Nuclear Operating Company

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

August 17, 2009
U7-C-STP-NRC-090097

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
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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 152 related to Combined License Application (COLA) Part 2, Tier 2, Section 3.9.6. This submittal completes the response to this RAI letter.

The twenty-six (26) attachments address the responses to the RAI questions listed below:

RAI 03.09.06-1	RAI 03.09.06-14
RAI 03.09.06-2	RAI 03.09.06-15
RAI 03.09.06-3	RAI 03.09.06-16
RAI 03.09.06-4	RAI 03.09.06-17
RAI 03.09.06-5	RAI 03.09.06-18
RAI 03.09.06-6	RAI 03.09.06-19
RAI 03.09.06-7	RAI 03.09.06-20
RAI 03.09.06-8	RAI 03.09.06-21
RAI 03.09.06-9	RAI 03.09.06-22
RAI 03.09.06-10	RAI 03.09.06-23
RAI 03.09.06-11	RAI 03.09.06-24
RAI 03.09.06-12	RAI 03.09.06-25
RAI 03.09.06-13	RAI 03.09.06-26

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.

STI 32515723

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NRO

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.

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

Executed on 8/17/09

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

jep

Attachments:

1. RAI 03.09.06-1
2. RAI 03.09.06-2
3. RAI 03.09.06-3
4. RAI 03.09.06-4
5. RAI 03.09.06-5
6. RAI 03.09.06-6
7. RAI 03.09.06-7
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21. RAI 03.09.06-21
22. RAI 03.09.06-22
23. RAI 03.09.06-23
24. RAI 03.09.06-24
25. RAI 03.09.06-25
26. RAI 03.09.06-26

cc: w/o attachment except*
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RAI 03.09.06-1

QUESTION:

STP Units 3 & 4 COL FSAR Section 3.9, "Mechanical Systems and Components," incorporates by reference this section in the ABWR DCD with departures and supplemental information. ABWR DCD Tier 2, Subsection 3.9.3.2, "Pump and Valve Operability Assurance," describes operability assurance of active ASME Code Section III pumps and valves. For example, ABWR DCD Tier 2, Subsection 3.9.3.2 states that safety-related valves and pumps are qualified by testing and analysis and by satisfying the stress and deformation criteria at the critical locations within the pumps and valves. ABWR DCD Tier 2, Subsection 3.9.3.4, "Component Supports," includes provisions for design specifications applicable to snubbers. The subsections in ABWR DCD Tier 2, Section 3.9.6 include general provisions for the design and qualification of pumps and valves. For example, ABWR DCD Tier 2, Subsection 3.9.6.1, "Testing of Safety-Related Pumps," states that the COL applicant will establish design and qualification requirements and will provide acceptance criteria for these requirements. The NRC staff requests that the STP COL applicant describe the implementation of the functional design and qualification process specified in the ABWR DCD for pumps, valves, and dynamic restraints to be used at STP Units 3 & 4. As discussed in Paragraph C.III.3.9.6.1 in Regulatory Guide (RG) 1.206 for equipment that do not have their functional design and qualification process specified in the ABWR DCD, provide the following information or reference these provisions in the ABWR DCD: (1) describe the provisions in the design of safety-related pumps, valves, and piping that allow testing of pumps and valves at the maximum flow rates specified in the plant accident analyses; (2) describe the provisions in the functional design and qualification of each safety-related pump and valve that demonstrate the capacity of the pumps and valves to perform their intended functions for a full range of system differential pressures and flows, ambient temperatures, and available voltages (as applicable) from normal operating to design-basis conditions; (3) verify that the qualification program for safety-related valves includes testing and analyses that demonstrate these valves do not experience any leakage, or increase in leakage, from their loading; (4) describe the provisions in the functional design and qualification of dynamic restraints in safety-related systems and access for performing inservice testing (IST) program activities that comply with the requirements in the latest edition and addenda of the ASME OM Code incorporated by reference in 10 CFR 50.55a on the date 12 months before the date for initial fuel load; and (5) give particular attention to flow-induced loading in functional design and qualification to incorporate degraded flow conditions such as those that might be encountered by the presence of debris, impurities, and contaminants in the fluid system (e.g., containment sump pump recirculating water with debris). As part of this information, STP is requested to discuss the incorporation of lessons learned from nuclear power plant operating experience in the functional design and qualification of plant components, such as provided in ASME Standard QME-1-2007, "Qualification of Active Mechanical Equipment Used in Nuclear Power Plants." Further, the STP COL applicant is requested to discuss the availability of design and procurement specifications for NRC on-site review to demonstrate the implementation of the ABWR functional design and qualification process for pumps, valves, and dynamic restraints to be used at STP Units 3 & 4.

RESPONSE:

ABWR DCD Tier 2, Section 3.9.6 "Testing of Pumps and Valves" describes the primary elements of the plans for preservice testing (PST) and periodic inservice testing (IST) of the pumps and valves. In ABWR DCD Tier 2, Section 3.9.7 "COL License Information," Subsection 3.9.7.3, "Pump and Valve Testing Program," the COLA applicant is required to provide a plan for the detailed pump and valve IST program. Additionally, there is a requirement that the COL applicant will include the design qualification test, inspection and analysis criteria in the development of safety-related pump and valve design specifications, and will address the design, qualification and pre-operational testing for motor-operated valves (MOVs) prior to plant startup.

STPNOC is developing the PST and IST program plans; however, the details, beyond the equipment design and procurement specifications, of these program plans are dependent on the specific equipment selected for the final design, and as such will not be fully available for NRC review until approximately 2012, based on the current project schedule. In STP Units 3 & 4 COLA Part 2, Tier 2, Section 3.9.7.3, "Pump and Valve Testing Program," the COL License Information Item 3.29 provides schedule information in FSAR Table 13.4S-1 "Operational Programs Required by NRC Regulation and Program Implementation," and commits the PST program to be complete by fuel load, and the IST program to be complete "after generator on line on nuclear heat."

Assurance that both programs will be completed well before the regulatory required milestones is based on several ABWR DCD Tier 1 ITAAC addressing pump and valve PST and IST requirements. For example:

- ITAAC Table 2.2.4.3a, Item 1 requires that a test tank and associated piping and valves permit testing of the Standby Liquid Control System during plant operation.

- ITAAC Table 2.4.2.3m requires that each division has a full flow test mode to permit testing during plant operation.

- More than a dozen ITAACs (e.g., Table 2.11.13.9a) require that MOVs having an active safety function (in their respective Tier 1 Design Description) will open, close, or both open and close under differential pressure, fluid flow and temperature conditions. Additionally, all of the significant Tier 1 systems having Basic Configuration ITAACs (e.g., Table 2.4.4, Item 1) require that "tests or type tests of active safety-related MOVs identified in the Design Description to demonstrate that the MOVs are qualified to perform their safety functions under design basis differential pressure, system pressure, fluid temperature, ambient temperature, minimum voltage, and minimum and /or maximum stroke times," per ABWR DCD Tier 1, Section 1.2.

- At least 17 ITAACs (e.g., Table 2.11.13.9b) require that check valves having an active safety function (in their respective Tier 1 Design Description) will both open and close under differential pressure, fluid flow and temperature conditions.

As part of our coordination with the NRC on ITAAC schedules, STPNOC is providing the NRC with information on when the initial (e.g., test plans) and final (e.g., testing completed) elements needed for closure of ITAACs are scheduled for STP Unit 3.

Regarding the specific items identified in the RAI, and items identified in RAIs 03.09.06-2 through -4, -6 through -15, -17 through -19, -21, -22 and -26, we recognize the need to update our PST/IST program plan description currently contained in the ABWR DCD and STP 3 & 4 COLA. Specifically, we will provide a consolidated PST/IST program plan description as a NRC reviewer's aid. The revision to the FSAR will include:

1. Updating from ASME/ANSI OMa-1988 Addenda to ASME/ANSI OM-1987, Parts 1, 6 and 10 to ASME OM-2004, Subsections ISTA, ISTB (pumps), ISTC (valves), ISTD (dynamic restraints) and mandatory Appendices I (pressure relief devices) and II (check valves). Additionally, STP has previously committed to update to the latest addenda of the ASME OM Code incorporated by reference in 10 CFR 50.55a on the date 12 months before the date for initial fuel load.

2. Incorporating requirements for MOV periodic verification testing in accordance with Joint Owners' Group (JOG) report MPR-2524-B, which incorporates the NRC's 2006 SER on MPR-2524-A.

3. Incorporating provisions for power-operated valve (POV) functional qualification, ASME QME-1, 2007, including QME-1 guidance for functional qualification of check and relief valves, pumps, and dynamic restraints.

The COLA markup, including the updated, PST/IST program plan description and the NRC reviewer's aid, will be provided by October 8, 2009.

RAI 03.09.06-2

QUESTION:

ABWR DCD Tier 2, Section 3.9.6, "Testing of Pumps and Valves," states that inservice testing of safety-related pumps and valves will be performed in accordance with the requirements of ASME/ANSI OMa-1988 Addenda to ASME/ANSI OM-1987, Parts 1, 6, and 10. This section also states that the reason for each code defined testing exception or justification for each code exemption requested is noted in Table 3.9-8, "Inservice Testing Safety-Related Pumps and Valves," for the affected pump or valve. The NRC regulations in 10 CFR 50.55a(f)(4)(i) and (g)(4)(i) require that the inservice testing and inspection programs during the initial 120-month interval comply with the requirements in the latest edition and addenda of the Code incorporated by reference in the regulations on the date 12 months before the date scheduled for initial loading of fuel under a combined license under 10 CFR Part 52 (or the optional ASME Code cases listed in the applicable regulatory guides), subject to the limitations and modifications listed in 10 CFR 50.55a of the NRC regulations. The STP COL applicant is requested to specify the edition and addenda of the ASME OM Code that is the basis for fully describing the IST Program in support of receiving a COL for STP Units 3 & 4. The STP COL applicant is also requested to indicate those instances where the applicable OM Code will not be satisfied, and to provide justification for relief from those Code requirements. The STP COL applicant is requested to justify any "code exemption" (as indicated in the ABWR DCD) intended for STP Units 3 & 4. The STP COL applicant is requested to provide appropriate references to the OM Code edition and addenda in describing the IST and MOV Testing programs for STP Units 3 & 4 outlined in ABWR DCD Tier 2, Section 3.9.6 and Table 3.9-8. In addition, the applicant is requested to discuss the planned use of any code cases and their implementation consistent with RG 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," and any other alternatives to the OM Code, and their justification.

RESPONSE:

The code approved in the ABWR DCD Table 1.8-21 and Tier 2, Section 3.9.6 is the ASME/ANSI OMa-1988 Addenda to ASME/ANSI OM-1987 Parts 1, 6 and 10. This establishes the basis for STP Units 3 & 4 inservice testing related design activity. That code corresponds to the ASME B&PV Code Section XI-1989 which is the basis for the Inservice Inspection program.

This is amended in STP 3 & 4 FSAR Table 1.8-21a for Site-Specific Systems. That table lists ASME BPVC Sec XI-2004 for Inservice Inspection. However, the corresponding ASME OM Code edition for Inservice Testing is not listed.

Table 1.8-21a will be revised, as provided below, to add ASME OM – 2004.

The inservice testing and inspection programs have not yet been established.

The ASME OM Code edition and addenda that will be the basis for fully describing the Inservice Testing Program will be reviewed and updated, if appropriate, 12 months before the date for

initial loading of fuel as provided in the regulations. At that time, any requests for relief for those instances in which the applicable OM Code will not be satisfied will be submitted along with justification for "code exemption," including references and discussion of applicable code cases.

Code or Standard Number	Year	Title
American Society of Mechanical Engineers (ASME)		
OM	2004	Code for Operation and Maintenance of Nuclear Power Plants

RAI 03.09.06-3

QUESTION:

ABWR DCD Tier 2, Section 3.9.6 and its subsections refer to numerous actions by the "COL applicant" related to the design and qualification, preservice testing, and IST programs for pumps and valves. RG 1.206 provides guidance for information to fully describe the IST program for pumps, valves, and dynamic restraints, and the motor-operated valve (MOV) Testing program. The STP COL applicant is requested to discuss its implementation of the COL applicant actions indicated in the ABWR DCD to fully describe the IST and MOV Testing operational programs in support of its request for a COL for STP Units 3 & 4. As part of fully describing these programs, the STP COL applicant is requested to specify the categorization of pumps, valves, and dynamic restraints in STP Units 3 & 4 as Tier 1, Tier 2*, or Tier 2 components, as appropriate.

RESPONSE:

STPNOC has included in the STP Units 3 & 4 COLA Tier 2, Section 3.9.7.3, "Pump and Valve Testing Program," a supplement addressing COL License Information Item 3.29, which includes the numerous actions to cover the design and qualification, preservice testing (PST), and inservice testing (IST) programs for pumps and valves, including motor-operated valves (MOVs). STPNOC also embraces the DCD requirements for dynamic restraints which are included in ABWR DCD Tier 2, Section 3.9.3.4.1(3) related to snubbers, which cover design and qualification, inspection, testing (including preservice), repair and/or replacement.

The inservice testing and inspection programs have not yet been established. See RAI 03.09.06-1 response for a description of the approach and details of the STP Units 3 & 4 PST and IST Programs. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information, of the ITAAC closure program, to facilitate NRC review and confirmation activities.

The classification of pumps and valves is contained in ABWR DCD Tier 2, Table 3.9-8 and COLA Tier 2, Table 3.9-8. The contents of the testing and inspection programs for pumps, valves, and dynamic restraints are not dependent upon whether such components are categorized as Tier 1, Tier 2*, or Tier 2, and such categorization is not relevant to the testing and inspection to be applied to a component.

No COLA Change is required with this response.

RAI 03.09.06-4

QUESTION:

ABWR DCD Tier 2, Subsection 3.9.6.1 refers to Table 3.9-8, "Inservice Testing Safety-Related Pumps and Valves," for test parameters for inservice testing of pumps with the criteria limits specified in the ASME Code. Note (b) in Table 3.9-8 lists speed, discharge pressure, inlet pressure, flow rate, peak-to-peak vibration displacement, and peak vibration velocity as pump test parameters. RG 1.206 provides guidance for a COL applicant to fully describe the IST Program for pumps. The NRC staff requests that the STP COL applicant describe (1) the methods for establishing and measuring the reference values and IST values for the pump parameters, including instrumentation range and accuracy; (2) the test plan (including test duration) for the pumps listed in Table 3.9-8 (which includes the test schedule) and whether Technical Specifications include the test schedule; and (3) the implementation program for establishing the IST Program for pumps, such as when the program will be available for NRC inspection to allow review prior to reliance on the pumps to perform their safety functions.

RESPONSE:

Design activities, which establish the methods for establishing and measuring the reference values for pump parameters, including instrumentation range and accuracy, are in progress.

Preparation of the Inservice Testing (IST) Procedures for safety-related pumps will follow completion of system design and component selection activities.

Descriptions of the IST test plans, including the details requested in items (1), (2), and (3) will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3 & 4 Preservice Testing and IST Programs for pumps. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information, of the ITAAC closure program, to facilitate NRC review and confirmation activities.

With regard to Technical Specifications in item (2) the independent Technical Specification requirements will be followed with regard to schedule information which may relate to the IST Program.

No COLA change is required with this response.

RAI 03.09.06-5

QUESTION:

ABWR DCD Tier 2, Table 3.9-8 includes Note i1 for the Residual Heat Removal System fill pump, which is referred to as a summary justification for a "code exemption request" to not include flow measurement. The STP COL applicant is requested to discuss this "code exemption request" and its justification for STP Units 3 & 4. See RG 1.206 for guidance on information to support requests for relief from the ASME OM Code.

RESPONSE:

The ABWR DCD Tier 2, Table 3.9-8 was specifically reviewed by the NRC as documented in the Final Safety Evaluation Report (FSER), NUREG -1503, Section 3.9.6.3 "Review of SSAR Table 3.9-8, Inservice Testing Plan" and the staff identified Technical Evaluation Report - Appendix I to the FSER, NUREG-1503. Appendix I documented where the NRC specifically reviewed and found acceptable the Note i1 justification for a "code exemption request" to not include flow measurement for the Residual Heat Removal System fill pump. The staff's summary and conclusion is "... The staff reviewed proposed testing of the RHR fill pumps and determined that it will ensure an acceptable level of quality and safety." There is no STPNOC departure for STP Units 3 & 4 regarding this table and note.

No COLA change is required with this response.

RAI 03.09.06-6

QUESTION:

ABWR DCD Tier 2, Subsection 3.9.6.2, "Testing of Safety-Related Valves," provides separate subsections for check valves, MOVs, power-operated valves (POVs) other than MOVs, and isolation valves. The STP COL applicant is requested to describe the following as listed in Paragraph C.III.3.9.6.3, "Inservice Testing Program for Valves," for the valves in IST Program to be established for STP Units 3 & 4: (1) the type for each valve listed in Table 3.9-8 (including valve type and actuator type if applicable); (2) the IST Program (including test requirements, procedures, and acceptance criteria) for valve preservice tests, valve replacement, valve repair and maintenance, and indicate of valve position; (3) the proposed methods for measuring the reference values and IST values for POVs, including MOVs, air-operated valves, hydraulic-operated valves, and solenoid-operated valves; (4) the valve test procedures and schedules (including justifications for cold shutdown and refueling outage test schedules) and whether this information will be included in the plant technical specifications; and (5) milestones for preparing and implementing the IST Program to allow for review and inspection of those programs in advance of relying on nuclear power plant components within the scope of those programs to perform their safety functions.

RESPONSE:

Response to this RAI is related to RAI 03.09.06-4 regarding the schedule for preparation of Inservice Testing (IST) Programs and related design activities.

Design activities which specify the type of valves, operators, selection of manufacturer, establish test requirements, and the reference values requested are in progress. Preparation of the IST Procedures for safety-related valves will follow completion of system design and component selection activities.

Descriptions of the IST test plans including the details requested in items (1) through (5) will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3 & 4 Preservice Testing and IST Programs for valves. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information, of the ITAAC closure program, to facilitate NRC review and confirmation activities.

With regard to Technical Specifications in item (4), the independent Technical Specification requirements will be followed with regard to schedule information which may relate to the IST Program.

No COLA change is required with this response.

RAI 03.09.06-7

QUESTION:

Note (e) in ABWR DCD Tier 2, Table 3.9-8 lists the valve test parameters of the ANSI/ASME OM Standard Part 10. The NRC regulations in 10 CFR 50.55a require that that the MOV stroke time testing provisions in the ASME OM Code be supplemented by periodic testing to demonstrate design-basis capability. The STP COL applicant is requested to update the reference to the applicable ASME OM Code to be used in fully describing the IST Program for STP Units 3 & 4. The STP COL applicant is also requested to discuss the "stroke exercise" test parameter and whether its inclusion of stroke time testing and, as applicable, MOV periodic design-basis capability testing.

RESPONSE:

See the RAI 03.09.06-2 response regarding the applicable ASME OM Code to be used in implementing the Inservice Testing (IST) Program for STP Units 3 & 4.

The IST Motor-Operated Valve (MOV) Procedures including the "stroke exercise" test parameter will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3 & 4 Preservice Testing and IST Programs for valves. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information, of the ITAAC closure program, to facilitate NRC review and confirmation activities.

Details of the "Stroke exercise" tests will be performed in accordance with the Pre-operational testing described in ABWR DCD Tier 2, Section 3.9.6.2.2 (2) and will measure thrust and/or torque, switch setting, stroke time, etc. including consideration of diagnostic equipment inaccuracy. The stroke time test parameter acceptance criteria for satisfactorily demonstrating the Tier 2 functional performance requirements have been met are included in paragraph (f) of Section 3.9.6.2.2 (2).

STP Units 3 & 4 COLA Tier 2, Section 3.9.7.3 states that, "The pump and valve inservice testing and inspection program will be provided to the NRC as specified in section 13.4S. This program will include the following: ... (2) Provide a study to determine the optimal frequency of the periodic verification of the continuing MOV capability for design basis conditions." This study requirement will be satisfied as identified in the RAI 03.09.06-1 response by utilizing the "Joint Owners' Group (JOG) Motor Operated Valve Periodic Verification Program Summary - MPR-2524-B."

No COLA change is required with this response.

RAI 03.09.06-8

QUESTION:

Note (f) in ABWR DCD Tier 2, Table 3.9-8 lists pump or valve test exclusions, alternatives and frequency per the ASME Code or Appendix I. The STP COL applicant is requested to specify the applicable OM Code sections for the components and their associated exclusions, alternatives, and frequencies covered in Note (f). The STP COL applicant is requested to provide appropriate justification for any relief or alternatives to the applicable ASME OM Code sections. The STP COL applicant is also requested to indicate the justification for cold shutdown and refueling outage test intervals if not indicated in Table 3.9-8 for each applicable valve. The STP COL applicant is requested to discuss its implementation of item E3, which is said to be an operability test every 6 months. The STP COL applicant is also requested to discuss its implementation of item E11, which refers to the absence of required fluid inventory with a test once every 2 years.

RESPONSE:

ABWR DCD Tier 2, Table 3.9-8 was previously reviewed as part of the Final Safety Evaluation Report (FSER), NUREG-1503 related to the Certification of the Advanced Boiling Water Reactor Design. In Section 3.9.6.5 of NUREG-1503 it was noted "that the pump and valve IST program described in the SSAR is acceptable...." In addition, the staff identified Technical Evaluation Report - Appendix I to the FSER NUREG-1503 that included "... an independent confirmation of each of the parameters delineated in Table 3.9-8 ....," which addresses the Note (f) - test exclusions, alternatives and frequency, including cold shutdown and refueling outage test frequencies, and found all of the parameters and justifications acceptable. The DCD and the COLA revisions to Table 3.9-8 have indicated test intervals for all valves.

See the RAI 03.09.06-2 response which addresses the applicable ASME OM code.

The STP 3 & 4 COLA makes no changes to the Table 3.9-8 notes contained in the approved ABWR DCD. Any changes to ABWR DCD Tier 2, Table 3.9-8 as presented in COLA Tier 2, Table 3.9-8 contain the same level of information, including identification of the applicable justification, as in the DCD and utilize the same notes, regarding exclusions, alternatives and frequencies, as the DCD table. Exclusion notes E3 and E11 are not used in the ABWR DCD, Table 3.9-8 and COLA revisions to Table 3.9-8 do not involve addition of components identified with these exclusion notes either.

The inservice testing (IST) and inspection programs have not yet been established. See RAI 03.09.06-1 response for a description of the approach and details of the STP Units 3 & 4 Preservice Testing IST Programs for valves. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information, of the ITAAC closure program, to facilitate NRC review and confirmation activities.

No COLA change is required with this response.

RAI 03.09.06-9

QUESTION:

Note (h) in ABWR DCD Tier 2, Table 3.9-8 lists reasons for code defined testing exceptions per the ANSI/ASME OM Standard Part 10. The NRC staff requests that the STP COL applicant justify the basis for deferring inservice testing for valves that rely on reasons h2 (avoids valve damage and impacts on power operations) and h3 (avoids impacts on power operations). The STP COL applicant is also requested to justify the basis for the use of reason h9 (test connection size is insufficient for full flow test during operation) in deferring testing. The NRC staff notes that the temporary loss of system redundancy during an inservice test is covered by the Limiting Conditions for Operations in plant Technical Specifications and, therefore, the loss of system redundancy is not acceptable as a basis for deferral of inservice testing to a refueling outage or cold shutdown interval.

RESPONSE:

ABWR DCD Tier 2, Table 3.9-8 was previously reviewed as part of the Final Safety Evaluation Report (FSER), NUREG-1503, related to the Certification of the Advanced Boiling Water Reactor Design. In Appendix I to the FSER (page I-2), the NRC reviewed and approved the exceptions discussed in Note (h) to ABWR DCD Tier 2, Table 3.9-8. There are no "special circumstances" as defined in 10 CFR 2.335 that would warrant the NRC to impose a departure from Note (h) pursuant to Section VIII.C of the ABWR Design Certification Rule.

The STP 3 & 4 COLA Part 2 (FSAR) makes no changes to the Table 3.9-8 notes contained in the approved ABWR DCD. Any changes to ABWR DCD Tier 2 Table 3.9-8 as presented in COLA Part 2, Tier 2, Table 3.9-8 contain the same level of information, including identification of the applicable justification, as in the DCD and utilize the same notes, regarding exclusions, alternatives and frequencies, as the DCD table. However, revisions to Table 3.9-8 do not involve addition of components identified with these exception notes. Therefore, reasons for code defined testing exceptions (per ANSI/ASME OM Standard Part 10, paragraphs 4.2.1.2, 4.3.2.2) listed in (h2), (h3), and (h9) are not subject to further review.

As provided on page 3-78 of the FSAR for the ABWR, the COL applicant is required to submit any requests for relief from 10 CFR 50.55(a)(f). In support of the relief requests for the exceptions that have been previously approved by the NRC in the FSER, STP is providing the following additional information as requested by this RAI. The inservice testing (IST) and inspection programs have not yet been established. See RAI 03.09.06-1 response for a description of the approach and details of the STP Units 3 & 4 Preservice Testing and IST Programs for valves. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information of the ITAAC closure program to facilitate NRC review and confirmation activities.

No COLA change is required with this response.

RAI 03.09.06-10

QUESTION:

ABWR DCD Tier 2, Subsection 3.9.6.2.1, "Check Valves," includes (1) Design and Qualification, and (2) Pre Operational Testing, which specify parameters and acceptance criteria to be established by the COL applicant for demonstrating that functional performance requirements have been met. The STP COL applicant is requested to discuss its implementation of those actions for STP Units 3 & 4.

RESPONSE:

ABWR DCD Tier 2, Subsection 3.9.6.2.1 was previously reviewed as part of the Final Safety Evaluation related to the Certification of the Advanced Boiling Water Reactor Design. In Section 3.9.6.2.1 of NUREG-1503 it was noted that "the staff finds these planned actions provide a reasonable assurance for the adequacy of the design, qualification, and pre-operational testing for safety-related check valves and are, therefore, acceptable."

No changes to the ABWR DCD Tier 2, Subsection 3.9.6.2.1 were made in the STP 3 & 4 COLA. Therefore, further review is not required.

Implementation of the check valve design, qualification and pre-operational testing actions will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3 & 4 Preservice Testing and Inservice Testing Programs for check valves. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information, of the ITAAC closure program, to facilitate NRC review and confirmation activities.

No COLA change is required with this response.

RAI 03.09.06-11

QUESTION:

The last paragraph of ABWR DCD Tier 2, Subsection 3.9.6.2.1 provides general information on inservice testing of check valves, including referencing ANSI/ASME OM Standard Part 10. The NRC staff requests that the STP COL applicant fully describe the program for inservice testing of check valves, including OM Code provisions for bi-directional testing for active and passive check valves. As indicated in Paragraph C.III.3.9.6.3.3, "Inservice Testing Program for Check Valves," of RG 1.206, the STP COL applicant is requested to (1) describe the preservice and IST for each check valve (including diagnostic equipment or nonintrusive techniques, testing performed under temperature and flow conditions, how test results identify flow required to open the check valve, and how testing includes effects of rapid pump starts and stops and other reverse flow conditions; (2) describe diagnostic techniques to periodically assess degradation and performance characteristics; (3) describe how successful completion of pre-service and IST is assessed (including demonstrating that the disk fully opens or closes, determining disk positions without disassembly, verifying free disk movement, and demonstrating disk is stable in open position); (4) confirm piping design features accommodate check valve testing requirements; and (5) show how the IST program meets guidelines of Appendix II to ASME OM Code. The STP COL applicant is also requested to discuss parameter and acceptance criteria for inservice testing as included for pre-operational testing in the ABWR DCD.

RESPONSE:

Also see the response to RAI 03.09.06-4 and RAI 03.09.06-10 regarding preparation of check valve Inservice Testing (IST) Programs and related design activities.

Design activities related to check valves and associated piping including provisions for testing are in progress. Preparation of the IST Program for safety-related valves will follow completion of system design and component selection activities.

Descriptions of the IST test plan including the details requested in items (1) through (5) will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3 & 4 Preservice Testing and IST Programs for check valves. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information of the ITAAC closure program to facilitate NRC review and confirmation activities. Parameter and acceptance criteria for the check valve IST Program will take into account the testing and information from the pre-operational testing activities.

No COLA change is required with this response.

RAI 03.09.06-12

QUESTION:

ABWR DCD Tier 2, Subsection 3.9.6.2.2, "Motor-Operated Valves," provides general information on MOV inservice testing, but does not fully describe the IST or MOV Testing operational programs. For example, the introduction of ABWR DCD Tier 2, Section 3.9.6 references Generic Letter 89-10, but does not address MOV lessons learned since issuance of that generic letter. Further, the ABWR DCD does not discuss the regulatory requirement in 10 CFR 50.55a to supplement the MOV stroke-time testing provision in the ASME OM Code with periodic testing to verify the design-basis capability of safety-related MOVs. The ABWR DCD also does not discuss the Joint Owners Group Program on MOV Periodic Verification, the performance of static or dynamic MOV periodic testing, or the periodic verification of MOV output capability. As indicated in Paragraph C.III.3.9.6.3.1, "Inservice Testing Program for Motor-Operated Valves," of RG 1.206, the STP COL applicant is requested to describe the IST Program that periodically verify the design-basis capability of safety-related MOVs, including (1) showing how periodic testing (or analysis combined with test results where testing is not conducted at design-basis conditions) objectively demonstrates continued MOV capability to open and/or close under design-basis conditions; and (2) justifying any IST intervals that exceed either 5 years or three refueling outages, whichever interval is longer. Also as indicated in Paragraph C.III.3.9.6.3.1 of RG 1.206, the STP COL applicant is requested to show how successful completion of the preservice and IST of MOVs demonstrates that the following criteria are met: (1) valve fully opens and/or closes as required by its safety function; (2) adequate margin exists and includes consideration of diagnostic equipment inaccuracies, degraded voltage, control switch repeatability, load-sensitive MOV behavior, and margin for degradation; and (3) maximum torque and/or thrust (as applicable) achieved by the MOV (allowing sufficient margin for diagnostic equipment inaccuracies and control switch repeatability) does not exceed the allowable structural and undervoltage motor capability limits for the individual parts of the MOV.

RESPONSE:

Descriptions of the inservice testing (IST) and motor-operated valve (MOV) test plans including the details requested in the second set of items (1) through (3) will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3 & 4 Preservice Testing and IST Programs for MOVs. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information of the ITAAC closure program to facilitate NRC review and confirmation activities. For the first set of items (1) and (2), for (1) the design and qualification activities will establish the analysis basis for MOV testing acceptance criteria that support MOV capability to open and/or close under design-basis conditions, and for (2) see the RAI 03.09.06-8 response and in ABWR DCD Tier 2, Table 3.9-8, including changes as presented in COLA Part 2, Tier 2, Table 3.9-8, there are no IST intervals that exceed either 5 years or three refueling outages.

See the RAI 03.09.06-2 response which addresses the applicable ASME OM code.

The information developed by the Joint Owners' Group Program on MOV Periodic Verification will be provided for consideration in the MOV Testing portion of the IST Program.
STP Units 3 & 4 COLA Part 2, Tier 2, Section 3.9.7.3 states that, "The pump and valve inservice testing and inspection program will be provided to the NRC as specified in section 13.4S. This program will include the following: ... (2) Provide a study to determine the optimal frequency of the periodic verification of the continuing MOV capability for design basis conditions." This study requirement will be satisfied as identified in the RAI 03.09.06-1 response by utilizing the "Joint Owners' Group (JOG) Motor Operated Valve Periodic Verification Program Summary - MPR-2524-B."

The MOV testing program will consider incorporating for periodic testing the MOV pre-operational testing requirements in ABWR DCD Tier 2, Section 3.9.6.2.2 (2), "Pre-operational Testing" which address items (1), (2), and (3) described above.

No COLA change is required with this response.

RAI 03.09.06-13

QUESTION:

ABWR DCD Tier 2, Subsection 3.9.6.2.3 states the IST program for POVs will incorporate the use of advance non-intrusive techniques to periodically assess degradation and performance characteristics of the POVs, and refers to ANSI/ASME OM Standard Part 10. The ABWR DCD does not fully describe the IST program for POVs. For example, the subsection does not discuss the MOV lessons learned applicable to other POVs in Regulatory Issue Summary (RIS) 2000-03, "Resolution of Generic Safety Issue 158: Performance of Safety-Related Power-Operated Valves Under Design Basis Conditions." As indicated in Paragraph C.III.3.9.6.3.2, "Inservice Testing Program for Power-Operated Valves Other Than Motor-Operated Valves," the STP COL applicant is requested to (1) describe how the POVs are qualified to perform their design-basis functions either before installation or as part of preoperational testing; (2) describe the POV IST program and show how the program incorporates the lessons learned from MOV analysis and tests performed in response to GL 89-10; and (3) explain how solenoid-operated valves are verified to meet their Class 1E electrical requirements by performing their safety functions for the appropriate electrical power supply amperage and voltage.

RESPONSE:

The inservice testing (IST) and inspection programs have not yet been established. The Motor-Operated Valve (MOV) Testing Program will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3 & 4 Preservice Testing and IST Programs for MOVs. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information of the ITAAC closure program to facilitate NRC review and confirmation activities. The information to be provided in these programs includes that outlined and referenced in the approved and certified ABWR DCD Tier 2, Section 3.9.6 "Testing of Pumps and Valves." The IST programs will consider requirements of Generic Letter 89-10 and other applicable codes, standards and regulatory guides. Also, the lessons learned information developed by the Joint Owners' Group Program on MOV Periodic Verification will be taken into consideration for the other power-operated valves (POVs).

As identified in ABWR DCD Tier 2, Section 3.9.6.2.3 (1) and (2) the POVs are qualified "... by testing each size, type and model" of valve to "acceptance criteria" based on the "design and qualification requirements" (operator force, differential pressure and fluid flow, system pressure, fluid temperature, ambient temperature, minimum air supply system pressure, spring force and minimum and maximum stroke time), utilizing test data from the manufacture, field test data, empirical data supported by test, or test data of similar valves.

Pre-operational POV testing will be conducted to demonstrate the "functional performance requirements" satisfy the "acceptance criteria" for the valve safety function(s) to fully open and/or close the valve, with adequate power-operator capability under minimum pneumatic or hydraulic pressure, that the maximum force achieved is appropriate, that the minimum and

maximum stroke-time is satisfied, and seat leakage is within the maximum leakage rate, with measurement of all of these parameters demonstrating adequate margin exists considering the diagnostic equipment inaccuracies and margin for degradation. Remote position indication testing also will confirm proper indication in the control room or other relied upon remote locations.

During the pre-operational POV testing, the solenoid-operated valves safety functions will be tested to demonstrate that their Class 1E electrical requirements for energized or denergized and rated conditions are satisfied with the appropriate electrical power supply amperage and voltage.

No COLA change is required with this response.

RAI 03.09.06-14

QUESTION:

ABWR DCD Tier 2, Subsection 3.9.6.2.4, "Isolation Valve Leak Tests," refers to pressure isolation valves, temperature isolation valves, and containment isolation valves. The STP COL applicant is requested to indicate the classification, allowable leak rate, and test interval for pressure isolation valves to be included at STP Units 3 & 4.

RESPONSE:

Classification of these pressure isolation valves is in ABWR DCD Tier 2, Table 3.9-8, including changes as presented in COLA Tier 2, Table 3.9-8, as well as depicted in the system P&ID figures contained in the COLA Chapter 21. COLA Tier 2, Table 3.9-8 identifies the individual valves with the P&ID figure and sheet number(s) where the valves are depicted.

The ABWR DCD Tier 2, Table 3.9-9, "Reactor Coolant System Pressure Isolation Valves" identifies the pressure isolation valves, with no changes made by the COLA. In the Final Safety Evaluation Report, NUREG-1503, it is stated that "the staff reviewed the RCS pressure isolation valves list provided in the SSAR and determined that this list contains all of the RCS pressure isolation valves and was acceptable..."

In ABWR DCD Section 3.9.6.2.4, "Leakage rate testing for valve group (1) is addressed in Subsection 3.9.6." In addition, the inservice testing procedures will identify the allowable leak rate. The isolation valve IST procedures will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3 & 4 Preservice Testing and Inservice Testing Programs for isolation valves. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information of the ITAAC closure program to facilitate NRC review and confirmation activities.

The test intervals are available in ABWR DCD Tier 2, Table 3.9-8, including changes as presented in COLA Tier 2, Table 3.9-8.

No COLA change is required with this response.

RAI 03.09.06-15

QUESTION:

ABWR DCD Tier 2, Section 3.9.3.4, "Component Supports," includes provisions to be addressed in design specifications for snubbers, but does not describe the inservice examination and testing program. The STP COL applicant needs to fully describe the IST program for dynamic restraints to support the COL application for STP Units 3 & 4. The NRC staff requests that the STP COL applicant provide the information on its IST program for dynamic restraints as indicated in Paragraph C.III.3.9.6.4 of RG 1.206. This information should (1) include a table listing the safety-related components that use snubbers in their support systems with (a) the systems and components that use snubbers; (b) number of snubbers used in each system and on components in that system; (c) types of snubbers (hydraulic or mechanical and corresponding supplier; (d) whether the snubber was constructed to industry codes; (e) whether snubber is used as a shock, vibration, or dual-purpose snubber; and (f) indication of whether dual-purpose or vibration arrester snubbers were evaluated for fatigue strength; (2) describe the IST program (including test frequency and duration and examination methods) related to visual inspections and functional testing of dynamic restraints and basis for testing; (3) describe the steps to be taken to assure snubbers are properly installed prior to preoperational piping and startup tests; (4) confirm accessibility provisions for maintenance, IST and testing, and repair and replacement of snubbers; and (5) describe implementation program to allow for NRC inspection to review the snubber program prior to reliance on dynamic restraints to perform their safety function. As part of this information, the STP COL applicant is requested to specify the ASME OM Code, Section ISTD, edition and addenda to be applied for the IST program for dynamic restraints.

RESPONSE:

The inservice testing (IST) and inspection programs have not yet been established. The snubber IST Program will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3& 4 Preservice Testing (PST) and IST Programs for snubbers. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information of the ITAAC closure program to facilitate NRC review and confirmation activities. The snubber IST Program will be developed in accordance with ASME OM Code Section ISTD.

Because the detailed piping and equipment design and related analysis activities have not been completed, the subsequent snubber design and procurement details requested in item (1) above, including specifics (a) through (f) about which safety-related components use snubbers, number of snubbers in each system, types of snubbers, manufacturer, etc., are not available at this time. However, consideration of items (2) through (4) will be included in the design, qualification and testing activities and item (5) will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3& 4 PST and IST Programs for snubbers. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information, of the ITAAC closure program, to facilitate NRC review and confirmation activities.

See the RAI 03.09.06-2 response which addresses the applicable ASME OM code.

No COLA change is required with this response.

RAI 03.09.06-16

QUESTION:

STP FSAR Subsection 3.9.7.3, "Pump and Valve Testing Program," states that the plant specific environmental parameters for the equipment qualification program will be available for NRC review as part of the ITAAC for basis configuration of systems, as provided in the reference ABWR DCD Tier 1 Section 1.2. The STP COL applicant needs to demonstrate its implementation of the design provisions specified for pumps, valves, and dynamic restraints in the ABWR DCD in support of the STP COL application. The NRC staff requests that the STP COL applicant discuss the availability of design and procurement specifications for pumps, valves, and dynamic restraints for NRC review.

RESPONSE:

Also see related RAI 03.09.06-24 response.

RAI 03.09.03-3 requested that the applicant provide schedule information for design specifications and component design reports to support staff audits and reviews.

In the RAI 03.09.03-3 response, STPNOC provided information and clarifications regarding current schedules for Design Specifications for Risk Significant ASME Class 1, 2 and 3 Components. This RAI also requests that the applicant specify when design and procurement specifications related to dynamic restraints would be available. Below are the current dates requested.

Table 1 – Design & Procurement Specification Dates for Safety Related Valves, Pumps, and Dynamic Restraints

Component	Current Design & Procurement Specification Date
Safety Related Valves	Q1-2011
Safety Related Pumps	Q2-2010
Safety Related Dynamic Restraints	Q2-2010

These dates represent the current dates from the integrated project schedule, and are subject to potential future adjustment. As part of our periodic issuance of the project schedule to the NRC, the NRC will become informed of any changes.

The design of pumps, valves, and dynamic restraints as provided in the ABWR DCD has finality. As provided in Section VI.D of the ABWR design certification rule (10 CFR 52 Appendix A),

STPNOC is not required to provide any further design-related information. Therefore, this schedule information is not relevant to the STP Units 3 & 4 COL application.

No COLA change is required with this RAI response.

RAI 03.09.06-17

QUESTION:

STP FSAR Subsection 3.9.7.3 states that the pump and valve IST and inspection program will be provided to the NRC as specified in FSAR Section 13.4S, "Operational Program Implementation." FSAR Section 13.4S states that descriptions of operational programs, consistent with the definition of "fully described" in Staff Requirements Memorandum for SECY-05-0197, are provided in the FSAR sections noted in Table 13.4S-1, "Operational Programs Required by NRC Regulation and Program Implementation." However, the IST program for pumps, valves, and dynamic restraints, and the MOV Testing program are not fully described in the sections referenced in Table 13.4S-1. As discussed in other RAIs, the STP COL applicant is requested to supplement the FSAR referenced sections with the information requested in RG 1.206 for these operational programs. STP FSAR Table 13.4S-1 specifies that the IST Program will be implemented after generator on line on nuclear heat. No implementation milestone is specified for the MOV Testing Program. The NRC staff requests that the STP COL applicant describe its milestones for preparing and implementing the IST and MOV Testing Programs to allow for review and inspection of those programs in advance of relying on pumps, valves, and dynamic restraints within the scope of those programs to perform their safety functions.

RESPONSE:

The inservice testing (IST) and inspection programs have not yet been established. The Motor-Operated Valve (MOV) Testing Program will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3 & 4 Preservice Testing and IST Programs for MOVs. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information of the ITAAC closure program to facilitate NRC review and confirmation activities. This schedule and milestone information will allow for NRC review and inspection of these programs in advance of relying on pumps, valves, and dynamic restraints within the scope of these programs to perform their safety functions

No COLA change is required with this response.

RAI 03.09.06-18

QUESTION:

STP FSAR Subsection 3.9.7.3 states that the design qualification test, inspection and analysis criteria in Subsections 3.9.6.1, 3.9.6.2.1, 3.9.6.2.2, and 3.9.6.2.3 of ABWR DCD Tier 2 will be included in the respective safety-related pump and valve design specifications prior to fuel load as Commitment 3.9-3. STP FSAR Subsection 3.9.7.3 also states that the design, qualification, and preoperational testing for MOVs will conform to the provisions in ABWR DCD Tier 2, Subsection 3.9.6.2.2 as Commitment 3.9-4. The NRC staff requests that the STP COL applicant discuss its compliance with the COL applicant actions specified in those subsections of the ABWR DCD as part of its COL application for STP Units 3 & 4.

RESPONSE:

Also see related RAI 03.09.06-17 response.

The inservice testing and inspection programs have not yet been established. The Motor-Operated Valve (MOV) Testing Program will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3 & 4 Preservice Testing and Inservice Testing Programs for MOVs. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information of the ITAAC closure program to facilitate NRC review and confirmation activities. The response will address the functional design and qualification process, including MOV testing plans and procedures that address the details of the design and qualification test, inspection and analysis criteria.

No COLA change is required with this response.

RAI 03.09.06-19

QUESTION:

STP FSAR Subsection 3.9.7.3 states that the safety-relief valve (SRV) IST requirements are included in Table 3.9-8, and additional SRV testing including technical specification testing is described in Section 5.2.2.10. The NRC staff requests that the STP COL applicant fully describe the IST program for SRVs consistent with RG 1.206 and Commission paper SECY-05-0197. For example, Paragraph C.III.3.9.6.3.6 in RG 1.206 requests that COL applicants provide a list of SRVs including type, valve identification number, code class, test parameters, and test frequency. The STP COL applicant is requested to confirm that this information is provided as part of the COL application for STP Units 3 & 4.

RESPONSE:

The inservice testing (IST) and inspection programs have not yet been established. The information to be provided in these programs includes the information that is outlined and referenced in the approved and certified ABWR DCD Tier 2, Section 3.9.6 "Testing of Pumps and Valves." While a summary of some of this information (e.g., code class, test parameters and test frequency) is provided in ABWR DCD, Tier 2, Table 3.9-8 and STP COLA Tier 2, Table 3.9-8, the remaining information (e.g., valve type and valve identification number) will be provided as part of the post-COLA IST Program information.

No COLA change is required with this response.

RAI 03.09.06-20

QUESTION:

STP FSAR Subsection 3.9.7.3 states that inservice tests to verify operational readiness of pumps and valves, whose function is required for safety, conducted during the initial 120-month interval must comply with the requirements in the latest edition and addenda of the Code incorporated by reference in 10 CFR 50.55a(b) of this section on the date 12 months before the date of issuance of the operating license (or the optional ASME Code cases listed in RG 1.192 that is incorporated by reference in 10 CFR 50.55a(b) of this section), subject to the limitations and modifications listed in 10 CFR 50.55a(b) of this section. STP FSAR Subsection 3.9.7.3 also states that inservice tests to verify operational readiness of pumps and valves, whose function is required for safety, conducted during successive 120-month intervals must comply with the requirements of the latest edition and addenda of the Code incorporated by reference in 10 CFR 50.55a(b) of this section 12 months before the start of the 120-month interval (or the optional ASME Code cases listed in RG 1.147, through Revision 14, or RG 1.192 that are incorporated by reference in 10 CFR 50.55a(b) of this section), subject to the limitations and modifications listed in 10 CFR 50.55a(b) of this section. RG 1.206, Section C.IV.4.3 states that the COL will contain a license condition that requires the licensee to submit to the NRC a schedule, 12 months after issuance of the COL that supports planning for and conduct of NRC inspections of operational programs. The schedule will be updated every 6 months until 12 months before scheduled fuel loading, and every month thereafter until either the operational programs in FSAR Table 13.4-201 have been fully implemented or the plant has been placed in commercial service, whichever comes first. The NRC staff requests that the STP COL applicant discuss the plans to develop license conditions for operational program implementation consistent with the guidance in RG 1.206 and Commission paper SECY-05-0197. The STP COL applicant is also requested to discuss updating the reference to Revision 14 to RG 1.147 to be consistent with the NRC regulations at the time of development of the IST program for STP Units 3 & 4.

RESPONSE:

Operational Program Implementation is contained in STP 3 & 4 COLA Part 2, Tier 2, Section 13.4S. COLA Part 2, Tier 2, Table 13.4S-1, Item 2 addresses the Inservice Testing (IST) Program to verify operational readiness of pumps and valves, whose function is required for safety.

Response to this RAI is related to RAI 03.09.06-4 regarding the schedule for preparation of IST Programs and related design activities. STPNOC intends to support planning for and conduct of NRC inspections of operational programs in accordance with Regulatory Guide 1.206, Section C.IV.4.3.

At present the approved ABWR DCD Tier 2, Table 1.8-20 establishes the applicable revision of Regulatory Guide 1.147 at Revision 8. As STPNOC continues to develop the STP Units 3 & 4 Preservice Testing and IST Programs, as discussed in the RAI 03.09.06-1 response, there will be

consideration of the present state of industry knowledge, including industry standards and regulatory guidance.

No COLA change is required with this response.

RAI 03.09.06-21

QUESTION:

In Attachment 3 to its COL application dated September 20, 2007, STP states the milestone for Commitment 3.9-3 (COL Item 3.29), summarized as the Pump and Valve IST Program, will be completed and available for review prior to fuel load. The STP milestone does not provide sufficient information on the IST program to allow the NRC staff to reach a safety finding in support of the STP COL application. The STP milestone is also not sufficient for the NRC staff to perform inspections in a timely manner to verify the successful development and implementation of the IST Program prior to relying on pumps and valves to perform their safety functions. The NRC staff requests that STP provide a schedule that allows for NRC inspections of the IST Program during its development and implementation prior to relying on pumps and valves to perform their safety functions. STP is also requested to discuss the basis for its use of "commitments" in the IST program as part of its COL application.

RESPONSE:

Also see related RAI 03.09.06-4 response.

Design activities which are integral to the establishment of the Inservice Testing (IST) Program are in progress. Preparation of the IST Procedures for safety-related pumps and valves will follow completion of system design and component selection activities.

Descriptions of the IST test plans and procedures will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3 & 4 Preservice Testing and IST Programs for pumps and valves. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information of the ITAAC closure program to facilitate NRC review and confirmation activities. This schedule and milestone information will allow for NRC review and inspection of these programs in advance of relying on pumps, valves, and dynamic restraints within the scope of these programs to perform their safety functions.

For STP Units 3 & 4, STPNOC considers the use of "commitments" in the COLA as consistent with industry and NRC dialog with respect to providing continuing linkage of COL applicant commitments to both post-COL actions and then COL operator actions for the life of the units.

No COLA change is required with this response.

RAI 03.09.06-22

QUESTION:

In Attachment 3 to its COL application dated September 20, 2007, STP states the milestone for Commitment 3.9-4 (COL Item 3.29), summarized as design, qualification, and preoperational testing of Motor-Operated Valves, to be prior to fuel load. The STP milestone does not provide sufficient information regarding MOV design and qualification to allow the NRC staff to reach a safety finding on the capability of MOVs to perform their safety functions in support of the STP COL application. The STP milestone is also not sufficient for the NRC staff to perform inspections in a timely manner to verify the successful development, implementation, and completion of the MOV Program prior to relying on MOVs to perform their safety functions. The NRC staff requests that STP provide a schedule that allows for NRC inspections of the MOV Program for its development, during implementation, and following completion prior to relying on MOVs to perform their safety functions. STP is also requested to discuss the basis for its use of "commitments" in the MOV Testing program as part of its COL application.

RESPONSE:

Also see related RAI 03.09.06-4 and RAI 03.09.06-17 responses.

Design activities which are integral to the establishment of the Motor-Operated Valve (MOV) Testing Program are in progress. Preparation of the MOV Testing Procedures will follow completion of system design and component selection activities.

Descriptions of the MOV test plans and procedures will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3 & 4 Preservice Testing and Inservice Testing Programs for MOVs. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information of the ITAAC closure program to facilitate NRC review and confirmation activities. This schedule and milestone information will allow for NRC review and inspection of these programs, including design, qualification, and preoperational testing, in advance of relying on MOVs to perform their safety functions.

For STP Units 3 & 4, STPNOC considers the use of "commitments" in the COLA as consistent with industry and NRC dialog with respect to providing continuing linkage of COL applicant commitments to both post-COL actions and then COL operator actions for the life of the units.

No COLA change is required with this response.

RAI 03.09.06-23

QUESTION:

RG 1.206, Paragraph C.III.3.9.6.1, "Functional Design and Qualification of Pumps, Valves, and Dynamic Restraints," requests that the COL applicant provide information related to equipment not included in the referenced certified design. The STP COL applicant is requested to confirm that STP Units 3 & 4 will not include equipment beyond that specified in the ABWR certified design, or to provide the information on such equipment as indicated in RG 1.206.

RESPONSE:

See the RAI 03.09.06-25 response.

STPNOC will construct STP Units 3 & 4 in accordance with the ABWR certified design subject to the Departures specified in the COLA. STP Units 3 & 4 COLA Tier 2, Section 3.9.6 identifies the information, including functional design and qualification of pumps, valves, and dynamic restraints, identified by the STP Units 3 & 4 COLA Part 7, Departures. According to the departures, the small number of valve additions are identified in Table 3.9-8 and use the same identification and requirement criteria already in the ABWR DCD Tier 2, Table 3.9-8; the remaining COLA departure changes to Table 3.9-8 are valve deletions. The small number of valve additions meets the same criteria already in the approved ABWR DCD, as identified in Table 3.9-8. There are no identified pump and dynamic restraints changes as a result of the COLA departures.

No COLA change is required with this response.

RAI 03.09.06-24

QUESTION:

ABWR DCD Tier 2, Subsection 3.9.7.4, "Audit of Design Specification and Design Reports," states that COL applicants will make the design specification and design reports available for NRC staff audit. STP FSAR Subsection 3.9.7.4 of the same title states that design specification and design reports required by ASME Code for vessels, pumps, valves and piping systems for the purpose of audit will be made available for NRC review. The STP COL applicant is requested to specify the availability of design specification and design reports related to pumps, valves, and dynamic restraints for NRC review.

RESPONSE:

The ABWR DCD Tier 2, Subsection 3.9.7.4 refers to Subsection 3.9.3.1, which covers the "... reports required by ASME Code for vessels, pumps, valves and piping systems for the purpose of audit...." Please note that the ASME Code certified stress reports are the subject of ABWR DCD Tier 1, Design Acceptance Criterion Table 3.3, Item 1.

For the design specification availability portion of this RAI response, see the response to RAI 03.09.06-16.

No COLA change is required with this RAI response.

RAI 03.09.06-25

QUESTION:

STP FSAR Table 3.9-8 modifies this table provided in the ABWR DCD. The modifications include addition or removal of specific components, and changes to the Code category, valve function, test parameters, and test frequency. The NRC staff requests that the STP COL applicant describe the modifications to Table 3.9-8 and the basis for the changes.

RESPONSE:

The modifications which were made to STP FSAR Table 3.9-8 are detailed in the following departures:

STD DEP T1 2.4-3	(MPL# E51)	Part 7, Section 2.1, pages 16-18
STD DEP T1 2.14-1	(MPL# T49 & P21)	Part 7, Section 2.1, pages 21-26
STD DEP T1 2.4-1	(MPL# E11)	Part 7, Section 2.1, pages12-13
STP DEP 9.2-5	(MPL# P41)	Part 7, Section 3.0, pages 88-90
STD DEP 9.3-2	(MPL# P51 & P81)	Part 7, Section 3.0, Pages 94-95

The listing of departures for Section 3.9 will be revised as shown below:

3.9 Mechanical Systems and Components

The information in this section of the reference ABWR DCD, including all subsections, tables, and figures, is incorporated by reference with the following departures and supplements.

STD DEP Admin	(Table 3.9-1)
STD DEP T1 2.4-3	(Table 3.9-8, MPL# E51)
STD DEP T1 2.14-1	(Table 3.9-8, MPL # T49 and P21)
STD DEP 3.9-1	
STD DEP T1 2.4-1	(Table 3.9-8, MPL# E11)
STP DEP 9.2-5	(Table 3.9-8, MPL# P41)
STD DEP 9.3-2	(Table 3.9-8, MPL# ~~P56~~ P51 and P81)

RAI 03.09.06-26

QUESTION:

Nuclear power plant operating experience has revealed the potential for adverse flow effects from vibration caused by hydrodynamic loads and acoustic resonance on reactor coolant, steam, and feedwater systems. ABWR DCD Tier 2, Subsection 3.9.2.1.1, "Vibration and Dynamic Effects Testing," describes tests to confirm that piping, components, restraints, and supports have been design to withstand the dynamic effects of steady-state flow-induced vibration (FIV) and anticipated operational transient conditions. ABWR DCD Tier 2, Subsection 14.2.12.1.51, "Expansion, Vibration and Dynamic Effects Preoperational Test," and Subsection 14.2.12.2.11, "System Vibration," discuss the verification during plant startup tests that vibration of critical system components and piping is within acceptable limits during normal steady-state power operation and during expected operational transients. The NRC staff requests that the STP COL applicant discuss the implementation of this program to identify potential adverse flow effects on pumps, valves, and dynamic restraints from hydraulic loading and acoustic resonance during plant operation.

RESPONSE:

The inservice testing (IST) and inspection programs have not yet been established.

While the IST Program will focus on addressing the dynamic effects of steady-state flow-induced vibration (FIV) and anticipated transient conditions as they relate to pumps, valves and dynamic restraints, a parallel program, taking advantage of nuclear power plant operating experience, will be developed to assure hydrodynamic loads and acoustic resonance is considered in the design of the reactor coolant, steam and feedwater systems.

The IST plans and procedures will be addressed through the RAI 03.09.06-1 response. The response provides a description of the approach and details of the STP Units 3 & 4 Preservice Testing and IST Programs for pumps, valves and dynamic restraints. For NRC planning purposes, the response also addresses the availability and linkage of milestone and schedule information of the ITAAC closure program to facilitate NRC review and confirmation activities.

No COLA change is required with this response.