March 21, 2011

MEMORANDUM TO: Tom M. Tai, Senior Project Manager
ESBWR/ABWR Projects Branch 2
Division of New Reactor Licensing
Office of New Reactors

FROM: Tuan D. Le **/RA/**
Engineering Mechanics Branch 1
Division of Engineering
Office of New Reactors

SUBJECT: JANUARY 18 - 21, 2011, AUDIT SUMMARY REPORT OF SOUTH TEXAS NUCLEAR OPERATING COMPANY COMBINED LICENSE APPLICATION – DESIGN SPECIFICATIONS OF RISK SIGNIFICANT COMPONENTS

During January 18 to 21, 2011, the staff of Engineering Mechanics Branch 1 and 2 performed the regulatory audit of design specifications of risk significant advanced boiling water reactor components for the South Texas Project (STP) Units 3 and 4 Combined License Application (COLA). The scope of the audit included a sampling of risk-significant components selected from the list of risk-significant components determined by the applicant, as listed in the attached audit summary report. All but two of the sixteen audit findings were resolved during the audit. The two unresolved audit items will be considered open items, as the staff will verify that they are resolved when the revised design documents are submitted by the applicant, Nuclear Innovation North America, LLC. The attached audit summary report supports the technical reviews of SRP Sections 3.2.1, 3.2.2, 3.9.3, 3.9.4 and 3.9.5 of the STP Units 3 and 4 COLA.

Enclosure:
As stated

CONTACT: Tuan D. Le, NRO/DE/EMB1
301-415-2297

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U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NEW REACTORS
DIVISION OF ENGINEERING
REGULATORY AUDIT REPORT

Applicant:	Nuclear Innovation North America, LLC- STP Unit 3 and 4
Application:	Advanced Boiling Water Reactor (ABWR)
Audit Dates:	January 18 - 21, 2011
Audit Reviewers:	Tuan D. Le, NRO/DE/EMB1, Team Leader Jennifer Dixon-Herrity, NRO/DE/EMB2 Richard McNally, NRO/DE/EMB2 Sardar Ahmed, NRO/DE/EMB2 Yiu Law, NRO/DE/EMB1 Jason Huang, NRO/DE/EMB2
Approved by:	Hsia, Anthony, Branch Chief Engineering Mechanics Branch 1 Division of Engineering Office of New Reactors

Enclosure

Table Content **Pages**

EXECUTIVE SUMMARY

During January 18 to 21, 2011, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an audit of the design documents of Advanced Boiling Water Reactor (ABWR) risk significant components at the office of Sargent and Lundy in Chicago, Illinois. The purpose of this audit was to verify that the design documents of STP units 3 and 4 for major components appropriately include the American Society of Mechanical Engineers (ASME) boiler and pressure vessel (B&PV) Code, Section III, Division 1, 1989 Edition requirements and are documented in accordance with the requirements of Subarticle NCA-3250 of the Code.
The scope of the audit includes a sampling of risk-significant components selected from the list of risk-significant components determined by the applicant, as listed in the audit plan, "Audit Plan: Audit of Risk Significant Components of South Texas Project." The second goal was to verify that the information on design criteria, analytical methods and functional capability specified in these documents is consistent with that included in the ABWR Design Control Document (DCD), to confirm that the functional design, qualification, and classification to be used in the STP units 3 and 4 satisfy SRP Sections 3.2.1, 3.2.2, 3.9.3, 3.9.4 and 3.9.5.

The STP Units 3 and 4 applicant, Nuclear Innovation North America, LLC (NINA), provided a list of risk significant components for which the design specifications would be completed and available for the NRC audit. The staff found that NINA plans to amend the COL license to allow the use of more recent versions of codes and standards, including the 2004 ASME Code edition in the plant design after they receive their license. Based on the information reviewed, the staff found that the design documents for the reviewed components reflected the methodology and criteria contained in the DCD, and met the requirements of ASME Code, Section III, Article NCA-3000 with the exception that the ASME Code Edition called out in the component design specifications was the code they plan to go to following issuance of the license rather than the code of record, ASME Code, Section III, 1989 Edition. Based on the audit findings, all but two of the sixteen audit findings were resolved during the audit. NINA committed to resolving the remaining open items by revising the design specification. The remaining audit open items will be considered open items, as the staff will verify that they have been incorporated when the revised design documents are submitted by NINA.

ASME COMPONENTS

The staff conducted the audit of the component design specifications as identified in Table 1 of the audit plan. The scope of the component audit was limited to the following risk significant ABWR components selected by the staff prior to the audit:

Table 1: Risk Significant Components

System / Function	Risk Significant SSC
RCIC (Reactor Core Isolation Cooling) System	Turbine, Pump, Min Flow Bypass Valve, Injection Valve, Check Valve F038, Check Valves {F003, F005}, Isolation Valves {F035, F036, F039}, Suction Strainers
COPS (Containment Overpressure Protection) System	AOV {F007, F010} Rupture Disks Flow Lines
RPV (Reactor Pressure Vessel)	Reactor Vessel Design Reactor Internals
Containment	Wetwell/Drywell Vacuum Breakers
Classification	Component Classification, Q-List, P & IDs
HPCF (High pressure core flooder)	Pumps, Maintenance Valve F005 {B, C}, Injection Valves F003 {B,C}
CRD (Control Rod Drive)	Hydraulic Control Units Scram Pilot Solenoid Valves (part of HCU) Scram Valves to FMCRDs (part of HCU)
NB (Nuclear Boiler) System	Isolation Check Valves F003B and F004B SRV discharge piping ADS F010 {A,C,F,H,L,N,R,T} Non-ADS F010 {B,D,E,G,J,K,M,P,S,U}
RSW (Reactor Service Water) System	Pumps Supply Isolation Valves F015 {A,B,C,D,E,F} F002 {A,B,C,D,E,F} Heat Exchangers
RCW (Reactor Cooling Water) System	Pumps Isolation Valves F015 {A,B,C,D,E,F} F002 {A,B,C,D,E,F} Heat Exchangers
RHR (Residual Heat Removal)	ACIWA Manual Valves {F101, F102} Heat Exchangers Pumps Injection Valves {F001, F003, F005, F006} {A,B,C} Admission Valves, F012
SLC (Standby Liquid Control)	Tank, Valves {F006}, Piping, Pumps
RWCU (Reactor Water Cleanup System)	Isolation Valves {F002, F003} Remote Manual Shutoff Valve {F026}
Emergency Diesel Generator System	Starting Receiver Tanks and Valves Safety-related diesel cooling water system and lube oil system

In addition, the staff conducted the classification reviews of the risk significant components using SRP Sections 3.2.1 and 3.2.2. The additional details of the reviews are provided in the Appendix A of this report.

DOCUMENTS REVIEWED

Specifications

- 3B11-D003-3005-01, Reactor Pressure Vessel Reactor Internals Specification, Rev. 7
- U7-SLC-M-SPEC-ASME-TANK-7333,Standby Liquid Control System (SLC) Tank Specification, Rev. B
- U7-SITE-M-SPEC-ASME-VLV-7343, Standby Liquid Control System (SLC) Valve Specification, Rev. E
- U7-SITE-P-SPEC-ASME-0002,Standby Liquid Control System (SLC) Piping Specification, Rev. B
- U7-SLC-M-SPEC-ASME-PUMP-7386, Standby Liquid Control System (SLC) Pumps Specification, Rev. D
- U7-SITE-P-SPEC-ASME-0001, ASME III, Division I, Class 1, 2, and 3 Piping and Piping Supports for the Nuclear Boiler System, Rev. C
- U7-SITE-M-SPEC-ASME-VLV-7384, Safety Related Large Bore Containment Isolation Valves – ASME Section III, Division I Class 1 & 2 Design Specification, Rev E
- U7-SITE-M-SPEC-ASME-MSRV-7381, Main Steam Safety Relief Valves-ASME Section III, Division I Class1 Design Specification, Rev. E
- U7-RBCW-M-SPEC-ASME-PUMP-7358, Reactor Building Cooling Water Pumps ASME Section III Division I Class 3 Design Specifications, Rev. D
- U7-SITE-M-SPEC-ASME-VLV-7342, Large Bore Valve-ASME Section III Division I Class 3 Design Specification, Rev. F
- U7-EDG-M-SPEC-ASME-DG-7300, Emergency Diesel Generator-ASME Section III, Division I Class1 Design Specification, Rev. 1
- 7C12-D004-3001-01, Hydraulic Control Unit Equipment Requirement Specification, Rev.3
- U7-RSW-M-SPEC-ASME-PUMP-7396, Service Water Pumps Specification, Rev. D
- U7-RHR-M-SPEC-ASME-HX-7322, RHR Heat Exchangers Specification, Rev. D
- U7-RHR-M-SPEC-ASME-PUMP-7387, RHR Pumps Specification, Rev. D
- U7-SLC-M-SPEC-ASME-PUMP-7383, SLC Pump Specification, Rev. D
- U7-SITE-M-SPEC-STNR-7399, ECCS Suction Strainer Specification, Rev. D
- U7-SITE-P-SPEC-ASME-PIPE-7347, Rev. D, Containment Overpressure Protection Rupture Disk SpecificationU7-SITE-P-SPEC-ASME-0018, Rev. B, Containment Overpressure Protection
- U7-FAB-P-SPEC-PIPE-7332, Rev. D, Piping Component Specification
- U7-RBCW-M-SPEC-PUMP-7358, Rev E, Reactor Building Cooling Water Pump Specification
- U7-EDG-M-SPEC-DG-7300, Rev 1, Emergency Diesel Generator Specification
- 7B11-D001-3001-01, Core Support Structures and Reactor Internals
- U7-PCS-S-ASME-7519, Rev. C1, Containment Wetwell/Drywell Vacuum Breakers (Draft)

Procedures:

- PI-STP34-116, “Preparation and Control of ASME Section III Design Safety-related and Nonsafety-related and Generic Specifications,” Revision 13, December 9, 2010
- PI-STP34-124, “STP Units 3 & 4 Impact Assessment Review,” Revision 1
- PI-STP34-122, “STP 3 & 4 Licensing Impact Screening – Change Proposal Notice and Requirements Change Request Processing,” Revision 3
- U7-P-EN02-0004, “Changes to STP 3 & 4 Requirements Documents,” Revision 5
- U7-PROJ-D-PRD-0009, “Project Specific Pre-Baseline Design Change Control Procedure,” Revision G
- U7-PROJ-G-PRD-011, “Applicable codes and Standards,” Revision 2
- RCR# S&L09-19062, “Tier 2* Codes and Standards Update”
- ASME Code Reconciliation Report 1989 Edition through 2004 Edition, Reddy Engineering, Inc.
- ASME Code Reconciliation Report 1989 Edition through 2004 Edition, S&L
- GDD-0013, Classification Summary
- GDD-0001, Seismic Design Classification
- PRD-0011, Applicable Codes and Standards

Hold Tabulation Sheets:

- U7-SITE-M-SPEC-HOLD-MSRV-7381
- U7-SITE-M-SPEC-HOLD-PUMP-7358
- U7-SITE-M-SPEC-HOLD—0001
- U7-SITE-M-SPEC-HOLD-HX-7323
- U7-SITE-M-SPEC-HOLD-VLV-7384

Drawings:

- 7C12-D004-3102-01, Hydraulic Control Unit Design Specification Drawing, Rev.1
- 7C12-D004-3102-03, Gate Valve 20A Design Specification Drawing, Rev.1
- 7C12-D004-3102-04, Gate Valve 32A Design Specification Drawing, Rev.1
- 7C12-D004-3102-05, Angle Valve Design Specification Drawing, Rev.1
- 7C12-D004-3102-06, Cartridge Valve Design Specification Drawing, Rev.1

P&IDs:

- U3-RBCW-P-DWG-PID-0001 Sheets 01, 04, and 07, Rev D
- U3-NB-M-DWG-PID-0001, Sheets 01 - 03, Rev. D
- U3-NB-M-DWG-PID-0001-03, Sheets 04 & 05, Rev B
- U7-PROJ-M-RPT-DESN-6001, Rev. A
- U7-PROJ-M-RPT-DESN-6003, Rev. A
- U3-ACS-M-DWG-P&ID-0001-01, Rev. F
- U3-ACS-M-DWG-P&ID-0001-02, Rev. F
- U3-ACS-M-DWG-P&ID-0001-03, Rev. F
- U3-ACS-M-DWG-P&ID-0001-04, Rev. F
- 3C12-2101-0001-00003, Rev. 4

- U3-SLC-M-DWG-P&ID-0001-01, Rev. D
- 3C12-2101-0001-00003, Rev. 4

Valve Data Sheets

- U3-ACS-FV-0133
- U3-ACS-FV-0134

AUDIT FINDINGS

PLANNED CODES AND STANDARDS AMENDMENT

The applicant informed the NRC that all the ASME design specifications that the staff would be reviewing were written to a more current set of codes and standards than those called out in the DCD. For example, rather than ASME Section III 1989, the STP Units 3&4 component design specifications called out the 2004 version. The applicant explained that it was their intent to request a license amendment during the construction period to update many of the codes called out in their application to the more current codes. The applicant further explained that the design hold was put in place as suggested in NRC Interim Staff Guidance 11 (ISG-11) with the plan to proceed with a license amendment request following issuance of the COL license. The staff observed that as a result, the current STP Units 3&4 component design specifications do not meet the current certified ABWR DCD.

In the case of the use of ASME codes, the approach adopted by STP Units 3&4 in preparing design specifications is not consistent. Earlier specifications simply called out the 2004 Edition of the codes that the applicant planned to go to later while reactor pressure vessel specification called out the 1989 Code Edition for reactor pressure vessel design. Design specifications signed off in the last two months noted "holds" for every code called out. The staff discussed these observations with the applicant to understand how the changes would be controlled. The applicant explained that the holds were put in place per their Procedure PI-STP34-116, "Preparation and Control of ASME Section III Design, Safety-Related and Non Safety-Related and Generic Specifications." This procedure called for a hold tabulation to track all information that the applicant put on hold or had concerns about. This applied to portions of the design that had yet to be provided because the design had not progressed far enough to have the information available or areas where they were questioning the validity of the information (the code edition, for example). It was the applicant's plan to put the holds in place until the procurement specifications were ready to go out for bid. At that point, either the license amendment for the codes has been approved and the code edition corrected to the code edition approved in the license or management determined that the new edition would be used at their own risk and the holds would be removed. The staff questioned how design control was maintained if applicant removed the hold at their own risk.

The applicant explained that changes to the design had been made after the change was approved for the FSAR. The applicant had several processes in place to track and to evaluate this change request. STP Procedure U7-P-EN02-0004, "Changes to STP 3&4 Requirements Documents," provides a process for submitting and processing changes to engineering technical specifications and changes to the COLA or DCD which would require NRC approval. The process involves a Project Design Review Board made up of senior NINA staff which reviews and approves each change to be made. Through this process, Requirements Change Request (RCR) #S&L 09-19062 was generated. This change request will evaluate the Tier 2*

Codes and Standards change recommended for the STP design to update the design specifications to the applicable Code/Standard year in the COLA to the most current codes approved by the NRC or used by industry. The update was previously suggested by the NRC and was found to be of value for the applicant because their design currently allows different edition of the code in different areas of the plant. This inconsistency was identified by the applicant as a potential for errors. Further, applicant found that it would avoid the need for code reconciliation in procurement. The review of the RCR was in process during the audit.

The applicant also provided Procedure 7A10-0301-0009, Rev. 6, "Project Specific Pre-Baseline Design Change Control Procedure." This document established direction for implementation of pre-baseline design change control using design proposal notices and design change notices. It did not apply in this case. It would be used to control changes to be made prior to licensing. The applicant maintains a baseline Document U7-PROJ-G-PD-0011, "Applicable Codes and Standards," which documents the codes and standards approved for the project. This document listed all the codes and standards described in the FSAR and DCD and had not been revised to use the newer codes at the time the audit was occurring. PI-STP34-122, "Licensing Impact Screening – Change Proposal Notice and Requirements Change Request Processing," describes a process for evaluating potential licensing impacts and documenting impacts in proposed change notices. Project Instruction PI-STP34-124, "STP 3&4 Impact Assessment Review," describes the process for assessing impact on STP design basis documents and engineering documents using the STP Impact Assessment Database. The staff noted that thru these two procedures, the applicant would be able to ensure that all affected documents would be identified for revision once a change was processed.

10 CFR 50 Appendix B Criterion III and V require that the applicant have measures established to assure that applicable regulatory requirements specified in the license are correctly translated into specifications and drawings and that applicant have procedures controlling activities affecting quality. Based on the staff's review, the staff concluded that the applicant has processes in place to control and document changes and that the pending license amendment and potential changes in the specifications were in these processes. The design was put on hold for the review by the NRC per NRC guidance in ISG-11, but the staff acknowledged that the design work will be ongoing until plant construction is complete. The processes discussed above should ensure that, when completed, the plant design would be in accordance with the codes approved. Further, the staff will have the opportunity to verify that the design was in accordance with approved codes and standards for the design through the existing piping design ITAAC (Tier 1 ITAAC 3.3.1) and an ITAAC added (Table 3.0-13) during the current application review calling for review of the Component Design Reports (in Site-Specific ITAAC Table 3.0-14 of FSAR, Rev 4).

The only remaining concern noted was that the code identified in the license amendment could not be used for piping design. In reviewing the piping design specifications provided, the staff noted that these documents are not yet signed by registered Professional Engineer (PE) and that the piping design is not being reviewed as part of this audit. Piping Design Acceptance Criteria (DAC) will be addressed through review of ITAAC at a later date. This concern will be addressed at that point or through staff review of the amendment.

ASME COMPONENTS

The staff found that each set of design specification documents addressed the following design related information consistent with the requirements of the ASME Section III, NCA-3250:

- ASME classification and jurisdiction boundary
- Design basis and service limits
- Design information
    - Loadings for design, service level (A, B, C, D), and test conditions
    - Load combinations and acceptance limits
    - Deformation limits (if applicable)
- Material specification including corrosion allowance
- Fabrication specification including welding requirements
- Leak testing and qualification requirements
- Overpressure protection (if applicable)
- Operability requirements
- Regulatory requirements

Each set of design documents reviewed during audit for a risk significant component included its design and/or purchase specification, detailed design drawings of the component parts, parts lists and other design-related documents. The design specification audit was conducted for the following risk significant components:

SUCTION STRAINERS - ECCS

The RCIC, RHR and HPCF pump suction strainers are designed to ASME Section III, Subsection NC, Quality Group B. Each STP unit has one (1) RCIC pump suction strainer, three (3) RHR pump suction strainers and two (2) HPCF pump suction strainers. In the Purchase Specification U7-SITE-M-SPEC-STNR-7399, the applicant uses NUREG/CR-6224 (2003 Revision) guidance to perform parametric study of potential BWR ECCS strainer blockage due to LOCA generated debris. The staff noted that this specification referenced ASME Section III Code Edition and was on hold. Where ASME Section II, V and IX referenced 2007 Edition with 2008 and 2009 Addenda were also on hold. Where the design specifications referenced Section XI Code was identified as using the 2004 Edition.

<u>Related RAI of Suction Strainers:</u>

In RAI 03.09.03-7, the staff asked the applicant to provide and to confirm the following:

1. The load combinations of the ECCS strainer will be evaluated as shown in Table 3.9-2 of the DCD.

2. The ECCS strainer design, stress analysis is performed in accordance with ASME Section III code requirements.

3. Provide ASME design specification and design report of the ECCS strainer for staff review. The strainer design specification and design report are prepared in accordance with the ASME Code, Section III, NCA-3250.

In response to this RAI, the applicant stated:

1. *The load combinations for the STP 3&4 ECCS suction strainers will be evaluated as shown in Table 3.9-2 of the DCD.*

2. *The ECCS strainer design and the stress analysis will be performed in accordance with ASME Section III code requirements.*

3. *A draft version of the design specification for the Emergency Core Cooling System (ECCS) strainers is currently available for NRC review. The specification does not yet include the specific loads and load combinations to be applied to the design of the STP 3&4 ECCS suction strainers. The final completed specifications for all ECCS strainers, which includes the specific loads and load combinations, will be available for NRC review by January 15, 2011. The design reports for the High Pressure Core Flooder (HPCF) and Residual Heat Removal (RHR) suction strainers will be available for NRC review by January 15, 2011 and the design report for the Reactor Core Isolation Cooling (RCIC) suction strainer will be available by March 15, 2011. Both the strainer design specification and the design reports will be prepared in accordance with the ASME Code, Section III, NCA-3250 requirements.*

During the audit of the suction strainer specifications, the staff inquired about the code used for the suction strainer stress analysis. The suction strainers of STP Units 3&4 are designed and analyzed in accordance with ASME Section III, Subsection NC requirements. The applicant provided a proposed design report (site-specific ITAAC, Table 3.0 – 14) that will include suction strainer stress analysis. The staff determined that the proposed ITAAC was an acceptable approach to resolve this issue.

AIR OPERATED VALVES, RUPTURE DISC, FLOW LINES - ACS

Air operated valves are specified Safety Class 2, Quality Group B and Seismic Category I. Valve Data Sheets U3-ACS-FV-0133 and U3-ACS-FV-0134 for valves FV-0133 and FV-0134 respectively, also identified valve acceleration loads (limits) for all three directions as follows:

Loading condition	Horizontal H1	Horizontal H2	Vertical V1
Upset	3G	3G	3G
Faulted	4G	4G	4G
Emergency	6G	6G	6G

The body configuration of the check valve and gate valve was indicated as “To be verified.” In response to staff’s question as to what process is in place to track the verification, the applicant provided the Hold Tabulation Sheet U7-SITE-M-SPEC-HOLD-VLV-7384 for tracking the verification of valve data. Upon review of Hold Tabulation Sheet, the staff noted that it incorrectly indicated U7-SITE-M-SPEC-ASME-VLV-7342 Rev. E instead of U7-SITE-M-SPEC-ASME-VLV-7384 Rev. E for ASME Design Spec No./Rev and U7-SITE-M-SPEC-VLV-7342 Rev. E instead of U7-SITE-M-SPEC-VLV-7384 Rev. E for Procurement Spec No./Rev. The applicant revised the Hold Tabulation Sheet during the audit. The staff found the revision of the Hold Tabulation Sheet acceptable.

The rupture discs are specified to be Safety Class 2, quality group B and Seismic Category I for Disc D001 and Safety Class 3, quality group C and Seismic Category I for Disc D002. In ASME Design Specification U7-SITE-P-SPEC-ASME-PIPE-7347, Rev. D, Piping Specialty Data Sheets were listed in Attachment A for the two rupture discs for Units 3&4. These data sheets were listed but were not included in the design specification. The applicant provided preliminary data sheet templates as these data sheets were not complete at the time of the audit. The applicant stated that these data sheets will be signed by a registered PE and issued separately. The staff reviewed the valve data sheet templates and found the response

acceptable since the staff would have the opportunity to review the final design through ITAAC. The flow lines are specified as Safety Class 2, quality group B and Seismic Category I for piping including supports and valves forming part of containment boundary. Flow lines beyond the first rupture disk up to and including the second rupture disc are specified as Safety Class 3, quality group C & Seismic Category I for piping including supports and valves.

The procurement specification number was listed as N/A in the document matrix. This was brought to the applicant's attention in item No. 3 of the Action Items List, in Table 1 of Attachment 1. Document matrix was updated by the applicant, as shown in Attachment 2, to include procurement specification number. The staff reviewed the valve data sheets and found the revision acceptable.

REACTOR PRESSURE VESSEL AND INTERNALS - RPV

Transitions (safe end) between nozzle, connecting pipes, weld to nozzle, steam outlet nozzle at the weld preparation at the end of the nozzle forging including integral support skirt attachment / attachment weld to conical portion of the support skirt, nozzles (stub tubes), bottom head penetrations including the differential pressure line tees, the weld between the shroud support and vessel, piping finish integral with vessel, weld between reactor internal pump (RIP) motor casing and the pressure vessel, are designed to ASME Section III, Subsection NB-1132.2. The remainder of the support skirt, support flange, and the anchor bolts shall be in full compliance with ASME Section III, Subsection NF. The crevices and annular gaps which are in contact with reactor coolant shall be eliminated where possible.

Additional stress evaluations will be performed in accordance with ASME Code requirements for RPV top head lifting lug and shall be evaluated following the guidelines in NUREG-0612 in addition to ASME Subsection NB-2300 requirements. The staff noted that the guidelines in REG 1.207 of environmental assist fatigue are not required to be used in the certified ABWR plant. However, the applicant uses RG 1.207 guidance to evaluate the environmental fatigue of the class 1 carbon steel piping, but not for other ASME component designs.

The reactor internals loading is specified in the Design Specification 3B11-D003-3005-01, Rev. 7, "Reactor Pressure Vessel Reactor Internals Specification" and addresses loads for core support components including top guide (with hardware), shroud, core plate, and fuel support (with hardware). The internal structures include the chimney head and bolts, chimney and chimney partitions are also subject to these loadings.

The staff found that the reactor internal components did not have the seismic requirements. At the staff's inquiry, the applicant will update the Procedure U7-SPEC-G-GDD-0013 (Classification Summary) to reflect seismic requirements for Specification 7B11-D001-3001-01 (Core Support Structures and Reactor Internals). Therefore, this item is an open item (#12).

The RPV vent and head spray assembly, listed as Reactor Internals in the DCD, was not included in the design specification. The applicant explained that this is not a risk significant component; however, since it is listed in the DCD, it should have been included in the audit. An open item was generated for the applicant to complete the design specification for this component. Therefore, this item is an open item (#8).

HYDRAULIC CONTROL UNIT, SCRAM PILOT SOLENOID VALVES, SCRAM VALVES - CRD

The hydraulic control unit (HCU) assembly is designed and classified as ASME Section III Subsection NC (Class 2) quality group B. The N2 gas bottles and scram accumulators are designed to ASME Section III Subsection NC. The connecting weld between N2 Gas Bottle and attachments is designed in accordance with ASME Section III Subsection NC. Other parts of the attachments are designed in accordance with ASME Section III Subsection NF. Remaining CRDS is designed to B31.1 Code Requirements. The staff found that these design specifications acceptable because they are consistent with the requirements of ASME Section III, NCA-3250.

ISOLATION CHECK VALVES, SRV DISCHARGE PIPING, ADS, NON-ADS - NB

In reviewing the design specifications for the nuclear boiler system, staff identified several questions with discrepancies in the wording in the specification as compared to the DCD. Terms used in a table describing materials in the specification did not match with the DCD. Further, the staff questioned the practice of identifying the use of regulatory guides (RGs) 1.31, 1.37, and 1.44) in the text, but not identifying the revision in the text or listing the RG in the list of references. The material changes resulted from their change process and were fully documented in the site specific application Table 5.2-4. The failure to include the RGs was identified as an over sight in the development of the specification and the applicant stated that it will be corrected. The correction is tracked by the applicant change notice process. The staff found the approach is acceptable. The staff found that these design specifications acceptable because they are consistent with the requirements of ASME Section III, NCA-3250.

PUMPS, SUPPLY ISOLATION VALVES, HEAT EXCHANGERS - RSW

The safety related RWS pumps are designed to ASME Section III, Division 1, Subsection ND. The design seismic loads, response spectra and SSE are specified in Technical Report U7-PROJ-C-RPT-DESN-6001, Rev. B, Applicable Seismic Response Spectra. The dynamic load cases are listed up to 100 Hz frequency and provided in this technical report.

The supplied valves are designed to ASME Section III, Subsection ND, quality group C, Seismic Category 1. The design requirements of these valves including design loads are specified in the Design Specification U7-SITE-M-SPEC-ASME-VLV-7342, Large Bore Valve-ASME Section III Division I Class 3 Design Specification, Rev. F.

The heat exchangers are designed to ASME Section III, Subsection NC (Tube) / Subsection ND (Shell Side), including the supports designed to Subsection NF and Tubular Exchanger Manufacturers Association (TEMA) Class C requirements. The staff found that these design specifications acceptable because they are consistent with the requirements of ASME Section III, NCA-3250.

MANUAL VALVES, HEAT EXCHANGERS, PUMPS, INJECTION VALVES, ADMISSION VALVES - RHR

The isolation valves including shutdown suction line isolation valves are designed to ASME Section III, Subsection NB, Seismic Category I, other isolation valves are designed to Subsection NC, Seismic Category I. The heat exchanger primary side is design to ASME Section III, Subsection NC, Seismic Category I. RHR pumps are designed to pumps ASME Section III, Subsection NC, Seismic Category I. The design specifications of RHR valves, heat

exchangers, pumps, injection valves and admission valves are acceptable per ASME Section III, NCA-3250.

TANK, VALVES, PIPING, PUMPS - SLC

The valve specification in Design Specification U7-SITE-M-SPEC-ASME-VLV-7343 has tag numbers and valve names that do not match the current P&ID drawing U3-SLC-M-DWG-PID-0001-01, Standby Liquid Control System (SLC), Rev. D for two SLC valves. The applicant explained that an alternative naming procedure was used to further clarify the valve function. An action item was created to update the valve specifications to include the new valve tag numbers, with the valve names unchanged. During the audit, the applicant revised the valve specifications to include the new valve tag numbers. The staff found that the revision of the valve specification was acceptable.

ISOLATION VALVES, REACTOR MANUAL SHUTOFF VALVE - RWCU

The remote manual shutoff valve F026 (Tag No. FV-0002), isolation valves FV-0003 & FV-0004 are specified Safety Class 1, Quality Group A, Seismic Category I. In Attachment B of Design Specification U7-SITE-M-SPEC-ASME-VLV-7384, Revision E on pages 21 of 25 and 22 of 25, the valve body type for check, gate and globe valves were not provided and were stated as “To be verified.” The verification was not documented in Hold Tabulation Sheet, U7-SITE-M-SPEC-HOLD-VLV-7384. In response to staff’s enquiry as action item No. 15 of Action Item Sheet, applicant provided this as item no. 18 on the “Hold Tabulation Sheet.”

The Valve Data Sheets U3-RWCU-M-DATA-VLV-FV-0002 Rev. A, dated December 4, 2009, for valve FV-0002, U3-RWCU-M-DATA-VLV-FV-0003 Rev. A, dated 12/04/09 for valve FV-0003 and U3-RWCU-M-DATA-VLV-FV-0004 Rev. A, dated 12/04/09 for valve FV-0004 indicated valve acceleration loads (limits) for horizontal (H1 & H2) and vertical (V) loading conditions for upset, emergency and faulted conditions are on hold. This hold item was not tracked on Hold Tabulation Sheet U7-SITE-M-SPEC-HOLD-VLV-7384. In response to staff’s inquiry, this was provided on the Hold tabulation sheet and was found to be acceptable.

MAIN STEAM SAFETY RELIEF VALVES - MSRV

Of the holds identified in the packages, only one, the need to address valve transients in the MSRV design specification, was identified other than the holds on the codes discussed above, which could cause an issue with procurement of the equipment (the hold needed to be addressed to meet ASME code). The applicant explained that this aspect of the design was not complete at that point and that the transients would be addressed prior to going out for procurement. The staff found that, due to the status of the design at the time of the review, that this was acceptable and that staff would have opportunities to verify that the hold was addressed through ITAAC that would call for review of the component design reports.

CLASSIFICATION REVIEW

The results of the seismic and quality group classification review, including staff observations and conclusions, are included in Appendix A.

CONCLUSIONS

In general, the staff found that both the design and procurement specifications were completed at a high level of quality. The staff has the following conclusions:

- With the exception of the RPV, the components are not designed to the codes of record. The applicant plans to submit a license amendment to address changing the code of record and has procedures in place that should control the design. Further, the applicant has an ITAAC in place that will allow for review of the final design.

- Each design/purchase specification document appropriately addresses information identified in NCA-3250, as applicable.

- Information on design criteria, analytical method, functional capability and classification specified in the design documents is consistent with that included in the DCD and satisfy the regulatory guidance provided in SRP Section 3.2.1, 3.2.2, 3.9.3 and 3.9.5.

- Fabrication and installation of the RPV and other risk significant components will be performed in accordance with the ASME Code, Section III, Subsection NB, NC, ND, NF or NG, Article 4000.

AUDIT OPEN ITEMS

1. RPV Vent and head spray requirements are not included in Reactor Internals Specification. Requirements are listed in DCD but are not included in Reactor Internals Specification. This is Action Item 8 in Attachment 1.

2. Update U7-SPEC-G-GDD-0013 (Classification Summary) to reflect seismic requirements for Specification 7B11-D001-3001-01 (Core Support Structures and Reactor Internals). This is Action Item 12 in Attachment 1.

REFERENCES

1. NRO Office Instruction NRO-REG-108 (Revision 0), “Regulatory Audits”

2. Audit Plan of South Texas Project Design Specifications – Regulatory Audit of Risk Significant Components dated January 6, 2011 (ML110030808), including list of risk significant components

3. ASME boiler and Pressure Vessel Code, Section III, Division 1, “Nuclear Power Plant Components, American Society of Mechanical Engineers”

4. Standard Review Plan (SRP) Section 3.2.1 “Seismic Classification”

5. SRP Section 3.2.2“System Quality Group Classification”

6. SRP Section 3.9.3 “ASME Code Class 1, 2, and 3 Components and Component Supports, and Core Support Structures”

7. SRP Section 3.9.5 “Reactor Pressure Vessel Internals”

ATTENDEE LIST:

Name	Organization
Jennifer Dixon-Herrity	NRC
Tuan Le	NRC
Richard McNally	NRC
Sardar Ahmed	NRC
Yiu Law	NRC
Tekia Govan	NRC
Michael Shewski	S & L
Dave Petin	S & L
Frank Pontillo	S & L
Bob Hooks	S & L
Sabastian Sirabusa	S & L
Milos Stepanovic	S & L
Sean Noonan	S & L
Koichi Kondo	TANE
Kiyohide Morishita	TANE
Yukitaka Yamazeaki	TANE
William R. Peebles	TANE
Yusuyuka Ito	Toshiba
Keiji Matsunaga	Toshiba
Makoto Vkai	Toshiba
Takuya Miyagawa	Toshiba
Hiroyuki Torigoe	Toshiba
Junichi Yamazaki	Toshiba
P. K. Agrawal	S & L
Tom Kujacoski	S & L
Jonathon Hagedorn	S & L
James Fisicaro	TANE
Dave Skiba	S & L
Terry Sopkin	S & L
Janey McIntyre	S & L
A. L Kurtz	S & L
R. H. Scheide	STPNOC
Tom Daley	STPNOC
Jim Tomkins	STPNOC
Delfo Blanchinl	S & L
Bansi Pandit	S & L
Caroline Schlaseman	MPR / TANE
Stefan Janusz	S & L

APPENDIX A: CLASSIFICATION REVIEW

COMPONENT CLASSIFICATION

Scope of Review

As defined in the audit plan (Reference 2), the objective of the classification review is to confirm that the functional design, qualification, and classification to be used in the STP Units 3&4 satisfy SRP Sections 3.2.1 and 3.2.2. The NRC Staff audit of quality group and seismic classifications was established to evaluate a sampling of design basis documentation for risk-significant components to confirm the classifications applied in the detailed design are consistent with NRC criteria, including GDC 1 and GDC 2, and the licensing basis. The primary purpose and focus of the Staff review is to determine if there is a sufficient documented basis to conclude that classifications are correct based on their specific safety function. A secondary purpose was to verify that the classification process satisfies GDC 1 and GDC 2 by ensuring appropriate classifications, as well as codes and standards, are correctly translated into design basis documents to be used for procurement. The scope of the audit includes a sampling of risk-significant components selected in the audit plan from the list of risk-significant components determined by the applicant. The documents to be available for review include all classification documents that establish the design basis for seismic and quality group classifications pertaining to risk-significant systems and components. The types of classification design basis documents to be reviewed include system P&IDs, design specifications and other design documents such as a "Q" List developed during the detailed design that provide the basis for the classifications. As included in the Document Matrix (see Attachment 2) for NRC review, the applicant's project team provided the following specific design documents to support the classification review:

- Document U7-PROJ-G-PRD-0004, Rev.0, Project Specific Safety/Quality Group Classification
- P&IDS listed on attached table
- Design Specifications Listed on attached table

Other Classification Documents

The NRC staff examined the design basis documents and requested copies of the following additional design documents referenced in U7-PROJ-G-PRD-0004 and other design documents.

- GDD-0013 Classification Summary
- GDD-0001 Seismic Design Classification
- PRD-0011 Applicable Codes and Standards

Although the applicant does not have a "Q" list or similar design document to readily identify the specific safety function of each system component to establish the basis for each system component classification, the applicant did provide an example of a Mechanical Equipment list that does identify a summary of basic component safety functions regarding reactor coolant pressure boundary and containment integrity. This document is:

- Document U7-SITE-M-LIST-EQPT-G0001, Rev. B, dated December 15, 2010

When asked if there was any documentation available of internal reviews, self-assessments or audits in the area of quality group or seismic classification, the applicant's project team provided the following reference documents:

NRC Inspection Report

- 99900507/2009-201, dated September 14-17, 2009

S&L Internal Audits

- 2009-037, dated March 2-6, 2009
- 2009-073, dated November 2-6, 2009
- 2010-012, dated May 3-6, 2010
- 2010-044, dated November 12-19, 2010

Fluor Surveillances of S&L

- SV-09-18, dated May 26-28, 2009
- S-09-S29, dated July 21-23, 2009 and August 4-6, 2009
- S-10-S-20, dated June 22-24, 2010
- S-10-S-36, dated June 22-24, 2010

NRC Staff Review Summary

QA Audits

During the review of the COL application, the NRC staff was concerned about a review to verify classifications and issued a number of RAIs about ITAAC. Although the applicant does not apply ITAAC for this purpose, the staff found that some type of inspection and verification is appropriate to establish that the as-built quality groups (QGs)/ASME Code Class and seismic classification are consistent with the Tier 1 design description and with the license. There should also be further clarification as to how the applicant will verify the as-built QGs/ASME Code Class and seismic classification, such as through quality assurance (QA) inspections, the generic piping ITAAC, basic configuration ITAAC, or by independent organizations such as the ASME Authorized Inspector.

In a revised response to RAI 03.02.02-6 dated February 10, 2010, (ML100490763) the applicant identified that classifications are verified though the design/QA process and therefore an ITAAC is not needed. Staff concurs that, consistent with the COL license information in ABWR DCD subsection 1.1.11.1, the cited design/QA verification process is an acceptable alternative way to close the RAI 03.02.02-6 open item without a separate ITAAC to verify quality group classification, provided there is some type of licensing commitment by the applicant to ensure the design verification process and as-built reconciliation are completed prior to fuel load.

The NRC Staff audit review determined that, although some of the above cited QA audits evaluated certain aspects of design control and specification reviews, none of the audits included verification or validation of quality group or seismic classifications. Therefore, NRC staff was unable to apply existing audits as confirmation that the comprehensive system and mechanical component classifications for all important to safety components have been validated, but other project documents were reviewed to ensure classifications for risk-significant mechanical components are verified by the applicant.

Classification Documents

Project Specific Safety/Quality Group Classification U7-PROJ-G-PRD-0004, Rev. 0

This project requirements document is the primary classification document referenced by the applicant in the matrix. The Staff review of this document determined that the applicable regulatory guides 1.26 and 1.29 are referenced as well as the ASME Section III Code, the ABWR DCD Revision 4 and project documents including applicable codes and standards, applicable RG, and the classification summary. The project requirements document identifies that the definitions are based on ANS 52.1. NRC Staff has not endorsed this standard and, therefore, has not used it as a basis for acceptability regarding classifications. The NRC Staff review did not identify any discrepancies between the Project Specific Safety/Quality Group Classification document and the licensing basis documents.

General Design Document Classification Summary U7-SPEC-G-GDD-0013, Rev. B.

This GDD-0013 document summarizes the systems and components classifications consistent with the DCD and COLA, includes QA Requirement E criteria and addresses a process to resolve any inconsistency by applying the Project Specific Safety/Quality Group document. This document references the Project Specific Safety/Quality Group Classification and the Seismic Design Classification documents. As described below under the review of the Seismic Design Classification document, staff is concerned that the RPV internals are not specifically designated as requiring a seismic analysis in the DCD and GDD-0013. Therefore, it is not clear that nonsafety-related RPV internals will be analyzed for seismic events to prevent their collapse. As discussed in Reactor Pressure Vessel (RPV) and Internals section of the main summary report, the applicant has an action item no. 12, in Table 1 of Attachment 1 to address this seismic classification of reactor internals. Therefore, this item is an open item. Other than the classification of RPV internals, the NRC Staff review did not identify any discrepancies between the General Design Document Classification Summary and the licensing basis documents.

Seismic Design Classification U7-PROJ-C-GDD-0001, Rev. A

This general design document describes the seismic classification criteria as Seismic Category I and Seismic Category II, but the DCD and COLA do not use the term Seismic Category II. The NRC does not specifically use the term Seismic Category II in RG 1.29, but the intent of this seismic Category II is to provide for analyzing nonsafety-related SSCs in the vicinity of safety-related SSCs that should be prevented from collapsing in a seismic event. The NRC staff was concerned that the design basis documents concerning use of this term was inconsistent with the licensing basis classification. The staff is also concerned that certain nonsafety-related SSCs, such as RPV internals are not specifically designated as Seismic Category II or requiring a seismic analysis in the DCD and GDD-0013. However, note (f) in DCD Table 3.2-1 does state that equipment that is not safety-related, but which could damage Seismic Category I equipment if its structural integrity failed, is checked analytically and designed to assure its integrity under seismic loading resulting from the SSE. The applicant has an action item No. 12 to address this seismic classification concern under GDD-0013.

Mechanical Equipment List U7-SITE-M-LIST-EQPT-6001, Rev. B, dated December 15, 2010

The Mechanical Equipment List includes Safety Class (CL), Quality Group (QG), Seismic Category (SC), RCPB (yes or no) and PCV (yes or no). The NRC Staff review did not identify any discrepancies between this document and the licensing basis documents.

Design Specifications and associated P&ID Review

Service Water Pumps Design Specification U7-RSW-M-SPEC-ASME-PUMP-7396, Rev. D, dated January 14, 2011

The service water pumps are not included in DCD Table 3.2-1, but are included in Table 3.2-1 of the COLA as QGC. The specification is certified by a PE and contains holds pending verification (see Hold Tabulation Sheet U7-RSW-M-SPEC-HOLD-PUMP-7396). The ASME Section III Code referenced is the 1994 edition with a hold. The data sheets are referenced for the safety related functions. The jurisdictional boundaries are described as the circumferential joint. Editions of various referenced codes vary as summarized below:

- ASME Section II 2007 with 2008 & 2009 Addenda (certificate holder to perform reconciliation)
- ASME Section III NCA/ND, 2004 Edition
- ASME Section V, 2004 Edition
- ASME Section XI, 2004 Edition
- Codes Cases per RG 1.84 Rev 23
- NQA-1, 1994 Edition (Hold)
- OM Code, 2004 Edition
- Specification U7-RSW-M-SPEC-PUMP-7396, Rev D includes general system functions
- *Data Sheet:* Section III, Cl. 3, QG C, Seismic Category I, ASME N Stamp required
- Service: cooling service for safety-related loads

Project P&ID U3-RSW-M-DWG-P&ID-0001-01, Rev D

The COLA did not include the classification of the service water system outside the scope of the ABWR standard design and a revision was proposed to include the classifications. The project P&ID was reviewed to ensure consistency with the licensing basis.

- QG C, SC-3, Seismic Category I

RHR Heat Exchangers Design Specification U7-RHR-M-SPEC-ASME-HX-7322, Rev. D., September 1, 2010

The RHR Heat Exchangers are in referenced DCD Table 3.2-1 as QG B. The specification is certified by a PE and contains holds pending verification (see Hold Tabulation Sheet U7-RHR-M-SPEC-HOLD-HX-7322). The data sheets are referenced for the safety related functions. The jurisdictional boundaries are described as the circumferential joint. In the design section, editions of various referenced codes vary as summarized below:

- ASME Section II, 2007 with 2008 & 2009 Addenda (certificate holder to perform reconciliation)
- ASME Section III, 2004 Edition (Hold)

- ASME Section V, 2007 with 2008 & 2009 Addenda
- ASME Section XI, 2004 Edition (Hold)
- Codes Cases per RG 1.84 Rev 23 and RG 1.147 Rev. 8
- OM Code 2004 Edition (Hold)
- *Data Sheets*
    1. Tube side: RG 1.26 QG B, Sect III Code Class 2
    2. Shell side: RG 1.26 QG C, Sect III Code Class 3
- Seismic Category I
- N stamp required
- 10 CFR 50 Appendix B NQA-1 1994 & NCA 4000

RHR Pumps Design Specification U7-RHR-M-SPEC-ASME-PUMP-7387, Rev. D, dated May 28, 2010

The RHR pumps are included in DCD Table 3.2-1 as QG B, Seismic Category I.
The specification is certified by a PE and contains holds pending verification (see Hold Tabulation Sheet U7-RHR-M-SPEC-HOLD-PUMP-7387). The pumps are designated as ASME Section III Division 1, Class 2 NQA-1. The safety related function is injecting water into the RPV. The jurisdictional boundaries are described as the circumferential joint. Editions of various referenced codes vary as summarized below:

- ASME Section II, 2007 with 2008 & 2009 Addenda (material reconciliation to be performed by certificate holder)
- ASME Section V, 2007 Edition with 2008 & 2009 Addenda
- ASME Section IX, 2007 Edition with 2008 & 2009 Addenda
- ASME Section XI, 2004 Edition
- Codes Cases per RG 1.84 Rev 23, RG 1.147
- OM Code 2004 Edition

QME-1 2007 Edition *Data Sheet:* Safety related, Section III, Cl. 2, QG B, Seismic Category I, *Active*

SLC Tank Design Specification U7-SLC-M-SPEC-ASME-TANK-7333, Rev. B, July 23, 2010

The SLC Tank is in referenced DCD Table 3.2-1 as QG B and designated as an ASME Section III Class 2 component in DCD subsection 3.9.31.6. The design specification is certified by a PE and contains holds pending verification (see U7-SLC-M-SPEC-HOLD-TANK-7333). The data sheets are referenced for the safety related functions. The jurisdictional boundaries are described as the circumferential joint. In the design section, editions of various referenced codes vary as summarized below:

- ASME Section II, 2007 with 2008 & 2009 Addenda
- ASME Section III, 2004 Edition
- ASME Section V, 2007 with 2008 & 2009 Addenda
- ASME Section IX, 2007 Edition with 2008 & 2009 Addenda
- ASME Section XI, 2004 Edition
- Codes Cases per RG 1.84 Rev 23 and RG 1.147 Rev. 8
- OM Code 2004 Edition

- *Data Sheets*

  QG B, SC-2, Section III, Cl. 2, Seismic Category I

SLC Pump Design Specification U7-SLC-M-SPEC-ASME-PUMP-7383, Rev. D, June 8, 2010

The SLC Pump is in referenced DCD Table 3.2-1 as QG B, SC-2 and Seismic Category I. The design specification is certified by a PE and contains holds pending verification (see U7-SLC-M-SPEC-HOLD-PUMP-7386). The data sheets are referenced for the safety related functions. The jurisdictional boundaries are described as the circumferential joint. In the design section, editions of various referenced codes vary as summarized below:

- ASME Section II, 2007 with 2008 & 2009 Addenda (material reconciliation by certificate holder)
- ASME Section III, 2004 Edition (NCA-4134.10(a) may not be applied per 10 CFR 50.55(a))
- ASME Section V, 2007 with 2008 & 2009 Addenda (Hold)
- ASME Section IX, 2007 Edition with 2008 & 2009 Addenda
- ASME Section XI, 2004 Edition
- Codes Cases per RG 1.84 Rev 23 and RG 1.147
- OM Code 2004 Edition (Hold)
- Operability considered
- *Data Sheet:* QG B, SC-2, ASME Section III, Cl. 2, Seismic Category I

Valves

Data sheets in design specifications for the following risk-significant valves were reviewed to evaluate consistency with licensing documents and the project P&ID. No discrepancies were identified.

RSW – QG C in DCD	Spec	QG	ASME	Project P&ID
FV-0003	7342	C	Cl. 3	U3-RSW-MDWG-P&ID-001
FV-0009	same	C	Cl. 3	same

RHR – QG A or B in DCD	Spec	QG	ASME	Project P&ID
FV-0001	7384 or 7342	B	Cl. 2	U3-RHR-M-DWG-P&ID-001
HV-0003 A, B, C	same	B	Cl. 2	same
FV-0005 A	same	B	Cl. 2	same
CHKV-0006 A, C	same	B	Cl. 2	same
CHKV-0006 B	same	A	Cl. 1	same
FV-0013 A, B, C	same	B	Cl. 2	same
FV-0005 B	same	A	Cl. 1	same
FV-005 C	same	A	Cl. 1	same

SLC – QG A in DCD	Spec	QG	ASME	Project P&ID
FV-005 A, B	7343	A	Cl. 1	U3-SLC-M-DWG-P&ID-001

Code Reconciliation Reports

U7-PROJ-M-RPT-DESN-6001, Rev. A, November 17, 2010

ASME Code Reconciliation Report, 1989 Edition through 2004 Edition, S&L

U7-PROJ-M-RPT-DESN-6003, Rev. A
ASME Code Reconciliation Report, 1989 Edition through 2004 Edition, Reddy Engineering, Inc.

Staff Observations

- A review of project documents determined that there is a process to correct discrepancies in classifications discovered during the detailed design.
- There is no specific "Q" list or other similar document that can be used to validate classifications based on the component safety function. However, design specifications are to include the specific safety function and no discrepancies were identified in the application of NRC criteria for the sample of risk-significant mechanical components.
- A project requirements document references the classification summary, seismic design classification and applicable codes and standards documents that are to reflect the licensing basis. This project requirements document explains the safety classes that are based on ANS standards not endorsed by the NRC. The NRC has not used the ANS standards or safety class as a basis for acceptability regarding classifications.
- A general design document includes a classification summary of quality group, safety class, QA requirement and seismic category that is in general consistent with the classification approach included in the DCD and FSAR, other than use of the term seismic Category II.
- Another general design document includes seismic design classification criteria that is in general consistent with the DCD and FSAR, except that the DCD, FSAR and the NRC do not use the term seismic Category II.
- A project requirements document identifies two lists of codes and standards used for the standard plant and COLA site-specific systems. No discrepancies between the licensing documents and the project requirements document were identified.
- Project P&IDs, data sheets in design specifications and summary lists in project documents were reviewed for selected risk-significant components and no discrepancies were identified in regard to quality group, seismic classification or ASME Code class were identified, other than application of the term seismic Category II that is not specifically used in the DCD and FSAR.
- Holds exist in design specifications regarding application of codes and standards editions and other design information. A process is in place to remove holds as the detailed design progresses. The project requirements document on codes includes a summary of codes and standards stated in the DCD and COL FSAR. The application of ASME Section III for risk-significant mechanical components is consistent with the licensing documents. The applicant intends to update the codes and standards to more recent codes and standard endorsed by the NRC, including ASME Section III 2004 and has performed code reconciliation between the 1989 and the 2004 Code editions.
  As shown in the design specifications, certificate holders will perform reconciliation pertaining to recent editions of ASME Section II material standards. Based on NRC

ISG-011, the applicant plans to update licensing and design documents to reflect current codes and standards acceptable to the NRC.

- Based on a review of design specifications for selected risk-significant mechanical components, the specifications are certified by a registered mechanical engineer, require N stamping, identify codes and standards (with selected holds on code editions and other design information), addresses jurisdictional boundaries with appropriate quality group, seismic category and ASME Code class designated on data sheets or attachments. No discrepancies were identified, other than the seismic Category II classification applied in design documents and a specific concern related to RPV nonsafety-related internals not specifically designated for seismic analysis. (Refer to applicant action item).

Conclusions

NRC Staff concludes that, although the detailed design is not complete and a license amendment request will be submitted for changes to code editions, the level of detail is sufficient to support the staff review and conclude that the classification of risk-significant mechanical components is consistent with NRC criteria and regulations. The following specific conclusions and recommendations were identified by NRC staff:

- Other than for code edition issues and a clarification needed concerning a seismic classification concern for the nonsafety-related RPV internals, the detailed design pertaining to the classification of risk-significant mechanical components is consistent with the licensing basis and NRC criteria.
- The applicant appears to have an effective process to translate licensing information pertaining to classifications into detailed design documents and resolve discrepancies in classifications discovered during the detailed design.
- It is understood that the applicant will submit a license amendment to update codes and standards to reflect more recent editions of codes and standards acceptable to the NRC.
- The applicant should consider performing QA audits, or design reviews to ensure that all system and component classifications are correct on the basis of the safety function they perform. A follow-up audit or Engineering Design Verification (EDV) may be needed to confirm correct final as-built classifications.
- Although the data sheets and design documents reviewed generally reflect Unit 3, it is understood that Unit 4 is expected to be a duplicate of Unit 3

ATTACHMENT 1

Table 1: **ACTION ITEMS LIST**
NRC Audit of South Texas Project Units 3 & 4

January 18 - 21, 2011

No.	Session Date	Session Time	Action Item Description	Specification Title	Requestor	Responsible Organization	Responsible Person	Due Date	Response/ Status	Notes/ Comments
1	1/18	1:00PM	Provide NRC with updated matrix file "Document Matrix for NRC Audit January 18-20, 2011" and ASME Design Specification presentation presented by B. Pandit.	N/A	Tekia Govan	STPNOC	Dick Scheide	Closed	Emailed files to Tekia Govan.	None
2	1/18	5:00PM	Add hold tabulation to binders for each applicable specification.	N/A	Jennifer Dixon-Herrity	S&L	S&L Engineers	Closed	Added hold tabulations to all specification binders.	None
3	1/18	5:00PM	Identify revision number for P&IDs in matrix file "Document Matrix for NRC Audit January 18-20, 2011" and provide to NRC. Identify procurement specification for piping.	N/A	Richard McNally/ Sardar Ahmed	STPNOC/ S&L	Dick Scheide/ Tom Kujawski	1/21/11	Matrix will be updated to include the P&ID revision number and piping specification number.	Matrix updated with P&ID revision numbers, piping specification numbers and a paper copy was provided to the NRC. Matrix will be released at the end of the audit due to potential for additional changes.
4	1/18	5:00PM	Provide NRC with QA audit reports for specifications.	N/A	Richard McNally	S&L	Jim McIntyre	Closed	S&L QA to provide audit report.	The QA list of reports / audits is in agreement with the documents given to the NRC.
5	1/18	5:00PM	Continue Rupture Disk discussion on 1/19/11	Piping Specialties	Sardar Ahmed	NRC	Sardar Ahmed	Closed	Discussion Completed 1/19/11	None
6	1/18	5:00PM	Continue Reactor Internals and Core Support Structure discussion on 1/19/11	Core Support Structures and Reactor Internals	Yiu Law	NRC	Yiu Law	Closed	Discussion Completed 1/19/11	None
7	1/19	10:45am	Provide details to NRC on the interface between the upper guide rod and the RPV head.	Core Support Structures and Reactor Internals	Yiu Law	TOSHIBA	Keiji Matsunaga	Closed	Toshiba provided details on the interface between the upper guide rod and the RPV head.	None
8	1/19	1:15 PM	RPV Vent and head spray requirements are not included in Reactor Internals Specification. Requirements are listed in DCD but are not included in Reactor Internals Spec.	Core Support Structures and Reactor Internals	Yiu Law	TOSHIBA	Keiji Matsunaga	2/28/11	RPV Vent and Head Spray shall be included in Reactor Pressure Vessel Specification.	**To be completed by February 28th, 2011**

ACTION ITEMS LIST (Con't)

NRC Audit of South Texas Project Units 3 & 4

January 18 - 21, 2011

No.	Session Date	Session Time	Action Item Description	Specification Title	Requestor	Responsible Organization	Responsible Person	Due Date	Response/ Status	Notes/ Comments
9	1/19	1:15 PM	Provide NRC with S&L project procedure process for closing hold points in specifications.	N/A	Jennifer Dixon-Herrity	S&L	Mike Shewski	Closed	Provided NRC with Project Instruction (PI-STP34-116).	Discussion completed on 1/20/11 in AM.
10	1/19	1:15 PM	Provide NRC with ASME Code Reconciliation documentation.	N/A	Richard McNally	S&L	Bansi Pandit	Closed	Reviewed Code Reconciliation with Richard McNally.	Provided PRD-0011 Applicable Codes and Standards to Jennifer Dixon-Herrity.
11	1/19	2:30 PM	Why doesn't the DCD discuss environmental effects on fatigue qualifications for components?	N/A	Tuan Le	TOSHIBA/ STPNOC/ TANE	Keiji Matsunaga/ Tom Daley/ Caroline Schlaseman	Closed	Discussion Completed 1/20/11	Regulatory Guide 1.207 does not apply to ABWR DCD.
12	1/19	2:30 PM	Update U7-SPEC-G-GDD-0013 (Classification Summary) to reflect seismic requirements for specification 7B11-D001-3001-01 (Core Support Structures and Reactor Internals).	Core Support Structures and Reactor Internals	Tuan Le	STPNOC/ TOSHIBA	Tom Daley/ Keiji Matsunaga	2/28/11	Discussion Completed 1/20/11	**To be completed by February 28th, 2011**
13	1/19	4:30 PM	Discuss Nuclear Boiler Main Steam Relief Valve Specification.	Nuclear Boiler Main Steam Relief Valves	Jennifer Dixon-Herrity	S&L/ TANE	Frank Pontillo/ Bansi Pandit/ Junichi Yamazaki	Closed	Discussion Completed 1/20/11	None
14	1/19	4:30 PM	Is there a tracking mechanism for components released from holds for bid purposes to ensure they are revisited if required?	N/A	Jennifer Dixon-Herrity	S&L	Mike Shewski	Closed	Discussion Completed 1/20/11	None
15	1/20	4:00 PM	Updating the hold list on Large Bore CIV Specification (7384) Attachment B.	Large Bore CIV	Sardar Ahmed	S&L	Milos Stefanovic	Closed	Revise documents by end of NRC Audit.	Provided the NRC with revised hold lists on 1/21/11.
16	1/20	4:00 PM	Revise valve tag number for SLC valve data sheet.	Small Bore Valves	Yiu Law	S&L	Milos Stefanovic	Closed	Revise documents by end of NRC Audit.	Provided the NRC with revised SLC valve data sheets on 1/21/11.

ATTACHMENT 2

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Item No.	System	Equipment/ Component Description	DCD Tag No. (Old)	Project P&ID Tag No. (New)	Project P&ID No.	ASME Design Spec No./Rev	Procurement Spec No./Rev.	Related DCD/COLA Section/Figure No.
1	Reactor Core Isolation Cooling System (RCIC)	RCIC Turbine Driven Pump	C001	PUMP-001	U3-RCIC-M-DWG-P&ID-0001-03, Rev. E	U7-RCIC-M-SPEC-ASME-PUMP-7389 Rev. D	U7-RCIC-M-SPEC-PUMP-7389 Rev. D	T1: 2.4.4 T2: 5.4.6 Figure 5.4-8
2	Reactor Core Isolation Cooling System (RCIC)	Min Flow Bypass Valve	F011	FV-0011	U3-RCIC-M-DWG-P&ID-0001-02, Rev. E	U7-SITE-M-SPEC-ASME-VLV-7384 Rev. E	U7-SITE-M-SPEC-VLV-7384 Rev. E	T1: 2.4.4 T2: 5.4.6 Figure 5.4-8
3	Reactor Core Isolation Cooling System (RCIC)	Injection Valve	F004	FCV-0004	U3-RCIC-M-DWG-P&ID-0001-02, Rev. E	U7-SITE-M-SPEC-ASME-VLV-7342 Rev. F	U7-SITE-M-SPEC-VLV-7342, Rev. F	T1: 2.4.4 T2: 5.4.6 Figure 5.4-8
4	Reactor Core Isolation Cooling System (RCIC)	Check Valve	F038	CHKV-0053	U3-RCIC-M-DWG-P&ID-0001-01, Rev. E	U7-SITE-M-SPEC-ASME-VLV-7384 Rev. E	U7-SITE-M-SPEC-VLV-7384 Rev. E	T1: 2.4.4 T2: 5.4.6 Figure 5.4-8
5	Reactor Core Isolation Cooling System (RCIC)	Check Valves	F003, F005	CHKV-0003, CHKV-0005	U3-RCIC-M-DWG-P&ID-0001-02, Rev. E	U7-SITE-M-SPEC-ASME-VLV-7342 Rev. F	U7-SITE-M-SPEC-VLV-7342, Rev. F	T1: 2.4.4 T2: 5.4.6 Figure 5.4-8
6	Reactor Core Isolation Cooling System (RCIC)	Isolation Valves	F035, F036, F039	FV-0050, FV-0051, FV-0054	U3-RCIC-M-DWG-P&ID-0001-01, Rev. E	U7-SITE-M-SPEC-ASME-VLV-7384 Rev. E	U7-SITE-M-SPEC-VLV-7384 Rev. E	T1: 2.4.4 T2: 5.4.6 Figure 5.4-8
7	Reactor Core Isolation Cooling System (RCIC)	ECCS Suction Strainer	D002	STNR-002	U3-RCIC-M-DWG-P&ID-0001-02, Rev. E	U7-SITE-M-SPEC-ASME-STNR-7399 Rev. D	U7-SITE-M-SPEC-STNR-7399 Rev. D	T1: 2.4.4 T2: 5.4.6 Figure 5.4-8
8	Containment Overpressure Protection System (ACS)	Air Operated Valve	F007	FV-0133	U3-ACS-M-DWG-P&ID-0001-01, Rev. F	U7-SITE-M-SPEC-ASME-VLV-7384 Rev. E	U7-SITE-M-SPEC-VLV-7384 Rev. E	T1: 2.14.6 T2: 6.2.5 Figure 6.2-39 Table 3.9-8
9	Containment Overpressure Protection System (ACS)	Air Operated Valve	F010	FV-0134	U3-ACS-M-DWG-P&ID-0001-01, Rev. F	U7-SITE-M-SPEC-ASME-VLV-7384 Rev. E	U7-SITE-M-SPEC-VLV-7384 Rev. E	T1: 2.14.6 T2: 6.2.5 Figure 6.2-39 Table 3.9-8

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10	Containment Overpressure Protection System (ACS)	Rupture Disk	D001	RPD-001	U3-ACS-M-DWG-P&ID-0001-01, Rev. F	U7-SITE-P-SPEC-ASME-PIPE-7347, Rev. D	U7-SITE-P-SPEC-PIPE-7347, Rev. E	T1: 2.14.6 T2: 6.2.5 Figure 6.2-39 19.5.2, 19E.2, 19K.11.6, Table 3.2-1, Table 6.2-7
11	Containment Overpressure Protection System (ACS)	Rupture Disk	D002	RPD-002	U3-ACS-M-DWG-P&ID-0001-01, Rev. F	U7-SITE-P-SPEC-ASME-PIPE-7347, Rev. D	U7-SITE-P-SPEC-PIPE-7347, Rev. E	T1: 2.14.6 T2: 6.2.5 Figure 6.2-39 19.5.2, 19E.2, 19K.11.6, Table 3.2-1, Table 6.2-7
12	Containment Overpressure Protection System (ACS)	Flow Lines	Various	Various	U3-ACS-M-DWG-P&ID-0001-01/02/03/04, Rev. F	U7-SITE-P-SPEC-ASME-0018 Rev. B	U7-FAB-P-SPEC-PIPE-7332, Rev. D	Figure 6.2-39
13	Reactor Pressure Vessel	Reactor Vessel Design	N/A	N/A	N/A	3B11-D003-3005-01 Rev.7 (U3-RPV-M-SPEC-ASME-0001 Rev. G)	3B11-D003-3005-01 Rev.7 (U3-RPV-M-SPEC-ASME-0001 Rev. G)	T1:2.1 T2:3.9, 4.1, 4.5, 5.2, 5.3
14	Reactor Pressure Vessel	Reactor Internals	N/A	N/A	N/A	3B11-D001-3005-01 Rev.3 (U3-RPV-M-SPEC-ASME-0002 Rev. D)	3B11-D001-3005-01 Rev.3 (U3-RPV-M-SPEC-ASME-0002 Rev. D)	T1:2.1 T2:3.9, 4.1, 4.5, 5.2, 5.3
15	Containment	Wetwell/Dry well Vacuum Breakers	N/A	N/A	N/A	U7-PCS-S-ASME-7519 Rev. C1 (DRAFT)	U7-PCS-S-ASME-7519 Rev. C1 (DRAFT)	T1: 2.14.1 T2: 6.2.1.1.2.1 6.2.1.1.4.1 6.2.1.1.5.5 6.2.1.1.5.6.3
16	Classification	Various (See Notes)	Various (See Notes)	Various (See Notes)	Various (See Notes)	N/A	U7-PROJ-G-PRD-0004, Rev. 0 (Classification Specification)	Table 3.2-1
17	High Pressure Core Flooder (HPCF)	Pump	C001B, C	PUMP-001B, C	U3-HPCF-M-DWG-P&ID-0001-01/02, Rev. E	U7-HPCF-M-SPEC-ASME-PUMP-7388 Rev. F	U7-HPCF-M-SPEC-PUMP-7388 Rev. F	Section 2.4.2, Section 6.3. Figure 6.3-7
18	High Pressure Core Flooder (HPCF)	Maintenance Valves	F005B, C	HV-0006B, C	U3-HPCF-M-DWG-P&ID-0001-01/02, Rev. E	U7-SITE-M-SPEC-ASME-VLV-7342, Rev. F	U7-SITE-M-SPEC-VLV-7342, Rev. F	Section 2.4.2, Section 6.3. Figure 6.3-7

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19	High Pressure Core Flooder (HPCF)	Injection Valves	F003B, C	FV-0004B, C	U3-HPCF-M-DWG-P&ID-0001-01/02, Rev. E	U7-SITE-M-SPEC-ASME-VLV-7384 Rev. E	U7-SITE-M-SPEC-VLV-7384 Rev. E	Section 2.4.2, Section 6.3. Figure 6.3-7
20	High Pressure Core Flooder (HPCF)	ECCS Suction Strainer	D003B, C	STNR-002 B, C	U3-HPCF-M-DWG-P&ID-0001-01/02, Rev. E	U7-SITE-M-SPEC-ASME-STNR-7399 Rev. D	U7-SITE-M-SPEC-STNR-7399 Rev. D	T1/2.4.2 Figure 6.3-7
21	Control Rod Drive (CRD)	Hydraulic Control Units	D004	HCU-WWXX/YYZZ	U3-CRD-M-DWG-P&ID-0001-03, Rev. E	U7-CRD-M-SPEC-ASME-0001 Rev. B	U7-CRD-M-SPEC-ASME-0001 Rev. B	Figure 4.6-8 Sh3
22	Control Rod Drive (CRD)	Scram Pilot Solenoid Valves (part of HCU)	D004	HCU-WWXX/YYZZ-139	U3-CRD-M-DWG-P&ID-0001-03, Rev. E	U7-CRD-M-SPEC-ASME-0001 Rev. B	U7-CRD-M-SPEC-ASME-0001 Rev. B	Figure 4.6-8 Sh3
23	Control Rod Drive (CRD)	Scram Valves to FMCRDs (part of HCU)	D004	HCU-WWXX/YYZZ-126	U3-CRD-M-DWG-P&ID-0001-03, Rev. E	U7-CRD-M-SPEC-ASME-0001 Rev. B	U7-CRD-M-SPEC-ASME-0001 Rev. B	Figure 4.6-8 Sh3
24	Nuclear Boiler System (NB)	Isolation Check Valves	F003B, F004B	CHKV-0052B, CHKV-0053B	U3-NB-M-DWG-PID-0001-02, Rev. D	U7-SITE-M-SPEC-ASME-VLV-7384 Rev. E	U7-SITE-M-SPEC-VLV-7384 Rev. E	Figure 5.1-3 Sh4/Section 2.1.2 (Tier 1)
25	Nuclear Boiler System (NB)	Safety Relief Valve Discharge Piping	Various	Various	U3-NB-M-DWG-PID-0001-01/02/03, Rev. D & 04/05, Rev. B	U7-SITE-P-SPEC-ASME-0001 Rev. C	U7-FAB-P-SPEC-PIPE-7332, Rev. D	Figure 5.1-3
26	Nuclear Boiler System (NB)	ADS Valves	F010A, C, F, H, L, N, R, T	SRV-003A, C, F, H, L, N, R, T	U3-NB-M-DWG-PID-0001-03, Rev. D & 04, Rev. B	U7-SITE-M-SPEC-ASME-MSRV-7381, Rev. E	U7-SITE-M-SPEC-MSRV-7381, Rev. E	Figure 5.1-3 Sh2/Section 2.1.2 (Tier 1)
27	Nuclear Boiler System (NB)	Non-ADS Valves	F010B, D, E, G, J, K, M, P, S, U	SRV-003B, D, E, G, J, K, M, P, S, U	U3-NB-M-DWG-PID-0001-03, Rev. D & 04, Rev. B	U7-SITE-M-SPEC-ASME-MSRV-7381, Rev. E	U7-SITE-M-SPEC-MSRV-7381, Rev. E	Figure 5.1-3 Sh2/Section 2.1.2 (Tier 1)
28	Reactor Service Water System (RSW)	Pump	C001	PUMP-001A1, A2, B1, B2, C1, C2	U3-RSW-M-DWG-P&ID-0001-01/02/03, Rev. D	U7-RSW-M-SPEC-ASME-PUMP-7396, Rev. D	U7-RSW-M-SPEC-PUMP-7396, Rev. D	T1: 2.11.9 T2: 9.2.15 Figure 9.2-7
29	Reactor Service Water System (RSW)	Supply Isolation Valve	F002, F015	FV-0003, FV-0009	U3-RSW-M-DWG-P&ID-0001-01/02/03, Rev. D	U7-SITE-M-SPEC-ASME-VLV-7342, Rev. F	U7-SITE-M-SPEC-VLV-7342, Rev. F	T1: 2.11.9 T2: 9.2.15 Figure 9.2-7
30	Reactor Service Water System (RSW)	Heat Exchanger **(Same as Item #33)**						

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31	Reactor Building Cooling Water System (RBCW)	Pumps	C001A,B,C,D,E,F	PUMP-001A1,A2, B1,B2,C1,C2	U3-RBCW-P-DWG-PID-0001-01/04/07, Rev. D	U7-RBCW-M-SPEC-ASME-PUMP-7358, REV. D	U7-RBCW-M-SPEC-PUMP-7358, REV. E	T1: 2.11.3, Table 8.3-1, T2: 9.2.11, Figure 9.2-1,
32	Reactor Building Cooling Water System (RBCW)	Isolation Valves	F015 (A,B,C,D,E,F), F002 (A,B,C,D,E,F)	HV-0013A1,A2, B1,B2,C1,C2 HV-0002A1,A2, B1,B2,C1,C2	U3-RBCW-P-DWG-PID-0001-01/04/07, Rev. D	U7-SITE-M-SPEC-ASME-VLV-7342, Rev. F	U7-SITE-M-SPEC-VLV-7342, Rev. F	Table 3.9-8, Figure 9.2-1
33	Reactor Building Cooling Water System (RBCW)	Heat Exchangers	B001A,B,C,D,E,F, G,H,J	HX-001A1,A2,A3, B1,B2,B3,C1,C2, C3	U3-RBCW-P-DWG-PID-0001-01/04/07, Rev. D	U7-RBCW-M-SPEC-ASME-HX-7323, REV. G	U7-RBCW-M-SPEC-HX-7323, REV. G	T1: 2.11.3, Table 8.3-1, T2: 9.2.11, Figure 9.2-1,
34	Residual Heat Removal System (RHR)	ACIWA Manual Valves	F101, F102	HV-0023, HV-0024	U3-RHR-M-DWG-P&ID-0001-01/02/03, Rev. E	U7-SITE-M-SPEC-ASME-VLV-7342, Rev. F	U7-SITE-M-SPEC-VLV-7342, Rev. F	T1: 2.4.1 T2: 5.4.7 Figure 5.4-10
35	Residual Heat Removal System (RHR)	Heat Exchangers	B001 A, B, C	HX-001 A, B, C	U3-RHR-M-DWG-P&ID-0001-01/02/03, Rev. E	U7-RHR-M-SPEC-ASME-HX-7322, Rev. D	U7-RHR-M-SPEC-HX-7322, Rev. D	T1: 2.4.1 T2: 5.4.7 Figure 5.4-10
36	Residual Heat Removal System (RHR)	Pumps	C001 A, B, C	PUMP-001 A, B, C	U3-RHR-M-DWG-P&ID-0001-01/02/03, Rev. E	U7-RHR-M-SPEC-ASME-PUMP-7387, Rev. D	U7-RHR-M-SPEC-PUMP-7387, Rev. D	T1: 2.4.1 T2: 5.4.7 Figure 5.4-10
37	Residual Heat Removal System (RHR)	Injection Valves	F001, F003, F005, F006 (A,B,C)	FV-0001, HV-0003, FV-0005, CHKV-0006 (A/B/C)	U3-RHR-M-DWG-P&ID-0001-01/02/03, Rev. E	U7-SITE-M-SPEC-ASME-VLV-7384 Rev. E U7-SITE-M-SPEC-ASME-VLV-7342, Rev. F	U7-SITE-M-SPEC-VLV-7384 Rev. E U7-SITE-M-SPEC-VLV-7342, Rev. F	T1: 2.4.1 T2: 5.4.7 Figure 5.4-10
38	Residual Heat Removal System (RHR)	Admission Valves	F012A,B,C	FV-0013 A, B, C	U3-RHR-M-DWG-P&ID-0001-01/02/03, Rev. E	U7-SITE-M-SPEC-ASME-VLV-7342, Rev. F	U7-SITE-M-SPEC-VLV-7342, Rev. F	T1: 2.4.1 T2: 5.4.7 Figure 5.4-10
39	Residual Heat Removal System (RHR)	ECCS Suction Strainer	D001 A, B, C	STNR-001 A, B, C	U3-RHR-M-DWG-P&ID-0001-01/02/03, Rev. E	U7-SITE-M-SPEC-ASME-STNR-7399 Rev. D	U7-SITE-M-SPEC-STNR-7399 Rev. D	T1: 2.4.1 T2: 5.4.7 Figure 5.4-10
40	Standby Liquid Control System (SLC)	Tank	A001	TANK-001	U3-SLC-M-DWG-PID-0001-01, Rev. D	U7-SLC-M-SPEC-ASME-TANK-7333, Rev. B	U7-SLC-M-SPEC-TANK-7333, Rev. B	Figure 9.3-1/Section 2.2.4 (Tier 1)/Table 6.1-1 (Tier 2)
41	Standby Liquid Control System (SLC)	Valve	F006A,F006B	FV-0005A, FV-0005B	U3-SLC-M-DWG-PID-0001-01, Rev. D	U7-SITE-M-SPEC-ASME-VLV-7343 Rev. E	U7-SITE-M-SPEC-VLV-7343 Rev. F	Figure 9.3-1, Table 6.2-7 (Tier 2)
42	Standby Liquid Control System (SLC)	Piping	Various	Various	U3-SLC-M-DWG-PID-0001-01, Rev. D	U7-SITE-P-SPEC-ASME-0002 Rev. B	U7-FAB-P-SPEC-PIPE-7332, Rev. D	Figure 9.3-1

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43	Standby Liquid Control System (SLC)	Pumps	C001A, C001B	PUMP-001A, PUMP-001B	U3-SLC-M-DWG-PID-0001-01, Rev. D	U7-SLC-M-SPEC-ASME-PUMP-7386, Rev. D	U7-SLC-M-SPEC-ASME-PUMP-7386, Rev. D	Figure 9.3-1/Section 2.2.4 (Tier 1)
44	Reactor Water Cleanup System (RWCU)	Isolation Valve	F002, F003	FV-0003, FV-0004	U3-RWCU-M-DWG-P&ID-0001-01, Rev. D	U7-SITE-M-SPEC-ASME-VLV-7384 Rev. E	U7-SITE-M-SPEC-VLV-7384 Rev. E	T1/2.6.1 T2/5.4.8 Figure 5.4-12
45	Reactor Water Cleanup System (RWCU)	Remote Manual Shutoff Valve	~~F028~~ F026	FV-0002	U3-RWCU-M-DWG-P&ID-0001-01, Rev. D	U7-SITE-M-SPEC-ASME-VLV-7384 Rev. E	U7-SITE-M-SPEC-VLV-7384 Rev. E	T1/2.6.1 T2/5.4.8 Figure 5.4-12
46	Emergency Diesel Generator System (EDG)	Starting Receiver Tanks and Valves	Receivers: A300A, A301A	See Note	U3-EDG-M-DWG-P&ID-0001-03, Rev. D2	U7-EDG-M-SPEC-ASME-DG-7300 Rev. 1	U7-EDG-M-SPEC-DG-7300 Rev. 1	2.12.13, 9.5.6
47	Emergency Diesel Generator System (EDG)	Safety-related lube oil system	NA	NA	U3-EDG-M-DWG-P&ID-0001-01, Rev. D2	U7-EDG-M-SPEC-ASME-DG-7300 Rev. 1	U7-EDG-M-SPEC-DG-7300 Rev. 1	2.12.13, 7.3.1.1.6, 9.5.7
48	Emergency Diesel Generator System (EDG)	Safety-related diesel cooling water system	NA	NA	U3-EDG-M-DWG-P&ID-0001-02, Rev. D2	U7-EDG-M-SPEC-ASME-DG-7300 Rev. 1	U7-EDG-M-SPEC-DG-7300 Rev. 1	2.12.13, 7.3.1.1.6, 9.5.5