ 1993	*Recommended Practice for Software Requirements Specifications*] (3)(4)
1008	1987	Standard for Software Unit Testing
[*1012*†	~~*1986*~~ 1998	*Standard for Software Verification and Validation*] (3)(4)
1028	1997	Standard for Software Reviews and Audits
[*1050*	~~*1989*~~ 2004	*Guide for Instrumentation and Control Equipment Grounding in Generating Stations*] (3)(4)
1074	1995	Standard for Developing Software Life Cycle Processes

10 The DI&C Systems will be evaluated for compliance with revised cyber security guidance being developed by the NRC and industry as computer security guidance to be issued as Secure Development and Operational Environment (SDOE) in the context of requirements in Revision 3 to Regulatory Guide 1.152 (DG-1249).

11 RG 1.180 endorses IEEE 1050-1996. The digital instrumentation and controls systems conform to IEEE 1050-2004 as shown in Table 1.8-21.

12 The DI&C Systems will comply with current RG 1.53 Rev. 2 (11/03), RG 1.118 Rev. 3 (1995), IEEE 323-2003, IEEE 338-1987, and IEEE 379-2000.

Table 1.8-21a Codes and Standards for Site-Specific Systems

Code or Standard Number	Year	Title
Institute of Electrical and Electronics Engineers (IEEE)		
~~1050~~	~~2004~~	~~Guide for Instrumentation and Control Equipment Grounding in Generating Stations~~

In COLA Part 7, the description of STD DEP 1.8-1 is revised as shown:

STD DEP 1.8-1, Tier 2* Codes, Standards, and Regulatory Guide Edition Changes

Description

Tier 2, Table 1.8-20 lists reference ABWR DCD compliance with NRC regulatory guides. Table 1.8-21 lists applicability of industry codes and standards. This departure identifies Tier 2* items on these two tables that are being updated to more current revisions/editions. Those Tier 2 items that are explicitly revised in the COLA or require change due to changes in the Tier 2* items are also included.

~~Regulatory Guide 1.75, "Physical Independence of Electric Systems," Revision 3, dated 2/05; and Regulatory Guide 1.153, "Criteria for Power, Instrumentation, and Control Portions of Safety Systems," Revision 1, dated 6/96~~ Newer revisions of selected instrumentation and control-related Regulatory Guides are adopted to ensure that more recent industry design and construction practices are used.

~~The 1992 edition of IEEE 384 "Criteria for Independence of Class 1E Equipment and Circuits" is adopted.~~ IEEE 603 "Standard Criteria for Safety Systems for Nuclear Generating Stations" is updated to the 1991 version. Newer editions of other selected instrumentation and control-related industry codes and standards are adopted. These editions of the standards are currently endorsed by the NRC.

Mil-Specs for electromagnetic inference analysis and control are updated to more current versions as this field has advanced considerably since certification.

Current approved ASME code cases per Regulatory Guide 1.84, "Design and Fabrication Code Case," Revision 33, dated 8/05 may be used in the future. With this update, Regulatory Guide 1.85, "Materials Code Case Acceptability, ASME Section III, Division 1" on ASME material code cases is obsolete and has been deleted as it is now incorporated into Revision 33 of R.G. 1.84.

The American Concrete Institute code ACI 349 is updated to the 1997 edition. The ASME Section III Division 2 is updated to the 2001 edition with 2003 Addenda. These combined recognize advances in earthquake engineering and allows efficient use of modularization during construction. Note that ASME Section III Division 1 for piping is not changed from the 1989 edition. This departure also updates Tier 2 to refer to Regulatory Guides 1.136, "Materials, Construction, and Testing of Concrete Containments," Revision 3, dated 3/07, and Regulatory Guide1.142, "Safety-Related Concrete Structures for Nuclear Power Plants" to Revision 2, dated 11/01. Also, this departure updates Tier 2 to refer to the 2006 International Building Code (IBC), deleting the 1991 Uniform Building Code (UBC). This change incorporates the requirements of Texas building code which adopted 2006 IBC.