Nuclear Operating Company

South Texas Project Electric Generating Station 4000 Avenue F – Suite A Bay City, Texas 77414

September 21, 2009
U7-C-STP-NRC-090150

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
Response to Request for Additional Information

Attached are the responses to the NRC staff questions included in Request for Additional Information (RAI) letter number 215 related to Combined License Application (COLA) Part 2, Tier 2, Section 14.3.2.

Attachments 1 through 8 address the responses to the RAI questions listed below:

RAI 14.03.02-1	RAI 14.03.02-5
RAI 14.03.02-2	RAI 14.03.02-6
RAI 14.03.02-3	RAI 14.03.02-7
RAI 14.03.02-4	RAI 14.03.02-8

When a change to the COLA is indicated, it will be incorporated in the next routine revision of the COLA following the NRC acceptance of the RAI response.

There are no commitments in this letter.

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

STI 32536114

D091
NRO

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

Executed on 9/24/09

Scott Head
Manager, Regulatory Affairs
South Texas Project Units 3 & 4

jep

Attachments:

1. RAI 14.03.02-1
2. RAI 14.03.02-2
3. RAI 14.03.02-3
4. RAI 14.03.02-4
5. RAI 14.03.02-5
6. RAI 14.03.02-6
7. RAI 14.03.02-7
8. RAI 14.03.02-8

cc: w/o attachment except*
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RAI 14.03.02-1

QUESTION:

STP Unit 3 & 4 FSAR 14.3S - Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) stated that "The selection criteria and methodology provided in Section 14.3 of the reference ABWR DCD for the certified ABWR design were utilized as the site-specific selection criteria and methodology for inspections, tests, analyses, and acceptance criteria including those applicable to the emergency planning and physical security hardware. In general, the ITAAC for site-specific systems were developed to correspond to the interface criteria in Tier 1 of the reference ABWR DCD." The applicant is requested (a) to explain the basis for the use of the phrase "in general," (e.g., Are there any exceptions taken?) and (2) to provide a screening summary table relating pertinent ABWR DCD interface requirements vs. STP 3 and 4 FSAR ITAAC actions taken in addressing the interface requirements for site-specific structures.

RESPONSE:

COLA Part 9, Section 3.0, "Site-Specific ITAAC," includes Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) tables corresponding to each of the ten (10) systems identified in DCD (Tier 1), Section 4.0, "Interface Requirements." The phrase "in general" is appropriate since Part 9 of the COLA also includes ITAAC for systems, structures, or components which are not addressed in DCD (Tier 1), Section 4.0 (i.e., Table 3.0-11, "Backfill under Category 1 Structures," and Table 3.0-12, "Breathing Air System (BAS)"). The site-specific ITAAC also reflect standard departures discussed in the COLA as noted in Table 1 below.

Table 1 provides the requested summary comparison. The table presents the specific interface requirements identified in DCD (Tier 1), Section 4.0 (either directly or by reference to other DCD Tier 1 sections) and the corresponding entries from the Design Requirements column of the ITAAC tables contained in COLA Part 9, Section 3.0. Additional detail relative to the specific tests and acceptance criteria associated with these design requirements is contained in the referenced tables in COLA Part 9, Section 3.0. Exceptions noted in this comparison table include:

- DCD (Tier 1), Section 4.0 identifies an interface requirement for the Reactor Service Water (RSW) System related to anti-siphon capability to prevent Control Building flooding after an RSW System pipe break and after the RSW System pumps have been stopped. Vacuum breaker valves have been removed from the STP Units 3 and 4 design as discussed in departure STP DEP 19R-1. Due to this departure, this interface requirement is not applicable to STP Units 3 and 4 and no corresponding ITAAC are provided in COLA Part 9, Section 3.0.
- DCD (Tier 1), Section 4.0 identifies interface requirements for the Heating, Ventilating and Air Conditioning System relative to toxic gas monitors. Toxic gas monitors are not included in the STP Units 3 and 4 design as discussed in departure STP DEP 9.4-1. Due

to this departure, this interface requirement is not applicable to STP Units 3 and 4 and no corresponding ITAAC are provided in COLA Part 9 Section 3.0.

- The response to RAI 09.02.04-6 (see letter U7-C-STP-NRC-090104 dated August 20, 2009) deletes the site-specific ITAAC for the Makeup Water Preparation (MWP) System. As discussed in the response, an ITAAC for the MWP System is unnecessary since the MWP System is not safety-related or important to safety and the components of the MWP System do not interact directly with safety-related structures, systems, and components (SSCs) and are not co-located with safety-related SSCs.

No additional COLA change is required for this response.

Table 1 – Comparison of DCD Tier 1 Interface Requirements and Site-Specific ITAAC Design Requirements[1]

Ultimate Heat Sink	
DCD Tier 1 Interface Requirement(s) – Section 4.1	**COLA Part 9 Section 3.0 Design Requirement - Table 3.0-1**
"(1) Provide cooling water to the RSW System for normal plant operation and to permit safe shutdown and cooldown of the plant and maintain the plant in a safe shutdown condition for design basis events."	"1. The basic configuration of the UHS is as shown on Figure 3.0-1."
"(2) Makeup water for the UHS shall not be required for at least 30 days following a design basis accident."	"2.(a) The UHS has sufficient cooling water to supply the RSW system for normal plant operation and to permit safe shutdown and cooldown of the plant and maintain the plant in a safe shutdown condition for design-basis events. 2.(b) Makeup water to the UHS shall not be required for at least 30 days following a design-basis accident."
"(3) Any active safety-related system, structure, or components within the UHS shall have three divisions powered by their respective Class 1E divisions. Each division shall be physically separated and electrically independent of the other divisions."	"3.(a) Active safety-related SSCs within the UHS shall have three divisions powered by their respective Class 1E divisions. 3.(b) Each division shall be physically separated. 3.(c) Each division shall be electrically independent of the other divisions."
"(4) UHS System Divisions A and B components shall have control interfaces with the Remote Shutdown System (RSS) as required to support UHS operation during RSS design basis conditions."	"4. Displays and controls in the main control room and remote shutdown system (RSS) are provided for required functions of the UHS system."
"(5) Be classified as Seismic Category I."	"5. The UHS is able to withstand the structural design-basis loads."

[1] ITAAC Design Requirements are taken from COLA Revision 2

Table 1 – Comparison of DCD Tier 1 Interface Requirements and Site-Specific ITAAC Design Requirements (cont.)

Offsite Power System	
DCD Tier 1 Interface Requirement(s) – Section 4.2 and reference Section 2.12.1	**COLA Part 9 Section 3.0 Design Requirement - Table 3.0-2**
"The offsite system shall consist of a minimum of two independent offsite transmission circuits from the TN."	"1. There is redundancy and independence in the offsite power system."
"Voltage variations of the offsite TN during steady state operation shall not cause voltage variations at the loads of more than plus or minus 10% of the loads nominal ratings."	"2. Site loads are protected from offsite voltage variations during steady-state operation."
"The normal steady state frequency of the offsite TN shall be within plus or minus 2 hertz of 60 hertz during recoverable periods of system instability."	"3. Site loads are protected from offsite frequency variations."
"The offsite transmission circuits from the TN through and including the main step-up power transformers and RAT(s) shall be sized to supply their load requirements, during all design operating modes, of their respective Class 1E divisions and non-Class 1E load groups."	"4. The offsite power system is adequately sized to supply necessary load requirements, during all design operating modes."
"The impedances of the main step-up power transformers and RAT(s) shall be compatible with the interrupting capability of the plant's circuit interrupting devices."	"5. The impedance of the offsite power system shall be compatible with the interrupting capability of the plants circuit interrupting devices."
"The independence of offsite transmission power, instrumentation, and control circuits shall be compatible with the portion of the offsite transmission power, instrumentation, and control circuits within GE's design scope."	"6. The offsite transmission power, instrumentation and control circuits are independent."
"Instrumentation and control system loads shall be compatible with the capacity and capability design requirements of DC systems within GE's design scope."	"7. Instrumentation and control system loads shall be compatible with the capacity and capability design requirements of the DC systems."

Table 1 – Comparison of DCD Tier 1 Interface Requirements and Site-Specific ITAAC Design Requirements (cont.)

Makeup Water Preparation System	
DCD Tier 1 Interface Requirement(s) – Section 4.3	**COLA Part 9 Section 3.0 Design Requirement - Table 3.0-3**
"A site-specific MWP System will be designed for any facility which has adopted the Certified Design to provide demineralized water to the MUWP System."	"1. The Makeup Water Preparation (MWP) System provides sufficient quantity and quality to meet plant demands during normal operations." NOTE: The response to RAI 09.02.04-6 (see letter U7-C-STP-NRC-090104 dated August 20, 2009) deletes the ITAAC for the Makeup Water Preparation System and incorporates the phrase "No entry for this system" in Table 3.0-3.

Potable and Sanitary Water System	
DCD Tier 1 Interface Requirement(s) – Section 4.4 and reference to Section 2.11.23)	**COLA Part 9 Section 3.0 Design Requirement - Table 3.0-4**
"None for this system."	"No entry for this system"

Table 1 – Comparison of DCD Tier 1 Interface Requirements and Site-Specific ITAAC Design Requirements (cont.)

Reactor Service Water System	
DCD Tier 1 Interface Requirement(s) – Section 4.5 and reference to Section 2.11.9	**COLA Part 9 Section 3.0 Design Requirement - Table 3.0-5[2]**
"(1) Design features shall be provided to limit the maximum flood height to 5.0 meters in each RCW heat exchanger room."	"1. The basic configuration of the site-specific RSW is as shown on Figure 3.0-1. 2. Each division is sized to prevent flooding greater than 5 meters above the floor level in each RCW heat exchanger room."
"(2) The design shall have three divisions which are physically separated. For any structure(s) housing RSW System components, there shall be inter-divisional boundaries (including walls, floors, doors and penetrations) that have three-hour fire rating. In addition, there shall be inter-divisional flood control features which preclude flooding from occurring in more than one division. Each division shall be powered by its respective Class 1E division. Each division shall be capable of removing the design heat capacity (as specified in Section 2.11.3) of the RCW heat exchangers in its division."	"3.(a) Active safety-related SSCs within the RSW shall have three divisions powered by their respective Class 1E divisions. 3.(b) Each division shall be physically separated. 3.(c) Each division shall be electrically independent of the other divisions. 3.(d) Each division shall be capable of removing the design basis heat load of the RSW heat exchangers in that division. 3.(e) Interdivisional flood control shall be provided to preclude flooding in more than one division"
"(3) Upon receipt of a loss-of-coolant (LOCA) signal, components in standby mode shall start and/or align to the operating mode."	"4. On a LOCA and/or LOPP signal, any closed valves for standby heat exchangers are automatically opened and the standby pumps automatically start."

[2] The response to RAI 09.02.01-6 (see letter U7-C-STP-NRC-090133 dated September 8, 2009) incorporates a new ITAAC to verify sufficient RSW pump net positive suction head.

Table 1 – Comparison of DCD Tier 1 Interface Requirements and Site-Specific ITAAC Design Requirements (cont.)

Reactor Service Water System (cont.)	
DCD Tier 1 Interface Requirement(s) – Section 4.5 and reference to Section 2.11.9	**COLA Part 9 Section 3.0 Design Requirement - Table 3.0-5[3]**
"(4) RSW System Divisions A and B shall have control interfaces with the Remote Shutdown System (RSS) as required to support RSW operation during RSS design basis conditions."	"5. Displays and controls in the main control room and RSS are provided for required functions of the RSW system." NOTE: The response to RAI 14.03.05-2 (see letter U7-C-STP-NRC-090028 dated April 2, 2009) deletes the ITAAC due to redundancy with ITAAC Items 7 and 8 in Tier 1, ITAAC Table 2.11.9.
"(5) If required by the elevation relationships between the UHS and the RSW System components in the Control Building (C/B), the RSW System shall have antisiphon capability to prevent a C/B flood after an RSW System break and after the RSW System pumps have been stopped."	"6. Not Used" NOTE: Departure STP DEP 19R-1 discusses the removal of RSW vacuum breaker valves from the Units 3 and 4 design. Therefore, there are no site-specific ITAAC corresponding to the associated DCD interface requirement.
"(6) RSW System pumps in any division shall be tripped on receipt of a signal indicating flooding in that division of the C/B basement area."	"7. For each division of RSW the heat exchanger inlet and outlet valves close, the pumps trip, and the isolation valves close upon receipt of a signal indicating Control Building flooding in that division."
"(7) Any tunnel structures used to route RSW System piping to the Control Building shall be classified as Seismic Category I. Tunnel flooding due to site flood conditions shall be precluded."	"8. Tunnel structures used to route piping are designed for design basis seismic loads and are protected against site flooding."

[3] The response to RAI 09.02.01-6 (see letter U7-C-STP-NRC-090133 dated September 8, 2009) incorporates a new ITAAC to verify sufficient RSW pump net positive suction head.

Table 1 – Comparison of DCD Tier 1 Interface Requirements and Site-Specific ITAAC Design Requirements (cont.)

Turbine Service Water System	
DCD Tier 1 Interface Requirement(s) – Section 4.6 and reference to Section 2.11.10	**COLA Part 9 Section 3.0 Design Requirement - Table 3.0-6**
"None identified for this system."	"No entry for this system."

Communication System	
DCD Tier 1 Interface Requirement(s) – Section 4.7 and reference to Section 2.12.16	**COLA Part 9 Section 3.0 Design Requirement - Table 3.0-7**
"An emergency communication system for off-site communication shall be provided."	"No entry for this system." NOTE: ITAAC for the emergency communication system are included in COLA Part 9, Section 4.0, "Emergency Planning ITAAC." The response to RAI 14.03.02-2 replaces "No entry for this system" with a reference to COLA Part 9, Section 4.0.

Site Security	
DCD Tier 1 Interface Requirement(s) – Section 4.8	**COLA Part 9 Section 3.0 Design Requirement - Table 3.0-8**
"Provisions for site security are not within the Certified Design and will be provided by each licensee on a site-specific basis."	"No entry for this system." NOTE: ITAAC for the site security system are included in COLA Part 9, Section 5.0, "Physical Security ITAAC." The response to RAI 14.03.02-2 proposes to replace "No entry for this system" with a reference to COLA Part 9, Section 5.0.

Table 1 – Comparison of DCD Tier 1 Interface Requirements and Site-Specific ITAAC Design Requirements (cont.)

Circulating Water System	
DCD Tier 1 Interface Requirement(s) – Section 4.9 and reference to Section 2.10.23	**COLA Part 9 Section 3.0 Design Requirement - Table 3.0-9**
"(1) Design features shall be provided to limit flooding in the Turbine Building."	"1. The circulating water condenser valves are closed in the event of a system isolation signal from the condenser area flood level switches."

Heating, Ventilating and Air Conditioning	
DCD Tier 1 Interface Requirement(s) – Section 4.10 and reference to Section 2.15.5	**COLA Part 9 Section 3.0 Design Requirement - Table 3.0-10**
"Toxic gas monitors will be located in the outside air intakes of the CRHA HVAC System, if the site is adjacent to toxic gas sources with the potential for releases of significance to plant operating personnel in the MCAE. These monitors should have the following requirements: (1) Be located in the outside air intakes of each division of the CRHA HVAC System. (2) Be capable of detecting toxic gas concentrations at which personnel protective actions must be initiated."	"No entry for this system." NOTE: Interface requirements related to toxic gas monitors are not applicable to Units 3 and 4 due to a departure. As described in departure STP DEP 9.4-1, instrumentation to detect and alarm a hazardous chemical release in the Units 3 and 4 vicinity and to isolate the main control area envelope from such releases is not required.

Table 1 – Comparison of DCD Tier 1 Interface Requirements and Site-Specific ITAAC Design Requirements (cont.)

Backfill under Category 1 Structures	
N/A	**COLA Part 9 Section 3.0 Design Requirement - Table 3.0-11**
None	"1.Backfill under Category 1 structures is compacted to not less than 95% of maximum dry density and within plus or minus 3% of the optimum moisture content." NOTE: The response to RAI 14.03.02-6 revises the ITAAC to provide additional detail requested by the RAI.

Breathing Air System	
N/A	**COLA Part 9 Section 3.0 Design Requirement - Table 3.0-12**
None NOTE: The DCD does not include specific interface requirements for the Breathing Air System (BAS). In the certified design (DCD (Tier 2) Section 9.3.7), the Service Air System (SAS) provides the breathing air function. DCD (Tier 1), Section 2.11.11 provides ITAAC for the certified design SAS. Departure STD DEP 9.3-2, as revised in COLA Revision 2, moves the design basis function of providing plant breathing air from the SAS to a new standalone system – the BAS. This departure included new Table 3.0-12 in Part 9 of COLA Revision 2 that contains two ITAAC items for the new standalone BAS.	"1. The Basic BA System containment penetration has one locked closed isolation valve inside and one locked closed isolation valve outside containment. 2. The ASME Code components of the BA System retain their pressure boundary integrity under internal pressures that will be experienced during service." NOTE: The response to RAI 03.02.01-3 (see letter U7-C-STP-NRC-090096 dated August 6, 2009) revises the first of these two ITAAC items to ensure that the as-built BAS containment isolation components will operate in conformity with the combined license and NRC regulations. With this revision, the scope and content of the two BAS ITAAC items are substantively the same as the applicable ITAAC items previously approved by the NRC in ABWR DCD Tier 1 for the SAS.

RAI 14.03.02-2

QUESTION:

ITAAC tables in COLA Part 9 Section 3.0 have been established in two different ways: some of the non-safety related systems have entries (e.g., Table 3.0-3 makeup Water Preparation System (MWP) and Table 3.0-9 Circulating Water System (CW)), while others are designated with "No entry for this system". Explain the reasons for using two different approaches.

RESPONSE:

Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) tables in COLA Part 9, Section 3.0, "Site-Specific ITAAC," were established corresponding to specific interface requirements identified in DCD (Tier 1), Section 4.0, "Interface Requirements," regardless of the safety classification of the system. The systems addressed in DCD (Tier 1), Section 4.0 are those systems identified in DCD (Tier 2), Section 1.1.2, "ABWR Standard Plant Scope," as outside of the scope of the certified design, either in whole or in part. COLA Part 9, Section 3.0 includes a table corresponding to each system identified in DCD (Tier 1), Section 4.0. Table 1 of the response to NRC RAI 14.03.02-1 demonstrates the correlation between DCD (Tier 1), Section 4.0 interface requirements and the site-specific ITAAC tables in COLA Part 9, Section 3.0.

With the exceptions discussed below, the designation of "No entry for this system" is used in instances when the DCD (Tier 1) explicitly states that there are no interface requirements associated with a system. For example, DCD (Tier 1), Section 4.0 specifies that the Turbine Service Water System and the Potable and Sanitary Water System have no interface requirements. Accordingly, COLA Part 9, Section 3.0 includes tables for these systems with the notation "No entry for this system," and the introductory text in COLA Part 9, Section 3.0 does not include these systems in the list of site-specific systems that require ITAAC. This convention is in accordance with the guidance in Regulatory Guide (RG) 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," Section C.III.7.2.

In the two examples cited in this RAI (i.e., Makeup Water Preparation and Circulating Water), DCD (Tier 1), Section 4.0 does not explicitly state that there are no interface requirements (e.g., DCD (Tier 1), Section 4.0 contains interface requirements, either directly or by reference to other DCD sections), and the corresponding tables in COLA Part 9, Section 3.0 currently contain ITAAC requirements for these systems.[4]

There are three exceptions to the convention described above. First, although DCD (Tier 1), Section 4.0 identifies interface requirements for the HVAC System, COLA Part 9, Section 3.0, Table 3.0-10, "Heating, Ventilating, and Air Conditioning (HVAC)," indicates "No entry for this

[4] Response to RAI 09.02.04-6 deletes the site-specific ITAAC for the Makeup Water Preparation (MWP) System. As discussed in the response, an ITAAC for the MWP System is unnecessary since the MWP System is not safety-related or important to safety and the components of the MWP System do not interact directly with safety-related structures, systems or components (SSCs) and are not co-located with safety-related SSCs. As revised, COLA Part 9, Section 3.0, Table 3.0-3 for the MWP System will also contain the notation "No entry for this system."

system." These DCD interface requirements address toxic gas monitors, but toxic gas monitors are not included in the Units 3 and 4 design as discussed in departure STP DEP 9.4-1. Therefore, the HVAC interface requirements specified in the DCD are not applicable to Units 3 and 4 and no corresponding site-specific ITAAC are needed.

Two additional exceptions involve Table 3.0-7, "Communication System," and Table 3.0-8, "Site Security," which also contain the notation of "No entry for this system." Although not included in Section 3.0, ITAAC for these systems are provided in COLA Part 9, Section 4.0, "Emergency Planning ITAAC," and Section 5.0, "Physical Security ITAAC," respectively. To provide consistency within COLA Part 9, Section 3.0, the entries for Table 3.0-7 and Table 3.0-8 are changed as shown below:

Table 3.0-7 Communication System

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
~~No entry for this system.~~ See COLA Part 9, Section 4.0, Table 4.0-1, Emergency Planning ITAAC.		

Table 3.0-8 Site Security

Design Requirement	Inspections, Tests, Analyses	Acceptance Criteria
~~No entry for this system.~~ See COLA Part 9, Section 5.0, Table 5.0-1, Physical Security ITAAC.		

RAI 14.03.02-3

QUESTION:

The UHS is designed to withstand the most severe natural phenomenon or site-related event (e.g., SSE, tornado, hurricane, flood, freezing, spraying pipe whip, jet forces, missiles, fire, failure of non- Seismic Category I equipment, flooding as a result of pipe failures or transportation accident), and reasonably probable combinations of less severe phenomena and/or events, without impairing its safety function (GDC 2 and 4). The UHS is also designed to withstand any credible single failure of man-made structural features and to withstand chemical and gas explosions without impairing its safety function. The UHS cooling tower internals are protected from missile impacts. There are also requirements concerning the integrity of the division structures between the three independent sections of the RSW system.

Given the complexity of safety functions intended for the UHS, its required design criteria, load cases and combination thereof, the applicant is requested to expand the ITAAC contents of Table 3.0-1 Ultimate Heat Sink (UHS) item 5 to provide necessary level of detail that are consistent with the design basis loads and required safety functions discussed above for the UHS.

RESPONSE:

COLA Part 9, Table 3.0-1, Item 5 will be revised as shown below to include additional detail for the Ultimate Heat Sink (UHS) Basin, Reactor Service Water Pump House, and UHS Cooling Tower Enclosure. The ITAAC for the Reactor Service Water Piping Tunnels are included in Table 3.0-5, Item 8, which is similarly revised in the response to RAI 14.03.02-5.

Table 3.0-1 Ultimate Heat Sink (UHS)

5. The UHS ~~is able to withstand the structural design-basis loads.~~Basin, Reactor Service Water Pump House, and UHS Cooling Tower Enclosure are classified as Seismic Category I. These structures are designed and constructed to accommodate the dynamic and static loading conditions associated with the various loads and load combinations which form the structural design basis. The structural design basis loads are those associated with: (1) Natural phenomena—wind, floods, tornadoes (including tornado missiles), earthquakes, rain and snow. (2) Internal events—floods, pipe breaks and missiles. (3) Normal plant operation—live loads, dead loads and temperature effects.	5. A structural analysis will be performed that reconciles the as-built data with the structural design basis.	5. A structural analysis report exists which concludes that the as-built UHS Basin, Reactor Service Water Pump House, and UHS Cooling Tower Enclosure are ~~is~~ able to withstand the structural design-basis loads.

RAI 14.03.02-4

QUESTION:

With respect to Table 3.0-2 Offsite Power System, provide additional information regarding Seismic Category I structures that either support or enclose Category IE electrical SSC. If such structures are present, their corresponding structural related ITAAC in Table 3.0-2 should be provided with the same level of detail and scope of coverage as those discussed in the previous question (14.03.02-3).

RESPONSE:

As indicated in COLA Part 2 (Tier 2), Figure 8.2-1, the Seismic Category I structures that either support or enclose portions of the Offsite Power System are the Reactor Building and the Control Building. The structural-related Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) for the Reactor Building are described in Item 10 of ABWR DCD (Tier 1), Table 2.15.10. The structural-related ITAAC for the Control Building are described in Item 13 of ABWR DCD (Tier 1), Table 2.15.12. Therefore, no additional or revised ITAAC are warranted in COLA Part 9, Table 3.0-2.

No COLA change is required as a result of this response.

RAI 14.03.02-5

QUESTION:

The RSW System is designed to withstand the most severe natural phenomenon or site-related event (e.g., SSE, tornado, hurricane, flood, freezing, spraying pipe whip, jet forces, missiles, fire, failure of non-Seismic Category I equipment, flooding as a result of pipe failures or transportation accident), and reasonably probable combinations of less severe phenomena and/or events, without impairing its safety function (GDC 2 and 4). The RSW system is also designed to withstand any credible single failure of man-made structural features and to withstand chemical and gas explosions without impairing its safety function. The RSW system is protected from missile impacts. There are also requirements concerning the integrity of the division structures between the three independent sections of the RSW system.

Given the complexity of safety functions intended for the RSW system, its required design criteria, load cases and combination thereof, the applicant is requested to expand the contents of Table 3.0-5 Reactor Service Water (RSW) system items 2 and 8 to provide structural ITAAC items with the same level of detail as those stipulated in the previous questions (14.03.02-3 and 14.03.02-4).

RESPONSE:

COLA Part 9, Table 3.0-5, Item 8 will be revised as shown below to include additional detail for the Reactor Service Water Piping Tunnels. The ITAAC for the Ultimate Heat Sink (UHS) Basin, Reactor Service Water Pump House, and UHS Cooling Tower Enclosure are included in Table 3.0-1, Item 5, which is similarly revised in the response to RAI 14.03.02-3.

Table 3.0-5 Reactor Service Water System (RSW)

8. ~~Tunnel structures used to route piping are designed for design basis seismic loads and are protected against site flooding.~~ The Reactor Service Water Piping Tunnels are classified as Seismic Category I. These tunnels are designed and constructed to accommodate the dynamic and static loading conditions associated with the various loads and load combinations which form the structural design basis. The structural design basis loads are those associated with: (1) Natural phenomena – wind, floods, tornadoes (including tornado missiles), earthquakes, rain and snow. (2) Internal events – floods, pipe breaks and missiles. (3) Normal plant operation – live loads, dead loads and temperature effects.	8. (a) A structural analysis will be performed to reconcile as-built data with the structural design basis. 8. (b) An inspection of the Reactor Service Water Piping T~~t~~unnels will be performed.	8. (a) A structural analysis report exists which concludes that the as-built Reactor Service Water Piping T~~t~~unnels are able to withstand the design basis loads. 8. (b) The Reactor Service Water Piping T~~t~~unnels have no openings that would permit external flooding from penetrating the tunnels.

RAI 14.03.02-6

QUESTION:

Given the importance and the safety significance of back fills under category I structures, the design description provided in Item 1 of Table 3.0-11 lacks the needed level of detail and specificity. The item should be expanded to include the specific method and approach as well as quantitative acceptance criteria to be implemented by the proposed ITAAC. Also provide references to pertinent FSAR sections where the technical basis for verifying adequacy and acceptability of the backfill material and placement is discussed.

RESPONSE:

As presented in COLA Part 2, Tier 2, Section 2.5S.4.5.2.1, the Seismic Category I structures for each unit include the Reactor Building, Control Building, Ultimate Heat Sink (UHS) Basin, Reactor Service Water (RSW) Pump House, RSW Piping Tunnels, and Diesel Generator Fuel Oil Storage Vaults. Of these structures, the RSW Piping Tunnels and Diesel Generator Fuel Oil Storage Vaults will have backfill under them.

The following references are provided to show pertinent COLA sections where the technical basis for verifying adequacy and acceptability of the backfill material and placement is discussed.

Property Type	Selected Property	COLA Section(s)
Material Type	Sand or Sand and Gravel: SM, SC, SW or GW	2.5S.4.5.1 2.5S.4.5.3
Percent Fines	<25%	2.5S.4.5.1
Compaction Criteria	95% of the modified Proctor maximum dry density	2.5S.4.5.3
Moisture Control	Plus or minus 3%	2.5S.4.5.3
Quality Control Recommendations	See Table 2.5S.4.5.3-1*	2.5S.4.5.3

*Note: The referenced table (Table 2.5S.4.5.3-1) is provided in COLA Revision 3. This table was referenced in, but inadvertently omitted from COLA Revision 2.

COLA Part 9, Table 3.0-11, ITAAC Item 1 will be revised and new Item 2 added as follows:

Table 3.0-11 Backfill under Category 1 Structures

Design Requirement	Inspections, Tests, and Analyses	Acceptance Criteria
1. Backfill material under Seismic Category I structures is ~~compacted to not less than 95% of maximum dry density and within plus or minus 3% of the optimum moisture content~~ installed to meet a minimum of 95 percent of the Modified Proctor density.	1. Testing will be performed during placement of the backfill materials.	1. ~~Installed backfill under Category 1 structures meets the minimum soil density design requirements.~~ A report exists that concludes the installed backfill material under Seismic Category I structures meets a minimum of 95 percent of the Modified Proctor density.
2. The shear wave velocity of backfill under Seismic Category I structures meets the value used in the site-specific design analyses.	2. Field measurements and analyses of shear wave velocity in backfill will be performed.	2. An engineering report exists that concludes that the shear wave velocity of backfill under Seismic Category I structures meets the value used in the site-specific design analyses.

RAI 14.03.02-7

QUESTION:

The Breathing Air (BA) system is not a safety-relevant system but uses primary containment penetrations that are safety-related, therefore this system should be designed such that its failure would not impair any Category I SSC under service or accident conditions, including containment penetrations. Expand item 2 of Table 3.0-12 to include necessary ITAAC tasks.

RESPONSE:

Additional or revised Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) for the Breathing Air System (BAS) are not warranted since such ITAAC would be beyond what the NRC previously approved for the system that provides the breathing air function in ABWR DCD, Tier 1. Specifically, the design basis functions for the certified design Station Service Air System (SAS) described in ABWR DCD (Tier 2), Section 9.3.7 include providing for plant breathing air requirements. Table 2.11.11 of the ABWR DCD, Tier 1, includes three ITAAC items for the certified design SAS, including ITAAC that would ensure proper performance of the SAS containment isolation components.

Standard Departure STD DEP 9.3-2 moves the design basis function of providing plant breathing air from the SAS to a new "stand-alone" system – the BAS. This departure included Table 3.0-12 of COLA Part 9 that contains two ITAAC items for the new BAS. In response to RAI 03.02.01-3 (see letter U7-C-STP-NRC-090096 dated August 6, 2009), the first of these two BAS ITAAC items was revised to ensure that the as-built BAS containment isolation components will operate in conformity with the combined license and NRC regulations.

With this recently amended ITAAC, the scope and content of the two BAS ITAAC items are substantively the same as the first two of the three ITAAC items previously approved by the NRC in ABWR DCD, Tier 1 for the SAS, and are consistent with the ITAAC for containment penetrations and associated isolation valves for other systems previously certified. The third ABWR DCD, Tier 1 ITAAC item for the SAS specifies the requirement to verify operation of a check valve that is part of the containment isolation scheme for the SAS primary containment penetration. This ITAAC item does not apply to the BAS since STD DEP 9.3-2 specifies (for the BAS) a locked closed manual isolation valve inside primary containment rather than a check valve.

Based on the above, it is concluded that the BAS ITAAC items in Table 3.0-12 (as amended in the response to RAI 03.02.01-3) are substantively the same as the applicable SAS ITAAC items approved by the NRC as part of the certified design in ABWR DCD, Tier 1. It follows that the specification of additional or revised ITAAC items for the BAS would be beyond what is specified in ABWR DCD, Tier 1 for a functionally similar system. Therefore, considering that the ITAAC selection criteria and methodology used for the ABWR DCD are materially the same as those applied for the BAS ITAAC, additional or revised BAS ITAAC are not warranted.

No COLA change is required as a result of this RAI response.

RAI 14.03.02-8

QUESTION:

With respect to the STP 3 and 4 site-specific SSCs, SRP Section 14.3.2, II (11) requires that structural analyses should be performed which reconcile the as-built configuration of the site-specific structures with their structural design bases. The applicant is requested to discuss how STP 3 and 4 intends to implement this ITAAC requirement and provide the corresponding ITAAC table addressing the as-built configuration reconciliation ITAAC for each site-specific SSCs, as applicable.

RESPONSE:

The STP Units 3 and 4 site-specific Seismic Category I structures include the Ultimate Heat Sink (UHS) Basin, Reactor Service Water Pump House, UHS Cooling Tower Enclosure, and Reactor Service Water Piping Tunnels. Inspections, Tests, Analyses and Acceptance Criteria (ITAAC) are provided in COLA Part 9 that require structural analyses reconciling the as-built configuration of these site-specific structures with their structural design bases.

Specifically, the ITAAC for the UHS Basin, Reactor Service Water Pump House, and UHS Cooling Tower Enclosure are included in COLA Part 9, Table 3.0-1, Item 5, which is revised in the response to RAI 14.03.02-3. The ITAAC for the Reactor Service Water Piping Tunnels are included in COLA Part 9, Table 3.0-5, Item 8, which is revised in the response to RAI 14.03.02-5.

No additional COLA change is required for this response.