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

ABWR

March 3, 2010
U7-C-STP-NRC-100056

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 No. 52-001
Response to Request for Additional Information

Reference: Letter, Mark McBurnett to Document Control Desk, "Application to Amend the Design Certification Rule for the U.S. Advanced Boiling Water Reactor (ABWR)," dated June 30, 2009, U7-C-STP-NRC-090070 (ML092040048).

This letter provides the response to Request for Additional Information (RAI) Letter Number 12 question 03.02.02-1 related to the application to amend the ABWR DCD Amendment Part 2, Tier 2, Section 3.2.

In addition, revised responses to RAIs 07.07-1, 07.07-2, and 07.07-3 are provided, as requested by the NRC Staff during a meeting on January 27, 2010, and replace the previous responses in their entirety. This submittal completes the responses to these RAIs.

The attachments to this letter provide the following RAI question response and revised responses:

03.02.02-1 07.07-1 Revision 1 07.07-2 Revision 1 07.07-3 Revision 1

Changes will be incorporated into the next update of the ABWR DCD Amendment request after review by the NRC Staff.

There are no commitments in this letter.

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

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NRD

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

Executed on 3/3/10

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

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Attachments:

1. Question 03.02.02-1
2. Question 07.07-1 Revision 1
3. Question 07.07-2 Revision 1
4. Question 07.07-3 Revision 1

cc: w/o attachments and enclosure except*
(paper copy)

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RAI 03.02.02-1

QUESTION:

The SSCs included in Table 3.2-1 do not appear to be complete. The nitrogen supply line, nitrogen bottle and AFI system outside the pump house do not appear to be included in updated Table 3.2-1. Review the SSCs being added in the AIA and update the 3.2-1 classification table to include SSCs shown on the P&IDs.

RESPONSE:

Because the additional nitrogen gas supply system as described in the initial DCD amendment application submittal is not required to meet the AIA rule, that system is being removed from the DCD amendment application, and consequently, all of the DCD amendment application markups associated with that change are being deleted (reference the markup attached to the response to RAI 06.02.04-1). As a result, there will no longer be a DCD amendment application change requiring an additional nitrogen supply line or nitrogen bottle as described in this RAI.

The non-safety related alternate feedwater injection (AFI) pump, valves and piping were already added to DCD Tier 2 Table 3.2-1 in the amendment application previously submitted. However, that submittal did not include identification of the AFI instrument lines and instruments as being safety-related. These lines and instruments are the only safety-related SSCs associated with the AFI system. The safety classification of the instrumentation and piping for the AFI system is the same as that for the existing instrumentation to which it is connected. The markup to DCD Tier 2 Table 3.2-1 below reflects the addition of these instrument lines and instruments. Changes to the DCD from the previous amendment application submittal are shown with gray shading.

Table 3.2-1 Classification Summary (Continued)

Principal Component[a]	Safety Class[b]	Location[c]	Quality Group Classi-fication[d]	Quality Assurance Require-ment[e]	Seismic Category[f]	Notes
P23 Alternate Feedwater Injection System						
1. Pumps, Valves, Piping (except instrumentation)	N	A	-	E	-	
2. Piping including supports – instrumentation up to and beyond outermost isolation valves (part of NBS)	2/N	SC	B/D	B/E	I/-	(g)
3. Instrumentation piping including supports and valves forming part of containment boundary – (part of ACS)	2	SC	B	B	I	

RAI 07.07-1 Revision 1

QUESTION:

Subsection 7.7.1.1 of ABWR Design Certification Rule (DCR) application references Chapter 9.5.14 in the description of the reactor water level instrumentation provided for the Alternate Feedwater Injection System. Subsection 9.5.14.4 reads: "*...The instrument lines to be used for monitoring the alternate feedwater injection are branched from the existing line and are connected to new level and pressure transmitters*".

GDC 24 "Separation of protection and control systems" reads "*The protection system shall be separated from control systems to the extent that failure of any single control system component or channel, or failure or removal from service of any single protection system component or channel which is common to the control and protection systems leaves intact a system satisfying all reliability, redundancy, and independence requirements of the protection system. Interconnection of the protection and control systems shall be limited so as to assure that safety is not significantly impaired*".

The staff request the applicant to clarify how and where the connection is made from which the AFI system gets its instrumentation signals and to demonstrate that the instrumentation included in the new AFI system does not create any potential for inadvertent actuation or creates challenges to current safety systems.

RESPONSE:

The instrumentation connections for the AFI system are shown in the marked-up drawings for FSAR Figure 5.1-3, Sheet 5 provided in the original amendment application submittal and in updated Figure 6.2-39, Sheets 2 and 3, attached to this RAI, which supersedes the Figure 6.2-39 markups provided in the original submittal. There are no automated control systems or functions for the AFI system, because it is a manually operated system. The instrumentation for the AFI system only includes indicators that are for operator information. In addition, the water level and pressure instrumentation in the AFI pump room uses separate transmitters and power supply from existing instrumentation. As noted in the response to RAI 03.02.02-1, the safety classification of the instrumentation and piping for the AFI system is the same as that for the existing instrumentation to which it is connected. Those requirements are identified in a mark-up to Table 3.2-1 which is included with that response. Consequently, the AFI system does not create any potential for inadvertent actuation or challenges to current safety systems.

As a result of this RAI, the DCD amendment application is being revised as shown below. These changes include correction of the markup to Section 7.7 in the original DCD amendment application submittal to remove the AFI system from the list of non-safety-related control systems in Subsection 7.7.1.11 and 7.7.2.11, because the AFI system has no control function.

7.7.1.11 Other Non-Safety-Related Control Systems

The following non-safety-related control systems are described in other Tier 2 subsections as indicated.

System	Subsection
Fire Protection	9.5.1
Offgas/Radwaste	11.2, 11.3, 11.4
Drywell Cooling	9.4.8
Sampling	9.3.2
Instrument Air	9.3.6
Makeup Water	9.2.3
Atmospheric Control	6.2.5
~~Alternate Feedwater Injection~~	~~9.5.14~~

7.7.2.11 Other Non-Safety-Related Control Systems

The following non-safety-related control systems are described in other subsections of the SSAR as indicated.

System	Subsection
Fire Protection	9.5.1
Offgas/Radwaste	11.2, 11.3, 11.4
Drywell Cooling	9.4.8
Sampling	9.3.2
Instrument Air	9.3.6
Makeup Water	9.2.3
Atmospheric Control	6.2.5
Reactor Water Cleanup	5.4.8
~~Alternate Feedwater Injection~~	~~9.5.14~~

9.5.14.4 Instrumentation Requirements

The AFI Instrument Rack is located in Room 314 of Floor B1F of the Reactor Building. The instrument lines, instrument rack and cables in the Reactor Building are protected from fire and shock. The AFI Instrument Rack is shock-mounted. Fire protection of instrument lines is achieved by protecting the instrument penetration room. Fire resistant cabling with at least 3 hour fire rating is used. The instrument lines to be used for monitoring the alternate feedwater injection are branched from the existing line and are connected to new level and pressure transmitters. The safety classification of the instrumentation and piping for the AFI system is the same as that for the existing instrumentation to which it is connected and is identified in Table 3.2-1. The additional transmitters for RPV water level, RPV pressure and wetwell WR pressure as well as the suppression pool water level

transmitter are installed in a room which is protected from fire effects. The room protection is achieved by additional fire doors or modification of fire doors to water-tight doors. In the unlikely event of an instrument line break, the break flow is limited by the small size of the instrument line orifice and is accounted for in the specified capacity for the AFI pump.

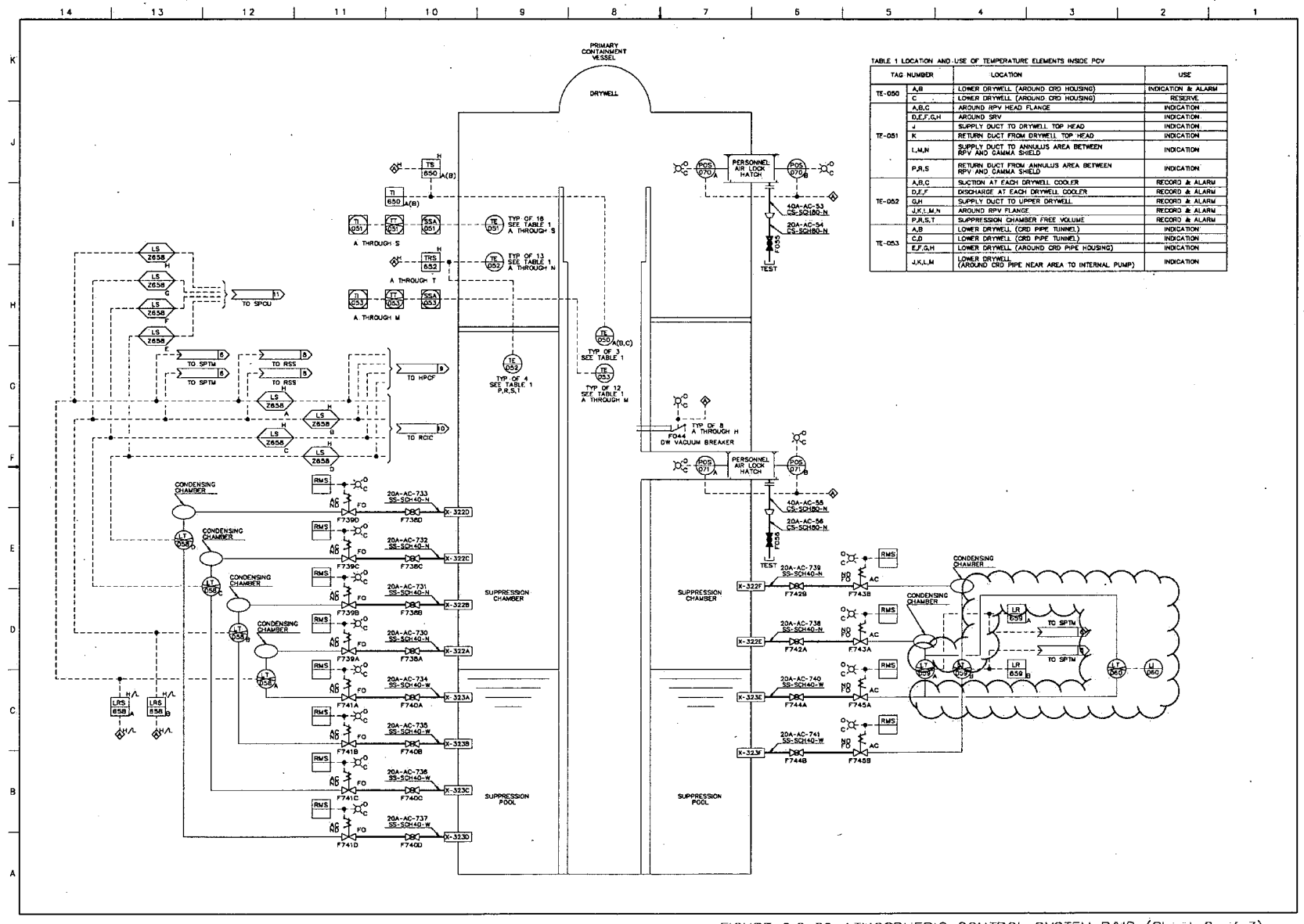

TABLE 1 LOCATION AND USE OF TEMPERATURE ELEMENTS INSIDE PCV

TAG NUMBER		LOCATION	USE
TE-050	A,B	LOWER DRYWELL (AROUND CRD HOUSING)	INDICATION & ALARM
	C	LOWER DRYWELL (AROUND CRD HOUSING)	RESERVE
TE-051	A,B,C	AROUND RPV HEAD FLANGE	INDICATION
	D,E,F,G,H	AROUND SRV	INDICATION
	J	SUPPLY DUCT TO DRYWELL TOP HEAD	INDICATION
	K	RETURN DUCT FROM DRYWELL TOP HEAD	INDICATION
	L,M,N	SUPPLY DUCT TO ANNULUS AREA BETWEEN RPV AND GAMMA SHIELD	INDICATION
	P,R,S	RETURN DUCT FROM ANNULUS AREA BETWEEN RPV AND GAMMA SHIELD	INDICATION
TE-052	A,B,C	SUCTION AT EACH DRYWELL COOLER	RECORD & ALARM
	D,E,F	DISCHARGE AT EACH DRYWELL COOLER	RECORD & ALARM
	G,H	SUPPLY DUCT TO UPPER DRYWELL	RECORD & ALARM
	J,K,L,M,N	AROUND RPV FLANGE	RECORD & ALARM
	P,R,S,T	SUPPRESSION CHAMBER FREE VOLUME	RECORD & ALARM
TE-053	A,B	LOWER DRYWELL (CRD PIPE TUNNEL)	INDICATION
	C,D	LOWER DRYWELL (CRD PIPE TUNNEL)	INDICATION
	E,F,G,H	LOWER DRYWELL (AROUND CRD PIPE HOUSING)	INDICATION
	J,K,L,M	LOWER DRYWELL (AROUND CRD PIPE NEAR AREA TO INTERNAL PUMP)	INDICATION

FIGURE 6.2-39 ATMOSPHERIC CONTROL SYSTEM P&ID (Sheet 2 of 3)
ABWR DCD/Tier 2 *Rev.5*

21-121

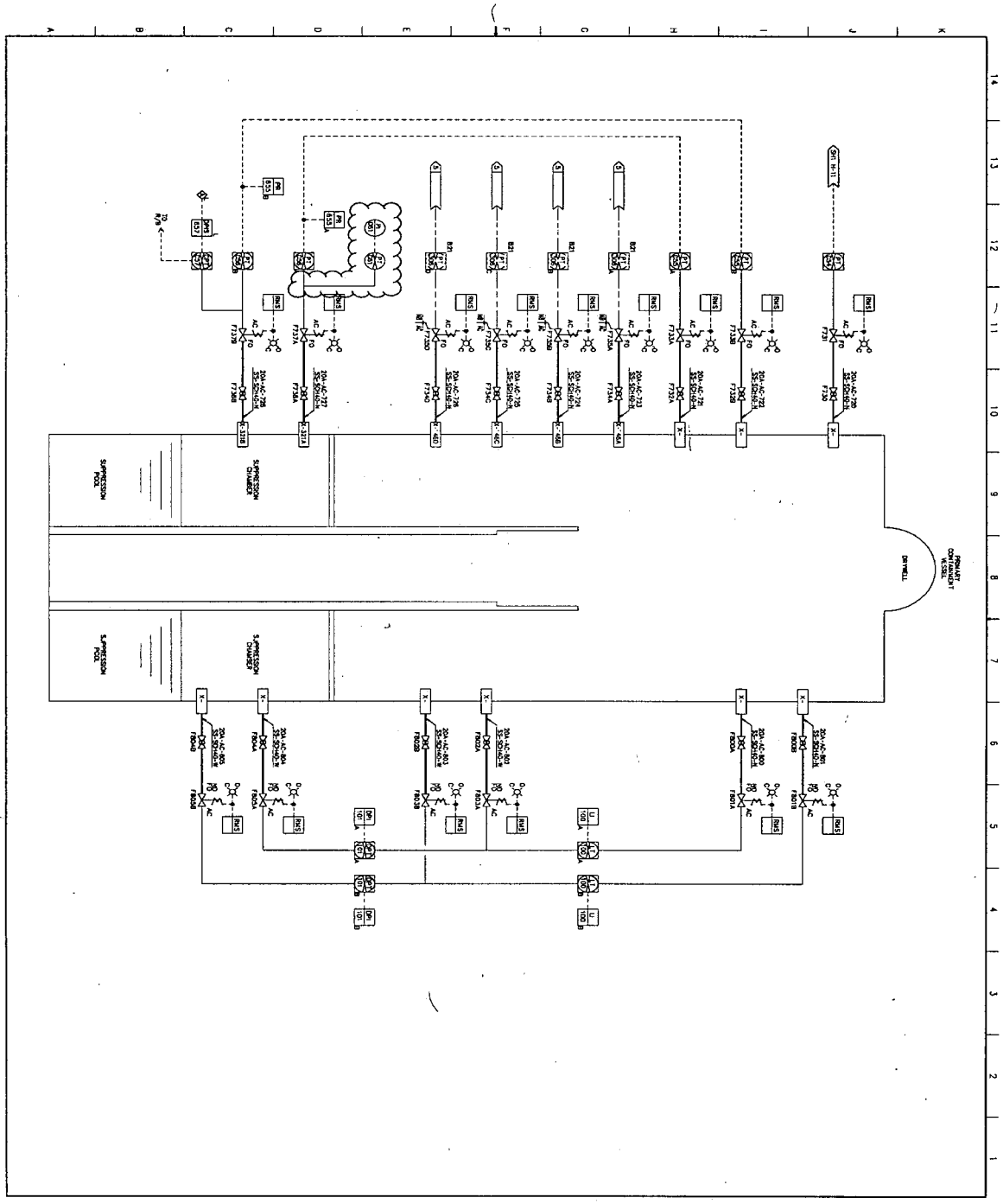

FIGURE 6.2-39 ATMOSPHERIC CONTROL SYSTEM P&ID (Sheet 3 of 3)
ABWR DCD/Tier 2 Rev.5

RAI 07.07-2 Revision 1

QUESTION:

In NUREG -0800, Chapter 7.7, Section III, Review Procedures, Paragraph 1, "Use of digital systems", it reads "*...control system software should be developed using a structured process similar to that applied to safety system software. ...*".

The staff recognizes that the applicant states that the AFI system is non safety related and as described in Subsection 9.5.14.2, it *...provides enhanced safety during and after beyond design basis events.* However, similar to the ATWS Rule, the I&C components should be designed to sufficient quality. If the AFI I&C system is intended to be software based, the applicant should provide the software QA that would be utilized for developing the I&C system.

RESPONSE:

The AFI system is not a software-based system. It is a hard-wired system that is manually initiated only. There is no control function associated with this system. All instrumentation is for indication only.

There are no additional DCD amendment application changes required as a result of this response.

RAI 07.07-3 Revision 1

QUESTION:

10 CFR 52.47(b)(1) requires that a DC application contain "... *proposed inspections, tests, analyses, and acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, a facility that incorporates the design certification has been constructed and will be operated in conformity with the design certification, the provisions of the Atomic Energy Act, and the commission's rule and regulations...*"

In the application to amend the Design Certification for the US ABWR, the applicant should provide the ITAAC used to demonstrate that the I&C included in the AFI system does not adversely affect the plant safety systems and is adequately isolated from the said safety systems.

RESPONSE:

The AFI system is a manually-operated, non-safety related system. All of the instrumentation for the AFI system is for operator information only. There are no automated control functions associated with the instrumentation for this system. As noted in the response to RAI 03.02.02-1, the safety classification of the instrumentation and piping for the AFI system is the same as that for the existing instrumentation to which it is connected. Those requirements are identified in a mark-up to Table 3.2-1 which is included with that response. Consequently, there is no possibility that the AFI system instrumentation can adversely affect the plant safety systems. Because there is no automated function associated with this instrumentation and it is also a non-safety related system, no ITAAC is necessary to demonstrate that the AFI instrumentation is adequately isolated from the safety systems.

DCD amendment application changes required as a result of this response are included with the response to the revision to RAI 07.07-1.