Nuclear Operating Company

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

April 19, 2010
U7-C-STP-NRC-100065

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, "Response to Request for Additional Information," dated September 24, 2009, U7-C-STP-NRC-090162 (ML092710226)

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 4/19/2010

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

jwc

Attachment:

Revised Response to RAI 07.01-14

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.

REVISED RESPONSE:

This response revises and replaces in entirety the response submitted in letter, Scott Head to Document Control Desk, "Response to Request for Additional Information," dated September 24, 2009, U7-C-STP-NRC-090162 (ML092710226). This revised response relocates information regarding the conformance to the Regulatory Guides and industry codes and standards that are applicable to I&C platform departures. This information was previously proposed to be included in existing FSAR Table 1.9S-1 and new Table 1.9S-1a. After further consideration, it was deemed more appropriate to include the new/revised information in existing FSAR Tables 1.8-20 and 1.8-21.

As described in the RAI, STPNOC letter U7-C-STP-NRC-090076 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, and that the two footnotes proposed for Tables 1.9S-1 and 1.9S-1a would not be incorporated. However, this statement needs to be clarified, as discussed below.

The Toshiba Field Programmable Gate Array (FPGA) platform is being used for the Neutron Monitoring System (NMS) and Reactor Trip and Isolation System (RTIS). Topical report UTLR-0001-P Rev. 0 referred to in STPNOC letter U7-C-STP-NRC-090009 has been withdrawn from NRC review. Instead, as previously communicated to the NRC, the Toshiba FPGA platform information will be provided in technical reports to be supplied for STP 3&4 as part of the DAC closure process. As such, the STP 3&4 COLA does not rely on approval of UTLR-0001-P. Therefore, reference to the UTLR-0001-P topical report is no longer relevant and will not be incorporated into the COLA.

The Westinghouse Common Q platform is being used for the Engineered Safety Feature (ESF) Logic and Control System (ELCS). The statement in STPNOC letter U7-C-STP-NRC-090076 that indicated that the design approval approach for the STP 3&4 safety-related digital I&C system does not rely on approval of the Common Q platform has been reviewed by STPNOC, and STPNOC is clarifying this statement to mean that STPNOC was not relying on an NRC approval of the Common-Q topical report as part of this COLA since the Common Q platform had been previously approved by the NRC for generic use. It has been STPNOC's continuing intent that the STP 3&4 ELCS platform is based on the NRC-approved Common Q topical report, WCAP-16097-P-A, Revision 0. Therefore, the reference to the Common Q topical report in STP 3&4 FSAR Table 1.9S-1 as provided in STPNOC letter U7-C-STP-NRC-090009 is still applicable, and will be included in the STP 3&4 COLA.

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 policy aims to minimize industry and NRC time and effort by providing for a streamlined review and approval of the safety-related subject with subsequent referencing in licensing actions, rather than repeated reviews of the same subject (ref: NRR Office Instruction LIC-500, "Processing Requests for Reviews of Topical Reports"). Per 10 CFR 52.79(a)(41), the COLA should address the Standard Review Plan in effect six months before the COLA docket date, and as such it is expected the departures to the certified design should address that SRP. However, 52.79(a)(41) also states, "Where a difference exists, the evaluation shall discuss how the proposed alternative provides an acceptable method of complying with the Commission's regulations, or portions thereof, that underlie the corresponding SRP acceptance criteria. The SRP is not a substitute for the regulations, and compliance is not a requirement." Further, SRP 7.3 (Revision 5, March 2007), which addresses ESF control systems, states in Section III, "The reviewer will select material from the procedures described ... typical reasons for non-uniform emphasis [in application of the SRP procedures] are ... the utilization in the design of features previously reviewed and found acceptable." The Common Q platform was previously reviewed and found acceptable, as documented in the applicable SERs, as described below. In its letter approving this topical report, the NRC stated that "We do not intend to repeat our review of the matters described in the report, and found acceptable, when the report appears as a reference in license applications, except to assure that the material presented is applicable to the specific plant involved." As such, for clarity the FSAR identifies the requirements to which this platform is approved, and these requirements are submitted as an acceptable alternate to current NRC guidance.

As part of the Common Q platform generic review process, the NRC issued Generic Open Items (GOIs) 7.1 thru 7.10. Subsequently, the NRC issued two SERs (NRC Safety Evaluation Report, "Safety Evaluation by the Office of Nuclear Reactor Regulation Related to the Westinghouse Common Q Platform Closeout of Generic Open Items and Approve Changes to Topical Report CENPD-396-P, Rev. 01, Common Qualified Platform", February 24, 2003. [ML030550776]; and NRC Safety Evaluation Report, "Safety Evaluation for the Closeout of Several of the Common Qualified Platform Category 1 Open Items Related to Reports CENPD-396-P, Revision 1 and CE-CES-195, Revision 1 (TAC No. MB0780)," June 22, 2001. [ML011690170]) that generically closed all of the GOIs, with the exception of GOI item 7.8. This GOI relates to the "level 3 loop controllers" referenced in the Common Q topical report integrated solution (Appendix 4). The level 3 loop controllers (LCs) provide component control based on signals from the ESF actuation system. The Component Interface Module (CIM) is being used to implement this function in the STP 3&4 ELCS. Westinghouse will be submitting a revision to the Common Q topical report to close GOI 7.8.

As part of the review process, the NRC also issued Plant Specific Action Items (PSAIs) 6.1 thru 6.14. These action items were provided by the NRC as a checklist for any utility that would be implementing a Common Q I&C system(s) upgrade. The PSAIs were written for an operating plant implementing a Common Q system(s) upgrade, therefore some of the language, may not directly be applicable to a new plant.

A technical report will be prepared that summarizes the resolution of the 10 GOIs, including GOI item 7.8, and the impact of the 14 PSAIs on the Common Q based STP 3&4 ELCS plant specific design. A technical report will also address any STP 3&4 specific design features that are required for implementation of the Common Q platform for ELCS for STP 3&4. The PSAIs and plant specific design features will be in accordance with the latest regulatory guides and codes and standards. These technical reports will be provided as part of DAC closure process.

In summary, the STP 3&4 ELCS platform is based on the NRC-approved Common Q topical report, WCAP-16097-P-A, Revision 0. The Common Q platform was previously reviewed and found acceptable, 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 PSAIs and plant specific design features will be in accordance with the latest 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 guide, codes and standards, is acceptable and appropriate for the STP 3&4 COLA.

The updates to the Regulatory Guides and industry codes and standards applicable to the departed I&C design, which were originally proposed to be included in existing Table 1.9S-1 and new Table 1.9S-1a in STPNOC letter U7-C-STP-NRC-090009, are provided below as changes to Tables 1.8-20 and 1.8-21. These changes, and the accompanying changes to Table 1.8-21a and

the Part 7 description of STD DEP 1.8-1, 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~~	~~0~~ 2	~~6/73~~ 11/03	~~Yes~~]	Rev 0 for ELCS[5]
[~~1.75~~	~~Physical Independence of Electrical Safety Systems~~	~~2~~ 3	~~9/78~~ ~~2/05~~	~~Yes~~][4]	Rev 2 for ELCS[5]
~~1.118~~	~~Periodic Testing of Electric Power and Protection System~~	~~2~~ 3	~~6/78~~ 1995	~~Yes~~	Rev 2 for ELCS[5]
[~~1.152~~	~~Criteria for Programmable Digital Computer System Software in Safety-Related Systems of Nuclear Power Plants~~	~~0~~ 2	~~11/85~~ ~~1/06~~	~~Yes~~][4]	Rev 1 for ELCS[5]
1.168	Verification, Validation, Reviews and Audits for Digital Computer Software Used in Safety Systems of Nuclear Power Plants	1	2004	Yes	Rev 0 for ELCS[5]
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[6]	1	10/03	Yes	Rev 0 for ELCS[5]
1.209	Guidelines for Environmental Qualification of Safety-Related Computer-Based Instrumentation and Control Systems in Nuclear Power Plants	0	03/07	Yes	See note 7 for ELCS

[5] The Common Q Digital Platform was submitted for generic use and was approved for reference as described in Topical Report WCAP-16097-P-A, Revision 0, "Common Qualified Platform Topical Report." This topical report includes the SERs dated August 11, 2000, June 22, 2001, and February 4, 2003, and is consistent with the referenced Regulatory Guide revisions identified in the comments. The Westinghouse "Software Program Manual for Common Q Systems" (SPM), WCAP-16096-NP-A also incorporates standards and Regulatory Guide requirements. The requirements that this platform were licensed to are submitted as an acceptable alternate to current requirements based on the original NRC review and SERs.

[6] 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.

[7] RG 1.209 endorses IEEE 323-2003. The ELCS conforms to IEEE 323-1983 as discussed in Note 5.

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 1993 for ELCS[10]	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[T]	~~1974~~ 2003 1983 for ELCS[10]	Qualifying Class IE Equipment for NPGS][(3)(4)(7)]
[338[T]	~~1977~~ 1987	Criteria for the Periodic Surveillance Testing of NPGS Safety Systems][(3)(9)]
379[T]	~~1977~~ 2000 1994 for ELCS[10]	Standard Application of the Single-Failure Criterion to NPGS Safety Systems
[384[T]	~~1981~~ 1992	Criteria for Independence of Class 1E Equipment and Circuits][(3)]
[603[T]	~~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[T]	~~1983~~ 1990	Standard for Software Configuration Management Plans][(3)(4)]
[830[T]	~~1984~~ 1993	Recommended Practice for Software Requirements Specifications][(3)(4)]
1008	1987	Standard for Software Unit Testing
[1012[T]	~~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 Common Q Digital Platform was submitted for generic use and was approved for reference as described in Topical Report WCAP-16097-P-A, Revision 0, "Common Qualified Platform Topical Report." This topical report includes the SERs dated August 11, 2000, June 22, 2001, and February 4, 2003, and is consistent with the industry standards that reference Note 10. The Westinghouse "Software Program Manual for Common Q Systems" (SPM), WCAP-16096-NP-A also incorporates standards and Regulatory Guide requirements. The requirements that this platform were licensed to are submitted as an acceptable alternate to current requirements based on the original NRC review and SERs.

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.