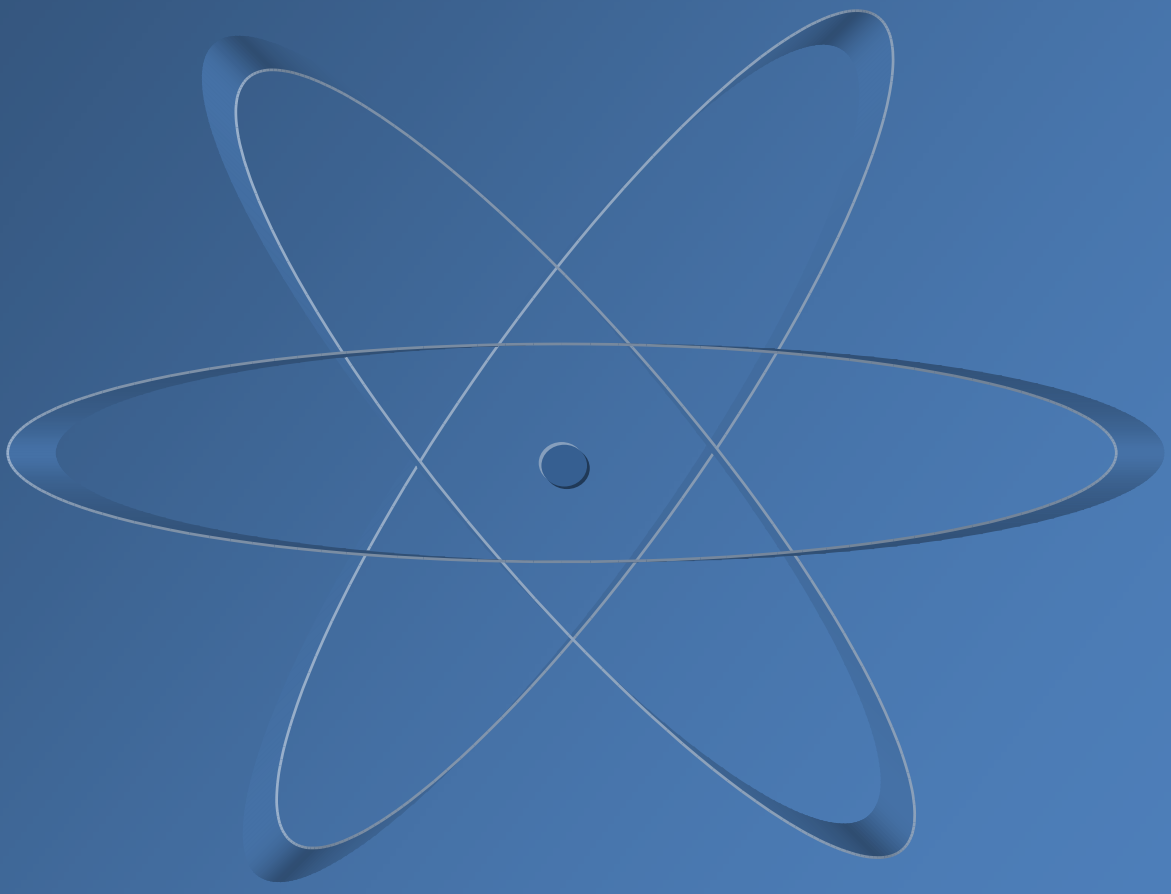
South Carolina Office of Regulatory Staff

Review of South Carolina Electric & Gas Company's 2012 3rd Quarter Report on V. C. Summer Units 2 and 3 Status of Construction



January 18, 2013

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Introduction

On March 2, 2009, the Public Service Commission of South Carolina ("Commission") approved South Carolina Electric & Gas Company's ("SCE&G" or the "Company") request for the construction of V.C. Summer Nuclear Station Units 2 and 3 (the "Units") and the Engineering, Procurement and Construction ("EPC") Contract. This approval can be found in the Base Load Review Order No. 2009-104(A) filed in Docket No. 2008-196-E. On January 21, 2010, the Commission approved the Company's request to update milestones and capital cost schedules in Order No. 2010-12, which is filed in Docket No. 2009-293-E. On May 16, 2011, the Commission approved SCE&G's petition for revisions and updates to capital cost schedules in Order No. 2011-345, which is filed in Docket No. 2010-376-E.

The anticipated dependable capacity from the Units is approximately 2,234 megawatts ("MW"), of which 55% (1,228 MW) will be available to serve SCE&G customers. South Carolina Public Service Authority ("Santee Cooper") is expected to receive the remaining 45% (1,006 MW) of the electric output when the Units are in operation, and is paying 45% of the costs of the construction of the Units. In October 2011, SCE&G and Santee Cooper executed the permanent construction and operating agreements for the project. The agreements grant SCE&G primary responsibility for oversight of the construction process and operation of the Units as they come online. On March 30, 2012 the Nuclear Regulatory Commission ("NRC") voted to issue SCE&G a Combined Construction and Operating License ("COL") for the construction of the Units.

In 2010, SCE&G reported that Santee Cooper began reviewing its level of ownership participation in the Units. Since then, Santee Cooper has sought partners in its 45% ownership. Santee Cooper signed a Letter of Intent with Duke Energy Carolinas, LLC in 2011. On April 13, 2012, Santee Cooper issued a press release announcing it had signed a Letter of Intent with South Mississippi Electric Power Association for the opportunity to secure 2 to 7 percent of the capacity and energy output from the Units (roughly 4 to 15 percent of Santee Cooper's 45% interest). On April 24, 2012, Santee Cooper issued another press release announcing it signed a Letter of Intent to provide for negotiations for the purchase of 2 to 5 percent (roughly 4 to 11 percent of Santee Cooper's 45% ownership) of the Units with American Municipal Power, Inc. These press releases can be found as Appendices C and D, respectively, in ORS's 2012 1st Quarterly Report.

On May 15, 2012, SCE&G filed an application with Commission in Docket No. 2012-203-E for updates and revisions to schedules related to the construction of the Units ("Update Filing"). The Update Filing indicated that SCE&G intended to delay the substantial completion date of Unit 2 from April 2016 until March 2017, while advancing the substantial completion date for Unit 3 from January 2019 to May 2018. The Update Filing also requested revision to the base project cost totaling $282,988,245 for changes in three (3) main categories: Change Orders, Owners Costs and Transmission Costs. The Commission held a hearing regarding the

Update Filing on October 2 and 3, 2012. The requested schedule changes, along with an increase to the base project cost totaling $278,038,245, were approved by the Commission in Order No. 2012-884 on November 15, 2012. The changes associated with these new substantial completion dates will be updated in the Company's EPC Contract with Westinghouse Electric Company ("WEC") and The Shaw Group, Incorporated ("Shaw"). The Update Filing was previously discussed in detail in ORS's review of SCE&G's 2012 1st Quarter Report.

On November 9, 2012, SCE&G submitted its 2012 3rd Quarter Report ("Report") related to construction of the Units. The Report is filed in Commission Docket No. 2008-196-E and covers the quarter ending September 30, 2012. The Company's Report is submitted pursuant to S.C. Code Ann. § 58-33-277 (Supp. 2011) of the Base Load Review Act ("BLRA"), which requires the Report to include the following information:

1. Progress of construction of the plant;
2. Updated construction schedules;
3. Schedules of the capital costs incurred including updates to the information required in Section 58-33-270(B)(5);
4. Updated schedules of the anticipated capital costs; and
5. Other information as the Office of Regulatory Staff may require.

With reference to Section 58-33-275(A) of the BLRA, ORS's review of the Company's Report focuses on SCE&G's ability to adhere to (1) the approved construction schedule and (2) the approved capital cost schedule.

Approved Schedule Review

Milestone Schedule

As of September 30, 2012, ORS verified that of the Milestone Schedule's 146 activities:

- Seventy-nine (79) milestone activities have been completed (includes seventy-eight (78) historical milestones and one (1) future milestone)
- Sixty-seven (67) milestone activities are yet to be completed (includes three (3) delayed historical and sixty-four (64) future milestones)

ORS also verified that during the 3rd Quarter of 2012:

- Five (5) milestone activities were scheduled to be completed
  - Two (2) of these milestones have been completed
  - Three (3) of these milestones have not been completed

Per the Base Load Review Order, overall construction is considered to be on schedule if the substantial completion dates are not accelerated more than twenty-four (24) months or delayed more than eighteen (18) months. For the purposes of this review, ORS is using the Milestone Schedule approved by the Commission in Order No. 2012-884. Although Order No. 2012-884 was issued subsequent to the end of the quarter, this most recently approved Milestone Schedule more accurately reflects current construction progress towards the revised Substantial Completion Dates. As part of its review of the approved schedule, ORS identifies Caution Milestones. Caution Milestones are those that have been delayed ten (10) months or longer. If any Milestone is delayed sixteen (16) months or greater, ORS may issue a formal notification to the Commission of the delay. As of the end of the 3rd quarter of 2012, ORS identified zero (0) Caution Milestones.

SCE&G's Milestone Schedule attached to the Report indicates that overall construction supports a substantial completion date of March 15, 2017 for Unit 2 and May 15, 2018 for Unit 3. ORS's review of the schedule approved in Order No. 2012-884 and the EPC Contract confirms that the project remains on schedule with the schedule criteria established in the Base Load Review Order. Appendix A shows details of the Milestone Schedule as of September 30, 2012.

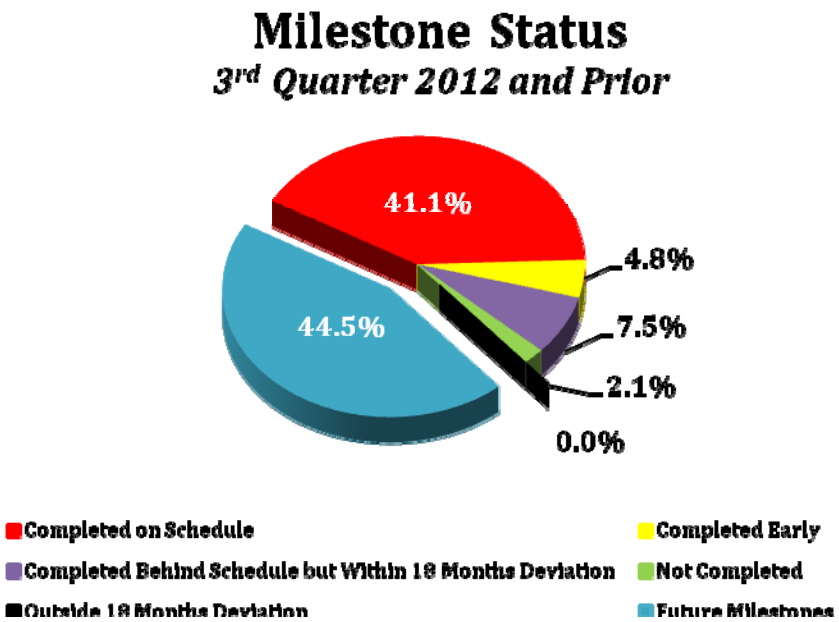
ORS reviews all invoices associated with the Milestone Schedule and during the 3rd quarter of 2012, there were three (3) invoices paid. ORS reviews invoices to ensure that the invoices are paid in accordance with Company policies and practices and in accordance with the terms of the EPC contract. ORS also reviews the escalation applied to these invoices for consistency with the appropriate Handy Whitman inflation indices.

Table 1 shows the status of the 81 historical milestones and Chart 1 shows the status of all 146 milestones for the 3rd quarter of 2012 and prior.[1]

Table 1:

Historical Milestones *3rd Quarter 2012 and Prior* ***81 of 146 Total Milestones***	# of Milestones	% of All Milestones[2]
Completed on Schedule	60	41.1%
Completed Early	7	4.8%
Completed Behind Schedule but Within 18 Months Deviation	11	7.5%
Not Completed	3	2.1%
Outside 18 Months Deviation	0	0.0%
Total Historical Milestones	**81**	**55.5%**

Chart 1:



[1] The numbers reported by ORS and SCE&G may vary. For reporting purposes, ORS applies a 30 day threshold before a milestone is deemed accelerated or delayed. SCE&G uses a threshold less than 30 days. For instance, if a milestone is scheduled to be completed January 2, 2013 and the actual completion date is December 29, 2012, SCE&G deems the milestone as completed one month early since it is completed in a prior calendar month. ORS would report this milestone as being accomplished on schedule since it was completed within 30 days of the scheduled completion date.

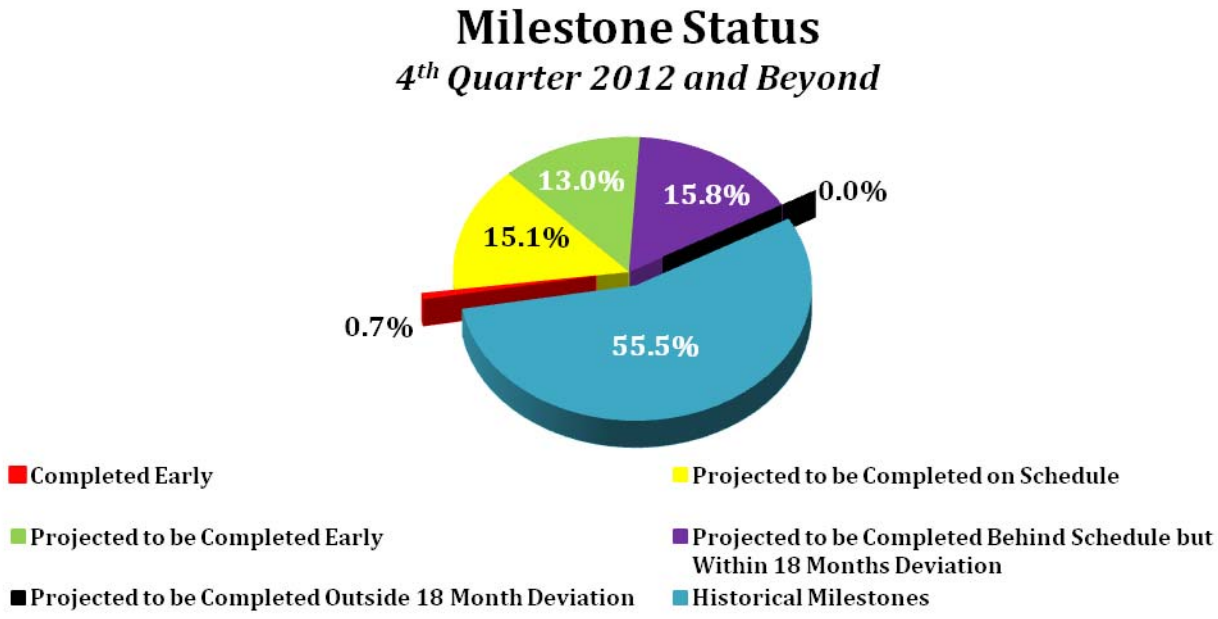
[2] Slight variances may occur due to rounding.

Table 2 shows the status of the 65 future milestones and Chart 2 shows the status of all 146 milestones for the 4th quarter 2012 and beyond.[3]

Table 2:

Future Milestones *4th Quarter 2012 and Beyond* ***65 of 146 Total Milestones***	# of Milestones	% of All Milestones[4]
Completed Early	1	0.7%
Projected to be Completed on Schedule	22	15.1%
Projected to be Completed Early	19	13.0%
Projected to be Completed Behind Schedule but Within 18 Months Deviation	23	15.8%
Projected to be Outside 18 Months Deviation	0	0.0%
Total Future Milestones	**65**	**44.5%**

Chart 2:



[3] The numbers reported by ORS and SCE&G may vary. For reporting purposes, ORS applies a 30-day threshold before a milestone is deemed accelerated or delayed. SCE&G uses a threshold less than 30 days. For instance, if a milestone is scheduled to be completed January 2, 2013 and the actual completion date is December 29, 2012, SCE&G deems the milestone as completed one month early since it is completed in a prior calendar month. ORS would report this milestone as being accomplished on schedule since it was completed within 30 days of the scheduled completion date.

[4] Slight variances may occur due to rounding.

Specific Construction Activities

Major construction activities during the 3rd quarter of 2012 are listed below:

- Nuclear Island concrete work in Unit 2 continued during the quarter, with the placement of safety related concrete through the upper mudmat completing in August. Installation of the waterproof membrane in both the Turbine Island and Nuclear Island were also completed.

- Rebar work in the Unit 2 Nuclear Island continued during the quarter, though three (3) major issues were identified that hampered progress on the basemat rebar. The NRC identified issues with the design compliance of "T" connections being used to terminate the floor rebar at the wall connection, quality issues related to the bend radius of fabricated rebar and questions from the NRC regarding rebar design surrounding the Nuclear Island elevator pit and sumps. The Company has remedied the first two issues, but the issue regarding the rebar design surrounding the elevator pit and sumps continues to be a challenge for the project.

- Unit 2 Containment Vessel ("CV") construction activities continued, with Shaw installing exterior rebar on the CV Bottom Head. Chicago Bridge and Iron continues to work on the CV ring segments, with fit-up and welding of the ring segments continuing during the quarter.

- Construction of the Unit 2 CR10 Module (Nuclear Island CV support structure) was completed during 2nd quarter 2012, but some rework was required to make changes to the rebar configuration. A portion of the installed rebar was removed from the CR10 Module and is being reinstalled by Shaw.

- Several CA20 submodules were installed on the CA20 Platen inside the Module Assembly Building ("MAB") during the quarter in preparation for welding. A total of thirty (30) CA20 submodules had been delivered to the site as of the end of the 3rd quarter of 2012, with nineteen (19) of these arriving on site during the 3rd quarter of 2012. However, pending unresolved issues relating to module design precluded the welding of the submodules inside of the MAB. Assembly of the CA20 module is a critical path activity.

- Construction of the CA01 Platen inside the MAB was completed during 2nd quarter 2012. As of September 30, 2012, no CA01 submodules have been received on site. Assembly of the CA01 module is a critical path activity as CA01 must be set before installation of CV ring segments can progress beyond the 1st ring.

- Unit 3 excavation activities were completed in July and geological mapping of the rock surface began shortly thereafter. The NRC conducted an inspection of the Unit 3

excavation itself, as well as the mapping program. This inspection yielded no findings or violations. This is a critical path activity for Unit 3.

- Work continued on the Cooling Towers throughout the quarter. Circulating Water System ("CWS") supply and return piping were completed for Cooling Tower 2A, while work on the supply and return piping continued in Cooling Towers 3A and 3B. Grading work for the area where Cooling Tower 2B is to be placed also continued.

- The Heavy Lift Derrick ("HLD") successfully completed its second rebar assembly lift during the 3rd quarter of 2012. The HLD also continues to be used for off-loading components as they are delivered to the site.

- Construction of the electrical switchyard continued throughout the quarter and is on schedule, with control cable installation and relay testing ongoing. It is anticipated that the switchyard will be energized in the 1st half of 2013. This date supports the project schedule.

Photographs of 3rd quarter construction activities are shown in Appendix B.

Critical Path Activities

Critical path activities are activities that drive the construction schedule. This report was filed during a time of transition from the previously approved schedule, based on a July 1, 2011 COL date, to a new schedule based on the March 30, 2012 COL date and the Update Filing. As such, a detailed analysis of critical path activities is not available. These assessments are based on previous critical paths and projected future critical paths.

- **Unit 2 Basemat:** As previously stated, the pouring of concrete in the Unit 2 Nuclear Island began during the 2nd quarter of 2012 and continued in the 3rd quarter of 2012. This consists of leveling concrete, followed by the mudmat, and finally the basemat. The pouring of the mud mat was previously scheduled to occur in June 2011, but was completed during the 3rd quarter of 2012. Pouring of the basemat is scheduled to begin during the 4th quarter of 2012. However, due to the unresolved issues previously mentioned regarding rebar design around the elevator pits and sumps, this has been delayed. This critical path activity continues to experience schedule challenges and is behind schedule.

- **Unit 2 CA01 Module:** Field assembly of the Unit 2 CA01 module was previously scheduled to begin in June 2011 but has not yet begun. The module segments required for the CA01 module are to be fabricated by Shaw Modular Solutions ("SMS"), and the delivery of these segments is behind schedule.

  In previous quarterly reports, ORS discussed deficiencies related to SMS's Quality Assurance Program ("QAP"). Additionally, production of the module segments has been

repeatedly delayed due to module redesign and production issues. Since March 2012, SCE&G is maintaining a full-time presence at the SMS facility, in addition to the previously-assigned WEC full-time presence, to monitor production and QAP issues. Also, monthly management meetings among SCE&G, WEC, Shaw and SMS are being held to monitor SMS progress. The NRC conducted an unannounced inspection of the SMS facilities from September 10, 2012 through September 14, 2012. Subsequent to the end of the quarter, a Notice of Nonconformance was issued to SMS by the NRC as a result of this inspection. This is discussed in more detail in the section entitled "Notable Activities Occurring After September 30, 2012."

The continued issues at SMS affect construction of the CA01 and CA20 modules inside the MAB. Efforts continue to re-baseline the schedule. ORS will continue to closely monitor and report on SMS. As the CA01 module must be placed before the setting of the CV rings can progress beyond the 1st ring this is a critical path activity. This critical path activity is behind schedule.

- **Unit 2 CA20 Module:** Site assembly of the CA20 module was previously scheduled to begin in November 2010, and the module was previously scheduled to be set prior to the end of the 4th quarter of 2011. CA20 submodule segments are being fabricated by SMS. As of the end of the 3rd quarter of 2012 a sufficient quantity of submodules had been received on site to begin assembly of the module. However, WEC identified a discrepancy regarding welds in certain structural modules between WEC's technical drawings and the NRC approved design. This issue is part of a larger class of issues relating to discrepancies between the design specification and the NRC approved design. WEC has undertaken a comprehensive review of these issues. Assembly of the modules was suspended pending production of a plan to remedy these discrepancies. This critical path activity is behind schedule.

- **Unit 2 Containment Vessel and Shield Building:** The Containment Vessel bottom-head segments were delivered early, and assembly is currently on schedule. Because of the production and quality issues associated with SMS, fabrication of the Shield Building modules has been reassigned to Newport News Industries and is scheduled to start soon. Installation of the CV and the Shield Building is dependent on the placement of the Unit 2 mud mat and basemat. The critical path for the schedule recently approved in the Update Filing runs directly from the basemat pour through these activities. As the basemat pour has been delayed, this critical path activity is currently behind schedule.

- **Unit 3 Basemat:** Excavation and blasting has been completed in the Nuclear Island and Turbine Island areas. Geologic mapping is ongoing, and these activities received a favorable NRC inspection report. This critical path activity is on schedule.

Transmission

On February 28, 2011, SCE&G entered into a contract with Pike Electric for the permitting, engineering and design, procurement of material, and the construction of four (4) 230 kV transmission lines and associated facilities related to the Units. This project will consist of two phases.

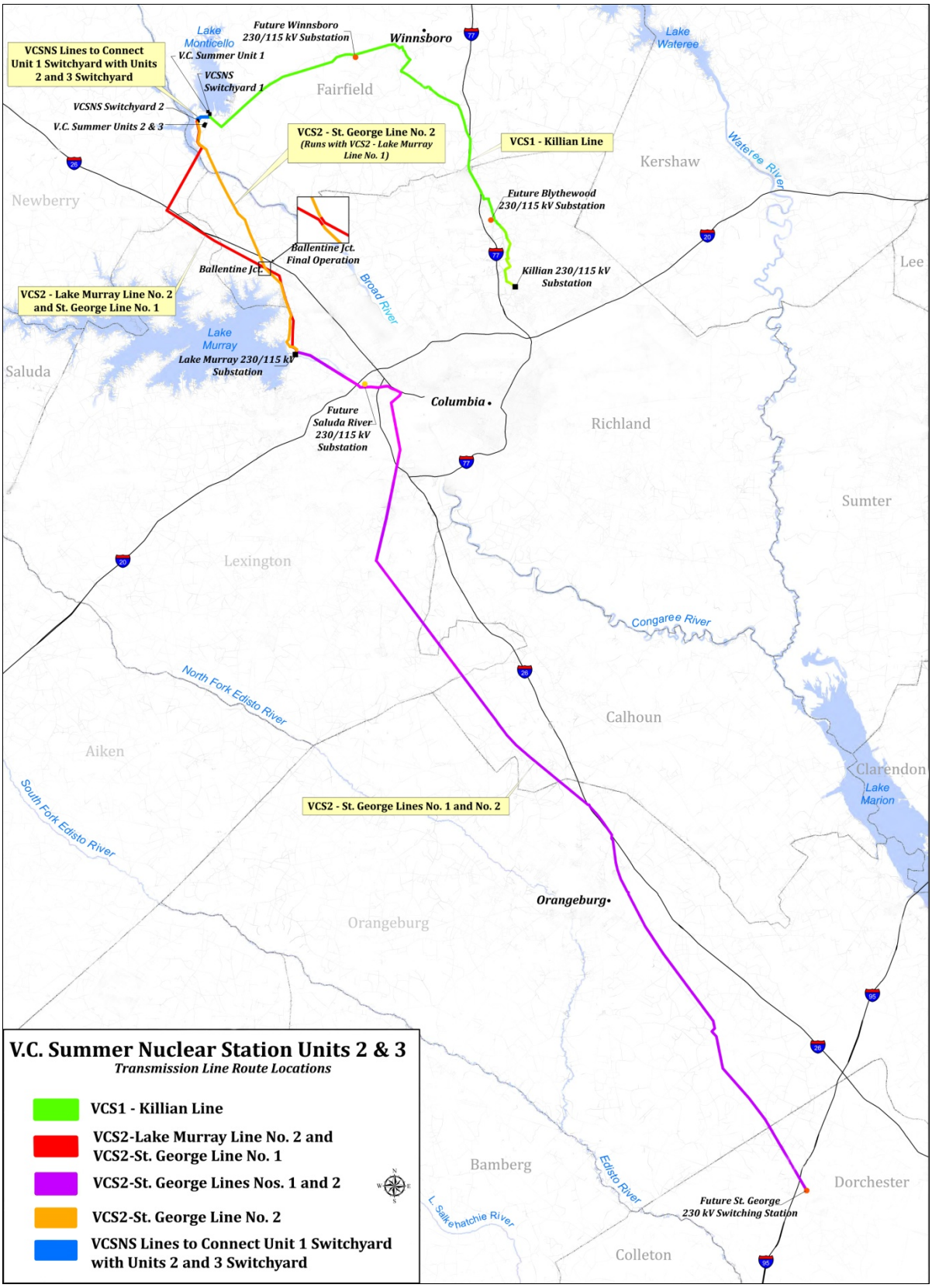
Phase 1 consists of construction of two (2) new 230 kV transmission lines in support of Unit 2: the VCS1–Killian Line and the VCS2–Lake Murray Line. The VCS1–Killian Line will connect the existing V.C. Summer Switchyard ("Switchyard 1") to the Company's existing Killian Road 230 kV Substation. The VCS2–Lake Murray Line will connect the newly-constructed Switchyard ("Switchyard 2") to the Company's existing Lake Murray 230 kV Substation. Switchyard 2 will allow the connection of both the Unit 2 and Unit 3 generators to the grid. Also, for Phase 1, two (2) new 230 kV interconnections between Switchyard 1 and Switchyard 2 will be constructed. Construction of the Phase 1 lines continued during the 3rd quarter of 2012. As of September 30, 2012, the VCS1–Killian Line was approximately seventy percent (70%) complete and the VCS2–Lake Murray Line was approximately thirty percent (30%) complete.

Phase 2 consists of construction of two (2) new 230 kV transmission lines and associated facilities in support of Unit 3. These consist of the VCS2–St. George Line #1, VCS2–St. George Line #2, St. George 230 kV Switching Station, and Saluda River 230/115 kV Substation. Both the VCS2–St. George Line #1 and VCS2–St. George Line #2 will connect Switchyard 2 to the yet-to-be constructed St. George 230 kV Switching Station. Additionally, a third new 230 kV interconnection between Switchyard 1 and Switchyard 2 will be required for Phase 2. SCE&G also entered into an agreement to purchase the site for the Saluda River 230/115 kV Substation, to be built adjacent to and interconnect with the VCS2-St. George lines. The preliminary environmental assessment of this site has been completed.

On June 1, 2012, the Company filed its application for Phase 2 of the project with the Commission in Docket No. 2012-225-E. A hearing was conducted on August 22, 2012, and Order No. 2012-730 approving the application was issued by the Commission on September 26, 2012.

Map 1 shows the geographical location of the new transmission lines and other associated facilities to support the Units.

Map 1: New Transmission Lines and Facilities Supporting V.C. Summer Units 2 & 3



Change Orders and Amendments

During the 3rd quarter of 2012, no Change Orders or Amendments were executed. One (1) Change Order was under negotiation at the end of the 3rd quarter 2012. This Change Order would incorporate the settlement agreement with WEC/Shaw into the EPC Contract. The costs associated with this change order are incorporated in the Company's Update Filing.

Table 3 details all Change Orders and Amendments. A list of definitions for each type of Change Order is found below.

- **Contractor Convenience:** These changes are requested by the contractor. They are undertaken at the contractor's own expense, and are both generally consistent with the contract and reasonably necessary to meet the terms of the contract.

- **Entitlement:** The contractor is entitled to a Change Order in the event certain actions occur, including changes in law, uncontrollable circumstances, and other actions as defined in the contract.

- **Owner Directed:** These changes are requested by the Company.

Table 3:

Change Orders and Amendments					
No.	**Summary**	**Cost Categories Involved**	**Type of Change**	**Date Approved**	**Status**
1	Operator training for WEC Reactor Vessel Systems and Simulator training	Fixed Price with 0% escalation [5]	Owner Directed	7/22/2009	Approved
2	Limited Scope Simulator	Firm Price	Owner Directed	9/11/2009	Approved
3	Repair of Parr Road	Time and Materials	Owner Directed	1/21/2010	Approved
4	Transfer of Erection of CA20 Module from WEC to Shaw	Target Price work shifting to Firm Price	Contractor Convenience	N/A	Superseded by Change Order No. 8
5	**Supplements Change Order No. 1** Increased training by two weeks	Fixed Price with 0% escalation [5]	Owner Directed	5/4/2010	Approved
6	Hydraulic Nuts	Fixed Price	Owner Directed	7/13/2010	Approved
7	St. George Lines 1 & 2	Firm and Target Price Categories	Entitlement	7/13/2010	Approved
8	Target to Firm/Fixed Shift	Target, Firm and Fixed Price Categories	Owner Directed	4/29/2011	Approved
9	Switchyard Lines Reconfiguration	Firm and Target Price Categories	Owner Directed	11/30/2010	Approved
10	Primavera	Fixed Price with 0% escalation	Owner Directed	12/16/2010	Approved
11	COL Delay Study	Fixed Price, but would be applied to T&M Work Allowances	Owner Directed	2/28/2011	Approved
12	2010 Health Care Act Costs	Fixed Price	Entitlement	11/14/2011	Approved
13	Ovation Workstations	No Cost	Owner Directed	3/12/2012	Approved
14	Cyber Security Phase 1	Firm Price and T&M Price	Entitlement	3/15/2012	Approved
15	Liquid Waste System Discharge Piping	Firm Price	Owner Directed	3/15/2012	Approved

Amendment #1	Includes Change Orders 1 and 2	Executed on 8/2/2010
Amendment #2	Incorporates Change Orders 3, 5-11	Executed on 11/15/2011
Amendment #3	Includes modified insurance wording	Executed on 4/30/12

[5] Fixed Price with 0% escalation, but would be applied to Time and Materials Work Allowances by adding a new category for Simulator Instructor training and reducing Startup Support by a commensurate amount.

Licensing and Inspection Activities

Federal Activities

As of September 30, 2012, SCE&G has identified the need to submit a total of 48 License Amendment Requests ("LARs") to the NRC. SCE&G submitted two (2) LARs to the NRC during the quarter. A LAR is the process by which a licensee requests changes to the COL issued by the NRC. The first LAR relates to the spacing for electrical penetration on modules. The second LAR relates to corrections to Table 3.3.1 in the COL such that the table is in agreement with the surrounding text. One (1) Preliminary Amendment Request ("PAR") has also been requested to accompany the LAR relating to Table 3.3.1 corrections. PARs allow the licensee to continue with construction at their own risk while they await final dispensation of the LAR.

SCE&G received its mid-cycle assessment letter from the NRC on August 9, 2012. This letter summarizes inspection activities from January 1, 2012 through June 30, 2012. This report is attached as Appendix C. During the 3rd quarter 2012, the NRC conducted four (4) on-site inspections related to the Units. These inspections resulted in one (1) unresolved issue ("URI") related to concrete reinforcement in the basemat elevator pit and sump areas. The NRC also conducted an inspection at SMS during the month of September, the results of which are discussed in more detail in the section entitled "Notable Activities Occurring After September 30, 2012."

The NRC is also closely monitoring the testing of squib valves, which are a type of valve used in the passive safety system of the AP1000. The development of a testing program for squib valves was one of the conditions imposed by the NRC in the COL. On July 27, 2012, the NRC issued a Notice of Violation and Notice of Nonconformance to National Testing Systems, the company contracted by WEC to implement the squib valve testing program, for failing to document and properly disposition test results for an internal gasket that did not operate as expected in a timely manner. This NRC report is included as Appendix D.

State Activities

SCE&G submitted a National Pollutant Discharge Elimination System ("NPDES") permit application to the South Carolina Department of Health and Environmental Control ("DHEC") during the 1st quarter of 2012. The NPDES permit is required to discharge water into the Parr Reservoir, and must be obtained before the construction of the Raw Water System and Wastewater System. A public hearing for the permit was held on June 19, 2012, with the public comment period expiring September 17, 2012. After the close of the comment period, DHEC made four (4) changes to the draft permit. The Company's NPDES permit application is further discussed in the section entitled "Notable Activities Occurring After September 30, 2012.

Approved Budget Review

ORS's budget review includes an analysis of the 3rd quarter 2012 capital costs, project cash flow, escalation and Allowance for Funds Used During Construction ("AFUDC").

Capital Costs

To determine how consistently the Company adheres to the budget approved by the Commission in Order No. 2011-345, ORS evaluates nine (9) major cost categories for variances. These cost categories are:

- Fixed with No Adjustment
- Firm with Fixed Adjustment A
- Firm with Fixed Adjustment B
- Firm with Indexed Adjustment
- Actual Craft Wages
- Non-Labor Cost
- Time & Materials
- Owners Costs
- Transmission Projects

For the purposes of this budget review, ORS has continued to use the budget approved in Order No. 2011-345. Order No. 2012-884 was not issued until the 4th quarter of 2012, and budget projections in the Report are based on historical expenditures made during the 3rd quarter of 2012. Future budget reviews will be evaluated with respect to Commission Order No. 2012-884. ORS monitors variances due to project changes (e.g., shifts in work scopes, payment timetables, construction schedule adjustments, Change Orders). At the end of the 3rd quarter of 2012, SCE&G's total base project cost (in 2007 dollars) is $4.553 billion. The Report shows the total base project cost has increased by approximately $283 million over the Commission approved budget amount. This includes a decision by the Company that it would not seek recovery for $103,000 in Community/Support Outreach costs that WEC and Shaw have included in costs to be charged under the EPC Contract.

Project Cash Flow

As shown in Appendix 2 of the Company's Report, the cumulative amount spent on the project as of December 31, 2011 is $1.210 billion. The cumulative amount forecasted to be spent on the project by December 31, 2012 is $1.805 billion.

With reference to Appendix 2, ORS evaluated the total revised project cash flow (Line 37) with respect to the annual project cash flow, adjusted for changes in escalation (Line 16). This evaluation provides a comparison of the Company's current project cash flow to the cash flow schedule approved by the Commission in Order No. 2011-345. To produce a common basis for the comparison, Line 16 adjusts the approved cash flow schedule to reflect the current escalation rates. As of September 30, 2012, the comparison shows the yearly maximum annual variance from the approved cash flow schedule through the life of the project. The comparison also shows that the cumulative project cash flow is forecasted to be approximately $323.142 million under budget at the end of 2012. At the completion of the project in 2018, the cumulative project cash flow is forecasted to be approximately $431.008 million over budget.

Table 4 shows the annual and cumulative project cash flows as compared to those approved in Order No. 2011-345.

Table 4:

Project Cash Flow Comparison

$'s in Thousands [6]

		Annual Over/(Under)	Cumulative Over/(Under)
Actual [7]	**2007**	-	-
	2008	$0	$0
	2009	$0	$0
	2010	$0	$0
	2011	($140,769)	($140,769)
Projected	**2012**	($182,372)	($323,141)
	2013	**$161,532**	($161,609)
	2014	**$482,340**	**$320,730**
	2015	**$282,162**	**$602,892**
	2016	**$82,442**	**$685,334**
	2017	($48,942)	**$636,392**
	2018	($205,384)	**$431,008**

[6] Slight variances may occur due to rounding.
[7] The actual comparison amounts for 2007 through 2010 equate to zero in accordance with the updated capital cost schedules approved in Order No. 2011-345

In summary, the Report shows an increase in the total base project cost approved in Order No. 2011-345 of approximately $282.951 million (in 2007 dollars). This increase in the total base project cost is consistent with the Company's request in the Update Filing against which future quarterly reports will be evaluated. Due to escalation, a project cash flow of approximately $431.008 million more would be necessary to complete the project in 2018. These forecasts reflect the updated capital cost schedules approved in Order No. 2011-345, the current construction schedule and the inflation indices in the Company's Appendix 4.

AFUDC and Escalation

The forecasted AFUDC for the total project as of the end of the 3rd quarter of 2012 is $216.764 million and is currently based on a forecasted 5.28% AFUDC rate.

As previously reported by ORS in its reviews of SCE&G's Quarterly Reports, the decline in the five-year average escalation rates reduces the projected project cash flow. Current worldwide economic conditions continue to reduce the projected escalation cost of the project. Primarily due to the decrease in escalation rates, the overall project is considered under budget. More specifically, as of September 30, 2012, the SCE&G forecasted gross construction cost of the plant is $5.700 billion as compared to the approved gross construction cost of $5.787 billion, which represents a decrease of approximately $87 million.

Annual Request for Revised Rates

Pursuant to the BLRA, SCE&G may request revised rates no earlier than one year after the request of a Base Load Review Order or any prior revised rates request. SCE&G filed its Annual Request for Revised Rates with the Commission in Docket No. 2012-186-E on May 30, 2012, the anniversary date of SCE&G's previous request for revised rates. The Commission approved an increase of $52,148,913 (2.33%) in Order No. 2012-761.

Table 5 below shows the requested increases and approved increases from all prior Revised Rate Filings with the Commission.

Table 5:

Requested vs. Approved Increases *SCE&G Revised Rate Filings*					
Docket No.	**Order No.**	**Requested Increase**	**ORS Examination**	**Approved Increase**	**Retail Increase**
2008-196-E	2009-104(A)	$8,986,000	($1,183,509)	$7,802,491	0.43%
2009-211-E	2009-696	$22,533,000	$0	$22,533,000	1.10%
2010-157-E	2010-625	$54,561,000	($7,260,000)	$47,301,000	2.31%
2011-207-E	2011-738	$58,537,000	($5,753,658)	$52,783,342	2.43%
2012-186-E	2012-761	$56,747,000	($4,598,087)	$52,148,913	2.33%

Additional ORS Monitoring Activities

ORS continually performs the following activities, as well as other monitoring activities as deemed necessary:

- Audits capital cost expenditures and resulting AFUDC in CWIP
- Physically observes construction activities
- Bi-monthly on-site review of construction documents
- Holds monthly update meetings with SCE&G
- Meets quarterly with representatives of WEC
- Participates in NRC Public Meetings regarding SCE&G COL and other construction activities

Construction Challenges

Based upon the information provided by the Company in its Report, as well as information obtained via additional ORS monitoring activities, ORS identifies the following ongoing challenges in the construction of the Units:

Nuclear Island Basemat

The most immediate challenge to the Project is the Nuclear Island basemat concrete pour. This activity must be completed before further meaningful progress can be made on construction activities in the Nuclear Island. Due to design and construction issues, approval by the NRC must now be obtained before this work can proceed. SCE&G is using the LAR process to resolve this issue and is requesting approval by March 1, 2013. This time frame could be extended if negative findings are identified in the Safety Evaluation Report ("SER"). The full impact of the delay of the construction schedule is not yet known because the NRC approval date is uncertain and the potential recovery activities are not yet identified; however, SCE&G does not anticipate that the resolution of this issue will cause a delay in the commercial operation of the Units in 2017 and 2018. SCE&G has stated that it will use the PAR process which will allow the Company to continue certain construction activities at its own risk pending final disposition of the LAR.

Structural Modules

Another significant challenge to the Project is the continued inability of SMS to reliably meet the quality and schedule requirements of the Project. Despite intense and continuous management focus from SMS, Shaw, WEC and SCE&G, SMS has been unable to meet its revised schedules to deliver submodules to VCS in a timely manner. SMS has also continued to struggle with quality issues, ranging from design compliance to the completion of final inspection paperwork. Once the issue of the Nuclear Island basemat concrete pour is resolved, this issue will become the most immediate challenge to the Project. Although SCE&G and Shaw have demonstrated success with the on-site assembly of the limited number of CA20 modules received, this area remains as a significant challenge to the Project. Specifically, the on-site weld repairs that need to be made, resulting from an incorrect interpretation of the approved design during the module fabrication process, and the assembly of the submodules into modules to be installed in the Nuclear Island, are significant construction challenges.

Shield Building Modules

Although shield building module fabrication has been reassigned to Newport News Industrial ("NNI"), thus freeing SMS to concentrate on the structural modules, NNI's performance has not yet been demonstrated. The shield building modules are more complex and present even greater fabrication and erection challenges to the Project than the structural modules. Though some mock-ups have been produced, these mock-ups are still being used for testing purposes. The full extent of challenges in this area remains unknown; however, given the Project's history with structural module fabrication, it is an area of concern moving forward. NNI will need to demonstrate sustained and reliable performance in both the quality and on-time delivery of submodules, and Shaw will need to do the same in the area of erecting the shield building modules on-site.

Structural Design Compliance

The issues relating to the basemat design, as well as a portion of the issues relating to the structural modules and shield building modules, are related to compliance to the design approved by the NRC. This Structural design compliance is emerging as an issue affecting multiple areas of the project. WEC has had challenges providing accurate directions for fabrication, in part because of differences in the interpretation of the Design Control Document ("DCD") approved by the NRC. Issues range from a lack of compliance to applicable building codes for concrete and rebar to the failure to correctly translate the requirement for full penetration welds in structural modules to documents used for fabrication. This raises questions of whether the overall WEC structural design will face similar challenges at each new phase of construction. WEC has taken steps to engage the services of structural experts from several leading nuclear plant design and engineering firms to assist them in the structural design area, which indicates a commitment to addressing these issues going forward. This is an area that presents a significant continuing challenge to the Project, and remains an open concern at this time.

Overlapping Unit 2 & Unit 3 Construction Schedules

The delays in starting Unit 2 construction, in particular those associated with submodule fabrication, may begin to challenge the ability of the Project to work on both Units simultaneously while adhering to the approved schedule. This has the potential to result in significant challenges to the Unit 3 construction schedule.

Manufacturing of Major Equipment

Factors such as design changes, labor conditions, shipping conditions, and the financial stability of manufacturers due to foreign financial market conditions must be monitored closely.

Notable Activities Occurring after September 30, 2012

The BLRA allows SCE&G forty-five (45) days from the end of the current quarter to file its Report. Items of importance that occurred subsequent to the closing of the 3rd quarter of 2012 are reported below.

Update Filing

The requested schedule changes, along with an increase to the base project cost totaling $278,038,245, were approved by the Commission in Order No. 2012-884 on November 15, 2012. Petitions for Rehearing or Reconsideration were filed on behalf of the Sierra Club and the South Carolina Energy Users Committee. Both of these petitions were denied via Commission Directive on December 12, 2012.

NPDES Permit Application

As previously stated, the Company filed an application for a NPDES permit during the 1st quarter of 2012 with DHEC. Subsequent to the Company submitting its Report, DHEC issued the permit to SCE&G on October 11, 2012. The decision to issue the permit was appealed, but the appeal was denied by DHEC on November 8, 2012. The decision was further appealed; however the court returned the filing due to non-payment of the required filing fees by the party appealing the decision. The permit is attached as Appendix E.

NRC Licensing

During the 3rd quarter 2012, the NRC conducted four (4) on site inspections related to the Units. The last of these inspections exited on September 30, 2012 and resulted in one unresolved issue related to concrete reinforcement in the basemat elevator pit and sump areas. On November 14, 2012 the NRC issued a Notice of Violation to SCE&G based on the results of that inspection with four (4) findings of very low safety significance. This Notice of Violation is attached as Appendix F. In November the NRC also inspected the Corrective Action Program ("CAP"). This inspection exited with only two potential findings, both of low safety significance.

No additional LARs have been requested since the end of the quarter, but SCE&G is working on two (2) additional LARs for submittal in early 2013. The company is tracking a total of fifty-one (51) known LARs that will be needed over the course of the project.

SMS

SCE&G took delivery of six (6) CA20 submodules during October and November 2012, bringing the total number of submodules on site to thirty-six (36). There are a total of seventy-two (72) submodules that make up the CA20 module. Submodules of a sufficient number and type had arrived on site such that welding activities would have been able to begin during the month of August. However, pending unresolved issues relating to structural module welding precluded the welding of the submodules inside of the MAB. In December 2012, welding commenced on the submodules inside of the MAB.

The NRC conducted an unannounced inspection of the SMS facilities from September 10, 2012 through September 14, 2012. Subsequent to the end of the quarter, a Notice of Nonconformance was issued to SMS by the NRC as a result of this inspection. On October 24, 2012, SMS was issued a Notice of Nonconformance by the NRC for its QAP program. This Notice of Nonconformance is included as Appendix G. Responses to this Notice of Nonconformance were due to the NRC by November 30, 2012. However, SMS requested and was granted an extension until January 11, 2013 to submit a response.

SCE&G's 2012 4th Quarter Report is due forty-five (45) days after December 31, 2012. ORS expects to continue publishing a review evaluating SCE&G's quarterly reports.

Appendix A

Detailed Milestone Schedule as of September 30, 2012

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
1	Approve Engineering, Procurement and Construction Agreement	5/23/2008		No	No	5/23/2008	
2	Issue Purchase Orders ("P.O.") to Nuclear Component Fabricators for Units 2 and 3 Containment Vessels	12/3/2008		No	No	12/3/2008	
3	Contractor Issue P.O. to Passive Residual Heat Removal Heat Exchanger Fabricator – First Payment - Unit 2	8/31/2008		No	No	8/18/2008	
4	Contractor Issue P.O. to Accumulator Tank Fabricator – Unit 2	7/31/2008		No	No	7/31/2008	
5	Contractor Issue P.O. to Core Makeup Tank Fabricator - Units 2 & 3	9/30/2008		No	No	9/30/2008	
6	Contractor Issue P.O. to Squib Valve Fabricator- Units 2 & 3	3/31/2009		No	No	3/31/2009	
7	Contractor Issue P.O. to Steam Generator Fabricator - Units 2 & 3	6/30/2008		No	No	5/29/2008	1 Month Early
8	Contractor Issue Long Lead Material P.O. to Reactor Coolant Pump Fabricator - Units 2 & 3	6/30/2008		No	No	6/30/2008	
9	Contractor Issue P.O. to Pressurizer Fabricator - Units 2 & 3	8/31/2008		No	No	8/18/2008	
10	Contractor Issue P.O. to Reactor Coolant Loop Pipe Fabricator - First Payment - Units 2 & 3	6/30/2008		No	No	6/20/2008	

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
11	Reactor Vessel Internals – Issue Long Lead Material P.O. to Fabricator - Units 2 & 3	11/21/2008		No	No	11/21/2008	
12	Contractor Issue Long Lead Material - P.O. to Reactor Vessel Fabricator - Units 2 & 3	6/30/2008		No	No	5/29/2008	1 Month Early
13	Contractor Issue P.O. to Integrated Head Package Fabricator - Units 2 & 3	7/31/2009		No	No	7/31/2009	
14	Control Rod Drive Mechanism – Issue P.O. for Long Lead Material to Fabricator - Units 2 & 3 - First Payment	6/21/2008		No	No	6/21/2008	
15	Issue P.O.'s to Nuclear Component Fabricators for Nuclear Island Structural CA20 Modules	7/31/2009		No	No	8/28/2009	
16	Start Site Specific and Balance of Plant Detailed Design	9/11/2007		No	No	9/11/2007	
17	Instrumentation & Control Simulator - Contractor Place Notice to Proceed - Units 2 & 3	10/31/2008		No	No	10/31/2008	
18	Stream Generator - Issue Final P.O. to Fabricator for Units 2 & 3	6/30/2008		No	No	6/30/2008	
19	Reactor Vessel Internals - Contractor Issue P.O. for Long Lead Material (Heavy Plate and Heavy Forgings) to Fabricator - Units 2 & 3	1/31/2010		No	No	1/29/2010	
20	Contractor Issue Final P.O. to Reactor Vessel Fabricator - Units 2 & 3	9/30/2008		No	No	9/30/2008	

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
21	Variable Frequency Drive Fabricator Issue Transformer P.O. - Units 2 & 3	4/30/2009		No	No	4/30/2009	
22	Start Clearing, Grubbing and Grading	1/26/2009		No	No	1/26/2009	
23	Core Makeup Tank Fabricator Issue Long Lead Material P.O. - Units 2 & 3	10/31/2008		No	No	10/31/2008	
24	Accumulator Tank Fabricator Issue Long Lead Material P.O. - Units 2 & 3	10/31/2008		No	No	10/31/2008	
25	Pressurizer Fabricator Issue Long Lead Material P.O. - Units 2 & 3	10/31/2008		No	No	10/31/2008	
26	Reactor Coolant Loop Pipe - Contractor Issue P.O. to Fabricator - Second Payment - Units 2 & 3	4/30/2009		No	No	4/30/2009	
27	Integrated Head Package - Issue P.O. to Fabricator - Units 2 & 3 - Second Payment	7/31/2009		No	No	7/31/2009	
28	Control Rod Drive Mechanism - Contractor Issue P.O. for Long Lead Material to Fabricator - Units 2 & 3	6/30/2008		No	No	6/30/2008	
29	Contractor Issue P.O. to Passive Residual Heat Removal Heat Exchanger Fabricator - Second Payment - Units 2 & 3	10/31/2008		No	No	10/31/2008	
30	Start Parr Road Intersection Work	2/13/2009		No	No	2/13/2009	

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
31	Reactor Coolant Pump - Issue Final P.O. to Fabricator - Units 2 & 3	6/30/2008		No	No	6/30/2008	
32	Integrated Heat Packages Fabricator Issue Long Lead Material P.O. - Units 2 & 3	10/31/2009		No	No	10/1/2009	1 Month Early
33	Design Finalization Payment 3	1/31/2009		No	No	1/30/2009	
34	Start Site Development	6/23/2008		No	No	6/23/2008	
35	Contractor Issue P.O. to Turbine Generator Fabricator - Units 2 & 3	2/28/2009		No	No	2/19/2009	
36	Contractor Issue P.O. to Main Transformers Fabricator - Units 2 & 3	9/30/2009		No	No	9/25/2009	
37	Core Makeup Tank Fabricator Notice to Contractor Receipt of Long Lead Material - Units 2 & 3	11/30/2010		No	No	12/30/2010	Delayed 1 Month
38	Design Finalization Payment 4	4/30/2009		No	No	4/30/2009	
39	Turbine Generator Fabricator Issue P.O. for Condenser Material - Unit 2	8/31/2009		No	No	8/28/2009	
40	Reactor Coolant Pump Fabricator Issue Long Lead Material Lot 2 - Units 2 & 3	4/30/2009		No	No	4/30/2009	

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
41	Passive Residual Heat Removal Heat Exchanger Fabricator Receipt of Long Lead Material - Units 2 & 3	5/31/2010		No	No	5/27/2010	
42	Design Finalization Payment 5	7/31/2009		No	No	7/31/2009	
43	Start Erection of Construction Buildings to include Craft Facilities for Personnel, Tools, Equipment; First Aid Facilities; Field Offices for Site Management and Support Personnel; Temporary Warehouses; and Construction Hiring Office	10/9/2009		No	No	12/18/2009	Delayed 2 Months
44	Reactor Vessel Fabricator Notice to Contractor of Receipt of Flange Nozzle Shell Forging - Unit 2	7/31/2009		No	No	8/28/2009	
45	Design Finalization Payment 6	10/31/2009		No	No	10/7/2009	
46	Instrumentation and Control Simulator - Contractor Issue P.O. to Subcontractor for Radiation Monitor System - Units 2 & 3	12/31/2009		No	No	12/17/2009	
47	Reactor Vessel Internals - Fabricator Start Fit and Welding of Core Shroud Assembly - Unit 2	6/30/2011		No	No	7/29/2011	
48	Turbine Generator Fabricator Issue P.O. for Moisture Separator Reheater/Feedwater Heater Material - Unit 2	4/30/2010		No	No	4/30/2010	
49	Reactor Coolant Loop Pipe Fabricator Acceptance of Raw Material - Unit 2	4/30/2010		No	No	2/18/2010	2 Months Early

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
50	**Reactor Vessel Internals - Fabricator Start Weld Neutron Shield Spacer Pads to Assembly - Unit 2**	**7/31/2012**		**No**	**No**	**8/28/2012**	
51	Control Rod Drive Mechanisms - Fabricator to Start Procurement of Long Lead Material - Unit 2	6/30/2009		No	No	6/30/2009	
52	Contractor Notified that Pressurizer Fabricator Performed Cladding on Bottom Head - Unit 2	11/30/2010		No	No	12/23/2010	
53	Start Excavation and Foundation Work for the Standard Plant for Unit 2	3/15/2010		No	No	3/15/2010	
54	Steam Generator Fabricator Notice to Contractor of Receipt of 2nd Steam Generator Tubesheet Forging - Unit 2	2/28/2010		No	No	4/30/2010	Delayed 2 Months
55	Reactor Vessel Fabricator Notice to Contractor of Outlet Nozzle Welding to Flange Nozzle Shell Completion - Unit 2	2/28/2010		No	No	12/30/2010	Delayed 10 Months
56	Turbine Generator Fabricator Notice to Contractor Condenser Fabrication Started - Unit 2	5/31/2010		No	No	5/17/2010	
57	Complete Preparations for Receiving the First Module On Site for Unit 2	8/18/2010		No	No	1/22/2010	6 Months Early
58	Steam Generator Fabricator Notice to Contractor of Receipt of 1st Steam Generator Transition Cone Forging - Unit 2	4/30/2010		No	No	4/21/2010	
59	Reactor Coolant Pump Fabricator Notice to Contractor of Manufacturing of Casing Completion - Unit 2	11/30/2010		No	No	11/16/2010	

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
60	Reactor Coolant Loop Pipe Fabricator Notice to Contractor of Machining, Heat Treating & Non-Destructive Testing Completion - Unit 2	12/31/2010		No	No	3/20/2012	Delayed 14 Months
61	**Core Makeup Tank Fabricator Notice to Contractor of Satisfactory Completion of Hydrotest - Unit 2**	**9/30/2012**	**10/31/2012**	**No**	**No**		**Delayed 1 Month**
62	Polar Crane Fabricator Issue P.O. for Main Hoist Drum and Wire Rope - Units 2 & 3	2/28/2011		No	No	2/1/2011	
63	Control Rod Drive Mechanisms - Fabricator to Start Procurement of Long Lead Material - Unit 3	6/30/2011		No	No	6/14/2011	
64	Turbine Generator Fabricator Notice to Contractor Condenser Ready to Ship - Unit 2	10/31/2011		No	No	3/26/2012	Delayed 4 Months
65	**Start Placement of Mud Mat for Unit 2**	**6/29/2012**		**No**	**No**	**7/20/2012**	
66	Steam Generator Fabricator Notice to Contractor of Receipt of 1st Steam Generator Tubing - Unit 2	1/31/2011		No	No	9/28/2010	4 Months Early
67	Pressurizer Fabricator Notice to Contractor of Welding of Upper and Intermediate Shells Completion - Unit 2	10/31/2010		No	No	10/28/2011	Delayed 12 Months
68	Reactor Vessel Fabricator Notice to Contractor of Closure Head Cladding Completion - Unit 3	6/30/2012		No	No	6/28/2012	

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
69	**Begin Unit 2 First Nuclear Concrete Placement**	**8/24/2012**	**10/17/2012**	**No**	**No**		**Delayed 1 Month**
70	Reactor Coolant Pump Fabricator Notice to Contractor of Stator Core Completion - Unit 2	9/30/2011		No	No	12/1/2011	Delayed 2 Months
71	Fabricator Start Fit and Welding of Core Shroud Assembly - Unit 2	6/30/2011		No	No	7/29/2011	
72	Steam Generator Fabricator Notice to Contractor of Completion of 1st Steam Generator Tubing Installation - Unit 2	5/31/2011		No	No	1/27/2012	Delayed 8 Months
73	**Reactor Coolant Loop Pipe - Shipment of Equipment to Site - Unit 2**	**12/31/2012**	**1/31/2013**	**No**	**No**		**Delayed 1 Month**
74	**Control Rod Drive Mechanism - Ship Remainder of Equipment (Latch Assembly & Rod Travel Housing) to Head Supplier - Unit 2**	**6/30/2012**		**No**	**No**	**7/16/2012**	
75	Pressurizer Fabricator Notice to Contractor of Welding of Lower Shell to Bottom Head Completion - Unit 2	10/31/2010		No	No	12/22/2011	Delayed 13 Months
76	Steam Generator Fabricator Notice to Contractor of Completion of 2nd Steam Generator Tubing Installation - Unit 2	5/31/2012		No	No	5/4/2012	
77	Design Finalization Payment 14	10/31/2011		No	No	10/31/2011	

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
78	**Set Module CA04 For Unit 2**	**11/6/2012**	**1/17/2013**	**No**	**No**		**Delayed 2 Months**
79	Passive Residual Heat Removal Heat Exchanger Fabricator Notice to Contractor of Final Post Weld Heat Treatment - Unit 2	6/30/2010		No	No	5/24/2011	Delayed 10 Months
80	Passive Residual Heat Removal Heat Exchanger Fabricator Notice to Contractor of Completion of Tubing - Unit 2	5/31/2012		No	No	5/29/2012	
81	**Polar Crane Fabricator Notice to Contractor of Girder Fabrication Completion - Unit 2**	**10/31/2012**	**10/31/2012**	**No**	**No**		
82	Turbine Generator Fabricator Notice to Contractor Condenser Ready to Ship - Unit 3	8/31/2013	7/31/2013	No	No		1 Month Early
83	Set Containment Vessel Ring #1 for Unit 2	1/7/2013	5/16/2013	No	No		Delayed 4 Months
84	**Reactor Coolant Pump Fabricator Delivery of Casings to Port of Export - Unit 2**	**7/31/2012**	**10/31/2012**	**No**	**No**		**Delayed 3 Months**
85	Reactor Coolant Pump Fabricator Notice to Contractor of Stator Core Completion - Unit 3	8/31/2013	6/30/2013	No	No		2 Months Early
86	**Reactor Vessel Fabricator Notice to Contractor of Receipt of Core Shell Forging - Unit 3**	**9/30/2012**		**No**	**No**	**3/29/2012**	**6 Months Early**

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
87	Contractor Notified that Pressurizer Fabricator Performed Cladding on Bottom Head - Unit 3	1/31/2013		No	No	11/9/2011	14 Months Early
88	Set Nuclear Island Structural Module CA03 for Unit 2	6/26/2013	9/12/2013	No	No		Delayed 2 Months
89	Squib Valve Fabricator Notice to Contractor of Completion of Assembly and Test for Squib Valve Hardware - Unit 2	5/31/2012		No	No	5/10/2012	
90	Accumulator Tank Fabricator Notice to Contractor of Satisfactory Completion of Hydrotest - Unit 3	3/31/2013	7/31/2012	No	No		8 Months Early
91	Polar Crane Fabricator Notice to Contractor of Electric Panel Assembly Completion - Unit 2	3/31/2013	4/30/2013	No	No		Delayed 1 Month
92	Start Containment Large Bore Pipe Supports for Unit 2	6/28/2013	9/12/2013	No	No		Delayed 2 Months
93	Integrated Head Package - Shipment of Equipment to Site - Unit 2	3/31/2013	6/30/2013	No	No		Delayed 3 Months
94	Reactor Coolant Pump Fabricator Notice to Contractor of Final Stator Assembly Completion - Unit 2	5/31/2013	9/30/2013	No	No		Delayed 4 Months
95	Steam Generator Fabricator Notice to Contractor of Completion of 2nd Steam Generator Tubing Installation - Unit 3	6/30/2013	4/30/2013	No	No		2 Months Early

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
96	Steam Generator Fabricator Notice to Contractor of Satisfactory Completion of 1st Steam Generator Hydrotest - Unit 2	1/31/2013	4/30/2013	No	No		Delayed 2 Months
97	Start Concrete Fill of Nuclear Island Structural Modules CA01 and CA02 for Unit 2	4/3/2014	5/14/2014	No	No		Delayed 1 Month
98	**Passive Residual Heat Removal Heat Exchanger - Delivery of Equipment to Port of Entry - Unit 2**	**12/31/2012**	**12/31/2012**	**No**	**No**		
99	Refueling Machine Fabricator Notice to Contractor of Satisfactory Completion of Factory Acceptance Test - Unit 2	11/30/2013	7/31/2013	No	No		4 Months Early
100	Deliver Reactor Vessel Internals to Port of Export - Unit 2	1/31/2014	4/30/2014	No	No		Delayed 2 Months
101	Set Unit 2 Containment Vessel #3	4/24/2014	7/22/2014	No	No		Delayed 2 Months
102	Steam Generator - Contractor Acceptance of Equipment at Port of Entry - Unit 2	7/31/2013	7/31/2013	No	No		
103	Turbine Generator Fabricator Notice to Contractor Turbine Generator Ready to Ship - Unit 2	4/30/2013	5/31/2013	No	No		Delayed 1 Month
104	Pressurizer Fabricator Notice to Contractor of Satisfactory Completion of Hydrotest - Unit 3	3/31/2014	12/31/2013	No	No		3 Months Early

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
105	Polar Crane - Shipment of Equipment to Site - Unit 2	1/31/2014	11/30/2013	No	No		2 Months Early
106	Receive Unit 2 Reactor Vessel On Site From Fabricator	5/13/2014	1/31/2013	No	No		15 Months Early
107	Set Unit 2 Reactor Vessel	6/23/2014	5/21/2014	No	No		1 Month Early
108	Steam Generator Fabricator Notice to Contractor of Completion of 2nd Channel Head to Tubesheet Assembly Welding - Unit 3	12/31/2013	11/30/2013	No	No		1 Month Early
109	Reactor Coolant Pump Fabricator Notice to Contractor of Final Stator Assembly Completion - Unit 3	8/31/2014	10/31/2014	No	No		Delayed 2 Months
110	Reactor Coolant Pump - Shipment of Equipment to Site (2 Reactor Coolant Pumps) - Unit 2	10/31/2013	8/31/2013	No	No		2 Months Early
111	Place First Nuclear Concrete for Unit 3	10/9/2013	10/9/2013	No	No		
112	Set Unit 2 Steam Generator	10/23/2014	10/21/2014	No	No		
113	Main Transformers Ready to Ship - Unit 2	9/30/2013	9/30/2013	No	No		

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
114	Complete Unit 3 Steam Generator Hydrotest at Fabricator	2/28/2014	5/31/2014	No	No		Delayed 3 Months
115	**Set Unit 2 Containment Vessel Bottom Head on Basemat Legs**	**10/11/2012**	**12/4/2012**	**No**	**No**		**Delayed 1 Month**
116	Set Unit 2 Pressurizer Vessel	5/16/2014	6/12/2014	No	No		
117	Reactor Coolant Pump Fabricator Notice to Contractor of Satisfactory Completion of Factory Acceptance Test - Unit 3	2/28/2015	3/31/2015	No	No		Delayed 1 Month
118	Deliver Reactor Vessel Internals to Port of Export - Unit 3	6/30/2015	7/31/2015	No	No		Delayed 1 Month
119	Main Transformers Fabricator Issue P.O. for Material - Unit 3	2/28/2015	2/28/2015	No	No		
120	Complete Welding of Unit 2 Passive Residual Heat Removal System Piping	2/5/2015	1/20/2015	No	No		
121	Steam Generator - Contractor Acceptance of Equipment At Port of Entry - Unit 3	4/30/2015	4/30/2015	No	No		
122	Refueling Machine - Shipment of Equipment to Site - Unit 3	2/28/2015	10/31/2014	No	No		4 Months Early
123	Set Unit 2 Polar Crane	1/9/2015	5/10/2015	No	No		Delayed 4 Months

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
124	Reactor Coolant Pumps - Shipment of Equipment to Site - Unit 3	6/30/2015	6/30/2015	No	No		
125	Main Transformers Ready to Ship - Unit 3	7/31/2015	6/30/2015	No	No		1 Month Early
126	Spent Fuel Storage Rack - Shipment of Last Rack Module - Unit 3	7/31/2014	12/31/2014	No	No		Delayed 5 Months
127	Start Electrical Cable Pulling in Unit 2 Auxiliary Building [2]	8/14/2013	12/13/2013	No	No		Delayed 4 Months
128	Complete Unit 2 Reactor Coolant System Cold Hydro	1/22/2016	1/15/2016	No	No		
129	Activate Class 1E DC Power in Unit 2 Auxiliary Building	3/15/2015	4/28/2015	No	No		Delayed 1 Month
130	Complete Unit 2 Hot Functional Test	5/3/2016	5/15/2016	No	No		
131	Install Unit 3 Ring 3 for Containment Vessel	8/25/2015	3/15/2015	No	No		5 Months Early
132	Load Unit 2 Nuclear Fuel	9/15/2016	10/13/2016	No	No		
133	Unit 2 Substantial Completion	3/15/2017	3/15/2017	No	No		

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
134	Set Unit 3 Reactor Vessel	10/22/2015	4/24/2015	No	No		6 Months Early
135	Set Unit 3 Steam Generator #2	2/25/2016	9/11/2015	No	No		5 Months Early
136	Set Unit 3 Pressurizer Vessel	7/16/2015	5/1/2015	No	No		2 Months Early
137	Complete Welding of Unit 3 Passive Residual Heat Removal System Piping	6/16/2016	12/9/2015	No	No		6 Months Early
138	Set Unit 3 Polar Crane	5/9/2016	4/11/2016	No	No		
139	Start Unit 3 Shield Building Roof Slab Rebar Placement	5/26/2016	1/16/2017	No	No		Delayed 7 Months
140	Start Unit 3 Auxiliary Building Electrical Cable Pulling [2]	11/7/2014	11/7/2014	No	No		
141	Activate Unit 3 Auxiliary Building Class 1E DC Power	5/15/2016	5/3/2016	No	No		
142	Complete Unit 3 Reactor Coolant System Cold Hydro	3/22/2017	2/6/2017	No	No		1 Month Early
143	Complete Unit 3 Hot Functional Test	7/3/2017	6/8/2017	No	No		

Key:	Milestones Not Completed	Completed Prior to Q3-12	Current Quarter	Scheduled to Be Completed Q4-12	ORS Caution Milestone

Activity No.	Milestone	Completion Date Approved in Order No. 2012-884	Scheduled Completion Date as of Q3-12	Outside 18 - 24 Month Contingency?	Impact to Substantial Completion Date? [1]	Actual Completion Date	Deviation from Order No. 2012-884
144	Complete Unit 3 Nuclear Fuel Load	11/15/2017	11/20/2017	No	No		
145	Begin Unit 3 Full Power Operation	4/8/2018	4/27/2018	No	No		
146	Unit 3 Substantial Completion	5/15/2018	5/15/2018	No	No		

1 Subsequent to the end of the quarter, the Commission approved revised substantial completion dates for the units. This column reflects the impact to substantial completion dates in Order No. 2012-884.

2 This milestone has changed due to the resequencing of construction activities and the date reflected here is a correction of the date in the Company's 3rd Quarter report.

Notes:

White highligting represents Future or Historical Milestones that have not been completed.
Grey highlighting represents Future or Historical Milestones that were completed prior to the 3rd Quarter 2012.
Yellow highlighting represents those Milestones that are scheduled to be or have been completed during the 3rd Quarter 2012. This is based on the schedule approved by the Commission in Order No. 2012-884.
Green highlighting represents Future Milestones that are scheduled to be completed in the 4th Quarter of 2012. This is based on the schedule approved by the Commission in Order No. 2012-884.
Red highlighting represents "Caution Milestones." Caution Milestones are those that are delayed by 10 months or greater.

Appendix B

Construction Site Photographs

Unit 2 Nuclear Island

Unit 2 Turbine Island

Unit 2 Main Condenser

Unit 3 Excavation

Cooling Tower

Appendix C

NRC Mid Cycle Assessment Letter for VCS Units 2 & 3

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

September 4, 2012

Mr. Ron Clary
Vice President, New Nuclear Deployment
South Carolina Electric and Gas Company
P.O. Box 88 (Mail Code P40)
Jenkinsville, SC 29065-0088

SUBJECT: MID-CYCLE ASSESSMENT LETTER FOR VIRGIL C. SUMMER NUCLEAR STATION UNITS 2 AND 3 (NRC INSPECTION REPORT NOS. 05200027/2012006 AND 05200028/2012006)

Dear Mr. Clary:

On August 9, 2012, the U. S. Nuclear Regulatory Commissioner (NRC) completed its mid-cycle performance review of Virgil C. Summer (VCS) Nuclear Station Units 2 and 3. The NRC reviewed the most recent inspection results and enforcement actions from January 1, 2012, through June 30, 2012. This letter informs you of the NRC's assessment of your facility during this period and its plans for future inspections at your facility.

The NRC determined the performance at VCS Nuclear Station Units 2 and 3 during the most recent quarter was within the Licensee Response Column of the NRC's Construction Reactor Oversight Process (cROP) Action Matrix because all inspection findings had very low (i.e., green) safety significance. Therefore, the NRC plans to conduct cROP baseline inspections at your facility.

The enclosed inspection plan lists the inspections scheduled through December 31, 2012. Routine inspections performed by construction resident inspectors are not included in the inspection plan. The inspections listed are tentative and may be revised based on construction activities occurring at the site. The NRC provides the inspection plan to allow for the resolution of any scheduling conflicts and personnel availability issues. The NRC will contact you as soon as possible to discuss changes to the inspection plan should circumstances warrant any changes.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Please contact me at (404)997-4540 with any questions you have regarding this letter or inspection plan.

Sincerely,

/RA/

Michael E. Ernstes, Chief
Construction Projects Branch 4
Division of Construction Projects

Docket Nos.: 05200027, 05200028
Combined Licenses Numbers: NPF-93 (Unit 2), NPF-94 (Unit 3)

Enclosure:
V. C. Summer Inspection Plan

cc w/encl.: (See next page)

Please contact me at (404)997-4540 with any questions you have regarding this letter or inspection plan.

Sincerely,

/RA/

Michael E. Ernstes, Chief
Construction Projects Branch 4
Division of Construction Projects

Docket Nos.: 05200027, 05200028
Combined Licenses Numbers: NPF-93 (Unit 2), NPF-94 (Unit 3)

Enclosure:
V. C. Summer Inspection Plan

cc w/encl.: (See next page)

■ PUBLICLY AVAILABLE □ NON-PUBLICLY AVAILABLE □ SENSITIVE ■ NON-SENSITIVE

ADAMS: ■ Yes ACCESSION NUMBER: **ML12243A446** ■SUNSI REVIEW COMPLETE □ FORM 665 ATTACHED

OFFICE	RII:DCP	RII:DCP					
SIGNATURE	JK	TS					
NAME	J. Kent	T. Steadham					
DATE	8/20/12	8/21/12					
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIALRECORD COPY DOCUMENT NAME: G:\CCI\DCP\CPB4\MID AND END OF CYCLE\MID-CYCLE LETTER 2012.DOCX

cc w/encl.:

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wmcherry@santeecooper.com (Marion Cherry)

Letter to Ron Clary from Michael E. Ernstes, dated September 4, 2012

SUBJECT: MID-CYCLE ASSESSMENT LETTER FOR VIRGIL C. SUMMER NUCLEAR STATION UNITS 2 AND 3 (NRC INSPECTION REPORT NOS. 05200027/2012006 AND 05200028/2012006)

Distribution:
ROPassessment Resource
NRO_cROP Resource
T. Fredette, NRO
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S. Freeman, RII
T. Steadham, RII
J. Kent, RII
R. Jackson, RII Summer Units 2 & 3 SRI
P. Donnelly, RII Summer Units 2 & 3 RI
M. Magee, RII Summer Units 2 & 3 RI
PUBLIC

V. C. Summer Inspection Plan

Programmatic Inspections (IMC 2504)	
Est. Date	**Description**
4Q 2012	Construction QA Semiannual Implementation
4Q 2012	Corrective Action Program Annual Inspection

ITAAC Inspections (IMC 2503)	
Est. Date	**Description**
2012	The majority of Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) related inspections, in 2012, are expected to be associated with the following construction and fabrication activities: 1. Foundation and waterproof membrane installation 2. Containment vessel fabrication 3. Nuclear Island construction 4. Structural and mechanical module fabrication The NRC staff will also inspect miscellaneous ITAAC and Design Acceptance Criteria activities (e.g. Protection and Safety Monitoring System and Human Factors Engineering development, type tests, and other ITAAC related work on site and at vendor facilities).
3Q-4Q 2012	Rebar Work Associated with: • The NI • Unit 2 Containment Vessel • CR-10
3Q-4Q 2012	Submodule Fabrication in the MAB
3Q-4Q 2012	Unit 2 CV Fabrication
4Q 2012	NI Basemat Pour
4Q 2012	Reactor Pressure Vessel Receipt Inspection

Note: Inspection schedule is subject to change based on licensing and construction activities.

Enclosure

Appendix D

NRC Squib Valve Testing Notice of Violation

July 27, 2012

Mr. Steve Eisenberg, General Manager
Energy Products
National Technical Systems
533 Main Street
Acton, MA 01720

SUBJECT: NUCLEAR REGULATORY COMMISSION INSPECTION REPORT NO. 99900923/2012-201, NOTICE OF VIOLATION, AND NOTICE OF NONCONFORMANCE

Dear Mr. Eisenberg:

From June 11-15, 2012, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an inspection at the National Technical Systems (NTS) facility in Acton, MA. The purpose of this limited-scope routine inspection was to assess NTS's compliance with the provisions of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance," and selected portions of Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities." This technically focused inspection evaluated NTS's quality assurance activities associated with the seismic qualification testing of the tension bolt and position switch of the AP1000 design squib valves. These qualification tests are associated with or directly impact closure of inspections, tests, analyses, and acceptance criteria (ITAAC) from Revision 19 of the certified AP1000 design. Currently, these ITAAC are incorporated into the combined licenses of Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3. The enclosed report presents the results of this inspection. This NRC inspection report does not constitute the NRC's endorsement of your overall quality assurance or 10 CFR Part 21 programs.

Based on the results of this inspection, the NRC has determined that one Severity Level IV violation of NRC requirements occurred. The NRC evaluated the violation in accordance with the agency's Enforcement Policy, which is available on the NRC's web site at http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html.

The violation is cited in the enclosed Notice of Violation (Notice) and the subject inspection report details the circumstances surrounding it. The Notice cites the violation because NTS failed to inform all affected purchasers within five working days that NTS did not have the capability to perform an evaluation to determine if a defect exists.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC's review of your response to the Notice also will determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In addition, during this inspection the NRC inspection team found that the implementation of your quality assurance program did not meet certain NRC requirements imposed on you by your customers or NRC licensees. Specifically, the NRC inspection team determined that NTS was not fully implementing its quality assurance program in the areas of design control, commercial grade-dedication, control of purchased material, equipment, and services, nonconforming materials, parts of components, and corrective action. The Notice of Nonconformance (NON) cites these nonconformances, and the circumstances surrounding them are described in detail in the enclosed inspection report. Even though the NRC inspection team did not identify issues in all areas reviewed, in the response to the enclosed NON, NTS should document the results of the extent of condition and determine if there are any effects on other components and testing activities.

Please provide a written explanation or statement within 30 days of this letter in accordance with the instructions specified in the enclosed NON. We will consider extending the response time if you show good cause for us to do so.

In accordance with 10 CFR 2.390, “Public Inspections, Exemptions, Requests for Withholding,” of the “NRC's Rules of Practice," a copy of this letter, its enclosure, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC’s Agencywide Documents Access and Management System, accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or Safeguards Information (SGI) so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information would create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If SGI is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, “Protection of Safeguards Information: Performance Requirements.”

Sincerely,

/RA/

Edward H. Roach, Chief
Mechanical Vendor Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No. 99900923

Enclosure:
As stated

In addition, during this inspection the NRC inspection team found that the implementation of your quality assurance program did not meet certain NRC requirements imposed on you by your customers or NRC licensees. Specifically, the NRC inspection team determined that NTS was not fully implementing its quality assurance program in the areas of design control, commercial grade-dedication, control of purchased material, equipment, and services, nonconforming materials, parts of components, and corrective action. The Notice of Nonconformance (NON) cites these nonconformances, and the circumstances surrounding them are described in detail in the enclosed inspection report. Even though the NRC inspection team did not identify issues in all areas reviewed, in the response to the enclosed NON, NTS should document the results of the extent of condition and determine if there are any effects on other components and testing activities.

Please provide a written explanation or statement within 30 days of this letter in accordance with the instructions specified in the enclosed NON. We will consider extending the response time if you show good cause for us to do so.

In accordance with 10 CFR 2.390, “Public Inspections, Exemptions, Requests for Withholding,” of the “NRC's Rules of Practice," a copy of this letter, its enclosure, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC’s Agencywide Documents Access and Management System, accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or Safeguards Information (SGI) so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information would create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If SGI is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, “Protection of Safeguards Information: Performance Requirements.”

Sincerely,

/RA

Edward H. Roach, Chief
Mechanical Vendor Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No. 99900923

Enclosure:
As stated

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NAME	YDiaz-Castillo	JOrtega-Luciano	RPatel	AKeim
DATE	07/23/12	07/26/2012	07/26/2012	07/26/2012
OFFICE	RII/DCI/CIB3	NRO/DCIP/CAEB	NRO/DCIP/CMVB	
NAME	JBartleman	TFrye	ERoach	
DATE	07/26/2012	07/27/2012	07/27/2012	

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NOTICE OF VIOLATION

National Technical Systems
533 Main Street
Acton, MA 01720

Docket No. 99900923
Report No. 2012-201

During a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the National Technical Systems (NTS) facility in Acton, MA, from June 11 through June 15, 2012, identified a violation of NRC requirements. In accordance with the NRC Enforcement Policy, the violation is listed below:

> Paragraph 21.21(b), "Notification of Failure to Comply or Existence of a Defect and its Evaluation," of Title 10 of the *Code of Federal Regulations* (10 CFR) 21.21(b) requires that "if the deviation or failure to comply is discovered by a supplier of basic components, or services associated with basic components, and the supplier determines that it does not have the capability to perform the evaluation to determine if a defect exists, then the supplier must inform the purchasers or affected licensees within five working days of this determination so that the purchasers or affected licensees may evaluate the deviation or failure to comply, pursuant to § 21.21(a)."
>
> Contrary to the above, as of June 15, 2012, NTS failed to inform all affected purchasers within five working days that NTS did not have the capability to perform an evaluation to determine if a defect exists. Specifically, on June 18, 2011, NTS determined that it could not perform a 10 CFR Part 21 evaluation of an identified test deviation and failed to inform the two customers affected of this determination until January 18, 2012, and January 23, 2012, respectively.

This issue has been identified as Violation 99900923/2012-201-01.

This is a Severity Level IV violation (Section 6.9.d of the NRC Enforcement Policy).

Pursuant to the provisions of 10 CFR 2.201, "Notice of Violation," NTS is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, Attn.: Document Control Desk, Washington, DC 20555-0001 with a copy to the Chief, Construction Mechanical Vendor Branch, Division of Construction Inspection and Operational Programs, Office of New Reactors, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation;" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence if the correspondence adequately addresses the required response. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Document Access and Management System, accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html, it

should not include any personal privacy, proprietary, or safeguards information, to the extent possible, so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

In accordance with 10 CFR 19.11, "Posting of Notices to Workers," you may be required to post this notice within 2 working days of receipt.

Dated this 27th of July 2012.

NOTICE OF NONCONFORMANCE

National Technical Systems
533 Main Street
Acton, MA 01720

Docket No. 99900923
Report No. 2012-201

Based on the results of a U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the National Technical Systems (NTS) facility in Acton, MA, from June 11, 2012, through June 15, 2012, it appears that certain activities were not conducted in accordance with NRC requirements that were contractually imposed upon NTS by its customers or by NRC licensees.

A. Criterion III, "Design Control," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," states, in part, that "Measures shall be also established for the selection and review for suitability of application of materials, parts, equipment, and processes that are essential to the safety-related functions of the structures, systems, and components."

   Subsection 5.3, "Design," of Section 23, "Design Control," of NTS's "Quality Policy Manual," Revision 6, dated October 14, 2011, states, in part, that "For design of new or replacement components intended for nuclear safety-related applications, an engineering evaluation is required to identify the critical characteristics that are required."

   Subsection 3.2.1 of Section 3, "Requirements," of Standard Operating Procedure NO NUC 04, "Dedication of Commercial Grade Items," Revision 1, dated December 18, 2011, states, in part, that "The Project Engineer shall determine the critical characteristics to be verified: Critical characteristics are identifiable and measurable attributes of a commercial-grade item which, once verified, provide reasonable assurance that the item received is the item specified."

   Contrary to the above, as of June 15, 2012, NTS failed to review the suitability of the application of commercially calibrated measuring and test equipment (M&TE) for use in activities affecting quality as part of a commercial-grade dedication process, failed to review the suitability of the application of the Honeywell Limit Micro Switch P/N BZE6-2RN in safety related applications, and failed to perform a technical evaluation to verify the design adequacy when performing commercial-grade dedication of the 8210G88 ASCO Solenoid Valves.

   Specifically,

   1. NTS did not conduct a technical evaluation to identify additional technical requirements for the specific M&TE being calibrated, and it did not review the calibration records (e.g., as part of receipt inspection) to verify that the critical characteristics had been met and would perform their intended safety function.

   2. NTS did not perform an engineering evaluation to document the sample population identified for the control of critical characteristics used for material verification of the Honeywell Limit Micro Switch P/N BZE6-2RN and did not verify that the supplier had lot and batch control to ensure traceability of material.

3. NTS did not identify and verify the following critical characteristics as specified in the 8210G88 ASCO Solenoid Valves purchase order: (1) valve material, (2) orifice size, and (3) size and thread type.

This issue has been identified as Nonconformance 99900923/2012-201-02.

B. Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50 states, in part, that "Measures shall be established to assure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents. These measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery. The effectiveness of the control of quality by contractors and subcontractors shall be assessed by the applicant or designee at intervals consistent with the importance, complexity, and quantity of the product or services."

Contrary to the above, as of June 15, 2012, NTS failed to perform an adequate evaluation of its commercial calibration suppliers and failed to perform an adequate evaluation of Specialized Technology Resources (STR) for use in activities affecting quality as part of the commercial-grade dedication process.

Specifically,

1. NTS placed its commercial calibration suppliers on its safety-related approved suppliers list based on the accreditation provided via ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories," by the American Association for Laboratory Accreditation or another domestic accrediting body. ISO/IEC 17025 accreditation may not be used as the basis for qualifying safety-related calibration services.

2. NTS did not perform a commercial-grade survey to verify that STR's testing program to support NTS's dedication activities included the requisite for the control of critical characteristics necessary to provide reasonable assurance that the commercial-grade items to be used as basic components will perform their intended safety function. NTS only verified that STR was certified to ISO/IEC 17025.

This issue has been identified as Nonconformance 99900923/2012-201-03.

C. Criterion XV, "Nonconforming Materials, Parts or Components," of Appendix B to 10 CFR Part 50 states, in part, that "Measures shall be established to control materials, parts, or components which do not conform to requirements in order to prevent their inadvertent use or installation…Nonconforming items shall be reviewed and accepted, rejected, repaired or reworked in accordance with documented procedures."

Subsection 3.0, "Requirements," of Section 11, "Corrective Action," of NTS's "Quality Policy Manual," Revision 6, dated October 14, 2011, states, in part, that "Nonconformances shall be identified promptly and corrected as soon as practical."

Subsection 5.2, "Testing Nonconformances/Anomalies," of NTS Quality Assurance Procedure (QAP) COR 16, "Control of Non-Conforming Items," Revision 3, dated November 5, 2004, states, in part, that "When a testing nonconformance occurs, a Notice of Deviation

(NOD) form shall be initiated. The disposition shall be noted on the NOD." Subsection 5.6, "Disposition Control," of COR 16 states, in part, that "The final disposition of nonconforming items shall be one of the following: (a) Use-as-is, (b) Reject, or (c) Repair or Rework."

Contrary to the above, as of June 15, 2012, NTS failed to document an NOD for material testing services provided by STR in a timely manner. Specifically, on February 24, 2010, NTS identified a test anomaly related to an internal gasket. NTS staff evaluated the deviation and dispositioned it as "use-as-is." NTS sent the gasket to the licensee on March 5, 2010, as a conforming item without documented objective evidence of how the NOD was dispositioned. During a quality review, NTS identified that the Project Manager (PM) failed to initiate and document the disposition of the NOD. The PM then proceeded to initiate and document the disposition of the NOD on November 8, 2011.

This issue has been identified as Nonconformance 99900923/2012-201-04.

D. Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50, states in part, that "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected."

NTS QAP COR 17, "Corrective and Preventive Action," Revision 1, dated January 24, 2003, states, in part, that "A Corrective/Preventive Action Report (CPAR) shall be used to document, process, track and drive any corrective/preventive action required as a result of internal audits, vendor audits, external audits, regulatory audits, vendor nonconformances, test nonconformances or customer complaints, as applicable."

Contrary to the above, as of June 15, 2012, NTS failed to promptly identify and correct conditions adverse to quality and failed to adequately implement corrective actions. Specifically, NTS failed to initiate a CPAR related to NTS's failure to document the disposition of an NOD related to a test anomaly results for an internal gasket in a timely manner and NTS failed to adequately implement corrective actions related to the review of calibration certificates. NTS did not generate a CPAR documenting its failure in initiating and documenting an NOD in a timely manner. In addition, NTS had generated CPAR 11-77 on August 22, 2011, in response to an external audit finding for its failure to review calibration certificates. NTS's response to the CPAR was to assure that it reviews all calibration certificates for measuring and test equipment; however, the review of calibration certificates was not performed in accordance with CPAR 11-77.

This issue has been identified as Nonconformance 99900923/2012-201-05.

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with a copy to the Chief, Mechanical Vendor Branch, Division of Construction Inspection and Operational Programs, Office of New Reactors, within 30 days of the date of the letter transmitting this notice of nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each noncompliance (1) the reason for the noncompliance or, if contested, the basis for disputing the noncompliance, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid noncompliance, and (4) the date the corrective action will be completed. Where good cause is shown, the NRC will consider extending the response time.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Document Access and Management System, accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html, it should not include any personal privacy, proprietary, or safeguards information, to the extent possible, so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Dated this 27th of July 2012.

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NEW REACTORS
DIVISION OF CONSTRUCTION INSPECTION AND OPERATIONAL PROGRAMS
VENDOR INSPECTION REPORT

Docket No.:	99900923
Report No.:	99900923/2012-201
Vendor:	National Technical Systems 533 Main Street Acton, MA 01720
Vendor Contact:	Mr. Steve Eisenberg, General Manager Energy Products Telephone: (978) 263-2933 ext. 223 E-mail: steve.eisenberg@nts.com
Nuclear Industry Activity:	National Technical Systems (NTS) provides testing, equipment qualification, commercial-grade dedication, engineering, component supply and field services to nuclear utilities and suppliers worldwide. NTS has been contracted by Westinghouse Electric Company to perform seismic qualification testing of the tension bolt and position switch for the AP1000 reactor design squib valves.
Inspection Dates:	June 11 - 15, 2012

Inspectors:		
	Yamir Diaz-Castillo	NRO/DCIP/CMVB, Lead Inspector
	Jonathan Ortega-Luciano	NRO/DCIP/CMVB
	Raju Patel	NRO/DCIP/CMVB
	Andrea Keim	NRO/DCIP/CEVB
	John Bartleman	R-II/DCI/CIB3

Approved by:	Edward H. Roach, Chief Mechanical Vendor Branch Division of Construction Inspection and Operational Programs Office of New Reactors

EXECUTIVE SUMMARY

National Technical Systems
99900923/2012-201

The U.S. Nuclear Regulatory Commission (NRC) conducted this inspection to verify that National Technical Systems (NTS) implemented an adequate quality assurance (QA) program for the seismic qualification testing of the tension bolt and position switch of the AP1000 squib valves that complied with the requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." In addition, the NRC performed this inspection to verify that NTS implemented a program under 10 CFR Part 21, "Reporting of Defects and Noncompliance," that met the NRC's regulatory requirements.

This technically focused inspection evaluated NTS's QA activities associated with the seismic qualification testing of the tension bolt and position switch of the AP1000 design squib valves. These tests, including qualification and functional tests are associated with or directly impact closure of inspections, tests, analyses, and acceptance criteria (ITAAC) from Revision 19 of the certified AP1000 design. Currently, these ITAAC are incorporated into the combined licenses of Vogtle Units 3 and 4 and V.C. Summer Units 2 and 3.

The NRC inspection team specifically observed the setup and performance of the low cycle fatigue qualification seismic testing simulating an operating basis earthquake and the sine beat seismic qualification testing simulating a safe shutdown earthquake for the 8-inch and 14-inch squib valve tension bolt and 14-inch squib valve position switch assemblies associated with ITAAC 2.01.02.5aii and 2.02.03.5aii from Revision 19 of the AP1000 certified design. The NRC inspection team also conducted interviews with responsible NTS personnel, and reviewed testing documents to determine if NTS performed these activities in accordance with the applicable design, quality, and technical requirements imposed in the Westinghouse Electric Company purchase orders.

Some of the activities observed by the NRC inspection team include:

- set-up and functional checks performed on the single axis seismic shaker table before the start of a new sequence of testing
- mounting and removal of the 8-inch and 14-inch squib valve test fixtures from the single axis seismic shaker table
- seismic test performance and documentation for the 8-inch and 14-inch squib valve tension bolts, and for the 14-inch squib valve position switch components to be used in production of AP1000 squib valves
- position displacement measurements on the 8-inch and 14 inch squib valve tension bolt test specimens after seismic tests
- function verification of the 14-inch squib valve position switch during and after seismic tests

In addition to these activities, the NRC inspection team observed commercial-grade dedication activities, and verified that measuring and test equipment (M&TE) used during seismic qualification testing was properly identified, marked, calibrated and used within its calibrated range. Furthermore, the NRC inspection team walked down NTS's commercial-grade dedication laboratory and testing areas and verified that nonconforming M&TE was properly identified, marked, and segregated when practical, to ensure it was not reintroduced into the dedication and testing activities.

The following regulations served as the bases for the NRC inspection:

- Appendix B of 10 CFR Part 50
- 10 CFR Part 21

During the course of this inspection, the NRC inspection team implemented Inspection Procedure (IP) 43002, "Routine Inspections of Nuclear Vendors," dated April 25, 2011, IP 43004, "Inspection of Commercial-Grade Dedication Programs," dated April 25, 2011, and IP 36100, "Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance," dated February 13, 2012.

The NRC had not previously performed any inspections at the NTS facility in Acton, MA.

With the exception of the violation and nonconformances described below, the NRC inspection team concluded that NTS is effectively implementing its QA and 10 CFR Part 21 programs in the performance of seismic qualification testing. The results of this inspection are summarized below.

10 CFR Part 21

The NRC inspection team issued Violation 99900923/2011-201-01 associated with NTS's failure to implement the regulatory requirements of 10 CFR Part 21. Specifically, Violation 99900923/2011-201-01 cites NTS for failing to inform all affected purchasers within 5 working days that NTS did not have the capability to perform an evaluation to determine if a defect exists. On June 18, 2011, NTS determined that it could not perform a 10 CFR Part 21 evaluation of an identified test deviation and failed to inform the two customers affected of this determination until January 18, 2012, and January 23, 2012, respectively.

Training and Qualification of Personnel

The NRC inspection team concluded that NTS is implementing its training and qualification program consistent with the regulatory requirements of Criterion II, "Quality Assurance Program," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that NTS is implementing its policies and procedures associated with its training and qualification program. No findings of significance were identified.

Commercial-Grade Dedication

The NRC inspection team issued Nonconformance 99900923/2012-201-02 in association with NTS's failure to implement the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. Nonconformance 99900923/2012-201-02 cites NTS for failing to adopt an effective dedication program. Specifically, NTS failed to conduct a technical

evaluation to identify additional technical requirements for the specific M&TE being calibrated, and did not review the calibration records (e.g., as part of receipt inspection) to verify that the critical characteristics had been met and would perform their intended safety function, failed to perform an engineering evaluation to document the sample population identified for the control of critical characteristics used for material verification and failed to verify that the supplier had lot/batch control to ensure traceability of material, and failed to identify and verify the following critical characteristics as specified in the customer's purchase order: (1) valve material, (2) orifice size, and (3) size and thread type.

Oversight of Contracted Activities

The NRC inspection team issued Nonconformance 99900923/2012-201-03 in association with NTS's failure to implement the regulatory requirements of Criterion VII, "Control of Purchased Equipment, Material, and Services," of Appendix B to 10 CFR Part 50. Nonconformance 99900923/2012-201-03 cites NTS for failing to adequately control its suppliers. Specifically, NTS placed its commercial calibration suppliers on its safety-related approved suppliers list based on the accreditation provided via ISO/IEC 17025 and failed to perform a commercial-grade survey of a commercial supplier's testing program to verify the supplier's control of critical characteristics necessary to provide reasonable assurance that the commercial-grade items to be used as basic components will perform their intended safety function.

Test Control and Configuration Management

The NRC inspection team concluded that NTS is implementing its test control program consistent with the regulatory requirements of Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that NTS is implementing its policies and procedures associated with its test control program. No findings of significance were identified.

Nonconforming Material, Parts, or Components and Corrective Action

The NRC inspection team issued Nonconformance 99900923/2012-201-04 in association with NTS's failure to implement the regulatory requirements of Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50. Nonconformance 99900923/2012-201-04 cites NTS for failing to document an NOD in a timely manner. Specifically, NTS failed to initiate and document the disposition of an NOD related to a test anomaly for an internal gasket in a timely manner.

The NRC inspection team issued Nonconformance 99900923/2012-201-04 in association with NTS's failure to implement the regulatory requirements of Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50. Nonconformance 99900923/2012-201-05 cites NTS for failing to promptly identify and correct conditions adverse to quality and for failing to adequately implement corrective actions. Specifically, NTS failed to initiate a corrective and preventive action report related to NTS's failure to document the disposition of an NOD related to a test anomaly for an internal gasket in a timely manner and failed to adequately implement corrective actions related to the review of calibration certificates.

Quality Assurance Records

The NRC inspection team concluded that NTS is implementing its QA records program consistent with the regulatory requirements of Criterion XVII, “Quality Assurance Records,” of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that NTS is implementing its policies and procedures associated with its QA records program. No findings of significance were identified.

REPORT DETAILS

The U.S. Nuclear Regulatory Commission (NRC) inspection team observed various activities associated with the seismic qualification testing of the tension bolt and position switch of the AP1000 design squib valves. The NRC inspection team specifically observed the setup and performance of the low cycle fatigue qualification seismic testing simulating an operating basis earthquake (OBE) and the sine beat seismic qualification testing simulating a safe shutdown earthquake (SSE) for the 8-inch and 14-inch squib valve tension bolt and 14-inch squib valve position switch assemblies associated with inspection, tests, analyses, and acceptance criterion (ITAAC) 2.01.02.5aii and ITAAC 2.02.03.5aii from Revision 19 of the AP1000 certified design. The NRC inspection team also conducted interviews with responsible National Technical Systems (NTS) personnel, and reviewed testing documents to determine if NTS performed these activities in accordance with the applicable design, quality, and technical requirements imposed in the Westinghouse Electric Company (WEC) purchase orders (POs).

Some of the activities observed by the NRC inspection team include:

- set-up and functional checks performed on the single axis seismic shaker table prior to start of a new sequence of testing
- mounting and removal of the 8-inch and 14-inch squib valve test fixtures from the single axis seismic shaker table
- seismic test performance and documentation for the 8-inch and 14-inch squib valve tension bolts, and for the 14-inch squib valve position switch components to be used in production AP1000 squib valves
- position displacement measurements on the 8-inch and 14 inch squib valve tension bolt test specimens after seismic tests
- function verification of the 14-inch squib valve position switch during and after seismic tests

In addition to these activities, the NRC inspection team observed commercial-grade dedication activities, verified that NTS used measuring and test equipment (M&TE) during seismic qualification testing that was properly identified, marked, calibrated and used within its calibrated range. Furthermore, the NRC inspection team walked down NTS's commercial-grade dedication laboratory and testing areas and verified that nonconforming M&TE were properly identified, marked, and segregated when practical, to ensure they were not reintroduced into the testing activities.

1. 10 CFR Part 21 Program

a. Inspection Scope

The U.S. Nuclear Regulatory Commission (NRC) reviewed National Technical Systems' (NTS) policies and implementing procedures that govern the NTS program under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 21, "Reporting of Defects and Noncompliance," to verify compliance with the regulatory requirements. In addition, the NRC inspection team evaluated the 10 CFR Part 21 postings and a sampling of NTS POs for compliance with the requirements

of 10 CFR 21.6, “Posting Requirements,” and 10 CFR 21.31, “Procurement Documents,” respectively. Furthermore, the NRC inspection team discussed the 10 CFR Part 21 program with NTS’s management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

b.1 Postings

The NRC inspection team verified that NTS had posted notices that included (1) a copy of Section 206 of the Energy Reorganization Act of 1974, (2) a copy of 10 CFR Part 21, and (3) a description of the NTS procedure that implements the regulation.

b.2 Purchase Orders

The NRC inspection team reviewed a sample of POs to verify that NTS had implemented a program consistent with the requirements described in 10 CFR 21.31, which specify the applicability of 10 CFR Part 21 in POs for safety-related services. The NRC inspection team verified that NTS imposed the requirements of 10 CFR Part 21 on qualified suppliers with programs that met the requirements of Appendix B, “Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,” to 10 CFR Part 50, “Domestic Licensing of Production and Utilization Facilities.”

b.3 10 CFR Part 21 Procedures and Implementation

NTS Quality Assurance Procedure (QAP) Corporate (COR) 25, “Reporting Requirements per 10 CFR Part 21,” Revision 2, dated July 22, 2009, establishes the requirements for compliance with the regulatory requirements of 10 CFR Part 21. This document defines the process for reporting defects; the posting requirements; and the responsibilities, timelines, and actions for identifying and evaluating deviations and failures to comply. The NRC inspection team verified that NTS’s nonconforming items and corrective action programs, as described in NTS Quality Assurance Procedure COR 16, “Control of Non-Conforming Items”, Revision 3, dated November 5, 2004, and NTS Quality Assurance Procedure COR 17, “Corrective Action and Preventive Action” Revision 1, dated January 24, 2003, respectively, provide a connection to the 10 CFR Part 21 program during the initial screening process.

The NRC inspection team verified that NTS’s procedural guidance adequately initiates the 10 CFR Part 21 process and that NTS’s staff is knowledgeable about the conditions that would warrant a 10 CFR Part 21 evaluation. During the review of procedure COR 25, the NRC inspection team noted that the procedure did not provide guidance on how to contact the NRC for initial notification in case NTS identified a defect or failure to comply that could create a substantial safety hazard (SSH). Specifically, Subsection 4.4, “General Manager,” of Section 4, “Responsibilities,” of COR 25 states that: “If the situation is deemed a reportable item in accordance with 10 CFR Part 21, the General Manager or a designee shall be notified by the Quality Management Representative (QMR). The General Manager or a designee shall notify the U. S. Nuclear Regulatory Commission by FAX or by telephone. The current U. S. Nuclear Regulatory Commission FAX and telephone numbers may be obtained online at the http://www.nrc.gov/ web site.” The NRC inspection team proceeded to ask the NTS staff to indicate where on the NRC’s public web site was the contact information to report an initial notification of a defect or failure to comply that could create an SSH. The NTS staff failed to find the NRC’s contact information for initial notification of a defect or failure to comply on the NRC’s

public web site as stated in procedure COR 25. NTS initiated corrective/preventive action report (CPAR) No. 12-38 to address this issue. As a result of CPAR 12-38, NTS revised COR 25 and included the phone numbers that are listed in the regulation to avoid any confusion or delay if NTS is required to report a defect or failure to comply to the NRC. The NRC inspection team reviewed the changes made to COR 25 and found them to be acceptable.

During the review of a sample of completed 10 CFR Part 21 evaluations, the NRC inspection team noted that NTS had initiated CPAR No. 11-37 on June 17, 2011, in response to an identified deviation associated with performing testing in accordance with the International Electrotechnical Commission (IEC) standard 61000-4-10, "Electromagnetic Compatibility - Part 4-10: Testing and Measurement Techniques - Damped Oscillatory Magnetic Field Immunity Test." On June 18, 2011, NTS attempted to perform an evaluation of the deviation but determined that it did not have the capability to perform the evaluation to determine if a defect exists. Although NTS initiated CPAR Nos. 12-08 and 12-09 for each of the customers affected, NTS failed to inform the two customers affected within 5 working days that NTS did not have the capability to perform an evaluation to determine if a defect exists in accordance with 10 CFR Part 21.21(b). NTS notified the two customers affected in letters dated January 18, 2012, and January 23, 2012, respectively. The NRC inspection team identified this issue as Violation 99900923/2012-201-01.

c. Conclusion

The NRC inspection team issued Violation 99900923/2011-201-01 associated with NTS's failure to implement the regulatory requirements of 10 CFR Part 21. Specifically, Violation 99900923/2011-201-01 cites NTS for failing to inform all affected purchasers within 5 working days that NTS did not have the capability to perform an evaluation to determine if a defect exists. On June 18, 2011, NTS determined that it could not perform a 10 CFR Part 21 evaluation of an identified test deviation and failed to inform the two customers affected by this determination until January 18, 2012, and January 23, 2012, respectively.

2. Training and Qualification of Personnel

a. Inspection Scope

The NRC inspection team reviewed NTS's policies and implementing procedures that govern the implementation of NTS's training and qualification of personnel to verify compliance with the regulatory requirements of Criterion II, "Quality Assurance Program," of Appendix B to 10 CFR Part 50. In addition, the NRC inspection team discussed the training and qualification of personnel with NTS's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

b.1 Testing Personnel

The NRC inspection team verified that NTS had established and implemented a training and qualification program for the training and qualification of test personnel involved in the seismic qualification testing of the tension bolt and position switch of the AP1000 squib valves. The NRC inspection team noted that NTS qualifies inspection and test personnel based on an evaluation of their education, experience, proficiency, and capability to perform the required task. Personnel designated to perform particular process functions, tests, and calibrations, and

to operate particular types of equipment and perform test functions must be sufficiently trained prior to conducting work without supervision. Completion of any training program is documented and placed in the employee's personnel file. NTS's department manager and the quality assurance manager review and approve test personnel proficiency and document it in the qualification and training record file and in the NTS facility specific Training Qualification Matrix.

The NRC inspection team reviewed a sample of training and qualification records, conducted interviews of NTS's testing personnel, and verified that the qualification records documented any certifications required by industry and contract requirements. The NRC inspection team confirmed that all personnel performing activities affecting the quality of the qualification testing had completed the required training and met all the specified requirements in accordance with NTS's policies and procedures.

b.2 Audit Personnel

The NRC inspection team reviewed a sample of the training and qualification records of NTS's lead auditors and auditors and confirmed that auditing personnel had completed all required training and maintained qualification and certification in accordance with NTS's policies and procedures. The NRC inspection team also verified that audit teams selected by NTS were sufficiently qualified to evaluate areas within the scope of the audit. In addition, the NRC inspection team verified that the qualification requirements for lead auditors and auditors are consistent with Supplement 2S-3, "Supplementary Requirements for the Qualification of Quality Assurance Program Audit Personnel," to ASME NQA-1-1994, "Quality Assurance Requirements for Nuclear Facility Applications," and Nonmandatory Appendix 2A-3, "Nonmandatory Guidance on the Education and Experience of Lead Auditors," to ASME NQA-1-1994.

c. Conclusion

The NRC inspection team concluded that NTS is implementing its training and qualification program consistent with the regulatory requirements of Criterion II of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that NTS is implementing its policies and procedures associated with its training and qualification program. The NRC inspection team identified no findings of significance.

3. Commercial-Grade Dedication

a. Inspection Scope

The NRC inspection team reviewed NTS's policies and implementing procedures that govern the dedication of commercial-grade items (CGIs) for use in safety-related applications to verify compliance with applicable regulatory requirements. The NRC inspection also reviewed several dedication packages, including dedication plans, the criteria for the selection of critical characteristics, the basis for sampling plan selection, and the selection of verification methods to verify effective implementation of the NTS's CGIs dedication process. The NRC inspection team observed the dedication of a Honeywell Limit Micro Switch by NTS staff. The NRC inspection team discussed the commercial-grade dedication program with NTS's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

NTS's Standard Operating Procedure NOR NUC 04, "Dedication of Commercial Grade Items." Revision 1, dated December 18, 2011, describes the authority, responsibilities, and methods to NTS implements to dedicate and control CGIs in safety-related applications. The NRC inspection team noted that NOR NUC 04 provides adequate controls for dedication activities, including CGI evaluation criteria, procurement controls, acceptance and rejection criteria consistent with safety function, material traceability controls, and controls for receipt inspection and test activities. The NRC inspection team confirmed that NTS implements the methods contained in the Electric Power Research Institute (EPRI) 5652, "Guideline for the Utilization of Commercial Grade Items in Nuclear Safety-Related Applications," issued June 1988, for dedication activities. EPRI 5652 provides four methods of accepting a CGI for use in safety-related applications: Method 1, "Special Tests and Inspection;" Method 2, "Commercial Grade Survey of Supplier;" Method 3, "Source Verification;" and Method 4, "Acceptable Supplier/Item Performance Record." NTS implements Methods 1, 2, and 3 for the verification of critical characteristics in during the dedication process.

The NRC inspection team performed a sample review of dedication packages to verify adequate implementation of NTS's dedication process. It reviewed the following dedication packages:

- NTS Procedure TP63686-13N,"Dedication Test Procedure of Honeywell Limit Micro Switch P/N BZE6-2RN for use at Pilgrim Nuclear Power Station," Revision 0

- NTS Procedure TP-63680-12N,"Dedication Procedure 8210G88 ASCO Solenoid Valves for First Energy Corporation," Revision 0

During the review of the dedication package for the Honeywell Limit Micro Switch, the NRC inspection team noted that the dedication plans did not provide adequate traceability to the items selected for testing. During discussions with NTS personnel, the NRC inspection team learned that NTS used sampling plans for the verification of critical characteristics in the majority of its dedication plans. The NRC inspection team reviewed the procedural guidance related to the use of sampling plans for dedicated items and noted that NOR NUC 04 referred to EPRI 7218, "Guideline for Sampling in the Commercial-Grade Item Acceptance Process," dated January 1999, for the lot or batch formation and selection of the sampling plan methodology. The NRC inspection team also noted that Section 7, "Sampling," of NOR NUC 04 only provided reference to EPRI 7218. NOR NUC 04 provides a table as guidance for the use of normal, reduced, or tightened sampling plans based on the established traceability of items supplied by one or multiple manufacturers. However, during the review of several dedication packages and the discussion of their content with responsible NTS personnel, the NRC inspection team determined that the use of this table by itself was not adequate and needed to be supplemented with other qualitative factors to ensure adequate selection and implementation of the sampling plans. Specifically, the NRC inspection team noted the following:

- The selection of a specific sampling plan did not consider factors such as safety significance of the item, adequacy of supplier controls, complexity of the item, and performance history of the item.

- Sampling plans did not establish their applicability to destructive tests or inspections or nondestructive tests or inspections, nor did it refer to the respective tables in EPRI 7218 that provide recommendations for sampling plan sample size.

- There is no guidance to provide an engineering justification in cases where a lot or batch is rejected and the dedication plan needs to be revised to change the sampling plan. This is important to ensure that the basis for the selection of a sampling plan remains valid after rejection of a lot or batch has occurred.

NTS's sampling practice for dedicating CGIs needs to include appropriate engineering involvement, provide adequate qualitative factors, and should be consistent with the guidance described in EPRI 7218 to ensure that all parts supplied as basic components for use in nuclear safety-related applications conform to the applicable procurement specification requirements. The NRC inspection team identified this issue as an example of Nonconformance 99900923/2012-201-02 for NTS's failure to adopt an effective dedication program. NTS initiated CPAR No. 12-40 to address this issue.

During the review of the dedication package for the ASCO solenoid valves, the NRC inspection team identified an example in which NTS's dedication process failed to select critical characteristics that would provide reasonable assurance that the item would perform its intended safety function. During the development of the dedication plan, NTS failed to verify specific requirements imposed in the procurement document from First Energy Corporation. Specifically, First Energy Corporation requested NTS to provide a safety-related ASCO solenoid valve with the following specific requirements: (1) 3/4-inch national pipe thread (NPT) tapered thread (NPT), (2) 5/8-inch orifice, (3) normally close, (4) 120 volts alternating current, (5) 2-way, (6) pilot operated, and flow rated to be between 3-8 standard cubic foot/feet per minute, and (7) stainless steel. NTS's dedication plan failed to identify and verify the following as critical characteristics: (1) 3/4-inch NPT, (2) 5/8-inch orifice, and (3) stainless steel. Additional engineering evaluation is needed to ensure that the critical characteristics selected for acceptance (which could include design, material, and performance characteristics) provide reasonable assurance that the item will perform its intended safety function. The NRC inspection team identified this issue as another example of Nonconformance 99900923/2012-201-02 for NTS's failure to adopt an effective dedication program. NTS initiated CPAR No. 12-43 to address this issue.

The NRC inspection team also noted that NTS uses a commercial supplier to calibrate all of its M&TE used in safety-related applications. The NRC inspection team proceeded to ask NTS to provide the dedication packages for the dedication of commercial calibration services for the M&TE provided by the commercial calibration supplier. NTS stated that it does not dedicate commercial calibration services based on the fact that the commercial calibration supplier they use is accredited by the American Association for Laboratory Accreditation (A2LA). A2LA accreditation may not be used as the basis for qualifying safety-related calibration services. The NRC staff has determined that, for procurement of commercial-grade calibration services for safety-related applications, laboratory accreditation programs administered by A2LA or any other accreditation service provided by a domestic accrediting body, as recognized through the mutual recognition arrangement of the International Laboratory Accreditation Program (ILAC), are acceptable in place of a commercial-grade survey as part of the commercial-grade dedication process when all of the requirements described in the Arizona Public Service (APS) Company safety evaluation report (SER) (Agencywide Documents Access and Management System (ADAMS) Accession No. ML052710224) are met. The NRC expanded this guidance to include the use of domestically accredited calibration laboratories by suppliers and sub-suppliers in a letter from the agency to Ms. Sherry Grier, Nuclear Procurement Issues Committee (NUPIC) Chairman, dated June 6, 2006 (ADAMS Accession No. ML061580350). This letter provides the same guidance for augmenting the laboratories' domestic accreditation

when using their services in activities governed by the requirements of Appendix B to 10 CFR Part 50, and 10 CFR Part 21.

The requirements for invoking this alternative are:

- The alternative method is documented in the quality assurance description
- Accreditation is provided by one of the six ILAC domestic accrediting bodies
- The scope of the accreditation covers the contracted services
- Purchase documents should: (1) require the use of the laboratory's ISO 17025, "General Requirements for the Competence of Testing and Calibration Laboratories" accredited quality program, (2) impose additional technical requirements identified in the evaluation, (3) require reporting of as-found calibration data when calibrated items are found to be out-of-tolerance, and (4) require identification of the laboratory equipment and standards used.

Even though the NRC inspection team verified that NTS had met most of the conditions described in the APS SER for using A2LA accreditation in lieu of commercial-grade surveys as part of a commercial-grade dedication process, NTS failed to perform a technical evaluation to identify any additional critical characteristics for the specific M&TE being calibrated, and it did not review the calibration records (e.g., as part of receipt inspection) to verify that the critical characteristics had been met and would perform their intended safety function. In addition, NTS's Quality Assurance Manual did not contain a description of the alternative for using the calibration laboratory accreditation provided by one of the domestic accrediting bodies in lieu of performing a commercial-grade survey as required by the APS SER. The NRC inspection team identified this issue as another example of Nonconformance 99900923/2012-201-02 for NTS's failure to adopt an effective dedication program. NTS initiated CPAR No. 12-36 to address this issue.

During the observation of dedication activities at the NTS facility, the NRC inspection team noted that NTS verified the critical characteristics in accordance with written instructions, procedures, and drawings. The NRC inspection team also noted that qualified personnel performed these activities using calibrated equipment. The NRC inspection team did not identify any issues with NTS's activities related to the verification of critical characteristics.

c. Conclusion

The NRC inspection team issued Nonconformance 99900923/2012-201-02 in association with NTS's failure to implement the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. Nonconformance 99900923/2012-201-02 cites NTS for failing to adopt an effective dedication program. Specifically, NTS failed to conduct a technical evaluation to identify additional technical requirements for the specific M&TE being calibrated, and did not review the calibration records (e.g., as part of receipt inspection) to verify that the critical characteristics had been met and would perform their intended safety function. It also failed to perform an engineering evaluation to document the sample population identified for the control of critical characteristics used for material verification, failed to verify that the supplier had lot and batch control to ensure traceability of material, and failed to identify and verify the

following critical characteristics as specified in the customer's purchase order: (1) valve material, (2) orifice size, and (3) size and thread type.

4. Oversight of Contracted Activities

a. Inspection Scope

The NRC inspection team reviewed NTS's policies and implementing procedures that govern the implementation of NTS's oversight of contracted activities to verify compliance with the regulatory requirements of Criterion IV, "Procurement Document Control," Criterion VII, "Control of Purchased Material, Equipment, and Services," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed a sample of POs and receipt inspection records associated with the seismic testing to evaluate compliance with NTS's program and technical requirements. In addition, the NRC inspection team discussed the oversight of contracted activities with NTS's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

b.1 Procurement Document Control

During discussions with the NTS personnel, the NRC inspection team identified that NTS did not procure any safety-related items related to the seismic qualification testing of the tension bolt and position switch of the AP1000 squib valves. The NRC inspection team increased the scope of the inspection to include other safety-related POs issued by NTS. The NRC inspection team found that the POs adequately documented the procurement requirements as established by NTS's governing policies and implementing procedures which include (1) task definitions and responsibilities, (2) imposition of appropriate quality, technical, and regulatory requirements, and (3) identification of applicable codes and standards. The NRC inspection team also found that these POs adequately defined contract deliverables, disposition of nonconformances, access rights to sub tier suppliers, and extension of contractual requirements to subcontractors.

b.2 Maintenance of the Approved Vendors List

The NRC inspection team reviewed the approved suppliers list (AVL) to ensure that qualified and approved suppliers were listed, that authorized personnel maintained, distributed, and periodically updated the list, and that any revisions to the list be implemented following the applicable procedures. The NRC inspection team confirmed that the AVL documented (1) the vendor name, (2) the scope of qualification, (3) limitations and restrictions, if necessary, (4) the date that re-approval is due, and (5) the vendor's quality program.

However, during the review of the NTS's Quality Assurance Procedure COR 03, "Vendor Assessment," Revision 3, dated November 3, 2006; the NRC inspection team noted that this procedure does not require suppliers of domestic calibration services to be evaluated before acceptance of material, equipment, or services. Specifically, Note 2, Section 6.0 of QAP COR 03 states, in part, that "For nuclear-related projects requiring 10 CFR Part 21 and/or Part 50, Appendix B; calibration vendors may be approved via ISO/IEC 17025 accreditation by A2LA or an accreditation body mutually recognized by A2LA." As discussed in Section 2.b of this report, A2LA accreditation may not be used as the basis for qualifying safety-related calibration services. A2LA accreditation may only be used as the basis for qualifying a commercial calibration laboratory as part of the commercial-grade dedication process when all of the

requirements described in the APS SER are met. The NRC inspection team identified this issue as an example of Nonconformance 99900923/2012-201-03 for NTS's failure to adequately control its suppliers. NTS initiated CPAR No. 12-36 to address this issue.

b.3 External Audits

The NRC inspection team reviewed a sample of external audits to verify the implementation of the NTS audit program. The NRC inspection team confirmed that the audit reports contained a review of the relevant QA criteria in Appendix B to 10 CFR Part 50 for the activities that individual suppliers performed as well as documentation of pertinent supplier guidance associated with each criterion. For audits that resulted in findings, the NRC inspection team verified that the supplier had established a plan for corrective action and that NTS had reviewed and approved the corrective action and verified its satisfactory completion and proper documentation.

b.4 Receiving Inspection

NTS Procedure No. TP63528-11N, "Seismic Qualification Test Plan for 8" and 14" Squib Valve Tension Bolt," dated June 4, 2012, and Procedure No. TP63714-13N, "Seismic Qualification Test Plan for 14" Squib Valve Switch Pin & Bracket Assembly," dated June 4, 2012, required NTS to perform a visual inspection of the test specimens for signs of damage as a result of shipment to NTS. In addition, NTS was required to verify the part number of the equipment received. The NRC inspection team reviewed the receipt inspection report generated as a result of the receipt inspection of the test specimens and verified that no damage occurred to the test specimens during shipment.

b.5 Commercial-Grade Surveys

During the review of the dedication packages, the NRC inspection team noted that for the dedication of the Honeywell Limit Micro Switch, NTS improperly took credit for a material analysis test. NTS took credit for the test performed by Specialized Technology Resources (STR), a commercial-grade testing supplier. NTS's dedication procedure states, in part, that "Method 2 should be used when the Project Manager desires to accept a commercial-grade item based on the merits of a supplier's commercial quality controls. These controls may constitute quality programs, and procedures that have been or can be verified by performance of a Commercial-Grade Survey in accordance with the Quality Assurance Procedure for Commercial Grade Surveys." The NRC inspection team identified that NTS had not performed a commercial-grade survey of STR to ensure that STR's quality assurance program and processes are adequate to provide reasonable assurance that the specified critical characteristics will be maintained in the item, and therefore incorrectly took credit for STR's material analysis test. The NRC inspection team identified this issue as another example of Nonconformance 99900923/2012-201-03 for NTS's failure to adequately control its suppliers. NTS initiated CPAR No. 12-37 to address this issue.

c. Conclusion

The NRC inspection team issued Nonconformance 99900923/2012-201-03 in association with NTS's failure to implement the regulatory requirements of Criterion VII of Appendix B to 10 CFR Part 50. Nonconformance 99900923/2012-201-03 cites NTS for failing to adequately control its suppliers. Specifically, NTS placed its commercial calibration suppliers on its safety-related approved suppliers list based on the accreditation provided via ISO/IEC 17025 and failed to

perform a commercial-grade survey of a commercial supplier's testing program to verify the supplier's control of critical characteristics necessary to provide reasonable assurance that the commercial-grade items to be used as basic components will perform their intended safety function.

5. Test Control and Configuration Management

a. Inspection Scope

The NRC inspection team reviewed NTS's policies and implementing procedures that govern the implementation of NTS's test control program to verify compliance with the regulatory requirements of Criterion XI, "Test Control," of Appendix B to 10 CFR Part 50. The NRC inspection team observed various testing activities associated with the 8-inch and 14-inch squib valve tension bolts, and the 14-inch squib valve position switch. The NRC inspection team conducted interviews with responsible NTS personnel, and reviewed testing documents to determine if NTS performed activities in accordance with the applicable design, quality, and technical requirements imposed in the WEC POs and industry standard requirements of the Institute of Electrical and Electronics Engineers (IEEE). The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

b.1 Test Plan

WEC document APP-GW-G1-002, "AP1000 Plant Equipment Qualification Methodology," Revision 3, issued February, 2012, is a top-tier document that contains the overall guidelines for equipment qualifications, including criteria, methods, and codes for the seismic testing for the AP1000 design. This document provides the test criteria for the vibration and seismic qualification for the AP1000 squib valves. Section 6.4.6, "Seismic Testing of AP1000 Line Mounted Equipment," describes the methodology for seismic qualification for line-mounted equipment by multiple and single frequency testing.

WEC developed the seismic qualification test program for the AP1000 squib valves. WEC documents EQ-TP-222-APP, "AP1000 Squib Valve Equipment Qualification Test Plan," Revision 1, issued June 2012, and WEC EQ-TP-49-APP, APP-PV95-VPH-002, Appendix B, "RIM Seismic Testing Guidelines," Revision 1, dated August 18, 2009, contain the specific requirements for seismic qualification testing of the AP1000 squib valves. Since seismic qualification testing of a complete squib valve cannot be performed because of its size and weight, supplemental seismic qualification testing of important-to-function parts of the squib valve is required to demonstrate their ability to function properly after a seismic event. The important-to-function parts which seismic qualification does not cover by either IEEE testing or ASME QME-1, "Qualification of Active Mechanical Equipment Used in Nuclear Power Plants," testing are the 8-inch and 14-inch squib valves' tension bolts and the 14-inch squib valve's position indication device. The seismic qualification tests are performed to demonstrate that the squib valves meet or exceed their capability to withstand the effects of earthquakes and be able to perform their intended safety function.

The test samples for each tension bolt consist of a piston with an outside diameter and weight identical to the production piston mounted in a seismic test fixture, one representing the 14-inch squib valve and the other representing the 8-inch squib valve, fabricated to design specifications and drawings D-403972, "8-inch Squib Valve Functional Testing 8" Tension Bolt Vibration Test

Fixture Welding/Assembly," Revision 2, dated January 30, 2012, and D-407009, "14-inch Squib Valve Testing Tension Bolt Vibration Test Fixture Welding, Revision 2, dated June 1, 2011, by SPX/Copes Vulcan Corporation (SPX), the manufacturer of the squib valves.

The 14-inch squib valve position indication switch test sample consists of an assembly of standoff piece, internal parts, and the Topworx switch, installed into a seismic test fixture that replicates the bottom of the 14-inch squib valve, as described in SPX drawing No. D-409861, "14-inch Switch Pin & Bracket Seismic Test Assembly," Revision 0, dated March 13, 2012.

b.2 Test Procedures

NTS Test Procedure No. TP63528-11N, "Seismic Qualification Test Plan for 8" and 14" Squib Valve Tension Bolt," Revision 0, dated June 4, 2012, and NTS Test Procedure No. TP-63714-13N, "Seismic Qualification Test Plan for 14" Squib Valve Switch Pin & Bracket Assembly," Revision 0, dated June 4, 2012, describe the test methodology for the seismic qualification testing on the 8-inch and 14-inch squib valve tension bolts and on the 14-inch squib valve position indication switch assembly, and include the requirements for qualification contained in EQ-TP-222-AP. The NRC inspection team verified that the NTS test procedures adequately included the technical, quality and regulatory requirements identified in the WEC PO. The NRC inspection team also verified that the NTS test procedures provided an adequate description of the test objectives, test sequences, test instructions, test parameters, M&TE usage, acceptance criteria, post-test activities, and that they meet the requirements of the following standards:

- IEEE 323-1974, "IEEE Standard for Qualifying Class 1E Equipment for Nuclear Power Generating Stations"

- IEEE 344-1987, "IEEE Recommended Practice for Seismic Qualification of Class 1E Equipment for Nuclear Power Generating Stations"

- IEEE 382-1996, "IEEE Standard for Qualification of Actuators for Power-Operated Valve Assemblies with Safety-Related Functions for Nuclear Power Plants"

b.3 Test Program Implementation

Each squib valve test sample is subjected to the following testing sequences as described in the NTS test procedures:

- resonance survey search
- vibration aging
- required input motion (RIM) testing
    - low cycle fatigue testing
    - sine beat testing
- multi-frequency testing

Low Cycle Fatigue Testing on the 8-inch and 14-inch Squib Valve Tension Bolt and 14-inch Squib Valve Position Indication Switch Test Samples

The NRC inspection team observed the test setup and the low cycle fatigue seismic qualification testing on the 8-inch and 14-inch squib valve tension bolt test samples and on the 14-inch squib

valve position indication switch test sample. Each test sample was subjected to a simulated operating basis earthquake (OBE) vibratory motion by exposing the test sample to two sinusoidal cycles at two-thirds of the RIM SSE (6.6 acceleration due to gravity). Each cycle was from 2 to 64 to 2 hertz (Hz) at a rate of 1 octave/minute in each of the three principal orthogonal directions per the requirements of APP-GW-G1-002. In addition, the NRC inspection team observed that the WEC representative performed visual and dimensional inspections on each tension bolt test sample during pre- and post-OBE testing for each 8-inch and 14-inch squib valve tension bolt test sample in each orthogonal direction. The WEC representative also performed a functional test on the 14-inch squib valve position indication switch test sample after the OBE test in each orthogonal direction, documenting the inspection results in the WEC datasheet, as part of the requirements of EQ-TP-222-AP.

The NRC inspection team confirmed that the following testing elements were satisfied, verified, and recorded, as appropriate: (a) test parameters and initial conditions, (b) test acceptance criteria, (c) test prerequisites, (d) test instrument range, accuracy, and uncertainty appropriate for the test, (e) current calibration, and (f) proper procedure sequence followed and any deviations documented and evaluated.

Sine Beat Testing on the 8-inch and 14-inch Squib Valve Tension Bolts and 14-inch Squib Valve Position Indication Switch Assembly

The NRC inspection team observed the test setup and the sine beat seismic qualification testing on the 14-inch squib valve position indication switch test sample, and a portion of the sine beat seismic qualification testing on the 14-inch squib valve tension bolt test sample. Each test sample was subjected to a simulated SSE by exposing each test sample to a series of single frequency sine beats spaced at $1/3^{rd}$ octave intervals from 2 to 32Hz and at $1/6^{th}$ octave over 32 Hz to 64Hz plus any defined resonances up to 100Hz in each of the orthogonal axes per the requirements of APP-GW-G1-002.

During the sine beat seismic qualification testing on the 14-inch squib valve position indication switch test sample in the horizontal Y-axis direction at the resonance frequency of 75.6Hz, a chatter noise was identified with one of the two electrical contacts in the position switch. The seismic test was immediately stopped with the NTS Project Manager (PM) requesting the WEC representative to verify if there was any damage to the test specimen. The WEC representative reviewed the test data, and performed a visual inspection. Based on satisfactory inspection results and lack of any visual damage to the test sample, the test was resumed at a different response time setting on the position switch. The NTS PM documented the test deviation and initiated a “Notice of Deviation,” (NOD) No. 001 for Job No.63714-13N and submitted it to the WEC representative for review, and disposition and recommendation. The NRC inspection team verified that NOD 001 documented the deviation, test requirements, root- cause evaluation and disposition approved by the WEC representative.

In addition, during the sine beat seismic qualification testing on the 14-inch squib valve position indication switch test sample in the X-axis direction (perpendicular to the length of the test fixture) at a resonance frequency between 2 and 2.5Hz, the test technician identified a test deviation resulting from an erroneous data output from one of the signal channels of the tri-axial accelerometer. The NTS PM documented the test deviation and initiated NOD No. 002 for Job No. 63714-13N. The NRC inspection team verified that NOD No. 002 documented the deviation, test requirements, root- cause evaluation and disposition approved by the WEC representative. Furthermore, during the sine beat seismic qualification testing on the 14-inch squib valve position indication switch test sample in the horizontal X-axis direction at the

resonance frequency of 75.6Hz, the test technician noted that the locknut and washer for the switch became loose during testing and was discovered in the erroneous data output from one of the tri-axial accelerometer channels during investigation. The NTS PM documented the test deviation and initiated NOD No. 003 for Job No. 63714-13N. The NRC inspection team verified that NOD No. 003 documented the deviation, test requirements, evaluation and disposition approved by the WEC representative. At WEC's request, NTS repeated the sine beat testing at the previous frequencies of 50.8, 57.02, 64, and 75.6Hz.

Another test deviation occurred during the first sine beat testing RIM simulation testing in the horizontal X-axis on the 14-inch squib valve tension bolt test specimen. At approximately 50.8 Hz frequency, a loud rattling noise from the test specimen was heard in the middle of the 15-second test run and was confirmed by NTS test personnel by spiking noted in the accelerometer test data. NTS immediately stopped the test upon request of the WEC representative. The WEC representatives reviewed the accelerometer data, and performed visual and dimensional inspection to determine the cause and to assess for a broken tension bolt. Based on satisfactory inspection results, the WEC representative recommended NTS management to rerun the test at the same frequency and the same rattling noise was heard upon rerun of the test, except this time it was earlier in the 15-second test run.

The WEC test representative decided to continue the testing at the next test frequency of 57.02 Hz to ensure that this was not an issue with a single frequency. A single sine pulse at 57.02 Hz was introduced into the test specimen and a similar rattling noise was heard. The WEC representative halted all the testing activity by providing a verbal stop work order to NTS, informing NTS to discontinue testing on both the 8-inch and 14-inch squib valve tension bolt test specimens until the cause of the test anomaly was analyzed. The NTS PM documented the test deviation and initiated NOD No. 001 for Job No. 63528-11N. The NRC inspection team verified that NOD No. 001 documented the test deviation, test requirements, and was evaluated by the WEC representative.

Concurrently, WEC documented the test deviation by initiating WEC Issue Report No. 12-165-M042 to address this issue. The NRC inspection team participated in a teleconference held between the SPX and WEC personnel where SPX discussed its analysis for the potential cause of the test deviation and recommended that testing continue. SPX decided to send a representative to NTS's facility to conduct a visual and dimensional inspection, and to observe the rest of the testing.

b.4 Test Results and Data Reduction

The NRC inspection team verified that NTS implemented suitable requirements for recording data during testing and had established a process with functional responsibilities for effective evaluation of test results. The NRC inspection team reviewed NTS's controls applicable to test log documentation and data acquisition software to assess the completeness of the requirements with regards to traceable and verifiable data, and documenting the accuracy of instruments used to collect data.

The NRC inspection team reviewed NTS's process of verifying and validating software used for the acquisition, processing, recording, reporting, and storage or retrieval of test data used during seismic qualification testing of the 8-inch and 14-inch squib valve tension bolts and 14-inch squib valve position switch assembly. NTS uses a Commercial-Off-the-Shelf Software, "VibrationVIEW," developed by Vibration Research Corporation, to generate the vibration signals, control the seismic qualification testing, and collect response data. NTS always

performs calibration and verification of the software before use for safety-related applications. The NRC inspection team reviewed documentation associated with VibrationVIEW, Revision 10.0.06, to verify that the process implemented by NTS was consistent with the applicable regulatory requirements and relevant industry standards. The NRC inspection team also interviewed NTS personnel management related to software verification and software dedication for safety-related test application. The NRC inspection team verified that the software reduces test data to a format that facilitates qualification of the components being tested.

During discussions with NTS's personnel, the NRC inspection team identified that during an audit of NTS by NUPIC, NTS was issued an audit finding related to the use commercial software in safety-related applications for NTS's failure to perform a technical evaluation under NTS's dedication program. The NRC inspection team reviewed NTS's response to the NUPIC audit finding which consisted of developing NTS Procedure SOP NOR CAL 15, "Commercial-Grade Dedication of Vibration Research Software Verification," that NTS submitted to the NUPIC team lead for review and approval.

The NRC inspection team did not identify any issues related to the process for verifying and validating the software, however, it identified several discrepancies in the verification test report. Among the discrepancies: the preparer and reviewer of the verification report was the same individual, the test technician did not sign the verification results, and some of the test plots did not have the correct frequency band range. The NRC inspection team discussed these discrepancies with the NTS personnel who acknowledged them and initiated CPAR No. 12-39 to address this issue.

b.5 Control of Measuring and Test Equipment

For a sample of M&TE used in the seismic qualification testing, the NRC inspection team verified that the M&TE used had appropriate calibration stickers and current calibration dates, including calibration due dates, and that the associated calibration records were current and available for review. The calibration records reviewed by the NRC inspection team also indicated the as-found or as-left conditions, accuracy required, calibration results, calibration dates, due date for recalibration and the applicable National Institute of Standards and Technology reference for the equipment used in the calibration. The NRC inspection team also verified that the selected M&TE was calibrated using procedures traceable to known industry standards.

During discussions about the M&TE activities with NTS personnel, the NRC inspection team was informed that NTS does not have an M&TE program on-site, but rather it subcontracts the calibration services to Tektronix Service Solutions (hereafter referred to as Tektronix). Tektronix is a commercial supplier of M&TE and is accredited to ISO/IEC 17025 to perform calibrations.

While the NRC inspection team concluded that NTS adequately controlled the M&TE, the NRC inspection team issued Nonconformance 99900923/2011-201-02 to NTS for failing to review the suitability of the application of commercially procured calibration services of the calibration laboratory that calibrated the instruments and generated the calibration records.

c. Conclusion

The NRC inspection team concluded that NTS is implementing its test control program consistent with the regulatory requirements of Criterion XI of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined

that NTS is implementing its policies and procedures associated with its test control program. The NRC inspection team identified no findings of significance.

6. Nonconforming Material, Parts or Components and Corrective Action

a. Inspection Scope

The NRC inspection team reviewed NTS's policies and implementing procedures that govern the implementation of NTS's nonconforming materials, parts, or components and corrective action programs to verify compliance with Criterion XV, "Nonconforming Materials, Parts, or Components," and Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50. The NRC inspection team reviewed a sample of nonconformance reports (NCRs), NODs and CPARs and discussed the nonconforming materials, parts, or components and the corrective action programs with NTS management and staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

b.1 Implementation of the Nonconforming Materials, Parts or Components Program

NTS's program for nonconforming materials, parts or components defines a nonconformance as an item or activity that does not meet the technical or quality requirements. NTS applies the nonconformance process to test activities as well as purchased items and services. All nonconformances are documented in a NCR and tracked in a Nonconformance Report Log. Nonconformances associated with testing activities are documented in an NOD and are treated in the same way as an NCR.

The NRC inspection team verified that NTS processes and procedures guidelines for the identification, documentation, segregation, evaluation and disposition of nonconforming items. The NRC inspection team also verified that SPX's nonconformance process provides guidance to evaluate nonconformances for reportability under NTS's 10 CFR Part 21 program. The nonconformance process is also linked to the corrective action program.

The NRC inspection team walked down NTS's commercial-grade dedication laboratory and testing areas and verified that nonconforming materials were properly identified, marked, and segregated when practical to ensure that they were not reintroduced into the dedication and testing activities. The NRC inspection team also verified that NTS had adequate controls for segregation of in-process nonconforming materials. The NRC inspection team reviewed items in the hold area and verified that everything was physically tagged with a QA Hold Tag and that the document package clearly identified the issue and status.

During the review of the dedication package for the Honeywell Limit Micro Switch, the NRC inspection team noted that on February 24, 2012, NTS identified a material analysis test anomaly related to an internal gasket. NTS evaluated the test deviation and dispositioned it as "use-as-is." NTS proceeded to send the micro switch to the licensee as a conforming item on March 5, 2010, without objective evidence of how the NOD was dispositioned. During a quality review, NTS identified that the PM failed to initiate and document the disposition of the NOD in accordance with NTS's procedures. The PM then proceeded to initiate and document the disposition of the NOD on November 8, 2011. The NRC inspection team identified this issue as an example of Nonconformance 99900923/2012-201-04 for NTS's failure to document an NOD in a timely manner. NTS initiated CPAR No. 12-41 to address this issue.

b.2 Implementation of the Corrective Action Program

NTS's program for corrective actions clearly defines the roles and responsibilities of NTS personnel, the identification and documentation requirements (e.g., CPAR forms, CPAR Log), identifies a process for periodic review of NCRs for initiation of a CPAR form, and establishes the process for initiating actions to correct the condition and prevent its reoccurrence. NTS's processes and procedures for corrective action describe the process for identifying, evaluating, reporting, and correcting nonconformances and deviations. The NRC inspection team noted that NTS's corrective action procedures lead them to evaluate conditions under NTS's 10 CFR Part 21 program for potential reportability, as required.

The NRC inspection team noted that NTS's corrective action program does not differentiate between conditions adverse to quality and significant conditions adverse to quality. In accordance with Criterion XVI of Appendix B to 10 CFR Part 50, all conditions adverse to quality must be promptly identified and corrected. For significant conditions adverse to quality, Criterion XVI requires that the cause of the condition be determined (root cause analysis), corrective action be taken to preclude repetition, and the appropriate level of management be notified. NTS treats all nonconformances and deviations the same and performs all the actions required for significant conditions adverse to quality.

The NRC inspection team reviewed a sample of CPARs resulting from a variety of issues (e.g., external and internal audits, customer complaints or returns) and verified that each contained a detailed description of the nonconformance, justification for the disposition of the condition that led to the nonconformance or deviation, root cause analysis, corrective action to prevent further recurrence and documenting NTS's verification of implementation of corrective actions taken to ensure its effectiveness before closing the CPAR. In relation to Nonconformance 99900923/2012-201-04 identified in Section 6.b.1 of this report, the NRC inspection team asked NTS for a copy of the CPAR initiated in response for NTS's failure to initiate and document the disposition of the NOD in a timely manner as required by NTS Procedure COR 16, "Control of Non-Conforming Items," Revision 3, dated November 5, 2004. NTS indicated that they had not generated a CPAR documenting NTS's failure in initiating and documenting an NOD in a timely manner. The NRC inspection team identified this issue as an example of Nonconformance 99900923/2012-201-05 for NTS's failure to promptly identify and correct conditions adverse to quality. NTS initiated CPAR No. 12-41 to address this issue.

In addition, during the review of a sample of CPARs, NTS had generated CPAR 11-77 on August 22, 2011, in response to an external audit finding for its failure to review calibration certificates. NTS's response to the CPAR was to ensure that all calibration certificates for M&TE are reviewed; however, as described in Nonconformance 99900923/2012-201-02 in Section 3.b of this report, the NRC inspection team determined that the review of calibration certificates was not performed in accordance with CPAR 11-77. The NRC inspection team identified this issue as another example of Nonconformance 99900923/2012-201-05 for NTS's failure to adequately implement corrective actions. NTS initiated CPAR No. 12-42 to address this issue.

c. Conclusion

The NRC inspection team issued Nonconformance 99900923/2012-201-04 in association with NTS's failure to implement the regulatory requirements of Criterion XV of Appendix B to 10 CFR Part 50. Nonconformance 99900923/2012-201-04 cites NTS for failing to document an NOD in

a timely manner. Specifically, NTS failed to initiate and document the disposition of an NOD related to a test anomaly for an internal gasket in a timely manner.

The NRC inspection team issued Nonconformance 99900923/2012-201-05 in association with NTS's failure to implement the regulatory requirements of Criterion XVI of Appendix B to 10 CFR Part 50. Nonconformance 99900923/2012-201-05 cites NTS for failing to promptly identify and correct conditions adverse to quality and for failing to adequately implement corrective actions. Specifically, NTS failed to initiate a CPAR related to NTS's failure to document the disposition of an NOD related to a test anomaly for an internal gasket in a timely manner and failed to adequately implement corrective actions related to the review of calibration certificates.

7. Quality Assurance Records

a. Inspection Scope

The NRC inspection team reviewed NTS's policies and implementing procedures that govern the implementation of NTS's quality assurance records program to verify compliance with the regulatory requirements of Criterion XVII, "Quality Assurance Records," of Appendix B to 10 CFR Part 50. In addition, the NRC inspection team discussed the quality assurance records program with NTS's management and technical staff. The attachment to this inspection report lists the documents reviewed by the NRC inspection team.

b. Observations and Findings

NTS Quality Assurance Procedure COR 09, "Control of Quality Records," Revision 6, dated June 13, 2008, provides the requirements and guidelines for the collection, storage, maintenance, and retrieval of quality records.

For nuclear safety-related activities, NTS classifies records as nuclear lifetime records and nuclear nonpermanent records. Lifetime records are required to be retained for the lifetime of the component while nonpermanent records are retained for 3 years.

Once a job is completed, the entire file is scanned and saved as an electronic file. Electronic records are backed up regularly per the requirements of NTS Standard Operating Procedure SOP COR IT 05, "Server Replication and Archival," Revision 1, dated October 1, 2009, which states, in part, that "All file servers are replicated on a daily basis to two separate geographical locations."

The NRC inspection team reviewed a sample of several NTS quality assurance records, including training and qualification records, calibration records, audit records, PO records, CPAR records, NOD records, test data records, and vendor audit records. During its review, the NRC inspection team verified that NTS had implemented a quality assurance records program that provided adequate measures for the identification, classification, validation, and distribution controls of records. The NRC inspection team noted that NTS's policies and implementing procedures provided the necessary guidance for the administration, identification, receipt, storage, preservation, safekeeping, and disposition of all records. For the sample of quality records reviewed, the NRC inspection team verified that the records were legible, adequate, retrievable, adequately protected, and traceable.

c. Conclusion

The NRC inspection team concluded that NTS is implementing its quality assurance records program consistent with the regulatory requirements of Criterion XVII of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed, the NRC inspection team also determined that NTS is implementing its policies and procedures associated with its quality assurance records program. The NRC inspection team identified no findings of significance.

8. Entrance and Exit Meetings

On June 11, 2012, the NRC inspection team discussed the inspection scope during an entrance meeting with Mr. Dwight D. Moore, PE, NTS's Chief Operating Officer, and other NTS personnel. On June 15, 2012, the NRC inspection team presented the inspection results during an exit meeting with Mr. Moore and other NTS personnel.

ATTACHMENT

1. PERSONS CONTACTED

Name	Title	Affiliation	Entrance	Exit	Interviewed
Dwight D. Moore	Chief Operating Officer	NTS	X	X	
Steve Eisenberg	General Manager	NTS	X	X	X
Charles R. Pilotte	Program Manager	NTS	X	X	X
Jonathan Mendoza	Engineering Supervisor	NTS	X	X	X
Ron Kelly	Quality Assurance Manager	NTS	X	X	X
Nathan Lowe	Engineer	NTS			X
Robert Wood	Master Technician	NTS			X
Ken LeSage	Test Technician	NTS			X
Stephen Feder	Test Engineer	Westinghouse	X		X
John Kearns	Test Engineer	Westinghouse	X		X
Yamir Diaz-Castillo	Team Lead	NRC	X	X	
Jonathan Ortega-Luciano	Reactor Operations Engineer	NRC	X	X	
Raju Patel	Reactor Operations Engineer	NRC	X	X	
Andrea Keim	Reactor Operations Engineer	NRC	X	X	
John Bartleman	Senior Construction Inspector	NRC	X	X	
Richard Rasmussen	Branch Chief	NRC		X	

2. INSPECTION PROCEDURES USED

Inspection Procedure (IP) 36100, “Inspection of 10 CFR Part 21 and Programs for Reporting Defects and Noncompliance,” dated April 25, 2011.

IP 43002, “Routine Inspections of Nuclear Vendors,” dated April 25, 2011.

IP 43004, “Inspection of Commercial-Grade Dedication Programs,” dated April 25, 2011.

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Type	Description
99900923/2012-201-01	Open	NOV	10 CFR 21.21(b)
99900923/2012-201-02	Open	NON	Criterion III
99900923/2012-201-03	Open	NON	Criterion VII
99900923/2012-201-04	Open	NON	Criterion XV
99900923/2012-201-05	Open	NON	Criterion XVI

4. INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA

The NRC inspection team identified the following inspections, tests, analyses, and acceptance criteria (ITAAC) related to the squib valves. These ITAAC are referenced in this section for future use by the NRC staff during the ITAAC closure process and by no means constitute that the ITAAC have been met and closed.

AP1000 Design Control Document, Tier 1, Revision 19	Table 2.1.2-4 ITAAC 5.a	ITAAC 2.01.02.5aii
AP1000 Design Control Document, Tier 1, Revision 19	Table 2.2.3-4 ITAAC 5.a	ITAAC 2.02.03.5aii

5. DOCUMENTS REVIEWED

- NTS “Corporate Quality Policy Manual,” Revision 6, dated October 14, 2011
- NTS Quality Assurance Procedure (QAP), Corporate (COR) 02, “Management Reviews,” Revision 3, dated November 5, 2004
- NTS QAP COR 03, “Vendor Assessment,” Revision 3, dated November 3, 2006
- NTS QAP COR 05, “Control of Measuring, Inspection & Test Equipment,” Revision 9, dated May 12, 2011
- NTS QAP COR 08, “Purchasing of Services and Supplies,” Revision 5, January 7, 2005
- NTS QAP COR 09, “Control of Quality Records,” Revision 6, dated June 13, 2008
- NTS QAP COR 12, “Customer Feedback,” Revision 4, dated June 2, 2009
- NTS QAP COR 14, “Vendor Audits,” Revision 2, October 27, 2008
- NTS QAP COR 15, “Internal Audits,” Revision 4, June 21, 2010
- NTS QAP COR 16, “Control of Nonconforming Items,” Revision 3, dated November 5, 2004

- NTS QAP COR 17, “Corrective and Preventive Action,” Revision 1, dated January 24, 2003
- NTS QAP COR 18, “Personnel Training and Qualification,” Revision 2, dated November 2, 2001
- NTS QAP COR 19, “Auditor Training and Qualification,” Revision 1, dated October 27, 2008
- NTS QAP COR 20, “Final Inspection,” Revision 1, dated January 24, 2003
- NTS QAP COR 21, “Data Recording Requirements,” Revision 3, dated March 15, 2005
- NTS QAP COR 23, “Test Control,” Revision 4, dated March 15, 2005
- NTS QAP COR 24, “Commercial Grade Surveys,” Revision 1, dated January 24, 2003
- NTS QAP COR 25, “Reporting Requirements Per 10 CFR Part 21, Revision 2, dated July 22, 2009
- NTS QAP COR 29, “Receiving of Purchased Items and Services,” Revision 2, dated October 24, 2009
- NTS QAP COR 30, “Evaluation and Client Notification of Nonconforming Work,” Revision 0, dated November 5, 2004
- NTS Standard Operating Procedure (SOP) COR Information Technology (IT) 05, “Server Replication and Archival,” Revision 1, dated October 1, 2009
- NTS SOP COR IT 10, “Electronic Data Filing,” Revision 3, dated October 1, 2009
- NTS Form COR 5.1, “Out-of-Tolerance Report,” for Monopole Antenna, ID No. BX-EMI-ANTENA-30283, dated April 24, 2012
- NTS Form COR 21.0, “General Log Sheet,” for NTS Master Job Order (MJO) No. TP63714-13N for 14-inch Squib Valve Position Indication Switch Subjected to Vibration Aging, dated June 6, 2012
- NTS Form COR 21.2, “Seismic Test Equipment List,” for NTS MJO No. TP63714-13N, dated June 12, 2012
- NTS Form COR 28.0, “Software Notice and Evaluation Form,” for PUMA software NTS ID No. BX1772, Model No. Analyzer Version 4.0 Patch 1.E, dated January 27, 2007
- NTS Procedure Northeast (NOR) CAL 15, “Vibration Research Software Verification,” Revision 2, dated October 10, 2008
- NTS Form NOR 23.1, “Pre-Test Inspection Checklist,” for MJO No. 63528-11N, with General Review, Data Acquisition System, Dynamics/Seismic, and Nuclear performed by Test Technician, dated June 4, 2012

- NTS SOP NOR CAL 15, “Commercial Grade Dedication of Vibration Research Software Verification,” Revision 3, dated March 5, 2012

- NTS Test Procedure No. TP63528-11N, “Seismic Qualification Test Plan for 8” and 14” Squib Valve Tension Bolt,” Revision 0, dated June 4, 2012

- NTS Procedure No. TP63714-13N, “Seismic Qualification Test Plan for 14 Squib Valve Switch Pin & Bracket Assembly,” Revision 0, dated June 4, 2012

- NTS Change of Procedure No. 001 for NTS Procedure No. TP63714-13N, “Seismic Qualification Test Plan for 14: Squib Valve Switch Pin & Bracket Assembly, “ Revision 0, June 12, 2012

- NTS Notice of Deviation (NOD) No. 001 for Job No. 63528-11N, “Audible Noise Anomaly was Observed during Seismic Testing on 14“ Squib Valve,” dated June 13, 2012

- NTS NOD No. 001 for MJO No. 63714-13N, “Spurious Actuation of Normally Closed Contact on 14“ Squib Valve Position Switch During Seismic Testing,” dated June 12, 2012

- NTS NOD No. 002 for MJO No. 63714-13N, “WEC 14 Squib Valve Switch & Bracket Assembly for Erroneous Data During the Sine Beat Testing in X Axis,” dated June 13, 2012

- NTS NOD No. 003 for MJO No. 63714-13N, “Locknut for the 14“ Squib Valve Position Switch Loosened During Seismic Testing,” dated June 13, 2012

- NTS MJO No. 63714-13N for the Seismic Testing on the 14” Squib Valve Indication Switch Assembly for the Westinghouse Electric Company (WEC) Purchase Order (PO) No. 4500362611, C/O No. 2

- NTS MJO No. 63528-11N for the Seismic Testing on the 8” & 14” Squib Valve Tension Bolts Assembly for the WEC PO No., 4500362610 C/O No. 2

- NTS MJO No. 63679-12N, “Dedication of Agastat Timing Relay Part No. E70242PC004,” for Entergy-Pilgrim Station PO No. 10337475

- NTS MJO No. 63680-12N, “Dedication of 3/4-inch 120VAC Solenoid Valve P/N 8210G88, “ for First Energy Beaver Valley PO No. 45384209

- NTS MJO No. 63515-11N, “Dedication of GE Relay P/N CR120B02202, 120VAC Coil, “ for Next Era Energy, Seabrook Station PO No. 002261585

- NTS Software Verification Test Report No. AC-DYN-SOFWRE-1890, “Control of Test Related Software Report No. AC-DYN-SOFWRE-1890 - Vibration Controller Software Revision 10.0.6,” Revision 9, dated October 18, 2011

- NTS Procedure TP63686-13N, “Dedication Test Procedure of Honeywell Limit Micro Switch P/N BZE6-2RN for use at Pilgrim Nuclear Power Station,” Revision 0

- NTS Procedure TP-63680-12N,”Dedication Procedure 8210G88 ASCO Solenoid Valves for First Energy Corporation,” Revision 0

- NRC Reactor Plant Event Notification Work Sheet EN# 47395
- NTS Report TR63656-12N, “Failure Evaluation on CR120B02201 GE Relays,” Revision 0, dated February 9, 2012
- NTS Report TR63656-12N Addendum, “Failure Evaluation Summary Report on CR120B02202 GE Relays,” Revision 0, dated May 3, 2012
- SBK-L-1 1232, Seabrook Station 10 CFR Part 21 Notification General Electric CR-120B Relays (120 VAC), dated November 17, 2011
- Part 21 Report 2011-38-00 ABB, Inc. “Defective Capacitors Cause Under-Frequency Trip Set point Drift In ABB KF Protective Relays,” dated July 22, 2011
- TP63515-11N, “Dedication Test Procedure of General Electric Industrial Relay for NextEra Energy Seabrook station,” Revision 2
- PO No. 59178N from NTS to STR to Perform Testing of the Material (Activation Energy),
- PO No. 436551 from Calvert Cliffs Nuclear Power Plant to NTS for Honeywell Limit Micro Switch P/N BZE6-2RN
- PO 10340630 from Pilgrim Station to NTS for Honeywell Limit Micro Switch P/N BZE6-2RN,
- PO No. 10263966 from Pilgrim Station to NTS for Honeywell Limit Micro Switch P/N BZE6-2RN
- PO No. 58204N to STR to Perform Testing of the Material (Activation Energy)
- PO No. 45384209 from Beaver Valley Nuclear Power Plant to NTS for an ASCO Solenoid Valve
- PO No 59032N from NTS to Washburn & Garfield for the ASCO Solenoid Valve
- PO No. B51936 from NTS to Tektronix for Calibration Services, dated January 24, 2012
- WEC PO No.4500363610 to NTS to Perform Seismic Testing of Tension Bolts, dated October 5, 2010
- WEC PO No.4500363610 to NTS to Perform Seismic Testing of Tension Bolts, dated October 5, 2010, Change Notice No. 1, dated May 23, 2012
- WEC PO No.4500363611 to NTS to Perform Seismic Testing of Position Indicating Switch, dated October 5, 2010
- WEC PO No.4500363611 to NTS to Perform Seismic Testing of Position Indicating Switch, October 5, 2010, Change Notice No. 1, dated May 23, 2012
- WEC PO No.4500363611 to NTS to Perform Seismic Testing of Position Indicating Switch, October 5, 2010, Change Notice No. 2, dated June 4, 2012

- WEC APP-GW-GI-002, “AP1000 Plant Equipment Qualification Methodology,” Revision 3, issued February, 2012

- WEC EQ-TP-222-APP, APP-PV70-VPH-001, “AP1000 Squib Valve Equipment Qualification Test Plan,” Revision 1, issued June 2012

- WEC EQ-TP-49-APP, APP-PV95-VPH-002, Appendix B, “RIM Seismic Testing Guidelines,” Revision 1, dated August 18, 2009

- WEC File Code APP-144-MISC-3, “Guidelines for RIM Seismic Testing of Safety Related Valve and Valve Appurtenances for Westinghouse Electric Company for use in AP1000 Nuclear Power Plants,” dated, August 18, 2009

- WEC Issue Report #12-165-M042, “Test Anomaly during Seismic Testing of 14-inch Squib Valve Tension Bolt,” dated June 13, 2012

- NTS Audit Report No. NTS/A-V-17025-11-01, XXXX, audit date January 24, 2011

- NTS Audit Report No. NTS/A-V-10CFR50-11-03, ABB, dated February 9, 2011

- NTS Audit Report No. NTS/A-V-10CFR50-10-07, Magnatrol International, dated September 29, 2010

- NTS Audit Report No. NTS/A-V-10-CFR50-10-11, Tyco, dated January 19, 2011

- SPX Drawing No. D-402377, “14-inch Squib Valve Body Finish Machining ASME Code Class 1,” Revision 7, dated March 22, 2010

- SPX Drawing No. D-402706, “14-inch Squib Valve Functional Testing Tension Bolt Vibration Test Fixture Assembly/Layout,” Revision 1, dated February 23, 2012

- SPX Drawing No. D-402707, “8-inch Squib Valve Testing Tension Bolt Vibration Test Fixture Assembly/Layout,” Revision 2, dated May 31, 2011

- SPX Drawing No. D-409861, “14-inch Switch Pin & Bracket Seismic Test Assembly,” Revision 0, dated March 13, 2012

- SPX Drawing No. D-403097, “8-inch HP Piston Machining,” Revision 5, dated April 15, 2010

- SPX Drawing No. D-403357, “14-inch Piston Finish Machining,” Revision 2, dated April 6, 2010

- SPX Drawing No. D-403677, “14-inch ADS Squib Valve Assembly,” Revision 4, dated June 19, 2010

- SPX Drawing No. D-403678, “8-inch HP-R Squib Valve Assembly,” Revision 5, dated May 12, 2010

- SPX Drawing. No. D-403687, “8-inch HP-R Squib Valve Body Finish Machining ASME Code Class 1,” Revision 7, dated May 7, 2010

- SPX Drawing No. D-403972, “8-inch Squib Valve Functional Testing 8” Tension Bolt Vibration Test Fixture Welding/Assembly, Revision 2, dated January 30, 2012

- SPX Drawing. No. D-407009, “14-inch Squib Valve Testing Tension Bolt Vibration Test Fixture Welding,” Revision 2, dated June 1, 2011

- Tektronix Service Solutions, “ACLASS Certificate of Accreditation to ISO/IEC 17025: 2005,” valid March 30, 2011 thru March 30, 2013

- Tektronix Certificate of Calibration for Accelerometer, NTS ID No. AC0751, Calibration Range 1 to 4KHz, Calibration Date March 14, 2014

- Tektronix Certificate of Calibration for Vibration Controller, NTS ID No. AC1871, Calibration Range 1-20 KHz, Calibration Date August 10, 2011

- Tektronix Certificate of Calibration for Mass Flow Meter, NTS ID No. AC3264, Calibration Range 0 to 50 SCFM, Calibration Date March 23, 2012

- Tektronix Certificate of Calibration for Tri-Axial Accelerometer, NTS ID No. AC2914 Calibration Date May 11, 2012

- Tektronix Certificate of Calibration for Mitutoyo Digital Caliper, NTS ID No. AC2012, calibration range 0 to 12”, calibration date October 20, 2011

- Tektronix Certificate of Calibration for Multimeter, NTS ID No. AC0757, Calibration Range 0 to 10000 Volts, Calibration Date March 27, 2012

- IEEE Standard 323-1974, “IEE Standard for Qualifying Class IE Equipment for Nuclear Generating Stations,”

- IEEE Standard 344-1987, “IEEE Recommended Practice for Seismic Qualification of Class IE Equipment for Nuclear Generating Stations,”

- IEEE Standard 382-1996, “IEEE Standard for Seismic Qualification of Actuators for Power-Operated Valve Assemblies With Safety-Related Functions for Nuclear Power Plants,”

- Corrective/Preventive Actions: 11-06, 11-37, 11-78, 11-81, 11-84, 12-08, 12-09, 12-20, 12-22, 12-38

- Nonconformance Reports: 12-02, 12-03, 12-05, 12-07

Appendix E

NPDES Permit

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

National Pollutant Discharge Elimination System Permit

for Discharge to Surface Waters

This Permit Certifies That

SCE&G
VC Summer Nuclear Station Units 2 & 3

has been granted permission to discharge from a facility located at

Junction of Hwy 213 and County Rd 16
Jenkinsville, SC
Fairfield County

to receiving waters named

Broad River at the Parr Reservoir

in accordance with limitations, monitoring requirements and other conditions set forth herein. This permit is issued in accordance with the provisions of the Pollution Control Act of South Carolina (S.C. Code Sections 48-1-10 *et seq.*, 1976), Regulation 61-9 and with the provisions of the Federal Clean Water Act (PL 92-500), as amended, 33 U.S.C. 1251 *et seq.*, the "Act."

Jeffrey P. deBessonet, P.E., Director
Water Facilities Permitting Division

Issue Date: **October 11, 2012**

Effective Date: **February 1, 2013**

Expiration Date: **January 31, 2018**

Permit No.: **SC0049131**

Table of Contents

PART I. Definitions

Any term not defined in this Part has the definition stated in the Pollution Control Act or in "Water Pollution Control Permits", R.61-9 or its normal meaning.

A. The "Act", or CWA, shall refer to the Clean Water Act (Formerly referred to as the Federal Water Pollution Control Act) Public Law 92-500, as amended.

B. The "average" or "arithmetic mean" of any set of values is the summation of the individual values divided by the number of individual values.

C. "Basin" (or "Lagoon") means any in-ground or earthen structure designed to receive, treat, store, temporarily retain and/or allow for the infiltration/evaporation of wastewater.

D. "Blowdown" means the minimum discharge of recirculating water for the purpose of discharging materials contained in the water, the further buildup of which would cause concentration in amounts exceeding limits established by best engineering practices.

E. "Bottom ash" means the ash that drops out of the furnace gas stream in the furnace and in the economizer sections. Economizer ash is included when it is collected with bottom ash (40 CFR 423.11(f)).

F. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.

G. "Chemical metal cleaning waste" means any wastewater resulting from the cleaning of any metal process equipment with chemical compounds, including, but not limited to, boiler tube cleaning (40 CFR 423.11(c)).

H. "Closed-cycle recirculating system" means a system designed, using minimized makeup and blowdown flows, to withdraw water from a natural or other water source to support contact and/or noncontact cooling uses within a facility. The water is usually sent to a cooling canal or channel, lake, pond, or tower to allow waste heat to be dissipated to the atmosphere and then is returned to the system. (Some facilities divert the waste heat to other process operations.) New source water (make-up water) is added to the system to replenish losses that have occurred due to blowdown, drift, and evaporation.

I. "Coal pile runoff" means the rainfall runoff from or through any coal storage pile (40 CFR 423.11(m)).

J. A "composite sample" shall be defined as one of the following four types:

1. An influent or effluent portion collected continuously over a specified period of time at a rate proportional to the flow.

2. A combination of not less than 8 influent or effluent grab samples collected at regular (equal) intervals over a specified period of time and composited by increasing the volume of each aliquot in proportion to flow. If continuous flow measurement is not used to composite in proportion to flow, the following method will be used: An instantaneous flow measurement should be taken each time a grab sample is collected. At the end of the sampling period, the instantaneous flow measurements should be summed to obtain a total flow. The instantaneous flow measurement can then be divided by the total flow to determine the percentage of each grab sample to be combined. These combined samples form the composite sample.

3. A combination of not less than 8 influent or effluent grab samples of equal volume but at variable time intervals that are inversely proportional to the volume of the flow. In other words, the time interval between aliquots is reduced as the volume of flow increases.

4. If the effluent flow varies by less than 15 percent, a combination of not less than 8 influent or effluent grab samples of constant (equal) volume collected at regular (equal) time intervals over a specified period of time.

All samples shall be properly preserved in accordance with Part II.J.4. Continuous flow or the sum of instantaneous flows measured and averaged for the specified compositing time period shall be used with composite results to calculate mass.

K. "Daily discharge" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the average measurement of the pollutant over the day.

L. "Daily maximum" is the highest average value recorded of samples collected on any single day during the calendar month.

M. "Daily minimum" is the lowest average value recorded of samples collected on any single day during the calendar month.

N. The "Department" or "DHEC" shall refer to the South Carolina Department of Health and Environmental Control.

O. "Fly ash" means the ash that is carried out of the furnace by the gas stream and collected by mechanical precipitators, electrostatic precipitators, and/or fabric filters. Economizer ash is included when it is collected with fly ash (40 CFR 423.11(e)).

P. The "geometric mean" of any set of values is the Nth root of the product of the individual values where N is equal to the number of individual values. The geometric mean is equivalent to the antilog of the arithmetic mean of the logarithms of the individual values. For purposes of calculating the geometric mean, values of zero (0) shall be considered to be one (1).

Q. A "grab sample" is an individual, discrete or single influent or effluent portion of at least 100 milliliters collected at a time representative of the discharge and over a period not exceeding 15 minutes and retained separately for analysis.

R. "Groundwater" means the water below the land surface found in fractured rock or various soil strata.

S. "Low volume waste sources" include, but are not limited to: wastewaters from wet scrubber air pollution control systems, ion exchange water treatment systems, water treatment evaporator blowdown, laboratory and sampling streams, boiler blowdown, floor drains, cooling tower basin cleaning wastes, and recirculating house service water systems. Sanitary and air conditioning wastes are not included (40 CFR 423.11(b)).

T. The "maximum or minimum" is the highest or lowest value, respectively, recorded of all samples collected during the calendar month. These terms may also be known as the instantaneous maximum or minimum.

U. "Metal cleaning waste" means any wastewater resulting from cleaning [with or without chemical cleaning compounds] any metal process equipment including, but not limited to, boiler tube cleaning, boiler fireside cleaning, and air preheater cleaning (40 CFR 423.11(d)).

V. "Monitoring well" means any well used to sample groundwater for water quality analysis or to measure groundwater levels.

W. The "monthly average", other than for fecal coliform and enterococci, is the arithmetic mean of all samples collected in a calendar month period. The monthly average for fecal coliform and enterococci bacteria is the geometric mean of all samples collected in a calendar month period. The monthly average loading is the arithmetic average of all daily discharges made during the month.

X. "Once through cooling water" means water passed through the main cooling condensers in one or two passes for the purpose of removing waste heat (40 CFR 423.11(g)).

Y. The "PCA" shall refer to the Pollution Control Act (Chapter 1, Title 48, Code of Laws of South Carolina).

Z. The "practical quantitation limit" (PQL) is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. It is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method-specific sample weights, volumes, and processing steps have been followed. It is also referred to as the reporting limit.

AA. "Quarter" is defined as the first three calendar months beginning with the month that this permit becomes effective and each group of three calendar months thereafter.

BB. "Quarterly average" is the arithmetic mean of all samples collected in a quarter.

CC. "Recirculated cooling water" means water which is passed through the main condensers for the purpose of removing waste heat, passed through a cooling device for the purpose of removing such heat from the water then passed again, except for blowdown, through the main condenser (40 CFR 423.11(h)).

DD. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

EE. "Sludge" means industrial sludge. Industrial sludge is a solid, semi-solid, or liquid residue generated during the treatment of industrial wastewater in a treatment works. Industrial sludge includes, but is not limited to, industrial septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from industrial sludge. Industrial sludge does not include ash generated during the firing of industrial sludge in an industrial sludge incinerator or grit and screenings generated during preliminary treatment of industrial wastewater in a treatment works. Industrial sludge by definition does not include sludge covered under 40 CFR Part 503 or R.61-9.503.

FF. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

GG. "Wastewater" means industrial wastewater. Industrial wastewater is wastewater generated from a federal facility, commercial or industrial process, including waste and wastewater from humans when generated at an industrial facility.

PART II. Standard Conditions

A. Duty to comply

The permittee must comply with all conditions of the permit. Any permit noncompliance constitutes a violation of the Clean Water Act and the Pollution Control Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. The Department's approval of wastewater facility plans and specifications does not relieve the permittee of responsibility to meet permit limits.

1. The permittee shall comply with effluent standards or prohibitions established under section 307(a) of the Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions or standards for sewage sludge use or disposal, even if the permit has not yet been modified to incorporate the requirement.

2. Failure to comply with permit conditions or the provisions of this permit may subject the permittee to civil penalties under S.C. Code Section 48-1-330 or criminal sanctions under S.C. Code Section 48-1-320. Sanctions for violations of the Federal Clean Water Act may be imposed in accordance with the provisions of 40 CFR Part 122.41(a)(2) and (3).

3. A person who violates any provision of this permit, a term, condition or schedule of compliance contained within this NPDES permit, or the State law is subject to the actions defined in the State law.

B. Duty to reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. A permittee with a currently effective permit shall submit a new application 180 days before the existing permit expires, unless permission for a later date has been granted by the Department. The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.

C. Need to halt or reduce activity not a defense

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to mitigate

The permittee shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper operation and maintenance

1. The permittee shall at all times properly operate and maintain in good working order and operate as efficiently as possible all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the terms and conditions of this permit. Proper operation and maintenance includes effective performance based on design facility removals, adequate funding, adequate

operator staffing and training and also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

2. Power Failures. In order to maintain compliance with effluent limitations and prohibitions of this permit, the permittee shall either:

   a. provide an alternative power source sufficient to operate the wastewater control facilities;

   b. or have a plan of operation which will halt, reduce, or otherwise control production and/or all discharges upon the reduction, loss, or failure of the primary source of power to the wastewater control facilities.

3. The permittee shall develop and maintain at the facility a complete Operations and Maintenance Manual for the waste treatment facilities. The manual shall be made available for on-site review during normal working hours. The manual shall contain operation and maintenance instructions for all equipment and appurtenances associated with the waste treatment facilities and land application system, if applicable. The manual shall contain a general description of the treatment process(es), the operational procedures to meet the requirements of E.1 above, and the corrective action to be taken should operating difficulties be encountered.

4. The permittee shall provide for the performance of daily treatment facility inspections by a certified operator of the appropriate grade as defined in Part V.E of this permit. The Department may make exceptions to the daily operator requirement in accordance with R.61-9.122.41(e)(3)(ii). The inspections shall include, but should not necessarily be limited to, areas which require visual observation to determine efficient operation and for which immediate corrective measures can be taken using the O & M manual as a guide. All inspections shall be recorded and shall include the date, time, and name of the person making the inspection, corrective measures taken, and routine equipment maintenance, repair, or replacement performed. The permittee shall maintain all records of inspections at the permitted facility as required by the permit, and the records shall be made available for on-site review during normal working hours.

5. A roster of operators associated with the facility's operation and their certification grades shall be submitted to the DHEC/Bureau of Water/Water Pollution Control Division. For existing facilities, this roster shall be submitted within thirty (30) days of the effective date of this permit. For new facilities, this roster must be submitted prior to placing the facility into operation. Additionally, any changes in operator or operators (including their certification grades) shall be submitted to the Department as they occur.

6. Wastewater Sewer Systems

   a. Purpose. This section establishes rules for governing the operation and maintenance of wastewater sewer systems, including gravity or pressure interceptor sewers. It is the purpose of this section to establish standards for the management of sewer systems to prevent and/or minimize system failures that would lead to public health or environmental impacts.

   b. Applicability. This section applies to all sewer systems that have been or would be subject to a DHEC construction permit under Regulation 61-67 and whose owner owns or operates the wastewater treatment system to which the sewer discharges.

c. General requirements. The permittee must:

(1) Properly manage, operate, and maintain at all times all parts of its sewer system(s), to include maintaining contractual operation agreements to provide services, if appropriate;

(2) Provide adequate capacity to convey base flows and peak flows for all parts of the sewer system or, if capital improvements are necessary to meet this standard, develop a schedule of short and long term improvements;

(3) Take all reasonable steps to stop and mitigate the impact of releases of wastewater to the environment; and

(4) Notify the Department within 30 days of a proposed change in ownership of a sewer system.

F. Permit actions

This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

G. Property rights

This permit does not convey any property rights of any sort, or any exclusive privilege nor does it authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

H. Duty to provide information

The permittee shall furnish to the Department, within a reasonable time, any information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit or to determine compliance with this permit. The permittee shall also furnish to the Department upon request, copies of records required to be kept by this permit.

I. Inspection and entry

The permittee shall allow the Department, or an authorized representative (including an authorized contractor acting as a representative of the Department), upon presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

4. Sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the Clean Water Act and Pollution Control Act, any substances or parameters at any location.

J. Monitoring and records

1. a. (1) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

(2) Samples shall be reasonably distributed in time, while maintaining representative sampling.

(3) No analysis, which is otherwise valid, shall be terminated for the purpose of preventing the analysis from showing a permit or water quality violation.

b. Flow Measurements.

(1) Where primary flow meters are required, appropriate flow measurement devices and methods consistent with accepted scientific practices shall be present and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated and maintained to ensure that the accuracy of the measurements are consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than 10% from the true discharge rates throughout the range of expected discharge volumes. The primary flow device, where required, must be accessible to the use of a continuous flow recorder.

(2) Where permits require an estimate of flow, the permittee shall maintain at the permitted facility a record of the method(s) used in estimating the discharge flow (e.g., pump curves, production charts, water use records) for the outfall(s) designated on limits pages to monitor flow by an estimate.

(3) Records of any necessary calibrations must be kept.

2. Except for records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by R.61-9.503 or R.61-9.504), the permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period may be extended by request of the Department at any time.

3. Records of monitoring information shall include:

a. The date, exact place, and time of sampling or measurements;

b. The individual(s) who performed the sampling or measurements;

c. The date(s) analyses were performed;

d. The individual(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of such analyses.

4. a. Analyses for required monitoring must be conducted according to test procedures approved under 40 CFR Part 136, equivalent test procedures approved by the Department or other test procedures that have been specified in the permit.

In the case of sludge use or disposal, analysis for required monitoring must be conducted according to test procedures approved under 40 CFR Part 136, test procedures specified in R.61-9.503 or R.61-9.504, equivalent test procedures approved by the Department or other test procedures that have been specified in the permit.

b. Unless addressed elsewhere in this permit, the permittee shall use a sufficiently sensitive analytical method that achieves a value below the derived permit limit stated in Part III. If more than one method of analysis is approved for use, the Department recommends for reasonable potential determinations that the permittee use the method having the lowest practical quantitation limit (PQL) unless otherwise specified in Part V of the permit. For the purposes of reporting analytical data on the Discharge Monitoring Report (DMR):

(1) Analytical results below the PQL conducted using a method in accordance with Part II.J.4.a above shall be reported as zero (0). Zero (0) shall also be used to average results which are below the PQL. When zero (0) is reported or used to average results, the permittee shall report, in the "Comment Section" or in an attachment to the DMR, the analytical method used, the PQL achieved, and the number of times results below the PQL were reported as zero (0).

(2) Analytical results above the PQL conducted using a method in accordance with Part II.J.4.a shall be reported as the value achieved. When averaging results using a value containing a "less than," the average shall be calculated using the value and reported as "less than" the average of all results collected.

(3)(a) The mass value for a pollutant collected using a grab sample shall be calculated using the 24-hour totalized flow for the day the sample was collected (if available) or the instantaneous flow at the time of the sample and either the concentration value actually achieved or the value as determined from the procedures in (1) or (2) above, as appropriate. Grab samples should be collected at a time representative of the discharge.

(b) The mass value for a pollutant collected using a composite sample shall be calculated using the 24-hour totalized flow measured for the day the sample was collected and either the concentration value actually achieved or the value as determined from the procedures in (1) or (2) above, as appropriate.

5. The PCA provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $25,000 or by imprisonment for not more than 2 years, or both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment provided by the Clean Water Act is also by imprisonment of not more than 4 years.

K. Signatory requirement.

1. All applications, reports, or information submitted to the Department shall be signed and certified.

   a. Applications. All permit applications shall be signed as follows:

      (1) For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

         (a) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or

         (b) The manager of one or more manufacturing, production, or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

      (2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

      (3) For a municipality, State, Federal, or other public agency or public facility: By either a principal executive officer, mayor, or other duly authorized employee or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

         (a) The chief executive officer of the agency, or

         (b) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator, Region IV, EPA).

   b. All reports required by permits, and other information requested by the Department, shall be signed by a person described in Part II.K.1.a of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

      (1) The authorization is made in writing by a person described in Part II.K.1.a of this section;

      (2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) and,

      (3) The written authorization is submitted to the Department.

c. Changes to authorization. If an authorization under Part II.K.1.b of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part II.K.1.b of this section must be submitted to the Department prior to or together with any reports, information, or applications to be signed by an authorized representative.

d. Certification. Any person signing a document under Part II.K.1.a or b of this section shall make the following certification: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

2. The PCA provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction, be punished by a fine of not more than $25,000 per violation, or by imprisonment for not more than two years per violation, or by both.

L. Reporting requirements

1. Planned changes.

The permittee shall give written notice to DHEC/Bureau of Water/Water Facilities Permitting Division as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

a. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in R 61-9.122.29(b); or

b. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to notification requirements under Part II.L.8 of this section.

c. The alteration or addition results in a significant change in the permittee's sewage sludge or industrial sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan (included in the NPDES permit directly or by reference);

2. Anticipated noncompliance.

The permittee shall give advance notice to the DHEC/Bureau of Water/Water Pollution Control Division of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

3. Transfers.

This permit is not transferable to any person except after written notice to the DHEC/Bureau of Water/NPDES Administration. The Department may require modification or revocation and reissuance of the permit to change the name of permittee and incorporate such other requirements as may be necessary under the Pollution Control Act and the Clean Water Act.

a. Transfers by modification. Except as provided in paragraph b of this section, a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued (under R.61-9.122.62(e)(2)), or a minor modification made (under R.61-9.122.63(d)), to identify the new permittee and incorporate such other requirements as may be necessary under CWA.

b. Other transfers. As an alternative to transfers under paragraph a of this section, any NPDES permit may be transferred to a new permittee if:

(1) The current permittee notifies the Department at least 30 days in advance of the proposed transfer date in Part II.L.3.b(2) of this section;

(2) The notice includes U.S. EPA NPDES Application Form 1 and a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and

(3) Permits are non-transferable except with prior consent of the Department. A modification under this section is a minor modification which does not require public notice.

4. Monitoring reports. Monitoring results shall be reported at the intervals specified elsewhere in this permit.

a. Monitoring results must be reported on a Discharge Monitoring Report (DMR) or forms provided or specified by the Department for reporting results of monitoring of sludge use or disposal practices including the following:

(1) Effluent Monitoring: Effluent monitoring results obtained at the required frequency shall be reported on a Discharge Monitoring Report Form (EPA Form 3320-1). The DMR is due postmarked no later than the 28th day of the month following the end of the monitoring period. One original and one copy of the Discharge Monitoring Reports (DMRs) shall be submitted to:

S.C. Department of Health and Environmental Control
Bureau of Water/Water Pollution Control Division
Data Management Section
2600 Bull Street
Columbia, South Carolina 29201

(2) Groundwater Monitoring: Groundwater monitoring results obtained at the required frequency shall be reported on a Groundwater Monitoring Report Form (DHEC 2110) postmarked no later than the 28th day of the month following the end of the monitoring period. One original and one copy of the Groundwater Monitoring Report Form (DHEC 2110) shall be submitted to:

S.C. Department of Health and Environmental Control
Bureau of Water/Water Monitoring, Assessment and Protection Division
Groundwater Management Section
2600 Bull Street
Columbia, South Carolina 29201

(3) Sludge, Biosolids and/or Soil Monitoring: Sludge, biosolids and/or soil monitoring results obtained at the required frequency shall be reported in a laboratory format as stated in Part V of the permit. Two copies of these results shall be submitted to:

S.C. Department of Health and Environmental Control
Bureau of Water/Water Pollution Control Division
Data and Records Management Section
2600 Bull Street
Columbia, South Carolina 29201

(4) All other reports required by this permit shall be submitted at the frequency specified elsewhere in the permit to:

S.C. Department of Health and Environmental Control
Bureau of Water/Water Pollution Control Division
Data and Records Management Section
2600 Bull Street
Columbia, South Carolina 29201

b. If the permittee monitors any pollutant more frequently than required by the permit using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in R.61-9.503 or R.61-9.504, or as specified in the permit, all valid results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Department. The permittee has sole responsibility for scheduling analyses, other than for the sample date specified in Part V, so as to ensure there is sufficient opportunity to complete and report the required number of valid results for each monitoring period.

c. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Department in the permit.

5. Twenty-four hour reporting

a. The permittee shall report any non-compliance, which may endanger health or the environment. Any information shall be provided orally to local DHEC office within 24 hours from the time the permittee becomes aware of the circumstances. During normal working hours call:

County	EQC Region	Phone No.
Fairfield, Lexington, Newberry, Richland	Region 3 –Columbia EQC Office	803-896-0620

*After-hour reporting should be made to the 24-Hour Emergency Response telephone number 803-253-6488 or 1-888-481-0125 outside of the Columbia area.

A written submission shall also be provided to the address in Part II.L.4.a(4) within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

b. The following shall be included as information which must be reported within 24 hours under this paragraph.

(1) Any unanticipated bypass which exceeds any effluent limitation in the permit. (See R.61-9.122.44(g)).

(2) Any upset which exceeds any effluent limitation in the permit.

(3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Department in the permit to be reported within 24 hours (See R 61-9.122.44(g)). If the permit contains maximum limitations for any of the pollutants listed below, a violation of the maximum limitations shall be reported orally to the DHEC/Bureau of Water/Water Pollution Control Division within 24 hours or the next business day.

(a) Whole Effluent Toxicity (WET),
(b) tributyl tin (TBT), and
(c) any of the following bioaccumulative pollutants:

α BHC	Mercury
β BHC	Mirex
δ BHC (Lindane)	Octachlorostyrene
BHC	PCBs
Chlordane	Pentachlorobenzene
DDD	Photomirex
DDE	1,2,3,4-Tetrachlorobenzene
DDT	1,2,4,5-Tetrachlorobenzene
Dieldrin	2,3,7,8-TCDD
Hexachlorobenzene	Toxaphene
Hexachlorobutadiene	

c. The Department may waive the written report on a case-by-case basis for reports under Part II.L.5.b of this section if the oral report has been received within 24 hours.

6. Other noncompliance.

The permittee shall report all instances of noncompliance not reported under Part II.L.4 and 5 of this section and Part IV at the time monitoring reports are submitted. The reports shall contain the information listed in Part II.L.5 of this section.

7. Other information.

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information to the Water Facilities Permitting Division. This information may result in permit modification, revocation and reissuance, or termination in accordance with Regulation 61-9.

8. Existing manufacturing, commercial, mining, and silvicultural dischargers.

In addition to the reporting requirements under Part II.L.1-7 of this section, all existing manufacturing, commercial, mining, and silvicultural dischargers must notify the DHEC/Bureau of Water/Water Pollution Control Division of the Department as soon as they know or have reason to believe:

a. That any activity has occurred or will occur which would result in the discharge on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

(1) One hundred micrograms per liter (100 μg/l);

(2) Two hundred micrograms per liter (200 μg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 μg/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;

(3) Five (5) times the maximum concentration value reported for that pollutant in the permit application; or

(4) The level established by the Department in accordance with section R.61-9.122.44(f).

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed in the highest of the following "notification levels":

(1) Five hundred micrograms per liter (500 μg/l);

(2) One milligram per liter (1 mg/l) for antimony;

(3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with R.61-9.122.21(g)(7).

(4) The level established by the Department in accordance with section R.61-9.122.44(f).

M. Bypass

1. Bypass not exceeding limitations. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Part II.M.2 and 3 of this section.

2. Notice.

a. Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible, at least ten days before the date of the bypass to the DHEC/Bureau of Water/ Water Facilities Permitting Division.

b. Unanticipated bypass. The permittee shall submit notice of an unanticipated bypass as required in Part II.L.5 of this section.

3. Prohibition of bypass

a. Bypass is prohibited, and the Department may take enforcement action against a permittee for bypass, unless:

(1) Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;

(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and

(3) The permittee submitted notices as required under Part II.M.2 of this section.

b. The Department may approve an anticipated bypass, after considering its adverse effects, if the Department determines that it will meet the three conditions listed above in Part II.M.3.a of this section.

N. Upset

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Part II.N.2 of this section are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

2. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:

a. An upset occurred and that the permittee can identify the cause(s) of the upset;

b. The permitted facility was at the time being properly operated; and

c. The permittee submitted notice of the upset as required in Part II.L.5.b(2) of this section.

d. The permittee complied with any remedial measures required under Part II.D of this section.

3. Burden of proof. In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.

O. Misrepresentation of Information

1. Any person making application for a NPDES discharge permit or filing any record, report, or other document pursuant to a regulation of the Department, shall certify that all information contained in such document is true. All application facts certified to by the applicant shall be considered valid conditions of the permit issued pursuant to the application.

2. Any person who knowingly makes any false statement, representation, or certification in any application, record, report, or other documents filed with the Department pursuant to the State law, and the rules and regulations pursuant to that law, shall be deemed to have violated a permit condition and shall be subject to the penalties provided for pursuant to 48-1-320 or 48-1-330.

Part III. Limitations and Monitoring Requirements

A. Effluent Limitations and Monitoring Requirements

1. During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from internal outfall serial number 002: sanitary wastewater. Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Sampling Frequency	Sample Type
Flow	MR[1], MGD	MR[1], MGD	-	-	Daily	Continuous[2]
pH	-	-	Min MR[1] su, Max MR[1] su[3]		1/Week	Grab
Biochemical Oxygen Demand (BOD_5)	-	-	30 mg/l	60 mg/l	1/Month	24 Hr. Comp.
Total Suspended Solids (TSS)	-	-	30 mg/l	60 mg/l	1/Month	24 Hr. Comp.
Fecal Coliform	-	-	200/100 ml	400/100 ml	1/Month	Grab

[1]MR: Monitor and Report
[2]See Part II.J.1.b
[3]See Part I.T.

a. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): after discharge from the post aeration chamber but prior to mixing with other waste streams or the receiving stream.

2. During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from internal outfall serial number 03A: low volume waste. Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Sampling Frequency	Sample Type
Flow	MR[1], MGD	MR[1], MGD	-	-	Daily	Continuous[2]
pH	-	-	Min MR[1] su, Max MR[1] su[3]		1/Week	Grab
Total Suspended Solids	-	-	30 mg/l	100 mg/l	1/Month	Grab
Oil and Grease	-	-	15 mg/l	20 mg/l	1/Month	Grab

[1]MR: Monitor and Report [2]See Part II.J.1.b [3]See Part I.T.

a. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): after discharge from the liquid radwaste treatment but prior to mixing with other waste streams or the receiving stream.

3 During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from internal outfall serial number 03B: low volume waste. Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Sampling Frequency	Sample Type
Flow	MR[1], MGD	MR[1], MGD	-	-	Daily	Continuous[2]
pH	-	-	Min MR[1] su, Max MR[1] su[3]		1/Week	Grab
Total Suspended Solids	-	-	30 mg/l	100 mg/l	1/Month	Grab
Oil and Grease	-	-	15 mg/l	20 mg/l	1/Month	Grab

[1]MR: Monitor and Report [2]See Part II.J.1.b [3]See Part I.T.

a. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): after discharge from the liquid radwaste treatment but prior to mixing with other waste streams or the receiving stream.

4. During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from internal outfall serial number 04A: low volume waste. Such discharge shall be limited and monitored by the permittee as specified below:

Effluent Characteristics	Discharge Limitations				Monitoring Requirements	
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Sampling Frequency	Sample Type
Flow	MR[1], MGD	MR[1], MGD	-	-	Daily	Continuous[2]
pH	-	-	Min MR[1] su, Max MR[1] su[3]		1/Week	Grab
Total Suspended Solids	-	-	30 mg/l	100 mg/l	1/Month	Grab
Oil and Grease	-	-	15 mg/l	20 mg/l	1/Month	Grab

[1]MR: Monitor and Report [2]See Part II.J.1.b [3]See Part I.T.

a. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): after discharge from the wastewater retention basins but prior to mixing with other waste streams or the receiving stream.

5 During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from internal outfall serial number 04B: low volume waste. Such discharge shall be limited and monitored by the permittee as specified below:

Effluent Characteristics	Discharge Limitations				Monitoring Requirements	
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Sampling Frequency	Sample Type
Flow	MR[1], MGD	MR[1], MGD	-	-	Daily	Continuous[2]
pH	-	-	Min MR[1] su, Max MR[1] su[3]		1/Week	Grab
Total Suspended Solids	-	-	30 mg/l	100 mg/l	1/Month	Grab
Oil and Grease	-	-	15 mg/l	20 mg/l	1/Month	Grab

[1]MR: Monitor and Report [2]See Part II.J.1.b [3]See Part I.T.

a. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): after discharge from the wastewater retention basins but prior to mixing with other waste streams or the receiving stream.

6. During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from internal outfall serial number 005: cooling tower blowdown and alternate mixing water. Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Sampling Frequency	Sample Type
Flow	MR[1], MGD	MR[1], MGD	-	-	Daily	Continuous[2]
pH	-	-	Min MR[1] su, Max MR[1] su[3]		1/Week	Grab
Free Available Chlorine (FAC)[4]	-	-	0.2 mg/l	0.5 mg/l	1/Month	Grab
Chromium, total	-	-	0.2 mg/l	0.2 mg/l	1/Month	Grab
Zinc, total	-	-	1.0 mg/l	1.0 mg/l	1/Month	Grab

[1]MR: Monitor and Report
[2]See Part II.J.1.b
[3]See Part I.T.

a. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): after discharge from the cooling tower basin but prior to mixing with other waste streams or the receiving stream.

7. During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from outfall serial number 001: sanitary wastewater, low volume waste, cooling tower blowdown and alternate mixing water (the combination of internal outfalls 002, 03A, 03B, 04A, 04B and 005). Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	Monthly Average	Daily Maximum	Monthly Average	Daily Maximum	Sampling Frequency	Sample Type
Flow	MR[1], MGD	MR[1], MGD	-	-	Daily	Calculation[3]
pH	-	-	Min 6.0 su, Max 8.5 su[2]		1/Week	Grab
Temperature (Mar.-Nov.) (Effluent)	-	-	-	95°F	Daily	Continuous
Temperature (Dec.-Feb.) (Effluent)	-	-	-	90°F	Daily	Continuous
Upstream Temperature[4,7]	-	-	-	MR°F	2/Month	Grab
Downstream Temperature[5,7]	-	-	-	MR°F	2/Month	Grab
Temperature Rise[6]	-	-	-	5°F	2/Month	Calculation
Total Phosphorus	-	-	0.47 mg/l	0.93 mg/l	2/Month	Grab
Total Zinc	-	-	2.2 mg/l	2.2 mg/l	2/Month	Grab
Total Residual Chlorine (TRC)	-	-	MR[1] mg/l	MR[1] mg/l	2/Month	Grab

[1]MR: Monitor and Report
[2]See Part I.T.
[3]001 Flow shall be the sum of flows from the internal outfalls 002, 03A, 03B, 04A, 04B and 005.
[4]The upstream temperature sample point shall be defined as approximately 500 yards upstream of the discharge diffuser and the upstream temperature shall be reported as the average temperature at 1-meter depth sampling intervals from the top to bottom of the Reservoir.
[5]The downstream temperature sample point shall be defined as approximately 61 feet downstream of the discharge diffuser and the downstream temperature shall be reported as the average temperature at 1-meter depth sampling intervals from the top to bottom of the Reservoir.
[6]Temperature rise is the difference between the upstream and downstream temperature.
[7]The lag between collection of the upstream and downstream temperature can be up to 2 hours.

a. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): after the combination of all internal outfalls 002, 03A, 03B, 04A, 04B and 005 but prior to mixing with the receiving stream.

B. Whole Effluent Toxicity and Other Biological Limitations and Monitoring Requirements

1. During the period beginning on the effective date of this permit and lasting through the expiration date, the permittee is authorized to discharge from outfall serial number 001: sanitary wastewater, low volume waste, cooling tower blowdown and alternate mixing water (the combination of internal outfalls 002, 03A, 03B, 04A, 04B and 005). Such discharge shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTICS	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS	
	Monthly Average	Daily Maximum	Measurement Frequency	Sample Type
Ceriodaphnia dubia Chronic Whole Effluent Toxicity @ CTC = 15.2%	MR%	MR%	1/month	Grab

See Part V.B.2 for additional toxicity reporting requirements.
MR = Monitor and Report.

The following notes apply only to valid tests. For invalid tests see Part V.B.

Note 1: The overall % effect is defined as the larger of the % survival effect or the % reproduction effect from DMR Attachment Form 3880.

Note 2: If only one test is conducted during a month, the monthly average and daily maximum are each equal to the overall % effect.

Note 3: If more than one test is conducted during a month, the monthly average is the arithmetic mean of the overall % effect values of all tests conducted during the month.

Note 4: The monthly average to be reported on the DMR is the highest monthly average for any month during the monitoring period. There is no averaging of data from tests from one month to another.

Note 5: The daily maximum to be reported on the DMR is the highest of the % survival effect or % reproduction effect of all tests conducted during the monitoring period.

Note 6: When a sample is collected in one month and the test is completed in the next month, the overall % effect applies to the month in which the sample was collected.

Note 7: Tests must be separated by at least 7 days (from the time the first sample is collected to start one test until the time the first sample is collected to start a different test). There is no restriction on when a new test may begin following a failed or invalid test.

Note 8: For any split sample:
- a. Determine the % survival effect and % reproduction effect values separately for each test.
- b. Determine the arithmetic mean of the % survival effects and of the % reproduction effects for all tests.
- c. The monthly average and daily maximum shall be the higher of the % effect values from (b) above.
- d. For the purposes of reporting, split samples are reported as an individual sample regardless of the number of times it is split. All laboratories used shall be identified on the DMR attachment and each test shall be reported individually on DMR Attachment Form DHEC 3880 (08/2005).

a. Samples used to demonstrate compliance with the discharge limitations and monitoring requirements specified above shall be taken at or near the final point-of-discharge but prior to mixing with the receiving waters or other waste streams.

C. Groundwater Monitoring Requirements

Not applicable to this permit.

D. Sludge Monitoring Requirements

Not applicable to this permit.

E. Soil Monitoring Requirements

Not applicable to this permit.

Part IV. Schedule of Compliance

A. Schedule(s)

Not applicable to this permit.

B. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each scheduled date.

Part V. Other Requirements

A. Effluent Requirements

1. There shall be no discharge of floating solids or visible foam in other than trace amounts, nor shall the effluent cause a visible sheen on the receiving waters.

2. There shall be no discharge of polychlorinated biphenyl compounds such as those commonly used for transformer fluid.

3. This permit may be reopened to reduce the monitoring frequency to monthly on Outfall 001 for upstream and downstream temperature, temperature rise, intake and effluent total phosphorus, total phosphorus rise, total zinc and/or total residual chlorine after two years of commencement of this discharge.

4. Unless authorized elsewhere in this permit, the permittee must meet the following requirements concerning maintenance chemicals for the following waste streams: discharges from the circulating water system, discharges from the service water system and discharges from the steam generator blowdown system. Maintenance chemicals shall be defined as any man-induced additives that may be added to the referenced waste streams.

   a. Detectable amounts, at or above the most sensitive analytical methods in 40 CFR Part 126, of any of the one hundred and twenty-six priority pollutants, except chromium and zinc, is prohibited in the discharge, if the pollutants are present due to the use of maintenance chemicals.

   b. Slimicides, algicides and biocides are to be used in accordance with registration requirements of the Federal Insecticides, Fungicide and Rodenticide Act.

   c. The use of maintenance chemicals containing bis(tributyltin) oxide is prohibited.

   d. Any maintenance chemicals added must degrade readily, either due to hydrolytic decomposition or biodegradation.

   e. Discharges of maintenance chemicals added to waste streams must be limited to concentrations which protect indigenous aquatic populations in the receiving stream.

   f. The permittee must keep the following documentation on-site for each maintenance chemical used. The information shall be made available for on-site review by Department personnel during normal working hours.

      (1) Material Safety Data Sheets (MSDS) including name, general composition, and aquatic toxicity information (i.e., NOEC or LC50) for each chemical used;
      (2) Quantity of each chemical used,
      (3) Frequency and location of use (including outfall to which it flows), and
      (4) Information, samples and/or calculations which demonstrate compliance with items (a) – (e) above.

   g. The permittee shall submit the information in (f) above with each permit renewal application.

h. The Department may request submittal of the information in (f) above at any time to determine permit compliance and may modify this permit to include additional monitoring and/or limitations as necessary to protect water quality.

5. No later than 2 years after the commencement of discharge, the permittee must fully complete and submit an EPA Application Form 2C for each outfall in accordance with Regulation 61-9.122.21(k)(5)(vi). The permittee shall use the most sensitive analytical methods in 40 CFR Part 126 to complete the Form 2C.

6. This permit may be reopened to change or remove limitations for total phosphorus based on an evaluation of the ambient instream total phosphorus and whether the discharge has the reasonable potential to cause or contributes to a water quality violation in accordance with Regulation 61-9.122.44(d) and the modification is in accordance with Regulation 61-9.122.62.

B. Whole Effluent Toxicity and Other Biological Requirements

1. Acute Toxicity

Not applicable to this permit.

2. Chronic Toxicity (For the requirements identified in Part III.B)

a. A *Ceriodaphnia dubia* three brood chronic toxicity test shall be conducted at the frequency stated in Part III.B, Effluent Toxicity Limitations and Monitoring Requirements, using the chronic test concentration (CTC) of 15.2% and the following test concentrations: 0% (control), 3%, 7%, 15.2%, 42% and 100% effluent. The permittee may add additional test concentrations without prior authorization from the Department provided that the test begins with at least 10 replicates in each concentration and all data is used to determine permit compliance.

b. The test shall be conducted using EPA Method 1002.0 in accordance with "Short-Term Methods for Estimating Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms," EPA/821/R-02/013 (October 2002).

c. The permittee shall use the linear interpolation method described in "Short-Term Methods for Estimating Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms," EPA/821/R-02/013 (October 2002), Appendix M to estimate the percent effect at the CTC according to the equations in d below.

d. The linear interpolation estimate of percent effect is $\left(1-\frac{M_{CTC}}{M_1}\right)*100$ if the CTC is a tested concentration.

Otherwise, it is $\left(1-\frac{M_J-\frac{M_{J+1}-M_J}{C_{J+1}-C_J}*C_J+\frac{M_{J+1}-M_J}{C_{J+1}-C_J}*CTC}{M_1}\right)*100.$

e. A test shall be invalidated if any part of Method 1002.0 is not followed or if the laboratory is not certified at the time the test is conducted.

f. All valid toxicity test results shall be submitted on the DHEC Form 3880 (08/2005) entitled "DMR Attachment for Toxicity Test Results" in accordance with Part II.L.4. In addition, results from all invalid tests must be appended to DMRs, including lab control data. The permittee has sole responsibility for scheduling toxicity tests so as to ensure there is sufficient opportunity to complete and report the required number of valid test results for each monitoring period.

g. The permittee is responsible for reporting a valid test during each monitoring period. However, the Department acknowledges that invalid tests may occur. All of the following conditions must be satisfied for the permittee to be in compliance with Whole Effluent Toxicity (WET) testing requirements for a particular monitoring period when a valid test was not obtained.

(1) A minimum of three (3) tests have been conducted which were invalid in accordance with Part V.B.1.e above;

(2) The data and results of all invalid tests are attached to the DMR;

(3) At least one additional State-certified laboratory was used after two (2) consecutive invalid tests were determined by the first laboratory. The name(s) and lab certification number(s) of the additional lab(s) shall be reported in the comment section of the DMR; and

(4) A valid test was reported during each of the previous three reporting periods.

If these conditions are satisfied, the permittee may enter "H" in the appropriate boxes on the toxicity DMR and add the statement to the Comment Section of the DMR that "H indicates invalid tests."

h. This permit may be modified based on new information that supports a modification in accordance with Regulation 61-9.122.62 and Regulation 61-68.D.

C. Groundwater Requirements

Not applicable to this permit.

D. Sludge Requirements

1. Sanitary wastewater sludges shall be disposed of at the Town of Whitmire wastewater treatment plant in accordance with the agreement/approval letter from the receiving facility dated January 18, 2012. The permittee shall apply in writing to the DHEC/Bureau of Water requesting written approval prior to disposal of other sludges or use of other sludge disposal methods. A letter of acceptance from the facility that will accept the sludge for disposal or reuse shall be included with the request.

2. Odor Requirements

a. The permittee shall not cause, allow, or permit emission into the ambient air of any substance or combinations of substances in quantities that an undesirable level of odor is determined to result unless

preventative measures of the type set out below are taken to abate or control the emission to the satisfaction of the Department. Should an odor problem come to the attention of the Department through field surveillance or specific complaints, the Department may determine, in accordance with section 48-1-120 of the Pollution Control Act, if the odor is at an undesirable level by considering the character and degree of injury or interference to:

(1) The health or welfare of the people;

(2) Plant, animal, freshwater aquatic, or marine life;

(3) Property; or

(4) Enjoyment of life or use of affected property.

b. Should the Department determine that an undesirable level of odor exists, the Department may require:

(1) The permittee to submit a corrective action plan to address the odor problem,

(2) Remediation of the undesirable level of odor within a reasonable timeframe, and

(3) In an order, specific methods to address the problem.

E. Other Conditions

1. The wastewater treatment systems are assigned a classification of Group III-Biological. This classification corresponds to an operator with a Grade of B-Biological.

2. The permittee shall maintain an all weather access road to the wastewater treatment plant and appurtenances at all times.

3. The permittee shall continue to maintain a Best Management Practices (BMP) plan to identify and control the discharge of significant amounts of oils and the hazardous and toxic substances listed in 40 CFR Part 117 and Tables II and III of Appendix D to 40 CFR Part 122. The plan shall include a listing of all potential sources of spills or leaks of these materials, a method for containment, a description of training, inspection and security procedures, and emergency response measures to be taken in the event of a discharge to surface waters or plans and/or procedures which constitute an equivalent BMP. Sources of such discharges may include materials storage areas; in-plant transfer, process and material handling areas; loading and unloading operations; plant site runoff; and sludge and waste disposal areas. The BMP plan shall be developed in accordance with good engineering practices, shall be documented in narrative form, and shall include any necessary plot plans, drawings, or maps. The BMP plan shall be maintained at the plant site and shall be available for inspection by EPA and Department personnel.

4. The company shall notify the South Carolina Department of Health and Environmental Control in writing no later than sixty (60) days prior to instituting use of any additional maintenance chemicals in the cooling water system. Such notification shall include:
   a. Name and general composition of the maintenance chemical
   b. Quantities to be used

c. Frequency of use
d. Proposed discharge concentration
e. EPA registration number, if applicable
f. Aquatic toxicity information

5. Within 24 months of the effective date of this permit, the permittee shall submit to the Department an approvable sampling schedule to meet the conditions of this permit. The permittee shall monitor all parameters consistent with conditions established by this permit in accordance with the approved sampling schedule. If the approved sample day falls on a holiday, sampling shall be conducted on the next business day. If no discharge occurs on the approved sample day, the permittee shall collect an effluent sample during the reporting period on a day when there is a discharge or report "no discharge" for the reporting period for all parameters. Additional monitoring as necessary to meet the frequency requirements of this permit shall be performed by the permittee.

6. The permittee shall notify the affected downstream water treatment plant(s), including but not limited to the City of Columbia (S40101 Canal Plant), the City of Cayce (S32109 Congaree River) and the City of West Columbia (S32102 Saluda River), of any emergency condition, plant upset, bypass or other system failure which has the potential to affect the quality of water withdrawn for drinking water purposes. This notification should be made as soon as possible and in anticipation of such event, if feasible, without taking away from any response time necessary to attempt to alleviate the situation.

7. The storm water discharging from this site is covered by the NPDES General Permit for Storm Water Discharges Associated with Industrial Activity via coverage #SCR005088.

8. The discharge of any waste resulting from the combustion of chemical metal cleaning wastes, toxic wastes, or hazardous wastes to any waste stream which ultimately discharges to waters of the State is prohibited.

9. This permit hereby incorporates Condition 14 of the 401 Water Quality Certification issued on December 16, 2011 which reads, "SCE&G must perform the proposed water quality, fish population, macroinvertebrate population, and sediment monitoring as proposed in the submission dated September 16, 2011, with the subsequent revisions agreed to in coordination with the commenting resource agencies."

10. Mixing verification study for Outfall 001:

    a. No later than 60 days after commencement of the discharge, the permittee shall submit to the Department a mixing verification study plan for review and approval to confirm the whole effluent toxicity (WET) chronic test concentration (CTC) identified in Part III.B.1 and to aid in determining if additional or other requirements on WET are needed. The study plan shall include the following information, at a minimum:

        (1) A copy of the diffuser design (as-built) drawings or other drawings accurately depicting the diffuser location and dimensions in the creek at low flow conditions. Plan and profile drawings of the diffuser are needed.

        (2) Identify the type of mixing study to be performed and how the information will be used to identify the test concentrations. Typically, a dye or conductivity tracer study is used.

        (3) A description of how the mixing zone criteria in R.61-68.C.10 will be met.

(4) A diagram of proposed sampling locations in the Parr Reservoir. The area to be sampled shall include samples to be taken upstream, downstream (at least twice the stream width in length), and across the width of the stream, and

(5) Other information which may be pertinent to the study.

b. Once approved by the Department, the study shall be conducted during low flow conditions, as close to critical low flow (7Q10) as possible. All diffuser ports shall be operational at the time of the study and the facility shall be discharging at or near normal conditions.

c. No later than one year after commencement of the discharge, the permittee shall submit all results of the mixing verification study in a report to the Department. The report shall provide the following information, at a minimum:

(1) The chronic and acute whole effluent toxicity test concentrations and an explanation of how they were determined.

(2) The results of all sampling conducted instream or otherwise during the study

(3) Completion of the Mixing Zone Request Form/NPDES Supplement, and

(4) Other information which may be pertinent to the study.

d. The information required herein will be used to determine future permitting requirements for whole effluent toxicity (WET). The permit may be modified based on the results of the study.

11. Cooling Water Intake Structure Requirements

a. The location, design, construction and capacity of the cooling water intake structure must comply with 40 CFR Part 125.80 through 125.89 and Section 316(b) of the Clean Water Act. The intake structure must employ the best technology available and be operated in such a way to minimize adverse environmental impacts associated with the use of the cooling water intake structure. The permittee shall locate, construct and operate the cooling water intake structure in accordance with the 316(b) Evaluation Report dated March 2011 for this facility. The permittee shall at all times properly operate and maintain all intake equipment. No change in the location, design, capacity and/or operation of the intake structure can be made without prior approval from the Department.

b. Implementation of Technology Requirements

(1) The technology(ies) and operational measures proposed in the Design and Construction Technology Plan shall be implemented.

(2) The circulating water system shall be a closed-cycle recirculating cooling water system.

(3) The cooling water intake structure at the facility shall be constructed to a maximum through-screen velocity of 0.5 fps.

(4) The total design intake flow must not disrupt the natural thermal stratification or turnover pattern (where present) of the source water.

(5) The permittee must select and implement design and construction technologies and operational measures for minimizing impingement mortality of fish and shellfish if:

(a) Based on any information submitted by any fishery management agency(ies) or other relevant information, there are migratory and/or sport or commercial species of impingement concern to the Department, which pass through the hydraulic zone of influence of the cooling water intake structure; or
(b) It is determined by the Department, based on any information submitted by any fishery management agency(ies) or other relevant information, that the proposed facility, after meeting the technology-based performance requirements of paragraphs 2, 3 and 4 of this section, would still contribute unacceptable stress to the protected species, critical habitat of those species, or species of concern.

Based on the Department's findings, implementation of technologies and operational measures for minimizing impingement mortality of fish and shellfish may be required.

(6) The permittee must select and implement design and construction technologies or operational measures for minimizing entrainment of entrainable life stages of fish and shellfish if:

Based on information submitted by any fishery management agency(ies) or other relevant information, there are or would be undesirable cumulative stressors affecting entrainable life stages of species of concern to the Department and the Department determines that the proposed facility, after meeting the technology-based performance requirements in paragraphs 2, 3 and 4 of this section, would still contribute unacceptable stress to the protected species , critical habitat of those species, or these species of concern.

Based on the Department's findings, implementation of technologies and operational measures for minimizing entrainment of entrainable life stages of fish and shellfish may be required.

c. Monitoring Requirements

(1) Biological Monitoring

The permittee shall monitor both impingement and entrainment of the commercial, recreational, and forage base fish and shellfish species identified in the Source Water Baseline Biological Characterization (Track I) required by 40 CFR 122.21(r)(3). The permittee shall conduct monitoring in accordance with the following procedures upon startup of operation of the cooling water intake structure:

(a) The permittee shall collect samples to monitor impingement rates (simple enumeration) for each species over a 24-hour period and no less than once per month when the cooling water structure is in operation.

(b) The permittee shall collect samples to monitor entrainment rates (simple enumeration) for each species over a 24-hour period and no less than twice per calendar month with sampling events performed at least seven days apart during the primary period of reproduction, larval recruitment, and peak abundance identified in the Source Water Baseline Biological Characterization (Track I). Samples shall be collected only when the cooling water intake structure is in operation.

Biological monitoring shall occur throughout the permit term at the specified frequencies unless this permit is modified to allow less frequent sampling based on a written request by the permittee following no less than two years of monitoring.

(2) Velocity Monitoring

The permittee shall monitor head loss across the screens and correlate the measured value with the design intake velocity. The head loss across the intake screens must be measured at the minimum ambient source water surface elevation (best professional judgment based on available hydrological data). The maximum head loss across the screen for each cooling water intake structure must be used to determine compliance with the 0.5 fps performance requirement. Monitoring shall be conducted daily at startup of the facility for the first two weeks, and at least once per month thereafter.

(3) Visual inspections of the cooling water intake structure(s) must be conducted weekly, at a minimum, to ensure that intake structure technologies are maintained and operated to ensure that they will continue to function as designed. Inspections may be performed using remote monitoring devices in lieu of visual inspections. Inspections shall only be conducted when the cooling water intake structure is in operation.

(4) Within twenty-four (24) months from the effective date of this permit, the permittee shall submit a monitoring plan to the Department for approval, prior to conducting monitoring. Upon approval of the Department, the permittee shall implement the approved monitoring plan. Changes to an approved monitoring plan must be reviewed and approved by the Department prior to being instituted.

d. Record Keeping Requirements

(1) The permittee shall keep records of all data used to complete the permit application, supplemental reports and information, and compliance monitoring data specified in Part V.E.11.b above for a period of at least three years from the date of permit issuance.

(2) The following information shall be submitted to the Department in a yearly status report:

(a) Biological monitoring records for each cooling water intake structure required by Part V.E.11.c(1) above;

(b) Velocity and head loss monitoring records for each cooling water intake structure required by Part V.E.11.c(2) above; and

(c) Records of visual or remote inspections as required by Part V.E.11.c(3) above.

All annual reports shall be submitted to the Department no later than April 1st of each calendar year, for the period of January 1st through December 31st of the previous calendar year. The permittee shall begin to submit annual reports once one of the new units is operational.

12. The discharge of metal cleaning or chemical metal cleaning wastes is prohibited by this permit. The permittee shall apply for pump and haul approval in accordance Regulation 61-67.300.G.2 prior to disposal of the metal cleaning or chemical metal cleaning wastes offsite.

13. Beginning on the effective date of this permit, the permittee shall conduct background quarterly instream monitoring for one year for the following parameters (upstream of the proposed discharge): antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium and zinc. The permittee shall submit the results to the Department within 60 days of completion of the monitoring. This permit may be reopened to change, add or remove monitoring requirements and/or limitations based on an evaluation of this data.

14. No later than 60 days prior to commencement of the discharge, the permittee shall submit to the Department a study plan for instream total phosphorus monitoring.

Appendix F

NRC Notice of Violation for VCS Units 2 & 3

UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

November 14, 2012

Mr. Ronald A. Jones
Vice President, New Nuclear Operations
South Carolina Electric and Gas
P.O. Box 88 (Mail Code P40)
Jenkinsville, SC 29065-0088

SUBJECT: SOUTH CAROLINA ELECTRIC AND GAS V.C. SUMER NUCLEAR STATION UNITS 2 AND 3 - NRC INSPECTION REPORT 05200027/2012004, 05200028/2012004, AND NOTICE OF VIOLATION

Dear Mr. Jones:

On September 30, 2012, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your V.C. Summer Nuclear Station Units 2 and 3. The enclosed inspection report documents the inspection results, which were discussed on October 9, 2012, with Mr. Ron Clary, Vice President New Nuclear Development, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents three findings of very low safety significance that were determined to involve violations of NRC requirements. Also, a licensee-identified violation which was determined to be of very low safety significance is listed in this report. The violations were evaluated in accordance with the NRC Enforcement Policy, Section 2.3 and the temporary enforcement guidance outlined in enforcement guidance memorandum number EGM-11-006. The current Enforcement Policy is included on the NRC's Web site at http://www.nrc.gov/about-nrc/regulatory/enforcement/enforce-pol.html. The violations are cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them are described in detail in the enclosed report. As described in Section 2.3, "Disposition of Violations," of the NRC Enforcement Policy, the violations are cited in the Notice, because for reactor facilities under construction in accordance with 10 CFR Part 52, the site corrective action program must have been demonstrated to be adequate prior to the issuance of non-cited violations for NRC identified violations. As of this inspection, the NRC had not yet made this determination for V.C. Summer Nuclear Station Units 2 and 3.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. If you have additional information that you believe the NRC should consider, you may provide it in your response to the Notice. The NRC review of your response to the Notice will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements. If you contest the violation or

significance of the NOV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to: (1) the Regional Administrator, Region II; (2) the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and (3) NRC Senior Resident Inspector at V.C. Summer Nuclear Station Units 2 and 3.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Michael Ernstes, Chief
Construction Projects Branch 4
Division of Construction Projects

Docket Nos.: 05200027, 05200028
License Nos: NPF-93 (Unit 2), NPF-94 (Unit 3)

Enclosure: Inspection Report 05200027/2012004 and 05200028/2012004
w/Attachment: Supplemental Information

cc w/encl: ***(Note: Use normal distribution list***

significance of the NOV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001, with copies to: (1) the Regional Administrator, Region II; (2) the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and (3) NRC Senior Resident Inspector at V.C. Summer Nuclear Station Units 2 and 3.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Website at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

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Division of Construction Projects

Docket Nos.: 05200027, 05200028
License Nos: NPF-93 (Unit 2), NPF-94 (Unit 3)

Enclosure: Inspection Report 05200027/2012004 and 05200028/2012004
w/Attachment: Supplemental Information

cc w/encl: ***(Note: Use normal distribution list***

P PUBLICLY AVAILABLE ■NON-PUBLICLY AVAILABLE ☐ SENSITIVE ■ NON-SENSITIVE
ADAMS: ☐ Yes ACCESSION NUMBER: **ML12319A648** P SUNSI REVIEW COMPLETE P FORM 665 ATTACHED

OFFICE	RII:DCP	RII:DCP	RII:DCP	RII:DCP	RII:DCP	RII:DCP	RII:DCI
SIGNATURE	RLJ3	PBD1	MSM4	CBA1	GJK3	MEE	JXK1
NAME	R. Jackson	P. Donnelly	M. Magee	C. Abbott	G. Khouri	M. Ernstes	K. Jonathan
DATE	11/13/2012	11/13/2012	11/14/2012	11/14/2012	1114 /2012	11/14/2012	11/13/2012
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	RII:DCP	RII:DCP	YES NO
OFFICE	RII:DCI	RII:DCI	RII:DCI	RII:DCI	RII:DCI	RII:DCI	RII:DCI
SIGNATURE	EXR4	CNO1	EJP1	AFP1	ASA1	JGV1	GLS3
NAME	E. Heher	C. Oelstrom	E. Patterson	A. Ponko	A. Artayet	j. Vasquez	G. Stirewalt
DATE	11/13/2012	11/14/2012	11/13/2012	11/14/2012	11/13/2012	11/13/2012	11/14/2012
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	Yes NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: G:\CCI\DCP\CPB2\2012\2012 Construction End-Of-Cycle Review Guidance Memo - 11-07-2012 rev2.docx

Letter to Ronald A. Jones from Michael E. Ernstes dated November 14, 2012

SUBJECT: SOUTH CAROLINA ELECTRIC AND GAS V.C. SUMER NUCLEAR STATION UNITS 2 AND 3 - NRC INSPECTION REPORT 05200027/2012004, 05200028/2012004, AND NOTICE OF VIOLATION

DISTRUBUTION w/encl:
Region II Regional Coordinator, OEDO (M. Kotzalas)
M. Brown, NRO
T. Kozak, NRO
M. Tonacci, NRO
D. McGovern, NRO
J. Munday, RII
R. Haag, RII
C. Ogle, RII
J. Yerokun, RII
M. Ernstes, RII
S. Freeman, RII
C. Evans, RII
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PUBLIC

NOTICE OF VIOLATION

South Carolina Electric & Gas Company
V.C. Summer Units 2 and 3

Docket Nos.: 052-00027, 052-00028
License Nos.: NPF-93, NPF-94

During an NRC inspection conducted between July 1, 2012, and September 30, 2012, three violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the violations are listed below:

1. Criterion III, "Design Control," of Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the Code of Federal Regulations (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," requires, in part, that "Measures shall be established to assure that applicable regulatory requirements and the design basis for safety-related structures, systems, and components are correctly translated into specifications, drawings, procedures, and instructions."

   Section 3.8.4.4.1, "Seismic Category I Structures," of the V.C. Summer Units 2 and 3 Updated Final Safety Analysis Report (UFSAR) required that Seismic Category I Structural Submodules CA20-29 and CA01-24 be designed in accordance with American Concrete Institute (ACI) 349-01, "Code requirements for Nuclear Safety Related Concrete Structures," and American Institute of Steel Construction (AISC) N690-94, "Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities."

   Contrary to the above, on and before May 10, 2012, the licensee failed to assure that applicable regulatory requirements and the design basis for safety-related systems, structures, and components were correctly translated into specifications, drawings, and instructions. As evidenced by the following examples, the licensee failed to translate the regulatory and design basis requirements established, in part, by ACI 349-01, and AISC N690-94 into specifications, drawings, and instructions for the design and fabrication of Seismic Category I Structural Submodules CA20-29 and CA01-24:

   a. The licensee failed to properly translate design requirements into design specifications, which resulted in Seismic Category I Structural Submodule CA01-24 containing shear studs that exceeded the maximum design spacing as specified by UFSAR Figure 3.8.3.8, Sheet 1 of 3. Specifically, the inspectors identified 5/8 inch shear studs located approximately 8 inches away from the plate edge for the CA01-24 sub-module. Once the adjacent sub-module would be joined to CA01-24, the distance between stud rows adjacent to the seam would exceed the maximum spacing requirements as specified by the UFSAR. As a result, the as-built configuration of Submodule CA01-24 failed to meet UFSAR maximum shear stud spacing requirements due to the spacing of shear studs near the plate edge.

   b. The licensee failed to properly translate design requirements into design specifications which resulted in Seismic Category I Structural Submodule CA20-29 containing shear studs which did not meet the minimum allowable spacing as required by AISC N690-94. Specifically, AISC N690-94 states that the transverse spacing for the 5/8 inch shear studs on submodule CA20-29 should have been no closer than 2.5 inches center to center. However, the as-built configuration of CA20-29 contained two rows of 5/8 inch shear studs that were located approximately 1.75 inches center-to-center.

This violation is associated with a Green SDP ITAAC finding.

2. Criterion III, “Design Control,” of Appendix B, “Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,” to Title 10 of the Code of Federal Regulations (10 CFR) Part 50, “Domestic Licensing of Production and Utilization Facilities,” requires, in part, that “Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 10CFR50.2 and as specified in the license application, for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions.”

   Section 6.1.2.1.6 of the UFSAR states “The inorganic zinc coating used on the inside surface (Service Level I coatings) and outside surface (Service Level III coatings) of the containment shell is inspected using a non-destructive dry film thickness test and a MEK rub test.”

   Contrary to the above, on or before July 20, 2012, the licensee failed to ensure that the testing described in the license application was correctly translated into specifications. Specifically, WEC Specification APP-GW-Z0-604 REV 6, Application of Protective Coatings to Systems, Structures, and Components for the AP1000 Reactor Plant, did not include provisions to perform the MEK rub test for either Unit 2 or 3.

   This violation is associated with a Green SDP construction finding.

3. Criterion VII, “Control of Purchased Material, Equipment, and Services,” of Appendix B, “Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,” to Title 10 of the Code of Federal Regulations (10 CFR) Part 50, “Domestic Licensing of Production and Utilization Facilities,” states, in part, that “Measures shall be established to assure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents. These measures shall include provisions, as appropriate, for source evaluation and selection, objective evidence of quality furnished by the contractor or subcontractor, inspection at the contractor or subcontractor source, and examination of products upon delivery.”

   Contrary to the above, as of August 7, 2012, the licensee, through its contractor Shaw, failed to perform adequate examinations of products upon delivery to assure that purchased materials conformed to the procurement documents. Specifically, during source and receipt inspections, Shaw failed to identify that embed plates did not conform to the following procurement documents for embed plates: purchase order 132177-D220.00 and APP-SS01-Z0-003, “Embedded and Miscellaneous Steel, Westinghouse Safety Class C,” Revision 2.

   This violation is associated with a Green SDP construction finding.

Pursuant to the provisions of 10 CFR 2.201, South Carolina Electric and Gas Company is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory

Commission, ATTN: Document Control Desk, Washington, DC 20555-0001 with a copy to the Regional Administrator, Region II, and a copy to the NRC Resident Inspector at the facility that

is the subject of this Notice, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation or severity level, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken, and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response, with the basis for your denial, to the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS), accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that delete such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

In accordance with 10 CFR 19.11, you may be required to post this Notice within two working days.

Dated this 14th day of November, 2012

U.S. NUCLEAR REGULATORY COMMISSION
Region II

Docket Numbers:	05200027; 05200028
License Numbers:	NPF-93 (Unit 2), NPF-94 (Unit 3)
Report Numbers:	05200027/2012-004; 05200028/2012-004
Licensee:	South Carolina Electric and Gas
Facility:	V.C. Summer Nuclear Station Units 2 and 3
Location:	Jenkinsville, SC
Inspection Dates:	July 1, 2012 through September 30, 2012
Inspectors:	R. Jackson, Senior Resident Inspector, DCP P. Donnelly, Resident Inspector, DCP M. Magee, Resident Inspector, DCP C. Abbott, Resident Inspector, DCP A. Artayet, Senior Construction Inspector, DCI B. Davis, Senior Construction Inspector, DCI D. Harmon, Construction Inspector, DCI E. Heher, Construction Inspector, DCI C. Oelstrom, Construction Inspector, DCI E. Patterson, Construction Inspector, DCI A. Ponko, Construction Inspector, DCI S. Smith, Senior Construction Inspector, DCI T. Steadham, Senior Construction Project Inspector, DCP G. Stirewalt, Senior Geologist, DSEA J. Vasquez, Construction Inspector, DCI
Accompanying Personnel:	R. Payne, Summer Intern Engineer (trainee), DCI
Approved by:	Michael Ernstes, Chief Construction Projects Branch 4 Division of Construction Projects

SUMMARY OF FINDINGS

Inspection Report (IR) 05200027/2012004, 05200028/2012004; 07/01/2012 through 09/30/2012; V.C. Summer Nuclear Station Units 2 and 3; Unit 2 ITAAC 760 (3.3.00.02a.i.a), Unit 2 ITAAC 763 (3.3.00.02a.i.d), Quality Assurance Program Implementation During Construction and Pre-Construction Activities.

This report covers a three-month period of inspection by resident inspectors, announced programmatic inspections by regional and headquarters inspectors, and announced Inspections, Tests, Analysis, and Inspection Criteria (ITAAC) inspections by regional inspectors. Three Green findings associated with three notices of violation were identified consistent with the Nuclear Regulatory Commission (NRC) Enforcement Policy, Section 2.3 and the temporary enforcement guidance outlined in enforcement guidance memorandum number EGM 11-006. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 2519P, "Construction Significance Determination Process". Construction Cross Cutting Aspects are determined using IMC 0613P, "Power Reactor Construction Inspection Reports - Pilot." The NRC's program for overseeing the construction of commercial nuclear power reactors is described in IMC 2506, "Construction Reactor Oversight Process General Guidance and Basis Document."

A. NRC-Identified and Self Revealed Findings

Cornerstone: Design/Engineering

- Green. The inspectors identified an ITAAC finding of very low safety significance (Green) and associated cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to assure that regulatory requirements and the design basis for systems, structures, and components were correctly translated into drawings and procedures associated with the shear stud spacing for Unit 2 safety related sub-modules. The licensee entered this issue into their corrective action program as PIP-0-L-12-0251 to evaluate the issue and to develop and implement corrective actions to address the violation.

  The performance deficiency was considered more than minor because it could adversely affect the closure of Unit 2 ITAAC 3.3.00.02a.i.a and 3.3.00.02a.i.d and was associated with the Design/Engineering cornerstone. The finding was evaluated under the construction significance determination process as outlined in IMC 2519P, Appendix A. The finding was of very low safety significance (Green) because the performance deficiency did not impair the design function of the structure. The inspectors determined that this finding was not related to any of the construction safety focus component aspects discussed in IMC 0613P. (Section 2503.6)

Cornerstone: Construction/Installation

- Green. The inspectors identified a Green construction finding and cited violation of 10 CFR 50, Appendix B, Criterion III, "Design Control," for the failure to ensure that an element of the design basis (methyl ethyl ketone rub test), as specified in the license application, was correctly translated into specifications. This issue was entered into the

- corrective action program as IR-12-216-M010 and CR-2012-00499 to evaluate the issue and to develop and implement corrective actions to address the violation.

  This performance deficiency had greater than minor safety significance because the failure to perform the rub test, if left uncorrected, represented a failure to establish, implement or maintain an adequate process, program, procedure, or quality oversight function that could render the quality of the construction activity unacceptable or indeterminate. Specifically, the rub test, if left unperformed, represented a failure to ensure that the coating would be adequately cured and that the coating would perform its intended safety function. The finding was associated with the construction/installation cornerstone and was evaluated under the construction significance determination process as outlined in IMC 2519P, Appendix A. The inspectors determined the finding was of very low safety significance (Green) because the finding was associated with a system in the low risk column of the risk importance table and was not a repetitive significant condition adverse to quality. The inspectors determined that this finding had a cross-cutting aspect in the area of Baseline Inspection, Resources (A.2.b), because the licensee did not ensure that procedures were available and adequate to assure construction quality. (Section 4OA2.4)

Cornerstone: Procurement/Fabrication

- Green. The inspectors identified a Green construction finding and cited violation of 10 CFR 50, Appendix B, Criterion VII, "Control of Purchased Material, Equipment, and Services," for the licensee's failure to assure that purchased material and equipment (embedded plates), purchased through contractors and subcontractors, conformed to procurement documents. The licensee entered this issue into their corrective action programs as VCS-ND-12-0419 and CR 0-L-2012-0583 to evaluate the issue and to develop and implement corrective actions to address the violation.

  The performance deficiency was considered more than minor because, if left uncorrected, it represented a failure to establish and implement an adequate program and quality oversight function that could render the quality of construction activities unacceptable or indeterminate. The finding was associated with the procurement/fabrication cornerstone and was evaluated under the construction significance determination process as outlined in IMC 2519P, Appendix A. The inspectors determined the finding was of very low safety significance (Green) because the finding: (1) was associated with a structure (basemat) in the intermediate risk column of the risk importance table; and (2) impaired a portion of the structures design function. The inspectors determined that this finding had a cross-cutting aspect in the area of Baseline Inspection, Work Control (A.4.c), because the licensee did not ensure supervisory and management oversight of work activities, including contractors, such that construction quality is supported. (Section 4OA2.9)

B. Licensee-Identified Violations

A violation of very low safety significance that was identified by the licensee was reviewed by the inspectors. Corrective actions planned or taken by the licensee have been entered into the licensee's corrective action program. This violation and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

1. CONSTRUCTION REACTOR SAFETY

Cornerstones: Design/Engineering, Procurement/Fabrication, Construction/Installation, Inspection/Testing

2503 Inspection, Tests, Analysis, and Acceptance Criteria (ITAAC)-Related Work Inspections

.1 ITAAC Number 91 / Family 06F (Unit 2)

a. Inspection Scope

During the week of July 23, 2012, the inspectors performed a direct inspection of construction activities on the Unit 2 containment vessel associated with ITAAC Number 91 (2.2.01.02a):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
The components identified in Table 2.2.1-1 as ASME Code Section III are designed and constructed in accordance with ASME Code Section III requirements.	Inspection will be conducted of the as-built components as documented in the ASME design reports.	The ASME Code Section III design reports exist for the as-built components identified in Table 2.2.1-1 as ASME Code Section III.

The inspectors used the following NRC inspection procedures to perform these inspections:

- 65001.F, “Inspection of the ITAAC-Related Design and Fabrication Requirements,” Section 02.03;
- 65001.06, “Inspection of ITAAC-Related Installation of Mechanical Components,” Sections 02.01 and 02.02; and
- 65001.11, “Construction Inspection Program Inspection of ITAAC-Related Containment Integrity and Containment Penetrations,” Sections 02.01 thru 02.05.

The inspectors reviewed 16 Certified Material Test Reports (CMTRs) to determine if materials for four shell plates and eight mechanical penetrations (P06 through P10, P12, P37 and P38 that included two insert plates, eight sleeves, and three pipes) met the requirements of American Society of Mechanical Engineers (ASME) Code Section II, Part A and Section III, Subsection NE.

The inspectors reviewed the record of a Quality Control (QC) Inspector to determine if his nondestructive examination (NDE) liquid penetrant examination (PT) Level II personnel certification met the requirements of Chicago Bridge and Iron’s (CB&I’s) Written Practice for NDE personnel qualifications.

The inspectors reviewed CB&I performance qualification test records for two welders and two welding operators who welded full penetration butt joints on the S1 lowest shell

course to determine if they were qualified and certified in accordance with the requirements of ASME Section IX.

The inspectors reviewed a CB&I postweld heat treatment (PWHT) procedure that referenced two procedures used for welding thermocouples and insulation pins to the pressure boundary of the shell to determine if the procedures were in accordance with the requirements of ASME Section III, Subsection NE.

The inspectors reviewed a sample of three IHI design reports documented on ASME N-2 data report forms for the Unit 2 S1 lowest shell course plates B2-A4, B2-A5, and B2-A12 (included eight mechanical penetrations P06 thru P10, P12, P37 and P38) to determine if those nuclear parts were constructed in accordance with the requirements of ASME Section III, Subsection NE and the Westinghouse Electric Company (WEC) design and material specifications.

b. Findings

No findings were identified.

.2 ITAAC Number 93 / Family 06B (Unit 2)

a. Inspection Scope

During the week of July 23, 2012, the inspectors performed a direct inspection of CB&I construction activities on the Unit 2 containment vessel associated with ITAAC Number 93 (2.2.01.03a):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
Pressure boundary welds in components identified in Table 2.2.1-1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non destructive examination of pressure boundary welds.

The inspectors used the following NRC inspection procedures to perform these inspections:

- 65001.B, “Inspection of the ITAAC-Related Welding Program,” Sections 02.01 through 02.06;
- 65001.F, Section 02.03;
- 65001.06, Sections 02.01 and 02.02; and
- 65001.11, Sections 02.01 thru 02.05.

Procurement and Receipt Inspection:

The inspectors reviewed 16 CMTRs on the following items that were receipt inspected to determine if the chemical composition and mechanical properties (including applicable strength, impact testing, grain size, carbon equivalency, Brinnell hardness, heat

treatment, and degassing process) met the requirements of the ASME Section III, Subsection NE code and WEC containment vessel design and material specifications:

- Lower ring S-1 lowest course plates B2-A4, -A5, -A11 and -A12 of the shell; and
- 8 mechanical penetration sleeves P06 through P10, P12, P37 and P38 welded by IHI to shell plate B2-A12.

Procedure Reviews:

The inspectors reviewed procedure CMS-830-15-PR-45162, Liquid Penetrant Examination Color Contrast, Solvent Removable, ASME Section III, Division 1, Revision 1 to determine if it was prepared and approved in accordance with the requirements of the CB&I Nuclear Quality Assurance Manual (NQAM) and ASME Section V – Article 6 for liquid penetrant examinations.

The inspectors reviewed procedure CMS-830-15-WI-81026, Calibration of Temperature Recorders, Revision 1 to determine if it was prepared and approved in accordance with the requirements of the CB&I NQAM and ASME Section III, Subsections NE and NCA.

The inspectors reviewed the following welding procedures to determine they were prepared and approved in accordance with the requirements of ASME Section III, Subsection NE for PWHT operations:

- WPS “TAU’” Revision 1 for the temporary attachment of type “K” thermocouples; and
- WPS “PIN’” Revision 1, for the temporary attachment of insulation pins.

The inspectors reviewed CMS-164621-830-15-PR-000001, Post Weld Heat Treat Procedure Shell Course S1 Vertical Seams, Revision 1, to determine if the contents for electric resistance heating were in accordance with the requirements of ASME Section III, Subsection NE for the minimum heat band width, heating rate, holding temperature and time, and cooling rate.

Welder/Operator Qualifications:

The inspectors reviewed performance qualification records for two manual welders using shielded metal arc welding and two welding operators using mechanized flux-cored arc welding (FCAW) to determine if welding personnel were qualified and maintained their skills to perform welding activities on field welds “N” and “D” for the S1 lowest shell course in accordance with the requirements of ASME Section III, Subsection NE and Section IX.

Production Controls:

The inspectors reviewed a weld traveler after completion of field weld “N” (shell plates A11 to A12) for the S1 lowest shell course to determine if welding operators and weld filler metals were documented for traceability, and that the QC, WEC and Authorized Nuclear Inspector established inspection hold/witness points were completed in accordance with the requirements of the CB&I NQAM and ASME Section III, Subsection NE.

The inspectors reviewed shell plate material thickness measurements recorded in the weld traveler for field weld “N” to determine if the recorded thicknesses were in accordance with the WEC containment vessel design specifications.

The inspectors observed in-process welding of field weld “D” (shell plates A4 to A5) for the S1 lowest shell course to determine if field welding activities met the requirements of the welding procedure using a weld traveler with established inspection hold/witness points in accordance with the requirements of the CB&I NQAM and ASME Section III, Subsection NE, including weld interpass cleanliness.

The inspectors reviewed the Preheat-Interpass Monitoring Log – Traveler System for field weld “D” to determine if preheat and interpass temperatures were monitored by QC personnel in accordance with procedure CMS-720-03-PR-09651, Preheat/Interpass Temperature Control, and ASME Section III, Subsection NE.

The inspectors reviewed a calibration record for the digital temperature data logger (S/N 14121) to determine if the PWHT recorder was calibrated in accordance with the requirements of the CB&I NQAM and calibration procedure, and ASME Section III, Subsection NCA-3858.

The inspectors reviewed the PWHT strip charts of field welds “N” and “M” (shell plates A10 to A11) accepted by the CB&I Quality Manager to determine if electric resistance heating controls were in accordance with ASME Section III, Subsection NE and the CB&I NQAM and PWHT procedures.

Inspections/Nondestructive Examinations:

The inspectors observed in-process PT (after PWHT) of field weld “N” (shell plates A11 to A12) for the S1 lowest shell course to determine if examination activities met the requirements of the CB&I NDE-PT procedure CMS-830-15-PR-45162 and ASME Section V – Article 6 for PT.

The inspectors reviewed the following for field weld “N”:

- “Visual Acuity and Shades of Gray Discrimination Test” records for the NDE-PT Level II QC Inspector-728683 to determine if he was certified in accordance with the CB&I Written Practice and ASME Section V, Article 6 and 9;
- Before and after PWHT X-ray radiography reports (VCS-U2-2012-RT-083 and VCS-U2-2012-RT-091, respectively) signed by a CB&I Level II film examiner to determine
- if the contents of the radiography reports were in accordance with ASME Section V, Article 2 for radiographic examination;
- Before and after PWHT X-ray films (including film density) to determine if radiography was performed and accepted in accordance with ASME Section V, Article 2 and ASME Section III – Subsection NE-5000, respectively.
- PT report VCS-U2-2012-PT-011 signed by a CB&I Level II QC Inspector to determine if the contents of the PT report were in accordance with ASME Section V, Article 6.

The inspectors reviewed final CB&I X-ray films (including film density and geometric unsharpness) and radiography reports signed by a Level II examiner for the following full

penetration butt joint welds on the Unit 2 containment vessel bottom head to determine if X-ray radiography was performed and accepted in accordance with ASME Section III, Subsection NE-5000:

- P11 fuel transfer tube penetration insert plate to shell (radiographic examination report VCS-U2-2012-RT-068);
- BH1 longitudinal seam Joint "A" (RT report VCS-U2-2012-RT-071); and
- BH1 to BH2 circumferential weld (RT report VCS-U2-2012-RT-080).

b. Findings

No findings were identified.

.3 ITAAC Number 93 / Family 06B (Unit 2)

a. Inspection Scope

During the week of August 27, 2012, the inspectors performed a direct inspection of CB&I construction activities on the Unit 2 containment vessel associated with ITAAC Number 93 (2.2.01.03a):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
Pressure boundary welds in components identified in Table 2.2.1-1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for non destructive examination of pressure boundary welds.

The inspectors used the following NRC inspection procedures to perform these inspections:

- 65001.B, Sections 02.04 and 02.05;
- 65001.F, Section 02.03;
- 65001.06, Sections 02.01 and 02.02; and
- 65001.11, Sections 02.03, 02.04, and 02.05.

Procurement and Receipt Inspection:

The inspectors reviewed six CMTRs on the following items that were receipt inspected and installed onsite to determine if the chemical composition and mechanical properties (including applicable strength, impact testing, grain size, carbon equivalency, Brinell hardness, heat treatment and degassing process) met the requirements of ASME Section III, Subsection NE code and WEC containment vessel design and material specifications:

- lower equipment hatch HO2 insert plate and sleeve;
- mechanical penetration sleeves P05, P27 and P28 welded by IHI to shell plate B2-A13; and

- Lincoln Electric flux cored wire.

The inspectors reviewed the magnetic particle examination records performed by IHI prior to shipment for the following items that were receipt inspected and installed onsite to determine if the tests were performed properly, if they were performed both before and after PWHT, and if they were performed in accordance with ASME Section III, Subsection NE code requirements:

- lower equipment hatch HO2 insert plate; and
- mechanical penetration sleeves P05, P27 and P28 in shell plate B2-A13.

Procedure Reviews:

The inspectors reviewed procedure, CMS-720-03-PR-09651, Preheat / Interpass Temperature Control, Revision 3, to determine if the in-process preheat and interpass temperature activities performed met applicable welding procedures and ASME Section III, Subsection NE requirements.

The inspectors reviewed procedure CMS-830-15-PR-45162, Liquid Penetrant Examination Color Contrast, Solvent Removable, ASME Section III, Division 1, Subsection NE, Revision 1, to determine if the procedure complied with ASME Section III, Subsection NE requirements.

Welder/Operator Qualifications:

The inspectors reviewed performance qualification records for two welders using FCAW on welds “E” and “F” for the containment vessel ring 1 B2-A5 Lower Equipment Hatch insert plate to determine if the welding personnel were qualified and maintained their skills to perform welding activities in accordance with the requirements of ASME Section III, Subsection NE, and Section IX.

Production Controls:

The inspectors observed in-process FCAW activities for the containment vessel ring 1 B2-A5 lower equipment hatch weld seams “E” and “F” to determine if the field welding activities met the requirements of the appropriate welding procedure. The inspectors reviewed controlled weld travelers B2A-S1-E-H02 and B2A-S1-F-H02 to determine if welding operators and weld filler metals were documented for traceability, and the QC, WEC, and Authorized Nuclear Inspector established inspection hold/witness points were completed in accordance with the requirements of the CB&I NQAM and ASME Section III, Subsection NE. In addition, the inspectors observed welding was performed under conditions suitable for welding and appropriate consideration was given to inclement conditions, such as rain.

The inspectors reviewed the Preheat-Interpass Monitoring Log – Traveler System and observed welders and QC personnel in-process activities for welds “E” and “F” to determine whether adequate checks were being performed on the weld joint prior to welding and were in accordance with the procedure CMS-720-03-PR-09651, Preheat/Interpass Temperature Control and ASME Section III, Subsection NE.

The inspectors reviewed the certificate of compliance for the Tempilstik temperature indicators used by the welders and the QC personnel in the field to determine whether they were in compliance with the controlled weld traveler and ASME Section III, Subsection NE requirements.

The inspectors reviewed the dimensional inspection reports contained in the weld travelers for the Lower Equipment Hatch to determine if the hatch insert plate was installed in accordance with the requirements of drawing number 164621, drawing 21, sheet 1, Lower Equipment Hatch H02 – Field Details, revision 1.

The inspectors reviewed the calibration records for the Leica Total Station (S/N 1610667) and Panametrics MG2 digital ultrasonic thickness gage (S/N 100833511) to determine if the survey equipment used to perform the dimensional inspection was calibrated in accordance with the requirements of CB&I NQAM and appropriate calibration procedures.

The inspectors interviewed the authorized nuclear inspector prior to his visual inspection of the completed containment vessel ring 1 B2-A5 lower equipment hatch weld seam “E” to determine if his inspection criteria would include prohibiting cracks and lack of fusion, and only permit undercuts, porosity and undersized welds as allowed by ASME Section III code.

The inspectors observed a qualified inspector performing PT of the completed containment vessel ring 1 B2-A5 equipment hatch weld seam “F” to determine if the testing was performed in accordance with procedure CMS-830-15-PR-45126 and ASME Section III, Subsection NE.

The inspectors reviewed the calibration records for the light meter (S/N Q559078) and infrared thermometer (S/N 16032703) used by the qualified inspector during the PT to determine if they were calibrated in accordance with the requirements of the CB&I NQAM and the appropriate calibration procedure.

The inspectors reviewed the certificates of compliance for the penetrant, cleaner and developer used by the examiner during the PT to determine if the materials met the requirements of procedure CMS-720-03-PR-03601 and ASME Section V, Article 6.

b. Findings

No findings were identified.

.4 ITAAC Number 93 / Family 06B

a. Inspection Scope

During the weeks of July 9 and 16, 2012, the inspectors performed a direct inspection of CB&I construction activities on the Unit 2 containment vessel associated with ITAAC Number 93 (2.2.01.03a):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
Pressure boundary welds in components identified in Table 2.2.1-1 as ASME Code Section III meet ASME Code Section III requirements.	Inspection of the as-built pressure boundary welds will be performed in accordance with the ASME Code Section III.	A report exists and concludes that the ASME Code Section III requirements are met for nondestructive examination of pressure boundary welds.

The inspectors used the following NRC inspection procedures to perform these inspections:

- 65001.06, Sections 02.01 and 02.02;
- 65001.B, Sections 02.01, 02.02, 02.04, 02.05, and 02.06; and
- 65001.11, Sections 02.03 and 02.05.

Procedure Reviews:

The inspectors reviewed implementing procedure, CB&I CMS 164621-830-15-PR-000001, Post-Weld Heat Treatment Procedure Shell Course S1 Vertical Seams, Revision 1, to determine if the in-process PWHT activities were completed in accordance with ASME Section III, Subsection NE.

The inspectors reviewed two CB&I Welding Procedure Specifications (WPSs) for the capacitor discharge process for installation of the thermocouples and insulation pins to determine if the procedures were in conformance with the ASME Section III, Subsection NE, were available to the welding operator, current and accurate, and implemented in accordance with the PWHT implementing procedure.

Production Controls:

The inspectors observed in-process welding activities to determine if the welding was within the parameters permitted by the associated WPS. The inspectors observed in process FCAW activities for the containment vessel ring 1 joining plates B2-A6 to B2-A7 for weld seam “H” of the S1 course to determine if they were performed in accordance with the controlled weld traveler, B2A-S1-H, Revision 2, and with appropriate references to procedures, drawings, and QC hold points. The inspectors interviewed QC personnel to ensure adequate checks were being performed on the weld joint prior to welding, and were in accordance with the CB&I procedures and requirements of ASME Section III, Subsection NE. The inspectors observed base metal preheat temperatures were checked prior to and during welding to determine if the work activities were completed in accordance with the WPS. The inspectors observed interpass temperature monitoring by welders and QC personnel to determine if the temperatures were within the limits required by the WPS. The inspectors interviewed QC personnel and confirmed measurements taken to ensure essential variables such as heat input were monitored, recorded, reviewed and within allowable ranges as required by the WPS.

The inspectors observed in-process PWHT activities for containment vessel ring 1 weld seam "N" of the S1 course to determine if the in-process activities were completed in accordance with the CB&I PWHT implementing procedures and ASME Section III, Subsection NE. The inspectors observed the in-process activities to determine if:

- they were performed in accordance with weld traveler BSA-S1-N, Revision 0;
- weld plate fit-up and dead loads were removed in accordance with the general specifications;
- heating pads and thermocouples were installed in accordance with the Shell Course S1 Vertical Seams PWHT, Revision 1; and
- temperature recorders were calibrated in accordance with CMS-830-15-WI-81026 Calibration of Temperature Recorders, Revision 1 and CMS-830-15-WI-81025 Calibration of Millivolt Potentiometers, Revision 1.

In addition, the inspectors interviewed PWHT installation personnel and observed the heat treatment controls for heating and cooling rates, holding temperatures, holding times, and time-temperature strip charts were monitored in accordance with the PWHT procedure.

Inspections/Nondestructive Examination:

The inspectors reviewed in-process radiography for the containment vessel ring 1, course 1 to determine if the NDE activities were in accordance with CMS-830-15-PR-45154, Radiographic Examination ASME Section III, Division 1 – Subsection NE, Revision 1. The inspectors reviewed the weld traveler for the vertical weld joining plates B2-A7 to B2-A8 for weld seam "J" to verify that the appropriate inspections were included, in accordance with the applicable ASME Code and CB&I Quality Assurance Program Document (QAPD) requirements. The inspectors evaluated the radiography in-process setup and practices to determine if the methods met the ASME Code.

b. Findings

No findings were identified.

.5 ITAAC Number 96 / Family 06F (Unit 2)

a. Inspection Scope

During the week of July 23, 2012, the inspectors performed a direct inspection of construction activities on the Unit 2 containment vessel associated with ITAAC Number 96 (2.2.01.04a.ii):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
The components identified in Table 2.2.1-1 as ASME Code Section III retain their pressure boundary integrity at their design pressure.	Impact testing will be performed on the containment and pressure-retaining penetration materials in accordance with the ASME Code Section III, Subsection NE,	A report exists and concludes that the containment and pressure-retaining penetration materials conform with fracture toughness requirements of the ASME

	to confirm the fracture toughness of the materials.	Code Section III.

The inspectors used NRC inspection procedure 65001.F, Section 02.03, to perform these inspections.

The inspectors reviewed a sample of CMTRs for four shell plates and five mechanical penetrations (consisting of two insert plates and five sleeves) to determine if impact testing for pressure retaining materials for Unit 2 were in accordance with the fracture toughness requirements of the WEC containment vessel design specification and ASME Section III, Subsection NE.

The inspectors reviewed ten CMTRs from JFE Steel and SEO Koatsu Kogyo for the following items:

- lower ring S-1 lowest course plates B2-A4, -A5, -A11 and -A12 of the shell; and
- five mechanical penetration sleeves (including two insert plates) for P06, P07, P10, P12, and P38 welded by IHI to shell plate B2-A12.

b. Findings

No findings were identified.

.6 ITAAC Numbers 760 and 763 / Family 01F (Unit 2)

a. Inspection Scope

During this inspection period, the inspectors performed an in-office inspection of construction activities associated with ITAAC Numbers 760 (3.3.00.02a.i.a) and 763 (3.3.00.02a.i.d):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
760) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	A report exists which reconciles deviations during construction and concludes that the as-built structures in the radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.

763) The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	A report exists which reconciles deviations during construction and concludes that the as-built containment internal structures, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.

The inspectors reviewed the licensee's response to Unresolved Item (URI) 5200027/2012-003-001 to determine if a violation of regulatory requirements existed. The inspectors compared the as-found specifications, drawings, and procedures against the requirements of the Updated Final Safety Analysis Report (UFSAR) and applicable codes to determine if the sub-modules conformed to the approved design.

b. Findings

Failure to Translate CA01 and CA20 Design Requirements Into Specifications and Drawings

Introduction: The inspectors identified an ITAAC finding of very low safety significance (Green) and associated cited violation (VIO) of 10 CFR 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to assure that regulatory requirements and the design basis for systems, structures, and components were correctly translated into drawings and procedures. Specifically, the licensee failed to ensure that the shear stud spacing for the Unit 2 containment internal structures (CA01) CA01-24 and the auxiliary building (CA20) CA20-29 sub-modules met the approved design.

Description: As described in inspection report 05200027/2012-003 (ML12219A188), the inspectors opened URI 05200027/2012-003-001 because of concerns with the stud spacing associated with safety related sub-modules. As part of that URI, the inspectors identified the following issues of concern:

- During a review of the design requirements for seismic category I structural submodule CA01-24, the inspectors determined that it was required to be designed in accordance with maximum spacing requirements as specified by the UFSAR which referred to WEC design calculation APP-1100-SUC-003, Revision 3. This calculation specified that 5/8-inch studs should be placed in a 6-inch by 6-inch pattern. During a review of the as-built configuration of Unit 2 submodule CA01-24, the inspectors identified 5/8 inch shear studs located approximately 8-inches away from the plate edge. When the adjacent submodule would later be joined to CA01-24, the distance between stud rows adjacent to the seam would exceed the maximum spacing requirements as specified by the UFSAR. The inspectors determined that the drawings did not reflect the approved design and that the 5/8-inch studs were not installed in accordance with the approved design.

- During a review of the design requirements for seismic category I structural submodule CA20-29, the inspectors determined that it was required to be designed in accordance with AISC N690-94 per UFSAR Section 3.8.4.4.1. AISC N690-94 stated that the minimum center-to-center spacing of stud connectors shall be 6 diameters along the longitudinal axis of the supporting composite beam and 4 diameters transverse to the longitudinal axis of the supporting composite beam. Therefore, the transverse spacing for the 5/8-inch shear studs on submodule CA20-29 should have been no closer than 2.5-inches center to center. During a review of the as-built configuration of Unit 2 submodule CA20-29, the inspectors identified that two rows of 5/8-inch shear studs were located approximately 1.75-inches center-to-center. The inspectors determined that the drawings did not reflect the approved design and that the shear studs were not installed in accordance with the approved design.

The inspectors noted that the submodules discussed above had not been installed in the nuclear island during this inspection period.

Analysis: The licensee's failure to assure that regulatory requirements and the design basis for systems, structures, and components were correctly translated into drawings and procedures associated with sub-module stud spacing was a performance deficiency. The performance deficiency was considered more than minor because, if left uncorrected, the failure to assure that regulatory requirements and the design basis for the auxiliary building and containment internal structures were correctly translated into specifications and instructions could adversely affect the closure of an ITAAC. The performance deficiency was associated with the Design/Engineering cornerstone.

The finding was determined to be an ITAAC finding because it was material to the acceptance criteria of Unit 2 ITAACs 763, and 760. Specifically, the acceptance criteria for these two ITAAC required that a report exists which concludes that the as-built

structures in the radiologically controlled area of the auxiliary building and the as-built containment internal structures, respectively, conform to the approved design. However, the as-built configuration of seismic category I structural submodules CA20-29 and CA01-24 did not conform to the approved design; therefore, these examples represented structural deviations that would not have been reconciled by the licensee.

The inspectors assessed the ITAAC finding in accordance with Inspection Manual Chapter (IMC) 2519P, Construction Significance Determination Process – Pilot, Appendix A and determined that the finding was of very low safety significance (Green) because it did not impair the design function of either the nuclear island auxiliary building or containment internal structures and was assigned to Row 1 of the risk importance table.

The inspectors screened the finding for a possible construction safety focus component aspect in accordance with Appendix F, "Construction Safety Focus Components and Aspects," of IMC 0613P, "Power Reactor Construction Inspection Reports - Pilot." The inspectors determined that this finding was not related to any of the construction safety focus component aspects discussed in IMC 0613P.

Enforcement: Criterion III, "Design Control," of Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the Code

of Federal Regulations (10 CFR) Part 50, “Domestic Licensing of Production and Utilization Facilities,” requires, in part, that “Measures shall be established to assure that applicable regulatory requirements and the design basis for safety-related structures, systems, and components are correctly translated into specifications, drawings, procedures, and instructions.”

Figure 3.8.3.8, Sheet 1 of 3 of the VC Summer Units 2 & 3 UFSAR specifies the maximum shear stud spacing for Seismic Category I Structural Submodules. Section 3.8.4.4.1, “Seismic Category I Structures,” of the VC Summer Units 2 and 3 UFSAR required that Seismic Category I Structural Submodules, specifically CA20-29 and CA01-24; be designed in accordance with UFSAR and AISC N690-94, “Specification for the Design, Fabrication, and Erection of Steel Safety-Related Structures for Nuclear Facilities.”

Contrary to the above, on and before October 2, 2012, the licensee failed to assure that applicable regulatory requirements and the design basis for safety-related systems, structures, and components were correctly translated into specifications, drawings, and instructions. As evidenced by the following examples, the licensee failed to translate the regulatory and design basis requirements established, in part, by UFSAR, and AISC N690-94 into specifications, drawings, and instructions for the design and fabrication of Seismic Category I Structural Submodules CA20-29, and CA01-24:

1. The licensee failed to properly translate design requirements into design specifications, which resulted in Seismic Category I Structural Submodule CA01-24 containing shear studs that exceeded the maximum design spacing as specified by UFSAR Figure 3.8.3.8, Sheet 1 of 3. Specifically, Figure 3.8.3.8, Sheet 1 of 3 specifies that 5/8-inch studs should be placed in a 6-inch by 6-inch pattern. However, the as-built configuration of Submodule CA01-24 contained 5/8-inch shear studs located approximately 8 inches away from the plate edge.

2. The licensee failed to properly translate design requirements into design specifications which resulted in Seismic Category I Structural Submodule CA20-29 containing shear studs which did not meet the minimum allowable spacing as required by AISC N690-94. Specifically, AISC N690-94 states that the transverse spacing for the 5/8-inch shear studs on Submodule CA20-29 should have been no closer than 2.5-inches center to center. However, the as-built configuration of CA20-29 contained two rows of 5/8-inch shear studs that were located approximately 1.75-inches center-to-center.

Because the licensee’s corrective action program has not yet been determined by the NRC to be effectively implemented, this violation (VIO 05200027/2012004-01, “Failure to Translate CA01 and CA20 Design Requirements Into Specifications and Drawings”), is being cited, consistent with Section 2.3.2 of NRC Enforcement Policy.

The licensee entered these issues into their corrective action program as Primary Identification Program (PIP) 0-L-12-0251 to evaluate the issue and implement corrective actions to address the violation. As described in Section 4OA3.1 of this report, URI 05200027/2012003-01 is closed.

.7 ITAAC Number 760 / Family 01F (Unit 2)

a. Inspection Scope

During the week of September 10, 2012, the inspectors performed a direct inspection of construction activities associated with ITAAC Number 760 (3.3.00.02a.i.a):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	A report exists which reconciles deviations during construction and concludes that the as-built containment internal structures, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.

The inspectors used the following NRC inspection procedures to perform these inspections:

- 65001.01, “Inspection of ITAAC-Related Foundation and Buildings,” Section 02.01;
- 65001.02, “Inspection of ITAAC-Related Installation of Structural Concrete,” Section 02.02;
- 65001.A, “ITAAC Attributes for As-Built Inspection,” Section 02.02; and
- 65001.F, Section 02.03..

Concrete Batching and Delivery:

The inspectors reviewed project specifications and procedures associated with the concrete batching plant and performed direct observations of concrete batching. The inspectors performed these activities to determine if the batching plant was being operated and controlled within project specifications, procedures, and applicable codes. Specifically, the inspectors reviewed the batch plant National Ready Mixed Concrete Association certification to verify the batch plant had been inspected and certified as required by WEC safety-related concrete specifications. The inspectors reviewed testing and calibration records associated with the water meters, aggregate scales, and cement scales to verify that all measuring equipment associated with the batching process was calibrated and maintained at the specified frequencies. The inspectors also reviewed the storage and transportation processes of all concrete constituents to verify that the materials were being stored and transported in manner that was not detrimental to the materials and prevented contamination and segregation. The inspectors observed the

receipt inspection and reviewed CMTRs for the concrete constituent material on site to verify that the concrete constituents received met the applicable requirements.
Laboratory Testing:

The inspectors reviewed project specifications and procedures associated with the onsite testing laboratory and performed direct observations of testing to determine if the testing laboratory was being operated and controlled within the applicable requirements. Specifically, the inspectors observed moisture tests for concrete aggregates and the capping of concrete test specimens to ensure the tests were conducted in accordance with the applicable American Society of Testing Materials standards. The inspectors reviewed the calibration of the testing equipment being used to verify all equipment was calibrated and maintained within the prescribed frequencies. The qualification of personnel conducting tests was verified by the inspectors and the process for qualification was also reviewed to verify adequacy. The inspectors verified that the output for each test was adequately documented, evaluated, and maintained in accordance with quality procedures.

b. Findings

No findings were identified.

.8 ITAAC Number 761 / Family 01F (Unit 2)

a. Inspection Scope

During the week of September 10, 2012, the inspectors performed a direct inspection of construction activities associated with ITAAC Number 761 (3.3.00.02a.i.b):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	A report exists which reconciles deviations during construction and concludes that the as-built shield building structures, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.

The inspectors used the following NRC inspection procedures to perform these inspections:

- 65001.01, Section 02.01;
- 65001.02, Sections 02.01 and 02.02;
- 65001.A, Section 02.02; and
- 65001.F, Sections 02.02 and 02.03.

The inspectors reviewed activities related to concrete batching and delivery as well as laboratory testing as described in Section 2503.7 of this report.

Reinforcing Steel and Embedment Placement:

The inspectors focused on activities associated with the design and construction of the basemat beneath the shield building. The inspectors reviewed documents, interviewed licensee personnel, and observed installation of reinforcing steel to verify:

- implementing procedures, specifications, and drawings adequately address the requirements of applicable American Concrete Institute (ACI) standards;
- structural concrete construction was being accomplished under controlled conditions and in conformance with design requirements;
- applicable documentation for selected design changes was complete and accurate;
- materials received for on-site fabrication (bending) of reinforcing steel met design procurement documents;
- contractors performing safety-related work have approved implementing procedures that describe administrative and procedural controls, approved work processes, and inspection requirements;
- placement of reinforcing steel was performed in accordance with the applicable specifications, codes, drawings, and procedures; and
- records associated with receipt of safety-related reinforcing steel confirmed the requisite material characteristics, performance tests, and other specification requirements.

The inspectors reviewed a sample of construction drawings, specifications, CMTRs, and procurement documents associated with the basemat beneath the shield building to determine whether construction activities were in conformance with regulatory requirements and licensee commitments. The inspectors reviewed design documents, Engineering and Design Coordination Reports (E&DCRs), and other design changes to determine whether design deviations were appropriately identified and addressed in a manner that would support closure of the ITAAC.

b. Findings

No findings were identified.

.9 ITAAC Number 762 / Family 01F (Unit 2)

a. Inspection Scope

During the week of September 10, 2012, the inspectors performed a direct inspection of construction activities associated with ITAAC Number 762 (3.3.00.02a.i.c):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	A report exists which reconciles deviations during construction and concludes that the as-built structures in the non-radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.

The inspectors used the following NRC inspection procedures to perform these inspections:

- 65001.01, Section 02.01;
- 65001.02, Sections 02.01 and 02.02;
- 65001.A, Section 02.02; and
- 65001.F, Sections 02.02 and 02.03.

The inspectors reviewed activities related to concrete batching and delivery as well as laboratory testing as described in Section 2503.7 of this report. For the reinforcing steel and embedment placement, the inspectors focused on activities associated with the design and construction of the basemat beneath the non-radiologically controlled area of the auxiliary building in a similar manner as described in Section 2503.8 of this report for the basemat beneath the shield building.

b. Findings

Introduction: The inspectors identified an URI related to the anchorage and spacing of the t-headed shear reinforcement in the 18-inch thick section of the basemat beneath the elevator pit in the non-radiologically controlled area of the auxiliary building.

Description: Section 3.8.4.4.1 of the UFSAR stated, in part, that the design and analysis procedures for the Seismic Category I structures were in accordance with ACI 349 for concrete structures.

Section 12.6.2 of ACI 349-01 required that mechanical anchorages be designed in accordance with Appendix B – Steel Embedments. Additionally, Section 3.8.5.5 of the UFSAR stated, in part, that the design and construction of anchors conformed to the procedures and standards of Appendix B to ACI 349-01.

Section 11.5.3 of ACI 349-01 required, in part, that stirrups or other bars used as shear reinforcement be anchored at both ends to develop the design yield strength of the reinforcement.

Section 11.5.4.1 of ACI 349-01 required, in part, that the spacing of shear reinforcement placed perpendicular to the axis shall not exceed “d/2” in non-prestressed members. The variable “d” was defined in Section 11.0 of ACI 349-01 as the “distance from extreme compression fiber to centroid of longitudinal tension reinforcement…”

Based on a review of the design drawings, product literature, and independently generated calculations, the inspectors questioned whether the t-headed shear reinforcement in the 18-inch thick section of the basemat beneath the elevator pit in the non-radiologically controlled area of the auxiliary building met the requirements of the UFSAR and ACI 349-01. Specifically, the inspectors could not verify that the reinforcement was adequately anchored as required by ACI 349-01 and that the spacing met the code prescribed maximum. As a result, the inspectors requested that the licensee provide their original calculations for review, demonstrating that the anchorage and spacing of the t-headed shear reinforcement was in conformance with code requirements and licensee commitments.

This issue of concern is unresolved pending the inspectors’ review and evaluation of the licensee’s calculations to determine if a performance deficiency exists. (URI 05200027/2012-004-002, Shear Stirrup Anchorage and Spacing in Nuclear Island Basemat). The licensee initiated PIP 0-L-12-0610 to address this issue.

The inspectors concluded that this URI also affected Unit 2 ITAAC 3.3.00.02a.i.d as described in Section 2503.10 of this report.

.10 ITAAC Number 763 / Family 01F (Unit 2)

a. Inspection Scope

During the week of September 10, 2012, the inspectors performed a direct inspection of construction activities associated with Unit 2 ITAAC Number 763 (3.3.00.02a.i.d):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	A report exists which reconciles deviations during construction and concludes that the as-built structures in the radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.

The inspectors used the following NRC inspection procedures to perform these inspections:

- 65001.01, Section 02.01;
- 65001.02, Sections 02.01 and 02.02;
- 65001.A, Appendix 1, Section 02; and
- 65001.F, Sections 02.01 and 02.02.

The inspectors reviewed activities related to concrete batching and delivery as well as laboratory testing as described in Section 2503.7 of this report. For the reinforcing steel and embedment placement, the inspectors focused on activities associated with the design and construction of the basemat beneath the radiologically controlled area of the auxiliary building in a similar manner as described in Section 2503.8 of this report for the basemat beneath the shield building.

b. Findings

The inspectors determined that URI 05200027/2012-004-002, Shear Stirrup Anchorage and Spacing in NI Basemat, as described in Section 2503.9 of this report, was also related to this ITAAC. For this ITAAC, the areas of concern related to the anchorage and spacing of the t-headed shear reinforcement in the 18-inch thick sections of the

basemat beneath the elevator and sump pits in the radiologically controlled area of the auxiliary building.

.11 ITAAC Number 763 / Family 01F (Unit 2)

a. Inspection Scope

During the week of August 6, 2012, the inspectors reviewed the licensee's programs and procedures controlling welding and NDE for on-site module fabrication in support of the inspectors' verification of Unit 2 ITAAC Number 763 (3.3.00.02a.i.d):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	A report exists which reconciles deviations during construction and concludes that the as-built structures in the radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.

The inspectors used the following NRC inspection procedures to perform these inspections:

- 65001.01, Section 02.05; and
- 65001.B, Sections 02.01, 02.02, 02.03, and 02.06.

The inspectors reviewed the procedures to determine if the procedures complied with the applicable provisions of the QAPD and the American Welding Society (AWS) structural steel welding code, AWS D1.1-2000.

The inspectors verified that contractors/subcontractors with on-site module welding and NDE-related responsibilities had approved procedures describing administrative controls and work processes. The inspectors reviewed the procedures to determine if:

- procedures prescribed adequate methods of quality assurance to ensure the as-built condition of structures, systems, and components meet engineering requirements;
- the identification of welds and welders was maintained for each weld;
- welding procedures and welders were qualified in accordance with AWS Code requirements and other codes or standards referenced by the product specifications;
- NDE methods and acceptance criteria complied with the applicable AWS Code and other codes or standards referenced by the product specifications;
- equipment and gauges used for process monitoring were calibrated and maintained; and
- procedures were established for ensuring craft and quality assurance inspection personnel performing quality related welding and examination activities were qualified to perform their assigned work.

The inspectors reviewed WPS 2-1.1-M71, Revision 0, to determine if:

- the WPS was qualified in conformance with the applicable AWS Code requirements;
- the WPS was available, current and accurate;
- welding positions qualified for the WPS were in accordance with the applicable AWS Code;
- the type and number of qualification tests required to qualify the WPS for a given thickness, diameter, or both were specified and conformed to the requirements of the applicable AWS Code; and
- the WPS specified all the applicable essential variables referenced in the AWS Code and the specific range of values of the WPS variables was obtained from one or more procedure qualification records.

The inspectors reviewed welder qualifications to determine if:

- welding personnel demonstrated their skill by performing specific performance qualification tests prescribed by the applicable AWS Code;
- performance qualification tests were fully documented and the welder qualification procedures included adequate provisions to verify the identity of the welder being tested;
- performance qualification expirations complied with the applicable AWS Code; and

- welders who were qualified for a given process were required to re-qualify if an essential variable for the process was changed beyond the limits specified in the applicable AWS Code.

The inspectors also determined whether quality assurance records were reviewed and approved by the proper authorities and were stored and maintained in such a manner as to demonstrate conformance with applicable AWS Codes, standards, and procedure requirements.

b. Findings

No findings were identified.

.12 ITAAC Number 763 / Family 01F (Unit 2)

a. Inspection Scope

During the week of September 10, 2012, the inspectors performed a direct inspection of construction activities associated with Unit 2 ITAAC Number 763 (3.3.00.02a.i.d):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	A report exists which reconciles deviations during construction and concludes that the as-built structures in the radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.

The inspectors used the following NRC inspection procedures to perform these inspections:

- 65001.01, Section 02.01;
- 65001.02, Sections 02.01 and 02.02;
- 65001.A, Appendix 1, Section 02; and
- 65001.F, Sections 02.01 and 02.02.

The inspectors reviewed activities related to concrete batching and delivery as well as laboratory testing as described in Section 2503.7 of this report. For the reinforcing steel and embedment placement, the inspectors focused on activities associated with the design and construction of the basemat beneath the radiologically controlled area of the auxiliary building in a similar manner as described in Section 2503.8 of this report for the basemat beneath the shield building.

b. Findings

The inspectors determined that URI 05200027/2012-004-002, Shear Stirrup Anchorage and Spacing in NI Basemat, as described in Section 2503.9 of this report, was also related to this ITAAC. For this ITAAC, the areas of concern related to the anchorage and spacing of the t-headed shear reinforcement in the 18-inch thick sections of the basemat beneath the elevator and sump pits in the radiologically controlled area of the auxiliary building.

.13 ITAAC Number 763 / Family 01F (Unit 2)

a. Inspection Scope

During the week of July 16, 2012, the inspectors performed a field inspection of construction activities in the modular assembly building associated with ITAAC Number 763 (3.3.00.02a.i.d):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	An inspection of the nuclear island structures will be performed. Deviations from the design due to as-built conditions will be analyzed for the design basis loads.	A report exists which reconciles deviations during construction and concludes that the as-built structures in the radiologically controlled area of the auxiliary building, including the critical sections, conform to the approved design and will withstand the design basis loads specified in the Design Description without loss of structural integrity or the safety-related functions.

The inspectors used the following NRC inspection procedures to perform these inspections:

- 65001.01, Sections 02.05, 02.06, 02.07; and
- 65001.F, Sections 02.01, 02.02, 02.03, and 02.04.

The inspectors conducted field measurements on sub-modules, reviewed documents, and interviewed licensee personnel to assess the implementation of the portion of the QA program specific to design and fabrication activities, and to determine whether:

- design and fabrication was completed in accordance with applicable specifications, drawings, and approved procedures;
- key building critical dimensions, materials, and separation satisfied design specifications, requirements, and relevant ITAAC;
- licensee records established an adequate basis for the acceptance of ITAAC with design and fabrication attributes;
- fabrication activities were performed by qualified personnel;

- records reflected that completed work meets design specifications and acceptance criteria;
- an adequate marking system was used to maintain the identity of material in the storage areas and that the structural steel sub-modules were protected from corrosion;
- the licensee confirmed that components inspected conformed to design drawings and that deviations were being addressed in accordance with procedure requirements;
- nonconforming conditions identified by the licensee were being appropriately resolved; and
- the licensee, vendor, and fabricator personnel had established an effective method for tracking, evaluating, and dispositioning changes or modifications to the component designs.

The inspectors performed independent measurements on the following structural wall sub-modules for the proposed Unit 2 radiologically controlled area of the auxiliary building:

- CA20-01, which will be located on the intersection between Column Line J-1 and Column Line 2, when installed at its final location;
- CA20-02, which will be located along Column Line J-1, between Column Lines 2 and 3, when installed at its final location;
- CA20-06, which will be located along Column Line 2, between Column Lines J-1 and J-2, when installed at its final location.

Specifically, the inspectors measured headed stud spacing and dimensions, module plate thickness, angle and channel used to construct module trusses, and truss spacing. The inspectors also observed reinforcing steel placement, general module assembly, and stud welds.

The inspectors reviewed various documents within the work packages and inspection packages for the selected modules, such as sub-assembly drawings, material traceability logs, design drawings, and specifications, to verify:

- the shape, size, dimensions, type, and grade of material conformed to the approved specifications and design drawings;
- certified mill test reports, or a certified report of tests, made by the fabricator or qualified testing laboratory were available;
- fit-up tolerances for length, depth, and straightness of structural members were as specified; and
- records reviewed were approved and correctly stored and maintained in accordance with procedure requirements.

The inspectors also reviewed non-conformance reports and corrective action reports associated with the sub-modules to determine whether:

- the licensee was identifying problems at an appropriate threshold and entering them into the corrective action program;
- nonconforming material was adequately identified and segregated; and
- deviations from requirements were effectively resolved.

b. Findings

No findings were identified.

.14 ITAAC Number 767 / Family 01A (Unit 2)

a. Inspection Scope

During the week of July 16, 2012, the inspectors performed a direct inspection of construction activities associated with ITAAC Number 767 (3.3.00.02a.ii.d):

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
The nuclear island structures, including the critical sections listed in Table 3.3-7, are seismic Category I and are designed and constructed to withstand design basis loads as specified in the Design Description, without loss of structural integrity and the safety-related functions.	An inspection of the as-built concrete thickness will be performed.	A report exists that concludes that the as-built concrete thicknesses of the radiologically controlled area of the auxiliary building sections conform to the building sections defined in Table 3.3-1.

The inspectors used the following NRC inspection procedures to perform these inspections:

- 65001.01, Sections 02.01, 02.05, 02.06, and 02.07;
- 65001.A, Sections 02.03, 02.04; and
- 65001.A, Appendix 1, Sections 01 and 02.

The inspectors used IPs 65001.01 and 65001.A, “ITAAC Attributes for As-built Inspection,” to conduct field measurements to determine if the plate separation in the sub-module assembly conformed to the required concrete thicknesses of the building sections. The inspectors also observed work activities to verify if structural steel installations were being accomplished under controlled conditions and in conformance with design requirements.

The inspectors performed independent measurements on structural wall sub-modules CA20-01, CA20-02, and CA20-06 for the proposed Unit 2 radiologically controlled area of the auxiliary building:

The inspectors reviewed various documents within the work packages and inspection packages for the selected modules, such as sub-assembly drawings, material traceability logs, design drawings, and specifications, to verify:

- the shape, size, dimensions, type, and grade of material conformed to the approved specifications and design drawings;
- certified mill test reports, or a certified report of tests, made by the fabricator or qualified testing laboratory were available;

- fit-up tolerances for length, depth, and straightness of structural members were as specified; and
- records reviewed were approved and correctly stored and maintained in accordance with procedure requirements.

The inspectors also reviewed non-conformance reports and corrective action reports associated with the sub-modules to determine whether:

- the licensee was identifying problems at an appropriate threshold and entering them into the corrective action program;
- nonconforming material was adequately identified and segregated; and
- deviations from requirements were effectively resolved.

b. Findings

No findings were identified.

.15 ITAAC Number 784 / Family 02C (Unit 2)

a. Inspection Scope

During this inspection period, the inspectors conducted a field inspection to determine if construction activities associated with Unit 2 ITAAC Number 784 (3.3.00.05a) were being conducted in accordance with the licensing basis:

Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria
Exterior walls and the basemat of the nuclear island have a water barrier up to site grade.	An inspection of the as-built water barrier will be performed during construction.	A report exists that confirms that a water barrier exists on the nuclear island exterior walls up to site grade.

The inspectors used NRC inspection procedure 65001.02, Sections 02.05 and 02.06, to perform these inspections.

The inspectors reviewed activities related to the coefficient of friction membrane qualification and to installation activities related to the design requirement contained in the UFSAR. The inspectors reviewed the qualification test reports to determine if the testing was performed in accordance with requirements contained in the UFSAR and whether the test results complied with the applicable acceptance criteria.

The inspectors reviewed the installation specification to determine if the field installation procedures and design details adequately duplicated the testing program and processes utilized in the laboratory. The inspectors also independently visually inspected the roughness of the supporting concrete surface using industry standards specified in the material qualification reports. The inspectors directly observed the application of the waterproofing membrane to verify the installation activities were being conducted per Shaw project specification VSG-AT01-Z0-800000, “Waterproofing Membrane Installation (Horizontal Application),” Revision 3. The inspectors directly observed the seam weld process used at the joints between the sheets of the waterproofing materials and

reviewed drawing VSG-1000-XE-800000, “Waterproofing Membrane Installation Plan,” Revision 0, to determine if the membrane seams were located per the specified design.

The inspectors reviewed a sample of installation release cards from work package VS2-1000-ATW-001-(i), “Nuclear Island Horizontal Waterproof Membrane Installation” to determine whether they were consistent with applicable quality and technical

requirements. The inspectors observed a Shaw quality control walk-down of a completed waterproof membrane section to determine if the walk-down was performed in accordance with procedures and if it adequately identified conditions adverse to quality.

The inspectors observed storage facilities for the waterproof membrane materials to determine if storage conditions met requirements of the procurement specifications. A sample of Shaw corrective action reports (CAR) related to field and laboratory testing was reviewed. The inspectors reviewed Shaw nonconformance and disposition reports (N&D), and licensee condition reports (CRs) related to waterproof membrane installation activities to verify adequate disposition.

b. Findings

No findings were identified.

2504 Program Inspections

4. OTHER ACTIVITIES

OA2 Quality Assurance Program Implementation During Construction and Pre-Construction Activities (IP 35007)

.1 Appendix 1, Inspection of Criterion I – Organization

a. Inspection Scope

The inspectors examined documents and records and interviewed personnel to verify implementation of the licensee’s organizational structure, responsibilities, and authorities. Specifically, the inspectors interviewed five personnel who performed specific QA functions to determine whether they had an adequate understanding of the program and their roles. The inspectors verified whether that they were sufficiently independent and had organizational freedom to identify quality problems; to initiate, recommend, or provide solutions; and to verify implementation of solutions. The inspectors also interviewed personnel to determine how delegation of authorities were documented. The inspectors examined documentation of the five most recent delegations to determine if the delegation was performed in accordance with license procedures and commitments in the QAPD.

The following inspection samples were completed:

- A1.03.02: 5 specific QA interview samples
- A1.03.02: 5 delegations of authority samples

b. Findings

No findings were identified.

.2 Appendix 3, Inspection of Criterion III – Design Control

a. Inspection Scope

The inspectors reviewed geologic mapping activities for consistency with regulatory requirements and the associated Unit 3 license condition. Specifically, the inspectors reviewed the Unit 3 excavation activities to ensure that they were performed in accordance with the commitments in Section 2.5 of the combined license application and in accordance with Regulatory Guide 1.208. To make this determination, the inspectors:

- observed the licensee's geologic mapping of foundation grade level bedrock in the Unit 3 nuclear island excavation;
- directly examined rock types and tectonic structures in the Unit 3 excavation, as well as the preliminary geologic maps prepared by the licensee; and
- examined the foundation bedrock surface to assess blast damage.

The inspectors performed these activities to determine if:

- the geologic characteristics reported in the UFSAR accurately described the rock types and tectonic structures that occurred in the Unit 3 excavation;
- any potentially detrimental geologic features that could affect site suitability existed; and
- blast damage was minimal and did not result in any degradation of the foundation bedrock units.

Because the final geologic maps were not complete by the close of this inspection period, the inspectors could not review the final maps and associated data.

As this was an interim inspection of the Unit 3 geological mapping activities, no samples were completed.

b. Findings

No findings were identified.

.3 Appendix 3, Inspection of Criterion III – Design Control

a. Inspection Scope

The inspectors reviewed the licensee's implementing documents associated with design change control to verify conformance with the NRC-approved QAPD and FSAR. In addition, the inspectors reviewed samples of completed design changes and field changes in order to verify conformance with implementing documents. The inspectors reviewed drawings, E&DCRs, test reports, and technical reports associated with installation and design of the waterproof membrane and reinforcing steel in the NI basemat. The inspectors reviewed these documents to verify if:

the design and design changes received the proper level of engineering review in accordance with licensee procedures;

- the design and design changes were incorporated into their respective documents in accordance with licensee procedures;
- affected design documents remained applicable, with valid design assumptions;
- seismic evaluations were acceptable; and
- applicable design and licensing documents were updated in accordance with licensee procedures.

The inspectors reviewed the following procedures related to design control to perform the above verifications:

- WEC 3.4.1, "Change Control for the AP1000 Program," Rev. 0
- NEPP 4-13-3, "Engineering and Design Coordination Report," Rev. 3
- APP-GW-GAP-420, "Engineering Design and Coordination Report," Rev. 6

The inspectors also reviewed licensee procedures for performing screenings and evaluations for changes to the facility made pursuant to 10 CFR 50.59 and for performing departure evaluations pursuant to 10 CFR 50.52, Appendix D, Section VIII. The inspectors reviewed the procedures to determine if the procedures were consistent with the applicable regulatory requirements. The inspectors reviewed the departure evaluations for the following activities to determine if the evaluations were performed in accordance with licensee procedures and the applicable regulations:

- LCE-12-002—CA Modular Liner Plate Material Change;
- LCE-12-006—WLS Containment Sump module and PSS containment atmosphere monitor seismic requirements;
- LCE-12-026—DCD clarification needed to support construction;
- LCE-12-29—Basemat Design Clarification; and
- LCE-12-030—RNS Pump Seal cooler-nozzle change.

The inspectors verified that drawings issued for construction related to the north end of the nuclear island basemat reinforcing steel were in compliance with section 3.8 of the UFSAR and design specification APP-CR01-Z0-011.

The inspectors reviewed four E&DCR's related to containment vessel coating applications, two conditional releases for coating application, and a design change proposal associated with the protective coating of the bottom head of the containment vessel to verify that those documents reflected the design changes described in design specification APP-GW-Z0-604. In addition the inspectors interviewed personnel from WEC responsible for design changes to determine if the proper turnover of design information from the design authority to the licensee was distributed in accordance with WEC procedures.

The inspectors reviewed work package VS2-1000-CRW-001, "Nuclear Island Basemat Stick Built Rebar," and the approved design changes to drawings to determine if the changes were implemented in the field and if those applicable design changes were posted to the drawings maintained in the field. Specifically, the inspectors reviewed the implementation of the following E&DCRs:

- APP-1000-GEF-005

- APP-CR01-GEF-005
- VS2-1000-GEF-000002
- VS2-1000-GEF-000003

The inspectors reviewed the above E&DCRs to determine if adequate licensing applicability screening was performed in accordance with APP-GW-GAP-420, "Engineering and Design Coordination Report," Revision 6. Specifically, whether approved and implemented E&DCRs were appropriately reviewed to identify any impact to the applicable licensing basis documents and were in accordance with 10CFR52, Appendix D, "Design Certification Rule for the AP1000 Design." The inspectors also reviewed these E&DCRs to determine if the affected installation specification was reviewed to ensure its continued applicability and that all design input assumptions remained valid.

The following inspection samples were completed:

- A3.03.02: 7 design change and 6 field change samples

b. Findings

No findings were identified.

.4 Appendix 3, Inspection of Criterion III – Design Control

a. Inspection Scope

The inspectors reviewed the containment vessel bottom head coating product data, the traveler for applying the carbozinc coating, daily inspection reports, film thickness logs, temperature, and thickness measuring equipment calibrations to determine if the containment vessel in-process activities were in compliance with WEC design specification APP-GW-Z0-604, Revision 5. The inspectors reviewed qualifications for coating inspectors to determine if the inspectors were qualified in accordance of American Society of Testing Materials D4537-04a.

The inspectors reviewed three E&DCRs associated with the coating specifications, six requests for information, the coating critical attribute test report, a critical characteristic deviation notice, a conditional release for coating use, two corrective action reports, the vendor's coating application procedure, and the certificate of conformance associated with the coating design specification to determine if the coating critical attributes were implemented into the work instructions for the coating application. In addition, the inspectors interviewed coating inspectors and WEC design personnel to determine if the proper controls were implemented for the material specification substitutions to include the appropriate level of engineering review.

The following inspection samples were completed:

- A3.03: 1 samples

b. Findings

Failure to Transfer Containment Coating Testing Requirements into Specifications

Introduction: The inspectors identified a construction finding of very low safety significance (Green) and associated VIO of 10 CFR Part 50, Appendix B, Criterion III, Design Control, for the licensee's failure to ensure that an element of the design basis, a methyl ethyl ketone (MEK) rub test, as specified in the license application, was correctly translated into specifications.

Description: While preparing for future coating inspection activities, the inspectors reviewed the design basis for the containment coating application contained in the UFSAR and the associated implementating specification. Specifically, Section 6.1.2.1.6 of the UFSAR stated, "The inorganic zinc coating used on the inside surface (Service Level I coatings) and outside surface (Service Level III coatings) of the containment shell is inspected using a nondestructive dry film thickness test and a MEK rub test. These inspections are performed after the initial application and after recoating. Long term surveillance of the coating is provided by visual inspections performed during refueling outages. Other inspections are not required."

WEC Specification APP-GW-Z0-604, Revision 6, Application of Protective Coatings to Systems, Structures, and Components for the AP1000 Reactor Plant, did not include provisions for an MEK rub test for either Unit 2 or Unit 3; however, the MEK rub test was required to determine the degree of coating cure. The licensee initiated Issue Report (IR) 12-216-M010 and CR 2012-0499 to address this issue. The licensee was also unable to find any other implementing document that would have ensured that the MEK rub test was performed.

Analysis: The inspectors determined that the licensee's failure to include the design basis (MEK rub test) in specification APP-GW-Z0-604, was contrary to the requirements of 10 CFR 50 Appendix B, Criterion III and was a performance deficiency. The performance deficiency was determined to be more than minor because the failure to perform the MEK rub test, if left uncorrected, represented a failure to establish, implement or maintain an adequate process, program, procedure, or quality oversight function that could render the quality of the construction activity unacceptable or indeterminate. Specifically, the MEK rub test, if left unperformed, represented a failure to ensure that the coating would be adequately cured and that the coating would perform its intended safety function.

The inspectors concluded this construction finding was associated with the Construction/Installation Cornerstone, in accordance with IMC 2519P. The inspectors determined the finding was of very low safety significance (Green) because the finding was associated with the passive containment cooling system which is in the low risk column of the risk importance table and was not a repetitive significant condition adverse to quality.

In accordance with IMC 0613P, Appendix F, the inspectors determined that this finding had a cross-cutting aspect in the area of Baseline Inspection, Resources (A.2.b), because the licensee did not ensure that procedures were available and adequate to assure construction quality. Specifically, the licensee failed to assure that the MEK rub test was included in the coating installation specification.

Enforcement: 10 CFR 50, Appendix B, Criterion III, Design Control, states in part that, "Measures shall be established to assure that applicable regulatory requirements and the design basis, as defined in 10 CFR 50.2 and as specified in the license application,

for those structures, systems, and components to which this appendix applies are correctly translated into specifications, drawings, procedures, and instructions."

Section 6.1.2.1.6 of the UFSAR states "The inorganic zinc coating used on the inside surface (Service Level I coatings) and outside surface (Service Level III coatings) of the containment shell is inspected using a nondestructive dry film thickness test and a MEK rub test."

Contrary to the above, on or before July 20, 2012, the licensee failed to ensure that the testing described in the license application was correctly translated into specifications. Specifically, WEC Specification APP-GW-Z0-604 REVISION 6, Application of Protective Coatings to Systems, Structures, and Components for the AP1000 Reactor Plant, did not include provisions to perform the MEK rub test.

This is a violation which has been evaluated under the risk significance determination process as having very low safety significance (Green). Because the licensee's corrective action program has not yet been demonstrated to be effectively implemented, this violation is being cited in the enclosed Notice of Violation, consistent with the NRC Enforcement Policy (VIO 05200027/2012-004-003, 05200028/2012-004-003, Failure to Transfer Containment Coating Testing Requirements into Specifications)

This issue was entered into the corrective action program as WEC IR 12-216-M010 and CR-2012-0499.

.5 Appendix 4, Inspection of Criterion IV – Procurement Document Control

a. Inspection Scope

The inspectors reviewed QA implementing documents for procurement document control of the reinforcing steel for the Unit 2 nuclear island basemat and horizontal waterproof membrane to ensure conformance with the NRC-approved QAPD and commitments in the UFSAR. The inspectors also reviewed the following 4 procurement documents to determine whether measures were established to communicate technical and quality requirements, including the requirements of Appendix B to 10 CFR Part 50, 10 CFR Part 21, and the QAPD:

- purchase order 132177-J40000
- purchase order 132177-J700.09
- 1322177-E-C-00002
- 1322177-679043-0015

The inspectors reviewed several critical characteristics of the waterproof membrane materials to determine if the materials were evaluated and appropriately documented in accordance with the applicable procedures.

The inspectors reviewed a selected sample of implementing documents and purchase orders to determine whether the following requirements were addressed:

- procurement documents were prepared in accordance with implementing documents;
- services were purchased from qualified contractors;

- procurement documents contained requirements for the contractor to provide appropriate documentation of quality;
- procurement documents were maintained in a document control program; and
- specifications differing from the original design documents were reviewed and approved by qualified technical personnel.

The inspectors conducted interviews with licensee and contractor personnel responsible for initiating and approving quality-related procurement documents in order to determine whether activities were performed in accordance with applicable procedures.

The following inspection samples were completed:

- A4.03.02: 4 samples

b. Findings

No findings were identified.

.6 Appendix 5, Inspection of Criterion V – Instructions, Procedures, and Drawings

a. Inspection Scope

The inspectors walked down work activities ongoing in the modular assembly building and reviewed two work packages associated with those activities. The inspectors selected four welding procedures and the general welding specification from the work packages and verified that they were the current revisions.

The following inspection samples were completed:

- A5.03.02: 5 samples

b. Findings

No findings were identified.

.7 Appendix 6, Inspection of Criterion VI – Document Control

a. Inspection Scope

The inspectors reviewed applicable sections of the licensee and contractor QAPDs and document control procedures, actual controlled documents, and document review records to determine whether the licensee and its contractors had implemented processes and documents to address the review, approval, revision, and issuance of controlled documents. The inspectors reviewed work control packages for the reinforcing steel installation for the nuclear island basemat. The inspectors verified documents were handled and processed in accordance with approved procedures.

The inspectors interviewed responsible staff concerning the document control system. The inspectors interviewed field personnel to determine whether personnel using designated work packages had the most current controlled implementing documents needed to conduct the work activity to ensure consistency and technical adequacy. The

inspectors reviewed a selected sample of implementing documents to determine whether the following requirements were addressed:

- documents are reviewed for adequacy, completeness, and correctness by designated personnel other than the preparer of the documents;
- documents are approved by designated personnel other than the preparer of the documents;
- documents are approved for release by authorized personnel;
- documents are issued with a unique identification and revision status and placed under document control; and
- current revisions of documents are made available where the prescribed activity is being performed to ensure staff uses the most recent controlled documents.

The inspectors examined a list of controlled documents to determine whether the documents were controlled in accordance with approved procedures. The inspectors reviewed paper controlled documents to determine whether:

- documents were available to personnel electronically;
- paper copy documents were indicated as controlled copies; and
- controlled documents were reviewed and approved by the same organization that reviewed and approved the original document.

The inspectors reviewed a sample of two work packages to determine if the document evaluation list, technical document list, and impact evaluation lists were in compliance with work package control documents. The samples were reviewed to determine if the access to documents, the records of review, and any paper copy documents were indicated as controlled document at the work location. The samples included electronic and/or paper drawings, procedures, E&DCRS, N&Ds, and work packages along with master controlled lists of electronic and/or paper controlled documents. The inspectors performed this review to determine if:

- controlled documents had the proper documents and revisions listed and present in each work package;
- controlled documents were reviewed and approved by independent, authorized personnel;
- the reviews required by the implementing documents were conducted;
- documents were reviewed and approved by the same organization that originally reviewed and approved the documents unless otherwise noted; and
- the controlled installation documents were made available promptly to construction personnel.

The inspectors interviewed responsible Shaw field and administrative staff on the document control system. The inspectors also performed direct observation on the use of implementing procedures for document control; which included the responsible staff accepting and reviewing changes and updating affected work packages.

The inspectors reviewed the following work packages and documents that Shaw used to prescribe the activities affecting the quality of the installation activities:

- VS2-1000-CCW-005 (i) – “Nuclear Island Upper Mudmat Concrete;”

- VS2-1000-ATW-001 (i) – “Nuclear island Horizontal Waterproof Membrane Installation;”
- VS2-1210-CRW-009 – “Nuclear Island North Rebar Assembly;”
- NCSP 2-19-1 – “Work Package Planning, Development, Approval, and Closure;”
- CSI 2-19-6 – Work Package Planning, Development, Approval, and Closure;” and
- QS 10.66 - "Work Packaging."

The inspectors performed these reviews to determine if:

- controlling documents in the work package were adhered to by personnel performing activities affecting quality;
- installation documents were made available promptly to construction personnel; and
- whether all quality-affecting work was being conducted in accordance with current revisions of approved documents.

The inspectors also interviewed field personnel performing waterproofing membrane and rebar installation activities to determine if they had access to the current controlled implementing documents. The inspectors compared a sample of their paper field controlled documents that were maintained in the work package to the master list of controlled documents in Shaw’s electronic document management system to determine if the field personnel had the most current revisions.
The following inspection samples were completed:

- A6.03.01: 1 sample
- A6.03.02c: 4 samples
- A6.03.02.b: 2 samples
- A6.03.02.e: 1 sample

b. Findings

No findings were identified.

.8 Appendix 7, Inspection of Criterion VII – Control of Purchased Material, Equipment, and Services

a. Inspection Scope

The inspectors reviewed approved implementing procedures to verify the requirements of the NRC-approved QAPD and commitments in the FSAR were addressed. The inspection scope included a review of measures to determine acceptability of reinforcing steel and waterproofing membrane for the nuclear island basemat. Procedures for conducting receipt inspections were reviewed, receipt inspection personnel were interviewed, and records of completed receipt inspections were examined to determine adequacy of measures to verify:

- qualified licensee personnel conduct and document receiving inspection;
- general receipt inspection is performed;
- items are examined for conformance with requirements specified in the procurement documents;

- certification documentation of item; and
- purchased items delivered to the plant site met specified technical and quality requirements.

The inspectors reviewed the following audits that Shaw performed on their subcontractors who were approved to provide safety related services:

- Audit No. V2011-14, Audit of Mistras Group, Inc., providing NDE services related to module fabrication.
- Audit No. V2012-05, Audit of Mistras Group, Inc., providing NDE services related to module fabrication.
- Audit No. V2012-12, Audit of Mistras Group, Inc., providing NDE services related to module fabrication.
- Audit No. V2011-019, Audit of Gerdau, Inc. Duluth, GA Fabrication Facility, providing concrete reinforcing bar.
- Audit No. V2011-022, Audit of Gerdau, Inc. Jacksonville, FL Fabrication Facility, providing concrete reinforcing bar.

The inspectors verified that the audits were performed and documented in accordance with applicable procedural and quality assurance requirements. The inspectors also verified that the subcontractors were added to the Shaw approved supplier list after performance of an initial audit and with restriction in accordance with the audit findings, as applicable. The inspectors reviewed a sample of contractors that were recently reclassified by Shaw as not being approved to supply safety related products or services and verified that those contractors were removed from the most current approved supplier list.

The inspectors selected two quality related items being used in the modular assembly building and reviewed receipt inspection documents to verify that they were procured and received in accordance with applicable code and quality requirements. The items

selected were ER70S-2 weld filler metal heat ED033892 and weld backing bars heat JI4757.

The following inspection samples were completed:

- A7.03.02b: 5 samples
- A7.03.02d: 4 samples

b. Findings

No findings were identified.

.9 Appendix 7, Inspection of Criterion VII – Control of Purchased Material, Equipment, and Services

a. Inspection Scope

The inspectors reviewed an example of safety related items that were procured from contractors. The inspectors reviewed these samples of licensee inspections to determine whether they had adequately implemented the requirements of 10 CFR 50,

Appendix B, Criterion VII, “Control of Purchased Material, Equipment, and Services” as well as procedures QS 7.1, "Receiving Process" and QAD 7.14, "Receiving Inspection." Specifically, the inspectors reviewed the following documents to determine if they conformed to the above quality requirements, requirements specified in applicable procurement documents, and were tagged/marked as acceptable for use:

- VCS-ND-12-0362;
- VCS-ND-12-0419;
- Q445-12-0506, “Nuclear Island Basemat Embeds – Load 5;”
- VCS-RR-12-0122, Embeds for North NI Preassembly (Risk Release);
- PO 132177-D220.00; and
- PO VS2-SS01-Z0-003, Revision 2.

The following inspection samples were completed:

- A7.03.02d: 1 sample

b. Findings

Failure to Assure Safety-Related Materials Conformed to the Procurement Documents

Introduction: The inspectors identified a construction finding of very low safety significance (Green) and associated cited violation of 10 CFR 50, Appendix B, Criterion VII, Control of Purchased Material, Equipment, and Services, for the licensee’s failure to assure that material and equipment, purchased through contractors and subcontractors, conformed to procurement documents.

Description: While inspecting a basemat rebar storage area, the inspectors identified several released-for-use safety-related embed plates with studs whose welds were repaired but were not bent per AWS D1.1-2000, Structural Welding Code. Shaw purchase order 132177-D220.00 required compliance with Westinghouse design specification, APP-SS01-Z0-003, Embedded and Miscellaneous Steel, Westinghouse Safety Class C. This design specification required that concrete studs be applied in accordance with Section 7.8.1 of AWS D1.1-2000 which required any stud that was repaired by welding to be bent to an angle of approximately 15° from its original axis.

The inspectors identified weld-repaired nelson studs that were not bent to 15° as required by AWS D1.1-2000, Section 7.8.1. The licensee initiated VCS-ND-12-0419 and CR 0-L-2012-0583 to address this issue.

Analysis: The inspectors determined that the licensee’s failure to assure that purchased material and equipment conformed to procurement documents was contrary to the requirements of 10 CFR 50 Appendix B, Criterion VII and was a performance deficiency. This performance deficiency was determined to be more than minor because the issue, if left uncorrected, represented a failure to establish and implement and adequate program and quality oversight function that could render the quality of construction activities unacceptable or indeterminate.

The inspectors concluded that this finding was associated with the Procurement/Fabrication Cornerstone, in accordance with IMC 2519P. The inspectors determined the finding was of very low safety significance (Green) because the finding is

associated with a structure (Basemat) in the intermediate risk column of the risk importance table and impaired a portion of the structures design function and is not a repetitive significant condition adverse to quality.

In accordance with IMC 0613P, Appendix F, the inspectors determined that this finding has a cross-cutting aspect in the area of Baseline Inspection, Work Control (A.4.c), because the licensee did not ensure supervisory and management oversight of work activities, including contractors, such that construction quality was supported. Specifically, the licensee failed to assure that material procured by its contractor conformed to the procurement documents.

Enforcement: 10 CFR 50, Appendix B, Criterion VII, Control of Purchased Material, Equipment, and Services, states, in part, that "Measures shall be established to assure that purchased material…whether purchased directly or through contractors and subcontractors, conform to the procurement documents." Purchase Order 132177-D220.00 required compliance with AWS D1.1-2000, Section 7.8.1.

Contrary to the above, as of August 7, 2012, the licensee failed to assure that safety-related material conformed to the procurement documents. Specifically, the licensee failed to identify that embed plates did not conform to AWS D1.1-2000, Section 7.8.1.

This is a violation which has been evaluated under the risk significance determination process as having very low safety significance (Green). Because the licensee's corrective action program has not yet been demonstrated to be effectively implemented,

this violation is being cited in the enclosed Notice of Violation, consistent with the NRC Enforcement Policy (VIO 05200027/2012-004-004, Failure to Assure Safety-Related Material Conformed to the Procurement Documents)

This issue was entered into the corrective action program as VCS-ND-12-0419 and CR 0-L-2012-0583. Immediate corrective actions included complete inspection of all embed plates. One plate failed due to a cracked weld and six plates failed due to undersized welds. A planned corrective action was to have engineering disposition the seven failed welds.

.10 Appendix 8, Inspection of Criterion VIII – Identification and Control of Materials, Parts, and Components

a. Inspection Scope

The inspectors reviewed applicable sections of the licensee's QAPD, UFSAR, and the associated implementing documents concerning the identification and control of materials, parts, and components. The inspectors selected two samples of safety related items that were stored in the warehouse, staged and stored on site, or installed. The inspectors examined associated records and other documentation that identified these items, verified that the items were properly identified and controlled in accordance with implementing documents. The inspectors also verified that traceability of the items were consistent and accurate from receipt and identification of the item through installation.

The inspectors verified that item identification methods used physical markings to the maximum extent possible. Specifically, the inspectors reviewed the following documents to verify the licensee's identification and control of materials, parts, and components were consistent with applicable procedures:

- VS2-1000-ATW-001 (i) – “Nuclear Island Horizontal Waterproof Membrane Installation;”
- VS2-1210-CRW-009 – “Nuclear Island North Rebar Assembly;”
- VCS-ND-12-0362
- VCS-ND-12-0364
- VCS-ND-12-0419
- VCS-RR-12-0124

The inspectors observed material control activities for a sample of components maintained in the Units 2 basemat reinforcing steel laydown areas. The inspectors reviewed requirements of the NRC-approved QAPD and commitments in the FSAR to ensure appropriate implementing documents were developed. The inspectors reviewed the implementing documents and procedures to verify:

- markings maintained on items were traceable to item throughout fabrication and construction;
- markings were applied using materials and methods that provide a clear and legible identification, and do not adversely affect the function or service life of the item;
- markings or other means of identification ensured that only specified and accepted items are used to prevent use of incorrect or defective items; and
- methods used to indicate nonconforming items were tagged and segregated.

The following inspection samples were completed:

- A8.03.01: 1 sample
- A8.03.02: 2 samples

b. Findings

No findings were identified.

.11 Appendix 9, Inspection of Criterion IX – Control of Special Processes

a. Inspection Scope

The inspectors reviewed the licensee’s implementing documents for 10 CFR 50, Appendix B, Criteria 9, "Control of Special Processes” to determine if they were consistent with the NRC-approved QAPD and commitments in the UFSAR.

As described in Section 2503.11 of this report, the inspectors reviewed approved programs, procedures, and qualification records for special processes to be performed in the modular assembly building to verify they met the applicable code and quality requirements. For welding, to be performed by Shaw, the inspectors reviewed a sample of welding procedures, procedure qualification records, welder qualification records, and governing procedures & programs. For NDE to be performed by Mistras, the inspectors

reviewed a 100% sample of NDE procedures, NDE inspector qualification records, governing procedures & programs, and audits of Mistras by Shaw.

The inspectors reviewed the concrete batch plant laboratory certifications, laboratory personnel qualifications, equipment testing and calibration logs, batch plant operating procedures, and E&DCR's associated with the placement of the lower mud-mat of the nuclear island. The inspectors reviewed the certification for the control system operators of the batch plant to establish compliance with WEC design specification APP-CC01-Z0-027.

The inspectors observed concrete placement for the lower and upper mud-mat on the south end of the nuclear island and inspected in-process testing for slump, air content, unit weight, density, and concrete temperature. The inspectors observed concrete cylinder curing conditions, cylinder-break testing, and interviewed personnel associated with operation of the concrete batch plant testing laboratory to determine if the proper controls were being implemented as specified by applicable procedures.

The following inspection samples were completed:

- A9.03: 9 samples

b. Findings

No findings were identified.

.12 Appendix 10, Inspection of Criterion X – Inspection

a. Inspection Scope

The inspectors reviewed implementing documents to determine whether they were developed to address the QAPD requirements and FSAR commitments for conducting inspections of the horizontal installation of the waterproof membrane for Unit 2. Specifically, the inspectors reviewed work instructions and procedures to determine whether the licensee's documents established adequate measures to provide for the following:

- examinations and measurements for each work operation, where necessary;
- methods/documents used to perform inspections and document results;
- frequency or point of inspections;
- sampling requirements;
- acceptance criteria;
- qualified inspection personnel and those who perform and supervise the work;
- monitoring of process methods; and
- final inspection to verify conformance with acceptance criteria.

The inspectors evaluated a sample of inspection documentation for the waterproof membrane horizontal installation for Unit 2 that require inspection, and conducted the following:

- verified that inspections were performed by qualified individuals other than those who performed or directly supervised the work being inspected;

- confirmed the inspection of item was performed at required frequency for each work operation, as described in the implementing document;
- results were documented and complete; and
- both process and inspection monitoring were provided, where needed.

The following inspection samples were completed:

- A10.03.02: 2 completed inspection samples

b. Findings

No findings were identified.

.13 Appendix 12, Inspection of Criterion XII – Control of Measuring and Test Equipment

a. Inspection Scope

The inspectors examined measuring and test equipment in use for reinforcing bar installation by licensee personnel to determine if it met the requirements of the implementing documents, including:

- measuring and test equipment was calibrated within specified calibration interval;
- accuracy was within specified limits; and
- documentation and test/inspection results were traceable to measuring and test equipment being verified.

The following inspection samples were completed:

- A12.04.02: 1 sample

b. Findings

No findings were identified.

.14 Appendix 13, Inspection of Criterion XIII – Handling, Storage, and Shipping

a. Inspection Scope

During field installation activities, the inspectors observed material storage areas for both reinforcing steel and reinforcing steel couplers to determine if material was being stored in accordance with ASME NQA-1-1994, Subpart 2.2 “Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Power Plants.” Specifically, the inspectors walked down the storage area to determine whether:

- items were stored in an area marked and designated for storage;
- designated storage area was well drained;
- designated storage area was reasonably removed from the actual construction area and traffic; and
- items were stored on cribbing or equivalent.

The inspectors reviewed the following licensee QA implementing documents for storage, handling, and shipping of equipment, materials, and spare parts (collectively referred to as “items”):

- QS 13.11, “Material Receipt Storage and Control,” Rev. C;
- NPP 10-01, “Material Receipt Storage and Control,” Rev. 1; and
- SWSQAP Section 13, “Handling, Storage and Shipping.”

The inspectors observed the storage of safety related items, such as embed plates for Unit 2 nuclear island basemat and reinforcing steel for both the containment vessel bottom head and Unit 2 nuclear island basemat. The inspectors toured the site level D laydown areas to determine whether the items were being stored in accordance with NQA-1-1994, subpart 2.2, Level D storage requirements, such as:

- protection from physical and mechanical damage;
- outdoor areas were marked and designated for storage;
- areas were well drained with gravel covered areas; and
- items were stored on cribbing and not subject to trapping water.

The following inspection samples were completed:

- A13.03.02a: 2 samples
- A13.04.02: 1 sample

b. Findings

No findings were identified.

.15 Appendix 15, Inspection of Criterion XV – Nonconforming Materials, Parts, or Components

a. Inspection Scope

The inspectors reviewed applicable sections of the licensee’s QAPD, UFSAR and the associated implementing documents related to the control of nonconforming items.

The inspectors toured the onsite storage areas to determine whether the licensee implemented established measures for material segregation and controlling of non-conforming items. Specifically, the inspectors inspected the marking and segregation of nonconforming items to determine whether the items were:
placed in a designated area;

- tagged, marked, and labeled as nonconforming; and
- properly documented and communicated to the affected organizations.

The inspectors reviewed a sample of N&Ds to determine if the conditions were adequately reviewed and accepted, rejected, repaired, or reworked in accordance with documented procedures. The inspectors compared these N&Ds to Section 15, “Nonconforming Materials, Parts, or Components,” of the Shaw Nuclear Quality Assurance Program, SWSQAP 1-74A, procedure QS 15.1, “Nonconformance &

Disposition Report," Revision G, and procedure QS 15.3 "Risk Release of Unsat/Nonconforming Material/Equipment." Specifically, the inspectors reviewed the following N&Ds:

- VCS-ND-12-0362
- VCS-ND-12-0364
- VCS-ND-12-0398
- VCS-ND-12-0403
- VCS-ND-12-0419
- VCS-ND-12-0444
- VCS-ND-12-0511

The inspectors toured the onsite warehouse facilities and other onsite storage areas to determine if the licensee had identified, tagged, and established segregated areas for controlling non-conforming items.

The following inspection samples were completed:

- A15.03.01: 1 sample
- A15.03.02: 2 samples of controlling non-conforming materials
- A15.04.02: 1 sample

b. Findings

No findings were identified.

.16 Appendix 16, Inspection of Criterion XVI – Corrective Actions

a. Inspection Scope

The inspectors reviewed applicable sections of the licensee's QAPD, UFSAR and the associated implementing documents concerning identification, evaluation and resolution of conditions adverse to quality. The inspectors performed routine screening of issues entered into the licensee, Shaw, and WEC corrective action programs to determine if conditions adverse to quality were controlled in accordance with each company's quality assurance program and whether potential adverse trends were appropriately identified and corrected by the licensee or their contractors. Specifically, the inspectors screened items entered into the corrective action program by:

- attending weekly issue review committee meetings at the site;
- reviewing a sample of licensee, Shaw, and WEC corrective action documents; and
- interviewing licensee and Shaw personnel responsible for the screening and correction of the issues.
-

The inspectors selected samples of issues entered in the corrective action programs to determine if the handling of these issues were consistent with the applicable QAPD requirements; and 10 CFR 50, Appendix B. The inspectors reviewed the corrective action documents referenced above to determine if:

conditions adverse to quality were promptly identified and corrected;

- classification and prioritization of the resolution of the problem was commensurate with its safety significance;
- for significant conditions adverse to quality: (1) the cause was determined; (2) corrective actions were taken to prevent recurrence; and (3) the cause and corrective actions taken were documented and reported to appropriate levels of management
- conditions were appropriately screened;
- the organization properly evaluated and reported the condition in accordance with 10 CFR 50.55(e) and 10CFR21;
- the identification and correction of design deficiencies was being adequately addressed;
- extent of condition was being adequately addressed; and
- appropriate corrective actions were developed and implemented.

Specifically, the inspectors reviewed the following corrective action documents:

- CR L-12-0509
- CR L-12-0567
- CR L-12-0570
- CR L-12-0620
- CAR 2012-0886
- CAR 2012-0950
- CAR 2012-1045
- CAR 2012-1061
- CAR 2012-1237
- IR 12-216-M010

The following inspection samples were completed:

- A16.03.02: 2 samples
- A16.04.02: 1 sample

b. Findings

No findings were identified.

.17 Appendix 17, Inspection of Criterion XVII – Quality Assurance Records

a. Inspection Scope

The inspectors reviewed completed quality assurance records (such as surveillances, audits, work packages, drawings, and E&DCRs) to verify that the records were authenticated and that corrections to the records did not obscure original information on record. The inspectors visited both the on-site temporary and the main records storage areas and interviewed staff to determine if the licensee was storing quality assurance records in accordance with the UFSAR and the QAPD. The inspectors verified that:

- records (including in-process records and electronic records) were accessible to designated personnel;
- access to the facility by visitors was controlled;

- records were readily retrievable;
- records were protected from damage (such as from water and fire) and theft; and
- records temporarily removed from the storage facility were controlled.

The following inspection samples were completed:

- A17.03.02a: 2 samples
- A17.03.02b: 1 sample
- A17.03.02c: 1 sample

b. Findings

No findings were identified.

.18 Appendix 18, Inspection of Criterion XVIII – Audits

a. Inspection Scope

The inspectors reviewed three completed internal and five external audit and surveillance reports performed by the licensee and Shaw to determine if:

- the reports included a determination of effectiveness of implementation and compliance with the QAPD;
- the reports were reviewed by management responsible for audited area;
- the reports included a summary of identified deficiencies and non-conformances and a response due date;
- audit/surveillance findings corrected during audit were documented and verified during audit process; and
- auditors did not have direct responsibility in the areas that were audited and did not perform the work being audited.

The inspectors reviewed the following audits and surveillances:

- Shaw Surveillance S-132177-2011-051, Moisture Barrier Receipt Inspection;
- Shaw Surveillance S-132177-2012-070, AMEC Sampling;
- Shaw Surveillance S-132177-2012-100, Moisture Barrier Installation;
- Audit No. V2011-14, Audit of Mistras Group, Inc., providing NDE services related to module fabrication;
- Audit No. V2012-05, Audit of Mistras Group, Inc., providing NDE services related to module fabrication;
- Audit No. V2012-12, Audit of Mistras Group, Inc., providing NDE services related to module fabrication;
- Audit No. V2011-019, Audit of Gerdau, Inc. Duluth, GA Fabrication Facility, providing concrete reinforcing bar; and
- Audit No. V2011-022, Audit of Gerdau, Inc. Jacksonville, FL Fabrication Facility, providing concrete reinforcing bar.

The following inspection samples were completed:

- A.18.03.02: 3 internal audits and 5 external audits

OA3 Followup of Licensee Reports, NOVs, and Notices of Enforcement Discretion

.1 Unresolved Item 05200027/2012-003-001 (Closed)

a. Inspection Scope

As described in Section 2503.6 of this report, the inspectors reviewed the licensee's response to URI 5200027/2012-003-001 to determine if a violation of regulatory requirements existed. The inspectors compared the as-found specifications, drawings, and procedures against the requirements of the UFSAR and applicable codes to determine if the sub-modules conformed to the approved design.

b. Findings

One finding was identified by the inspectors as described in Section 2503.6 of this report. This URI is closed.

OA6 Meetings, Including Exit

On October 9, 2012, the inspectors presented the inspection results to Mr. R. Clary, Vice President - New Nuclear Deployment, along with other licensee and consortium staff members. The inspectors stated that no proprietary information would be included in the inspection report.

OA7 Licensee-Identified Violations.

The following violation of very low safety significance (Green) was identified by the Licensee and is a violation of NRC requirements which meet the criteria of the NRC Enforcement Policy for being dispositioned as a Non-Cited Violation.

.1 Construction Quality Assurance

10 CFR 50, Appendix B, Criterion VII, requires, in part, that measures be established to assure that purchased material, equipment, and services, whether purchased directly or through contractors and subcontractors, conform to the procurement documents. Contrary to the above, on August 14, 2012, the licensee identified that nuclear island prefabricated rebar procured by their contractor, Shaw, from Gerdau Steel was not fabricated to meet minimum bend diameters as required the procurement documents. This issue was screened to be of very low safety significance (Green). The violation was not greater than Green because the licensee demonstrated that the design function of the applicable structures or systems would not be impaired by the deficiency. Once identified, the licensee performed inspections of all affected rebar. The discrepant rebar was identified, tagged, and dispositioned as "scrap". The issue was documented in CAR 2012-1050 and ND-12-0398. The licensee also began the evaluation for potential reportability under 10CFR21 and 10 CFR 50.55(e). Because the licensee identified the issue, documented it into their corrective action program, and because the finding is of very low safety significance, this violation is being treated as a licensee identified violation (LIV 05200027/2012-004-005, Failure to Meet Rebar Minimum Bend Diameter) consistent with the NRC Enforcement Policy.

KEY POINTS OF CONTACT

Licensees and Contractor Personnel

Licensee Personnel
A. Paglia, Licensing Manager
A. Torres, General Manager of Construction
B. Stokes, General Manager of Engineering
K. Young, Construction Supervisor
L. Cunningham, Quality Systems Manager
P. Young, Consortium Design Engineering Manager
R. Clary, Vice President – New Nuclear Deployment
R. Jones, VP of Nuclear Operations
R. Thompson, ITAAC Supervisor
R. Ward, OD&P Manager

Westinghouse
B. Koons, Design Engineer
B. McIntyre, Consortium Licensing Director
G. Drake, Containment Vessel Program Manager
J. Cole, Licensing
R. Driscoll, Quality Assurance Manager
W. Macecevic, Site Operations Director

Shaw Nuclear Personnel
B. Fox, VP/Project Director
B. Mcclung, QC Manager
B. Wood, Engineering Manager
C. Castell, Licensing Manager
J. Johnson, QA Manager
M. Goyda, QC Engineering Manager
M. Griswold, Welding Manager

CB&I
B. Walsh, Quality Manager
P. Fleming, Project Manager

MISTRAS
S. Lippai, Quality Assurance

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05200027/2012-004-001	VIO	ITAAC Finding for Failure to Translate CA01 and CA20 Design Requirements Into Specifications and Drawings (Section 2503.6)
05200027/2012-004-002,	URI	Shear Stirrup Anchorage and Spacing in NI Basemat (Sections 2503.9 and 2503.12)
05200027/2012-004-003, 05200028/2012-004-003	VIO	Failure to Transfer Containment Coating Testing Requirements into Specifications (Section 4OA2.4)
05200027/2012-004-004	VIO	Failure to Assure Safety Related Materials Conformed to the Procurement Documents (Section 4OA2.9)

Closed

05200027/2012-003-001	URI	Maximum and Minimum Stud Spacing Requirements (Section 4OA3.1)

Opened and Closed

05200027/2012-004-005	LIV	Failure to Meet Rebar Minimum Bend Diameter (Section 4OA7.1)

LIST OF DOCUMENTS REVIEWED

Audits and Surveillances:
SCE&G Audit NND-AUD-201203-0, Corrective Action Program, April 26, 2012
Shaw Surveillance S-132177-2011-051, Moisture Barrier Receipt Inspection, May 15, 2012
Shaw Surveillance S-132177-2012-070, AMEC Sampling, March 13, 2012
Shaw Surveillance S-132177-2012-100, Moisture Barrier Installation, June 29, 2012

Corrective Action / Nonconformance Records:
0-L-12-0586
0-L-12-0608
0-L-12-0610
11-300-M020, APP-GW-Z0-604, Revision 5 items for clarification
AR-WSS-2012-3081-021, dated 6/28/12
CAP IR 11-300-M020, dated 7/21/2012
CAP IR 12-216-M010, dated 8/03/1012
CAR 2011-231
CAR 2012-0682
CAR 2012-0693
CAR 2012-0797
CAR 2012-0798
CAR 2012-0799
CAR 2012-0886
CAR 2012-0950
CAR 2012-0968
CAR 2012-0974
CAR 2012-0998
CAR 2012-1045
CAR 2012-1061
CAR 2012-1237
CR 0-L-12-0442
CR-2012-0499
CR L-12-0509
CR L-12-0567
CR L-12-0570
CR L-12-0620
IR 12-216-M010
N&D VCS-ND-12-0362
N&D VCS-ND-12-0364
N&D VCS-ND-12-0444
PIP 0-L-12-0424
PIP 0-L-12-0513
PIP 0-L-12-0515
PIP 0-L-12-0517
PIP 0-L-12-0518
VCS-ND-12-0362
VCS-ND-12-0398
VCS-ND-12-0403
VCS-ND-12-0419

VCS-ND-12-0511

CB&I Procedures:

CMS-164621-830-15-PR-000001, Post Weld Heat Treat Procedure Shell Course S1 Vertical Seams, Revision 1

CMS-830-15-PR-45162, Liquid Penetrant Examination, Color Contrast, Solvent Removable, ASME Section III, Division 1 – Subsection NE, Revision 1

CMS-830-15-WI-81026, Calibration of Temperature Recorders, Revision 1

Certified Material Test Reports (CMTRs):

CMTR 6033-1, Heat No. 5-3669, Lot No. GT077A, JFE Steel Corporation for SA-738 Grade B Hot Rolled Steel Plate Equipment Hatch Insert Plate dated 10/28/2010 (with 10.2 hrs PWHT specimens at 1141°F and furnace cooled)

CMTR 6033-8, Heat No. 6-1392, Lot No. LG057A, JFE Steel Corporation for SA-738 Grade B Hot Rolled Steel Plate Equipment Hatch Sleeve dated 10/28/2010 (with 10.2 hrs PWHT specimens at 1141°F and furnace cooled)

CMTR 6056-1, Heat No. 6-8563, Lot No. HX336A, JFE Steel Corporation for SA-738 Grade B Hot Rolled Steel Plate ID mark B2-A12-31 and -32 insert plates for mechanical penetrations P07 and P12, respectively, welded to the S1 shell plate B2-A12 and dated 10/28/2010 (with 10.2 hrs PWHT specimens at 1141°F and furnace cooled)

CMTR 6057-5, Heat No. 5-5154, Lot No. HY336A, JFE Steel Corporation for SA-738 Grade B Hot Rolled Steel Plate ID mark B2-A11 for S1 shell plate dated 10/28/2010 (2 pages with and without 10.2 hrs PWHT specimens at 1141°F and furnace cooled)

CMTR 6057-9, Heat No. 5-5154, Lot No. HP307A, JFE Steel Corporation for SA-738 Grade B Hot Rolled Steel Plate ID mark B2-A12 for S1 shell plate dated 10/28/2010 (with 10.2 hrs PWHT specimens at 1141°F and furnace cooled)CMTR 6164-12, Heat No. 4-0897, Lot No. EM279A, JFE Steel Corporation for SA-738 Grade B Hot Rolled Steel Plate ID mark B2-A4 for S1 shell plate dated 7/8/2011 (with 10.2 hrs PWHT specimens at 1141°F and furnace cooled)

CMTR 6057-10, Heat No. 5-5154, Lot No. HP303A, JFE Steel Corporation for SA-738 Grade B Hot Rolled Steel Plate ID mark B2-A5 for S1 shell plate dated 10/28/2010 (with 10.2 hrs PWHT specimens at 1141°F and furnace cooled)

CMTR 6164-12, Heat No. 4-0897, Lot No. EM279A, JFE Steel Corporation for SA-738 Grade B Hot Rolled Steel Plate ID mark B2-A4 for S1 shell plate dated 7/8/2011 (with 10.2 hrs PWHT specimens at 1141°F and furnace cooled)

CMTR G23719-032CM, Heat No. JOL4527, Piece No. AF72901, SEO Koatsu Kogyo Company, SA-350 Grade LF2 Class 1, Mechanical Penetration P07 Sleeve, 10/18/2011

CMTR G23719-033CM, Heat No. JOL4527, Piece No. AF73001, SEO Koatsu Kogyo Company, SA-350 Grade LF2 Class 1, Mechanical Penetration P12 Sleeve, 10/18/2011

CMTR G23719-036CM, Heat No. JOL4527, Piece No. AF73301, SEO Koatsu Kogyo Company, SA-350 Grade LF2 Class 1, Mechanical Penetration P27 Sleeve, 10/18/2011

CMTR G23719-037CM, Heat No. JOL4527, Piece No. AF73401, SEO Koatsu Kogyo Company, SA-350 Grade LF2 Class 1, Mechanical Penetration P28 Sleeve, 10/18/2011

CMTR G23719-049CM, Heat No. JOL4527, Piece No. AF74501, SEO Koatsu Kogyo Company, SA-350 Grade LF2 Class 1, Mechanical Penetration P06 Sleeve, 10/18/2011

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CMTR C-560444, Heat ID C016253, Charlotte Steel Mill, A706 Grade 420, X25MM Rebar, Ship Date 10/24/11
CMTR C-560839, Heat ID C016251, Charlotte Steel Mill, A706 Grade 420, X25MM Rebar, Ship Date 11/2/11
CMTR C-560844, Heat ID C014992, Charlotte Steel Mill, A706 Grade 420, X19MM Rebar, Ship Date 11/02/11
CMTR C-561482, Heat ID C016249, Charlotte Steel Mill, A706 Grade 420, X25MM Rebar, Ship Date 11/28/11
CMTR C-567278, Heat ID C014984, Charlotte Steel Mill, A706 Grade 420, X19MM Rebar, Ship Date 5/16/12
CMTR C-568619, Heat ID C023464, Charlotte Steel Mill, A706 Grade 420, X19MM Rebar, Ship Date 6/22/12
CMTR C-570480, Heat ID C024661, Charlotte Steel Mill, A706 Grade 420, X19MM Rebar, Ship Date 8/14/12
CMTR C-571135, Heat ID C024663, Charlotte Steel Mill, A706 Grade 420, X19MM Rebar, Ship Date 8/28/12
CMTR J-672003, Heat ID J122470, Jacksonville Steel Mill, A706 Grade 420, X25MM Rebar, Ship Date 5/17/12CMTR J-679015, Heat ID J116377, Jackson Steel Mill, A706 Grade 420, X13MM Rebar, Ship Date 8/28/11
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APP-1000-GEF-005 Revision 0, Nuclear Island Basemat Reinforcement Clarifications
APP-CR01-GEF-005, Revision 0, Allowance for Mechanical Couplers Requiring Staggered Installation and Guidance for Weldable Coupler Testing and Qualifications
APP-GW-GEE-3105 Modification of design criteria to APP-GW-Z0-604 Revision 5 "Application of protective coatings to systems, structures, and components for the AP1000 plant"
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VS2-1000-GEF-000003 Revision 0, Coupler Stagger Dimension

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164621 Drawing 9, Sheet 1, Shell Stretch-Out S1 Thru S4, Revision 5
164621 Drawing 13, Sheet 1,Field Edge Preps & Weld Detail Main Shell, Revision 4
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APP-1000-CR-903, Nuclear Island and Basemat Dowel Plan at Elevation 66'6" Shield Building South-West Quadrant, Revision 2
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APP-1210-CR-903, Auxiliary Building Reinforcement Details Pit and Sump Area EL 66'-6", Revision 6
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CB&I, Drawing No. PCD2 Sheet 12, Revision 0 for Process Control of Shell S1 thru S4 Azimuth 90° to 180° weld map with welder's unique ID numbers and weld filler metal control ID for field weld "D"
CB&I, Drawing No. PCD2 Sheet 14, Revision 0 for Process Control of Shell S1 thru S4 Azimuth 270° to 0° weld map with welder's unique ID numbers and weld filler metal control ID for field weld "N"
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VS2-1000-C8H-800002-R0, Nuclear Island Basemat Bottom Reinforcement – Layer 2
VS2-1000-C8H-800003-R0, Nuclear Island Basemat Bottom Reinforcement – Layer 2
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VS2-1210-CR-903-R3, Auxiliary Building Reinforcement Details Pit and Sump Area El. 66'-6"
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164621 Drawing FS4012 sheet 1, CB&I Roller Cage AP1000 130' Containment Vessel, Revision 0
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CMS-830-15-WI-81025 Calibration of Millivolt Potentionometers used for Temperature Measurements Revision 1
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CSI 2-19-6, Work Package Planning, Development, Approval, and Closure - Construction Site Instruction
CSI 3-30-3, Batch Plant and Delivery Equipment – Testing, Calibration, and Certification, 3/5/12
CSI 3-31-3, Concrete Batch Plant Operations, 4/10/12
CSI 3-32-3, Concrete Batch Plant Mix and Material Control, 3/9/12
CSI 3-33, Concrete Field Testing and Curing Records, Revision 2
CSI 3-34, Concrete Pumping Correlation Testing, Revision 0
CSI 3-35, Concrete Strength (Maturity Method) Estimating, Revision 0
CSI 3-36, Field Adjustment of Fresh Concrete, Revision 0
F-C111-003, Aggregate Testing, Revision 2
F-Q445-04, Receipt Inspection – Modules- Structural
FMC-1, Filler Metal Control, Revision 2
NCSP 2-16-2, Construction Documents, Records Management and Control
NCSP 2-19-1, Work Package Planning, Development, Approval, and Closure - Nuclear Construction and Startup Procedure
NCSP 3.23, Waterproof Membrane
NCSP 3.42.1, Reinforcing Steel Installation

NEPP 4-13-3, Engineering and Design Coordination Report, Revision 3
NND-AP-0203, 50.59/52 Appendix D Section VIII Change Review
NPP 10-01, Material Receipt Storage and Control, Revision 1
PP-5-6, VC Summer Licensing Applicability Determination and 50.59/52 Screening, Revision 0
PRIMP-00010, Construction Site Document Control, Revision 0
QAD 2.15, Qualification and Certification of Inspection and Test Personnel, Revision F
QAD 7.1, Inspection Report System for Procurement Quality Assurance Source Inspection – Type “B” IR
QAD 7.14 "Receiving Inspection"
QAD 10.68, Inspection Planning, Revision A
QAD 11.2, Testing of Concrete, Grout, and Soils, Revision G
QAD 14.1 Inspection Report System Type “A” Inspection Report
QAD 18.1, Quality Assurance Audits, Revision 1
QS 3.1 Revision A.1- TCN – Standard QA Program Requirements in Specifications and Engineering Services Scope of Work (ESSOW)
QS 6.1, Document Control, Revision J
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QS 10.66, Work Packaging
QS 13.11, Material Receipt Storage and Control, Revision C
QS 15.1, Nonconformance & Disposition Report, Revision G

QS 15.3, Risk Release of Unsat/Nonconforming Material/Equipment
QS 17.1, Quality Assurance Records System, Revision G
QSI 10.3, Inspection Plans
QSI 10.67, Inspection Planning System
QSI 11.1, Testing of Reinforcing Bars, Mechanical Splices, and Sampling and Testing of Concrete, and Concrete Related Materials, Revision 1
SWSQAP Section 10 "Inspection"
SWSQAP Section 14 "Inspection, Test and Operating Status)
WEC 3.4.1, Change Control for the AP1000 Program Revision 0
WQ-1, Qualification of Welders and Welding Operators, Revision 1

RFIs:
MV50-086, Paint Specification straight line technique clarification, 4/23/2012
MV50-087, WEC paint specification clarifications, 4/23/2012
MV50-089, Epoxy Top Coat color/gloss retention & chalking, 5/2/2012
MV50-096, CV coating map, 5/1/2012
MV50-095, clarification on bottom head penetration block out area for painting, 5/12/2012
MV50-100, content of carboline deviation report, 6/20/2012
RFI-MV50-082, Carboline coating products – purchase agreements
RFI APP-CA20-GF-454
RFI SMS-GA20-000335

Specifications:
APP-CR01-Z0-011 Furnishing of safety related reinforcing steel
APP-CC01-Z0-026 Safety related mixing and delivering concrete, Westinghouse safety Class C
APP-CC01-Z0-027 Safety related concrete testing services, Westinghouse safety Class C

APP-CC01-Z0-031, Safety Related Placing Concrete and Reinforcing Steel, Westinghouse Seismic Category I Safety Class C “NUCLEAR SAFETY” Revision 2, 12/21/11
APP-CR01-Z0-010, Specification for Supply and Installation of Mechanical Splices for Reinforcing Steel, Revision 6, 4/19/11
APP-CR01-Z0-011, Furnishing of Safety Related Reinforcing Steel, Westinghouse Safety Class C “NUCLEAR SAFETY RELATED” Revision 4, 8/11/2011
APP-CC01-Z0-031, Safety Related Placing Concrete and Reinforcing Steel, Westinghouse Seismic Category I Safety Class C “NUCLEAR SAFETY” Revision 2, 12/21/11
APP-GW-T2R-013, AP1000 Containment Vessel Coating Test Report Summary
APP-GW-Z0-604, Application of protective coatings to systems, structures, and components for the AP 1000 reactor plant
APP-GW-Z0-604 Coating Design Specification Revision 5
APP-GW-Z0-604 Coating Design Specification page 16, Revision 6
APP-CA20-S5Y-00001, Structural Module CA20 General Notes
APP-CA20-S5Y-00002, Structural Module CA20 General Notes
APP-CA20-S5Y-00002A, Structural Module CA20 General Notes
APP-CA20-S5Y-00003, Structural Module CA20 General Notes
APP-CA20-S5Y-00004, Structural Module CA20 General Notes
APP-CA20-S5Y-00005, Structural Module CA20 General Notes
APP-MV50-Z0-001, Containment Vessel Design Specification, Revision 7, 1/14/10
CB&I WPS TAU TC Capacitor discharge 5/08/2012
CB&I WPS PIN, insulation pin capacitor discharge 5/8/2012

GWS-2, AWS D1.1 – Structural Steel, General Welding Specification, Revision 1
QS 12.1, “Shaw Nuclear Calibration Program”, Revision G
VSG-AT01-VVR-800000, VC Summer Unites 2 & 3 Nuclear Island Waterproof Membrane Summary of Supplemental Testing, Revision 0
VSG-AT01-Z0-800000, Waterproofing Membrane Installation (Horizontal Application), Revision 3
VSG-CC01-T3C-800021, (AMEC) VC Summer Units 2 & 3 Field and Periodic Laboratory Testing Services Work Plan, Revision 4
VSG-AT01-Z0-8000000, Waterproofing Membrane Installation (Horizontal Application), Revision 2
VSG-CC01-T3C-800021, (AMEC) VC Summer Units 2 & 3 Field and Periodic Laboratory Testing Services Work Plan, Revision 4
VS2-CC01-Z0-026, Safety Related Mixing and Delivering Concrete Design Specification, Revision 3, 8/2/12
VS2-CC01-Z0-027, Safety Related Concrete Testing Services Design Specification, Revision 3, 8/1/12
WPS E9018M-H4 R, Welding Procedure Specification, Revision 6, 5/23/12
WPS E91TG-H4, Welding Procedure Specification, Revision 4, 2/6/12 - delete

Test Reports:
(NTS) Test Procedure TP63594-12N, Initial Qualification Program for Laboratory Testing of Various Membrane Systems
(NTS) Test Procedure TP63594-12N-Addendum II, Supplemental Testing For Waterproofing
(NTS) Test Procedure TP63594-12N-DED, Dedication Program for Waterproof Membrane Materials

Work Packages
CA20 SA1 Wall Submodule Assembly 1, 2, 3, 4, 5, 6, 7, 8
VS2-1000-ATW-001 (i) - Nuclear Island Horizontal Waterproof Membrane Installation
VS2-1000-CCW-003, NI Backfill Concrete
VS2-1000-CCW-005 (i) - Nuclear Island Upper Mudmat Concrete
VS2-1000-CRW-001 Revision 1, Nuclear Island Stick Built Rebar
VS2-1210-CRW-009 Revision 1, Reassembly of the Nuclear Island North Assembly
VS2-1210-CRW-010 Revision 1, Reassembly of the Nuclear Island South Assembly

LIST OF ACRONYMS

10CFR	Title 10 of the Code of Federal Regulations
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ASME	American Society of Mechanical Engineers
AWS	American Welding Society
CAR	Corrective Action Report
CB&I	Chicago Bridge and Iron
CMTR	Certified Material Test Report
CR	Condition Report
E&DCR	Engineering and Design Coordination Reports
FCAW	Flux-Cored Arc Welding
IMC	Inspection Manual Chapter
IP	Inspection Procedure
IR	Inspection Report
ITAAC	Inspections, Tests, Analysis, and Inspection Criteria
N&D	Nonconformance and Disposition Report
NDE	Nondestructive Examination
NOV	Notice of Violation
NQAM	Nuclear Quality Assurance Manual
NRC	Nuclear Regulatory Commission
PIP	Primary Identification Program
PT	Liquid Penetrant Examination
PWHT	Postweld Heat Treatment
QAPD	Quality Assurance Program Document
QC	Quality Control
SDP	Significance Determination Process
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VIO	Cited Violation
WEC	Westinghouse Electric Company
WPS	Welding Procedure Specification

Appendix G

NRC Notice of Nonconformance for SMS

October 24, 2012

Mr. Joseph L. Ernst, Senior Vice President Quality
Shaw Modular Solutions
Shaw Fabrication & Manufacturing Group
3191 West Lincoln Road
Lake Charles, LA 70605

SUBJECT: NRC INSPECTION REPORT NO. 99901401/2012-201 AND NOTICE OF NONCONFORMANCE

Dear Mr. Ernst:

During September 10–14, 2012, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an unannounced inspection at the Shaw Modular Solutions facility (SMS) in Lake Charles, LA. The purpose of the technically-focused limited-scope inspection was to assess SMS's compliance with the provisions of selected portions of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities."

This inspection evaluated SMS's implementation of quality activities associated with the fabrication of structural modules for V.C. Summer Units 2 and 3 and Vogtle Units 3 and 4. The inspectors reviewed selected procedures and records, observed fabrication activities, and interviewed personnel. The enclosed report presents the results of this inspection. This NRC inspection report does not constitute NRC endorsement of your overall quality assurance (QA) or 10 CFR Part 21, "Reporting of Defects and Noncompliance," programs.

During this inspection, the inspectors found that the implementation of your QA program did not to meet certain NRC requirements imposed on you by your customers or NRC licensees. Specifically, SMS failed to promptly correct conditions adverse to quality and significant conditions adverse to quality, failed to effectively implement a corrective action regarding documentation of late entries in a quality records procedure, failed to preclude recurrence of significant conditions adverse to quality related to identification and control of items, and failed to perform adequate corrective actions associated with a nonconformance identified during a previous NRC inspection. The specific findings associated with the effectiveness of your corrective action program and references to the pertinent requirements are identified in the enclosures to this letter.

Please provide a written explanation or statement within 30 days of this letter in accordance with the instructions specified in the enclosed Notice of Nonconformance. The NRC will consider extending the response time if you show good cause to do so.

The inspectors determined that overall, the manufacturing activities performed in support of the structural modules for V.C. Summer Units 2 and 3 and Vogtle Units 3 and 4 were conducted in accordance with the Commission's rules and regulations and the technical and quality

requirements passed down from your customers or NRC licensees. The inspectors determined that, with the exception of the cited nonconformance, your programs for implementing the requirements of Appendix B to 10 CFR Part 50 for nonconforming materials, parts, or components; inspection; control of manufacturing activities; traceability; and personnel training generally met the applicable regulations.

However, the inspectors observed several issues related to SMS's implementation of its processes and procedures. These issues were identified as minor findings during the inspection that required corrective action on your part. Specifically, SMS's procedural guidance related to tracking and incorporating engineering and departure change requests (E&DCRs) lacks sufficient detail to ensure consistent implementation of the process. While the NRC did not have findings in the areas of inspection and special processes, the inspectors noted that SMS is still challenged by documentation in its travelers and drawings and that there is inconsistency in how it is documenting inspections, welding, and incorporating E&DCRs through the redline process (a process that identifies revisions or corrections to documents). These issues warrant your attention and consideration for their impact on past and future safety-related work and for determination of the extent of these conditions.

In accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or Safeguards Information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21 "Protection of Safeguards Information: Performance Requirements."

Sincerely,

/RA/

Kerri A. Kavanagh, Chief
Quality Assurance Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99901401

Enclosures:
As stated

requirements passed down from your customers or NRC licensees. The inspectors determined that, with the exception of the cited nonconformance, your programs for implementing the requirements of Appendix B to 10 CFR Part 50 for nonconforming materials, parts, or components; inspection; control of manufacturing activities; traceability; and personnel training generally met the applicable regulations.

However, the inspectors observed several issues related to SMS's implementation of its processes and procedures. These issues were identified as minor findings during the inspection that required corrective action on your part. Specifically, SMS's procedural guidance related to tracking and incorporating engineering and departure change requests (E&DCRs) lacks sufficient detail to ensure consistent implementation of the process. While the NRC did not have findings in the areas of inspection and special processes, the inspectors noted that SMS is still challenged by documentation in its travelers and drawings and that there is inconsistency in how it is documenting inspections, welding, and incorporating E&DCRs through the redline process (a process that identifies revisions or corrections to documents). These issues warrant your attention and consideration for their impact on past and future safety-related work and for determination of the extent of these conditions.

In accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice and Procedure," a copy of this letter, its enclosures, and your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's Agencywide Documents Access and Management System accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. To the extent possible, your response should not include any personal privacy, proprietary, or Safeguards Information so that it can be made available to the public without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material is withheld from public disclosure, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21 "Protection of Safeguards Information: Performance Requirements."

Sincerely,

/RA/

Kerri A. Kavanagh, Chief
Quality Assurance Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

Docket No.: 99901401

Enclosures:
As stated

DISTRIBUTION:
ASakadales ERoach RRasmussen KO'Donohue joseph.ernst@shawgrp.com AP1000 CONTACTS
ADAMS Accession No.: ML12279A119 *concurred via email NRO-002

OFFICE	NRO/DCIP/CQAB	NRO/DCIP/CQAB	NRO/DCIP/CQAB	RII/DCI/CIB2
NAME	LTrocine	ABelen	PPrescott *	SSmith *
DATE	10/11/12	10/12/12	10/16/12	10/11/12
OFFICE	NRO/DCIP/CMVB	NRO/DCIP/CAEB	NRO/DCIP/CQAB	
NAME	SCrane (RL for)	TFrye	KKavanagh	
DATE	10/24/12	10/18/12	10/25/12	

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NOTICE OF NONCONFORMANCE

Shaw Modular Solutions
Lake Charles, LA

Docket No.: 99901401
Inspection Report No.: 2012-201

Based on the results of an unannounced U.S. Nuclear Regulatory Commission (NRC) inspection conducted at the Shaw Modular Solutions (SMS) facility in Lake Charles, LA, during September 10-14, 2012, it appears that certain of your activities were not conducted in accordance with NRC requirements that were contractually imposed on SMS by its customers or NRC licensees.

Criterion XVI, "Corrective Action," in Appendix B to Title 10 of the *Code of Federal Regulation* (10 CFR) Part 50, states that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality (SCAQs), the measures shall assure that the cause of the condition is determined and corrective action taken to prevent repetition. The identification of the SCAQ, the cause of the condition, and the corrective action taken shall be documented and reported to appropriate levels of management.

Section 16 of the SMS Quality Assurance Manual, Revision 7, dated February 29, 2012, states, in part, that conditions adverse to quality shall be identified and documented. The actions necessary to correct conditions adverse to quality shall be determined and implemented. For SCAQs, actions necessary to correct the root cause shall be included so as to prevent recurrence. The implementation of corrective action for significant conditions adverse to quality shall be verified and shall be assessed to determine its effectiveness.

Contrary to the above, as of September 14, 2012, SMS failed to promptly correct conditions adverse to quality and SCAQs, failed to correct a condition adverse to quality regarding documentation of late entries in a quality records procedure, failed to preclude recurrence of SCAQs related to identification and control of items, and failed to correct a condition adverse to quality associated with a nonconformance identified during a previous NRC inspection. Specifically:

1. SMS failed to promptly correct conditions adverse to quality and SCAQs. SMS failed to implement corrective actions for conditions adverse to quality in a timely manner in that there were numerous repetitive condition reports (CRs) with common causes. Additionally, SMS failed to perform root cause analyses for SCAQs within the 30 calendar days as required by Section 6.7.2.a of Procedure QP-G-16, "Corrective Action Program," Revision 6, dated June 28, 2012.

2. SMS failed to correct a condition adverse to quality. SMS opened CR No. 12-346 to address the documentation of late entries in Procedure QP-G-17, "Quality Records," and SMS subsequently closed CR No. 12-346 by publishing Revision 5 of Procedure QP-G-17. However, SMS later published Procedure QP-G-17, Revision 6, but deleted all of the guidance for the late entries incorporated in Revision 5 that addressed and resulted in the closure of CR No. 12-346.

3. SMS failed to prevent recurrence of SCAQs related to identification and control of items. SMS had a closed SCAQ CR (CR No. 12-177) related to the inadequate

control of issuance of weld wires used in the fabrication of safety-related modules. However, SCAQ CR Nos. 12-272_and 12-543) were open with the same root cause analysis as the one already closed.

4. SMS failed to perform adequate corrective actions associated with a nonconformance identified during a previous NRC inspection. SMS failed to complete procedure revisions by August 31, 2012, as committed to in its March 9, 2012, response (Agencywide Document Access and Management System (ADAMS) Accession No. ML12082A161) to a notice of nonconformance issued on January 6, 2012 (ADAMS Accession No. ML11354A389). These procedure revisions were documented as corrective actions for Nonconformance 99901401/ 2011-201-09, which was identified during a November 14-18, 2011, inspection for SMS's failure to perform a trend analysis of conditions adverse to quality as required by the Shaw Nuclear Services purchase orders. Additionally, some SMS staff members were performing trending analysis using a draft procedure, but there was no formal guidance provided.

This issue has been identified as Nonconformance 99901401/2012-201-01.

Please provide a written statement or explanation to the U.S. Nuclear Regulatory Commission, Attn: Document Control Desk, Washington, DC 20555-0001, with a copy to the Chief, Quality Assurance Branch, Division of Construction Inspection and Operational Programs, Office of New Reactors, within 30 days of the date of the letter transmitting this Notice of Nonconformance. This reply should be clearly marked as a "Reply to a Notice of Nonconformance" and should include for each noncompliance: (1) the reason for the noncompliance, or if contested, the basis for disputing the noncompliance, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid noncompliances, and (4) the date when your corrective action will be achieved. Where good cause is shown, the NRC will consider extending the response time.

Because your response will be made available electronically for public inspection in the NRC Public Document Room or from the NRC's ADAMS, to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be made available to the public without redaction. ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request that such material be withheld, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.390(b) to support a request for withholding confidential commercial or financial information). If Safeguards Information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21, "Protection of Safeguards Information: Performance Requirements."

Dated this the 24th Day of October 2012.

U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NEW REACTORS
DIVISION OF CONSTRUCTION INSPECTION AND OPERATIONAL PROGRAMS
VENDOR INSPECTION REPORT

Docket No.:	99901401
Report No.:	99901401/2012-201
Vendor:	Shaw Modular Solutions 3191 W. Lincoln Road Lake Charles, LA 70605
Vendor Contact:	Mr. Joseph Ernst Executive Vice President Telephone: 337-562-3542 E-mail: joseph.ernst@shawgrp.com
Nuclear Industry Activity:	Shaw Modular Solutions is under contract with Shaw Nuclear Services to fabricate structural equipment modules for the AP1000 units to be constructed at Vogtle and V.C. Summer.
Inspection Dates:	September 10-14, 2012

Inspectors:		
Samantha Crane	NRO/DCIP/CMVB	Team Leader
Paul Prescott	NRO/DCIP/CQAB	
Leigh Trocine	NRO/DCIP/CQAB	
Aixa Belen	NRO/DCIP/CQAB	
Steven Smith	RII/CIB2/DCI	

Approved by: Kerri A. Kavanagh, Chief
Quality Assurance Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors

EXECUTIVE SUMMARY

Shaw Modular Solutions
99901401/2012-201

During September 10-14, 2012, the U.S. Nuclear Regulatory Commission (NRC) staff conducted an unannounced inspection at the Shaw Modular Solutions facility (SMS) in Lake Charles, LA. The inspection focused on manufacturing and inspection activities related to the fabrication of safety-related structural modules for the V.C. Summer and Vogtle projects.

NOTE: This inspection was not performed as part of the NRC's overall strategy for inspecting targeted Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) related to the functional and type testing of safety-related components being supplied by Westinghouse Electric Company and their sub-suppliers as part of the AP1000 certified reactor design.

Specifically, the inspectors observed a corrective action screening meeting and the implementation of supplemental work instructions related to the resolution of nonconforming conditions. The inspectors also observed quality control (QC) inspections on the shop floor that included traceability checks, nondestructive examination (NDE), final welding inspections, and fit and tack inspections. The inspectors reviewed the product identity certification (PIC) tickets and parts lists associated with two modules to ensure material traceability was maintained and could be identified in the modules, and they also conducted an inspection of a sample of material in the modules to ensure there was no uncontrolled material present. Lastly, the inspectors reviewed drawings, shop travelers, and welder sign-off sheets to verify that they appropriately incorporated engineering and departure change requests (E&DCRs) through the redline process, that they appropriately identified welds on the drawings and recorded them in the welder sign-off sheet, and that they appropriately identified inspection points and documented the results of those inspections.

The purpose of this inspection was to verify that SMS performed the quality activities in support of the fabrication of safety-related structural modules in accordance with a quality assurance (QA) program that complied with the requirements of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities."

The following regulation served as the bases for the NRC inspection:

- Appendix B of 10 CFR Part 50

During this inspection, the inspectors implemented Inspection Procedure (IP) 43003, "Reactive Inspections of Nuclear Vendors," dated April 25, 2011.

The NRC previously performed a vendor inspection at the SMS facility in Lake Charles, LA, during November 14-18, 2011 (Agencywide Document Access and Management System Accession No. ML11354A389). The inspection documented in this report was a reactive inspection based on new issues as well as a followup to the findings of the November 2011 inspection.

With the exception of the nonconformance described below, the inspectors concluded that SMS is effectively implementing its QA programs in support of the fabrication of safety-related structural modules. The information below summarized the results of this inspection.

Nonconforming Material, Parts, or Components and Corrective Action

The inspectors determined the implementation of SMS's program for corrective actions was not consistent with the regulatory requirements in Criterion XVI, "Corrective Action," of Appendix B to 10 CFR Part 50. Specifically, SMS failed to promptly correct conditions adverse to quality and significant conditions adverse to quality (SCAQs), failed to correct a condition adverse to quality regarding documentation of late entries in a quality records procedure, failed to preclude recurrence of SCAQs related to identification and control of items, and failed to correct a condition adverse to quality associated with a nonconformance identified during a previous NRC inspection. The inspectors identified this finding as Nonconformance 99901401/2012-201-01.

The inspectors determined that the implementation of SMS's program for control of nonconforming material, parts, or components was consistent with the regulatory requirements in Criterion XV, "Nonconforming Materials, Parts, or Components," of Appendix B to 10 CFR Part 50. Based on the limited sample of nonconformance reports reviewed and the observation of activities on the shop floor at SMS related to nonconformances, the inspectors determined that SMS is effectively implementing its quality assurance manual (QAM) and the associated nonconformance procedures.

Inspection

The inspectors reviewed drawings, shop travelers and welder sign-off sheets for equipment modules and safety-related structural modules to verify that they appropriately identified welds on the drawings and recorded them in the welder sign-off sheet and appropriately identified inspection points and documented the results of those inspections. In addition, the NRC inspectors observed QC inspections on the shop floor that included traceability checks, NDE, final welding inspections, and fit and tack inspections to verify that inspections are performed in accordance with SMS policies and procedures, as well as applicable codes and standards. The inspectors also reviewed the "SMS Policy on the Treatment of Temporary Bracing" to verify that the vendor followed appropriate practices for welding of temporary bracing on safety-related modules. The inspectors held discussions with the responsible welding engineer to determine how the policy was implemented, which bracing may be considered safety-related, and what actions were required if the temporary bracing was removed.

The inspectors identified several findings of minor significance related to welding studs out of sequence, improperly documenting changes to the welder sign-off sheets, including duplicate welds in the welder sign-off sheets, and using unqualified weld procedure specifications. However, the inspectors concluded that the implementation of the SMS program for inspection is consistent with the regulatory requirements of Criterion X, "Inspection," of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and observation of ongoing inspection activities at the SMS facility, the inspectors also determined that SMS is effectively implementing its QAM and the associated inspection procedures. The inspectors identified no findings of significance.

Control of Manufacturing Activities

The inspectors reviewed SMS's processes and procedures for how design drawings and requirements are reviewed, approved, and distributed for use in the fabrication of the AP1000 structural submodules. The inspectors also reviewed how E&DCRs are incorporated into work orders during various stages of fabrication to ensure that changes were appropriately captured and completed as part of the work order. In addition, inspectors verified that information, such as weld size, weld configurations, and materials incorporated though the redline process, was adequately identified and documented in work orders and drawings.

The inspectors concluded that SMS implemented its control of the manufacturing process consistent with the regulatory requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. Based on the limited samples of documents reviewed, the inspectors also determined that SMS implemented its policies and procedures as written. The inspectors identified no findings of significance.

Traceability

The inspectors reviewed SMS's processes and procedures for ensuring that material traceability was maintained per SMS's requirements and reviewed the PIC tickets and parts lists associated with Module No. KB37 for Vogtle and CA20-25 for V.C. Summer to ensure material traceability was maintained and could be identified in the modules. The inspectors also conducted an inspection of a sample of material in the modules to ensure no uncontrolled material was present. Additionally, the inspectors reviewed the PIC tickets and parts lists associated with Module Nos. KB37 for Vogtle and CA20-25 for V.C. Summer to ensure that material that had been currently used for fabrication in the assembly could be traced to the associated module. The inspectors also conducted an inspection of a sample of material in the modules to ensure no uncontrolled material was present.

The inspectors determined that the implementation of SMS's program for traceability was consistent with the regulatory requirements in Criterion VIII, "Identification and Control of Material, Parts, and Components." Based on the limited sample of PIC tickets and parts lists reviewed and the observation of activities on the shop floor at SMS related to traceability, the inspectors determined that SMS is effectively implementing its QAM and the associated nonconformance procedures. The inspectors identified no findings of significance.

Personnel Qualification

The inspectors reviewed the personnel training and qualification process for QC personnel and reviewed the training and qualification records of 14 QC inspectors and foremen. The inspectors also attended a safety meeting, interviewed QC inspectors, observed QC inspectors during the performance of their work, and discussed the personnel training and qualification process with SMS management and staff.

The inspectors determined that the training and qualification of SMS personnel conforms to the regulatory requirements in Criterion II, "Quality Assurance Program," of Appendix B to 10 CFR Part 50. In addition, the inspectors determined that, for the limited sample reviewed, the SMS staff has been effectively implementing the SMS QAM and implementing procedures for the training and qualification of its personnel. The inspectors identified no findings of significance.

REPORT DETAILS

The U.S. Nuclear Regulatory Commission (NRC) inspectors observed various activities associated with the fabrication of safety-related modules for the V.C. Summer and Vogtle projects; conducted interviews with responsible Shaw Modular Solutions (SMS) personnel; and verified that fabrication for Module No. CA05-01-200 for Vogtle, CA20-04 for Vogtle, CA20-05-200-220 for Vogtle, CA20-25 for V.C. Summer, CA20-28-200 for Vogtle, CA20-29 for V.C. Summer, CA20-76 for V.C. Summer, CA20-77 for V.C. Summer, CA20-77 for Vogtle, KB37 for Vogtle, R1-06 for V.C. Summer, and R1-06 for Vogtle was performed in accordance with the applicable quality and technical requirements imposed in the associated purchase orders (POs) and engineering and departure change requests (E&DCRs). Specifically, the inspectors observed a corrective action screening meeting and the implementation of supplemental work instructions related to the resolution of nonconforming conditions. The inspectors also observed quality control (QC) inspections on the shop floor that included traceability checks, nondestructive examination (NDE), final welding inspections, and fit and tack inspections. The inspectors reviewed the product identity certification (PIC) tickets and parts lists associated with two modules to ensure material traceability was maintained and could be identified in the modules, and they conducted an inspection of a sample of material in the modules to ensure no uncontrolled material was present. Lastly, the inspectors reviewed drawings, shop travelers, and welder sign-off sheets to verify that they appropriately incorporated E&DCRs through the redline process, that they appropriately identified welds on the drawings and recorded them in the welder sign-off sheet, and that they appropriately identified inspection points and documented the results of those inspections.

NOTE: This inspection was not performed as part of the NRC's overall strategy for inspecting targeted Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) related to the functional and type testing of safety related components being supplied by Westinghouse Electric Company and their sub-suppliers as part of the AP1000 certified reactor design.

1. Nonconforming Materials, Parts, or Components and Corrective Actions

   a. Inspection Scope

      The inspectors reviewed the SMS policies and procedures that govern the programs for the control of nonconforming materials, parts, or components and corrective actions to verify compliance with Criterion XV, "Nonconforming Materials, Parts, or Components," and Criterion XVI, "Corrective Action," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," respectively. The inspectors reviewed a sample of condition reports (CRs) and nonconformance reports (NCRs) associated with the fabrication of safety-related modules to verify the adequacy of SMS's implementation and control over nonconforming quality materials, parts, or components and corrective action. In addition, the inspectors discussed the corrective action program with SMS management and technical staff, and observed a corrective action screening meeting and a corrective action program oversight meeting. Also, the inspectors performed walkdowns of material storage areas, work areas, and the facility to inspect the segregation of nonconforming materials, the control of NCRs on ongoing work, and material conditions that could contribute to quality issues. The inspectors observed ongoing craft work and

inspection activities for the identification and control of NCRs. The attachment to this inspection report lists the documents reviewed by the inspectors.

b. Observations and Findings

The inspectors verified through interviews that SMS personnel knew that they could submit an NCR or CR. The inspectors verified that the SMS process and procedures for corrective action define conditions adverse to quality and significant conditions adverse to quality (SCAQ), conditions that may require a reportability review (e.g., 10 CFR Part 21, "Reporting of Defects and Noncompliance," review), and provisions for a stop work order.

The inspectors noted that the corrective action program has no specific requirements for prompt correction of a condition adverse to quality. The inspectors reviewed CR logs and observed that SMS's average time to close a CR related to a condition adverse to quality is 98 days and to close a CR related to an SCAQ is 120 days. The inspectors noted that there were CRs open with similar issues, such as procedure adherence, bypass of hold points, loss of traceability, and loss of document control. For example, SMS opened CR No. 12-597 and 12-206 to address procedural adherence; CR No. 12-166, 12-358, and 12-784 to address the bypass of hold points; CR No. 12-327, 12-345, and 12-356 to address issues related to heat number and loss of traceability; and CR No. 12-356, 12-401, and 12-504 to address issues with document control in which V.C. Summer documents were with Vogtle assemblies, and vice versa. The inspectors determined that the repetitive nature of these examples was caused by the failure to implement corrective actions for conditions adverse to quality in a timely manner. Additionally, the inspectors noted that the root cause analyses performed for five out of eight SCAQs opened in 2012 were not completed within the 30-calendar-day requirement described in Section 6.7.2.a of Procedure QP-G-16, "Corrective Action Program." The inspectors identified these issues as one example of Nonconformance 99901401/2012-201-01, for the failure of SMS to promptly correct conditions adverse to quality. SMS initiated CR No. 12-938 to address the failure to promptly close out SCAQs.

The inspectors reviewed CR No. 12-346, which was opened to address documentation of late entries in Procedure QP-G-17, "Quality Records." SMS closed the CR by publishing Revision 5 of Procedure QP-G-17. However, the inspectors noted that SMS had published Procedure QP-G-17, Revision 6, and had deleted the guidance for late entries incorporated in Revision 5 that addressed CR No. 12-346. The inspectors identified these issues as a second example of Nonconformance 99901401/ 2012-201-01 for the failure of SMS to correct a condition adverse to quality.

The inspectors reviewed eight SCAQs opened in 2012. CR No. 12-177 was opened to address the use of a weld wire with a hold tag in production. The root cause analysis report described the root causes, which included inadequate control of weld filler material. SMS implemented corrective actions, and the CR was closed. However, the inspectors noted that CR Nos. 12-272 and 12-543 were opened to address the inadequate use of weld wire in the fabrication of modules. In addition, the root cause analysis (RCA) report for CR No. 12-543 concluded that one of the causes was inadequate control of weld filler material and that this contributing cause was identical to Cause No. 2 in the RCA report for CR No. 12-177. The inspectors identified this issue

as a third example of Nonconformance 99901401/2012-201-01 for the failure of SMS to preclude recurrence of SCAQs.

The inspectors verified the corrective actions for Nonconformance 99901401/ 2011-202-09, which was identified during the November 14-18, 2011, NRC inspection for SMS's failure to do trending required by the POs from Shaw Nuclear Services (SNS) for the submodules at Vogtle and V.C. Summer. Nonconformance 99901401/ 2011-201-09 was documented in a Notice of Nonconformance issued on January 6, 2012 (Agencywide Document Access and Management System (ADAMS) Accession No. ML11354A389). In SMS's March 9, 2012, response to the NRC (ADAMS Accession No. ML12082A161), SMS committed to complete its transition to an electronic corrective action program that includes procedure revisions, the establishment of the Corrective Action Review Board (CARB), and training for implementation of electronic trending by August 31, 2012. The inspectors reviewed Procedure QP-G-16, "Corrective Action," Revision 6, dated June 28, 2012. The inspectors noted that SMS established the CARB and performed some trending analysis for conditions adverse to quality. The inspectors also noted that Procedure QP-G-16 states that the quality assurance (QA) manager is responsible for assessing and reporting identified trends. However, the procedure does not have further guidance on how to perform the trending. The inspectors were informed that some SMS staff members were performing trending analysis using a draft procedure, but there was no formal guidance provided. The inspectors identified this issue as a fourth example of Nonconformance 99901401/2012-201-01 for the failure of SMS to fully implement the committed actions as of September 14, 2012. SMS initiated CR No. 12-924 to address this issue.

The inspectors reviewed the following CR's to develop an understanding of recurring issues related to the redline process (a process that identifies revisions or corrections to documents) and to evaluated the adequacy of corrective actions.

- The first CR reviewed by the inspectors (CR No. 2012-703) documents that, on Drawing No. APP-CA 20-S5-28-200-2817, a process engineer had incorrectly redlined a seam weld at a location different from the design location. When QC informed the process engineer that it was incorrect, the redline marking was lined through and removed by process engineering. The associated procedure (Procedure QP-PC-06, "Implementation of Shop Travelers," Revision 8) restricts process engineering to redlining only minor changes and clarifications without design authority. The inspectors considered the corrective actions associated with this CR to be appropriate.

- The second CR reviewed by the inspectors (CR No. 2012-704) documents that the original tack weld entry, which had already been signed off by QC, was subsequently lined through and annotated "tack broke" on a welder sign-off sheet for Tack Weld No. 000-20-0027. The broken tack was later removed, and the pieces were re-fit and re-tacked. A QC inspector inspected the new fit-up, including new tack weld, and accepted it. The inspectors noted that rework of in-process items is allowed without initiating an NCR, as specified in Procedure QP-PC-06. The inspectors determined that the condition reported was within the scope of in-process rework, and they considered the corrective actions associated with this CR to be appropriate.

- The third CR reviewed by the inspectors (CR No. 2012-705) documents that welder sign-off sheets showed the original finish welder entries for welds were performed, lined out, and later annotated as lined out in error. A second entry was made noting that the welder was on annual leave when this entry was signed off as welding complete and acceptable by QC. A third entry was made re-logging the original entry; however, the date of welding performed was incorrectly entered. SMS subsequently corrected the problem by lining out the second welder's entries with QC concurrence. With regard to the third entries that restored the original entries, SMS lined out the incorrect dates of welding and entered the correct dates. QC then re-verified the weld entries, re-inspected the welds, and signed off the welds as acceptable. An all-hands meeting was conducted that covered expectations of procedure use and adherence. All of the documentation errors covered in this CR preceded the date of this all-hands meeting, except for the welder's and supervisor's entry. The supervisor is no longer employed at SMS, and the welder was coached by the CR investigator on the importance of using the date the weld was made to maintain traceability. The inspectors considered the corrective actions associated with this CR to be appropriate.

The inspectors considered the safety significance of these issues to be minor because SMS identified the issues and placed them into their CR process to ensure adequate correction and because the issues did not rise to the level of SCAQs. Based on the limited scope of this review, the inspectors also considered the associated corrective actions to be appropriate.

c. Conclusions

The inspectors determined the implementation of SMS's program for corrective actions was not consistent with the regulatory requirements in Criterion XVI of Appendix B to 10 CFR Part 50. Specifically, SMS failed to promptly correct conditions adverse to quality and SCAQs, failed to correct a condition adverse to quality regarding documentation of late entries in a quality records procedure, failed to preclude recurrence of SCAQs related to identification and control of weld wire, and failed to correct a condition adverse to quality associated with a nonconformance identified during a previous NRC inspection. This has been identified as Nonconformance 99901401/2012-201-01.

The inspectors determined that the implementation of SMS's program for control of nonconforming material, parts, or components was consistent with the regulatory requirements in Criterion XV of Appendix B to 10 CFR Part 50. Based on the limited sample of nonconformance reports reviewed and the observation of activities on the shop floor at SMS related to nonconformances, the inspectors determined that SMS is effectively implementing its quality assurance manual (QAM) and the associated nonconformance procedures.

2. Inspection

a. Scope

The inspectors reviewed SMS's policies and procedures that govern inspection to verify compliance with the requirements of Criterion X, "Inspection," of Appendix B to

10 CFR Part 50. The inspectors reviewed drawings, shop travelers, and welder sign-off sheets to verify that they appropriately identified welds on the drawings, recorded them on the welder sign-off sheet, appropriately identified inspection points, and documented the results of those inspections. In addition, the inspectors observed QC inspections on the shop floor that included traceability checks, NDE, final welding inspections, and fit and tack inspections to verify that SMS is performing inspections in accordance with its policies and procedures and applicable codes and standards.

The inspectors also reviewed the "SMS Policy on the Treatment of Temporary Bracing" to verify that the vendor followed appropriate practices for welding of temporary bracing on safety-related modules. The inspectors held discussions with the responsible welding engineer to determine how the policy was implemented, what bracing may be considered safety-related, and what actions were required if the temporary bracing was removed. The inspectors also reviewed the applicable welding code requirements in the American Welding Society (AWS) D1.1, "Structural Welding Code – Steel." The attachment to this inspection report lists the documents reviewed by the inspectors.

b. Observations and Findings

The inspectors verified that SMS had procedures for inspection that provided measures for the generation of inspection control documents, such as travelers, process sheets, instructions, checklists, or other appropriate means.

b.1. Review of Process Control Documents

For a sample of drawings, shop travelers, and welder sign-off sheets, the inspectors verified that inspection control documents include the following information: the item inspected, inspection date, type of observation, results of examination and tests, and the initials of the QC inspector or welder for the activities witnessed. The inspectors verified that mandatory hold points were indicated in the controlling documents and that work does not proceed without appropriate approval.

The inspectors reviewed the drawings, assembly shop travelers, and welder sign-off sheets for the following modules to verify that documents were appropriately signed, that the drawings included weld symbols that appropriately documented the welds to be performed, and that changes to the travelers and welder sign-off sheet were made in accordance with SMS procedures:

- CA05-01-200 for Vogtle
- CA20-05-200-220 for Vogtle
- CA20-28-200 for Vogtle
- CA20-76 for V.C. Summer
- CA20-77 for V.C. Summer
- CA20-77 for Vogtle
- R1-06 for V.C. Summer
- R1-06 for Vogtle

For the reviewed drawings and portions of the assembly shop travelers and welder sign-off sheets for Module No. R1-06 for Vogtle and V.C. Summer, Module

No. CA20-76 for V.C. Summer, and Module No. CA05-01-200 for Vogtle, the inspectors did not identify any findings of significance.

For Module No. CA20-05-200-220 for Vogtle, the inspectors identified that Step 130, "Weld CA-20-05-200-220 Stud Welds," in the assembly shop traveler identified specific studs to be omitted when welding the submodule. These studs were to be welded in the assembled module. However, Stud No. 220-10-0851, 220-10-0951, 220-10-0935, and 220-10-0936 were welded and listed in the welder sign-off sheet. The inspectors discussed this issue with SMS staff, who indicated that the omission of these studs during the assembly of the submodule is included in the traveler for ease of assembly of the module and that the welding of the studs during submodule fabrication does not affect the safety function of the module. The stud welds were included in the welder sign-off sheets and had received appropriate QC inspection. While the welds were performed out of sequence, this issue is of minor significance because the welds do not affect the ability of the module to perform its safety function and the welds were documented. In addition, the traveler is still under review, and SMS still has the opportunity to correct the documentation.

For Module No. CA20-05-200-220 for Vogtle, Fillet Weld No. 220-20-0100 was lined out on Page 22 of the welder sign-off sheet. The note says that Weld No. 220-20-0100 is no longer an existing weld and that two new weld numbers are to be issued per NCR No. 12-000340. NCR No. 12-000340 is listed in the traveler. The inspectors verified that the NCR included the supplemental work instructions, that they were completed and signed-off on, and that the new welds were documented in the welder sign-off sheet in accordance with the NCR.

However, the inspectors did identify an issue of minor significance related to documenting changes to the welder sign-off sheets for Module No. CA20-05-200-220 for Vogtle. Procedure QP-G-17, "Quality Assurance Records," Revision 1, dated March 8, 2010, Step 6.2.2 states, "Records shall be legible, accurate, and verified complete as appropriate for the work accomplished." In addition, Step 6.2.3 states, "Corrections/changes on documents shall be made by a single line through the incorrect information and typing or writing the correct information in an adjacent area or be written on a supplemental page, if insufficient space on the document to add the correction. The individual making the change/correction shall initial and date the change."

The inspectors identified that Stud Weld Nos. 220-10-0084 through 220-10-0099 were originally logged as a group on Page 11 on the welder sign-off sheet. The welds were performed on April 16, 2012, and the entry was lined-out on April 18, 2012. The note says that the welds were re-logged on the next page. The inspectors verified that the welds were re-logged on the next page and noted that the date of the welds on the new weld log entry was April 18, 2012, even though the welds were welded on April 16, 2012. Welds 220-10-0094, 220-10-0095, 220-10-0096, and 220-10-0099 were rejected and listed in the stud re-weld section as having been re-welded on April 17, 2012, which is prior to the date listed in the log for the original welds. Stud Weld No. 220-10-0098 was logged on page 15 and dated May 9, 2012. While the changes to the welder sign-off sheet were not made in accordance with QP-G-17, the issue is of minor significance because the welds and associated QC inspections were documented

and the welder sign-off sheet has not yet undergone final review. SMS took immediate corrective action and opened CR No. 2012-936 to address the improper change to the welder sign-off sheet.

For Module No. CA20-28-200 for Vogtle, the inspectors identified that entries for Stud Weld Nos. 200-10-3738 through 3743 and 200-10-3746 through 3756 on page 26 were logged without the stud welder or weld date recorded and with no supervisor signature or visual test recorded. These are duplicate entries to weld log entries on page 15 that have the stud welder and date as well as the supervisor and QC sign off. This issue is a documentation issue of minor significance since the welds were entered into the welder sign-off sheet and had received appropriate inspection and sign-offs. SMS took immediate corrective action and issued CR No. 2012-935 to address the issue.

During the course of the inspection SMS self-identified that Drawing APP-CA20-11-77-000-7701 for V.C. Summer and Drawing APP-CA20-S5-77-000-7702 for Vogtle call out partial joint penetration (PJP) welds on welds 40-0001 through 40-0011. PJP Weld Nos. 40-0001 through 40-0011 on Submodule No. CA20-77 for Vogtle and V.C. Summer were made using welding procedure specification (WPS) 1-1-107, Revision 4, which was not qualified to produce PJP welds. There was no supporting procedure qualification record for this WPS, but it was still released to the floor and used to create the welds. This issue was identified by SMS QC inspectors, NCR Nos. 12-000914 and 12-000916 were immediately opened, the submodules were tagged as nonconforming, and SMS issued CR No. 2012-921 to address the issue. This issue is of minor significance since SMS self-identified the issue and took immediate corrective action.

b.2. Observation of Inspection Activities

The inspectors observed and assessed actual techniques being used and their acceptability relative to contract and procedural requirements. Specifically, the inspectors observed QC inspections that included those with customer quality representative hold and notification points for a fit and tack inspection for Mechanical Module No. KB37 for Vogtle, a final weld-out inspection for Module Nos. R1-06 for Vogtle and V.C. Summer, and material verification inspection for Module No. CA20-76 for V.C. Summer. The inspectors verified that the traveler included items to be inspected and documented the inspection date, type of observation, results of the examination, and the initials of the QC inspector. The inspectors verified that the travelers contained mandatory hold points and that work did not proceed without appropriate approval. The inspectors also verified through direct observation that the QC inspectors were using the correct drawings and documentation, that the documents and drawings in the work package matched the job, and that the QC inspector's sign-off attested to this. In addition, the inspectors verified that the welder sign-off sheets for the activities observed, appropriately identified the weld number, welder, and type of weld. For the activities observed, the QC inspectors performed the verification of work and records required by Procedure QP-WI-01, "Welding Inspection Procedure," Revision 9, dated July 18, 2012. The inspections were performed by qualified personnel other than those who performed or directly supervised the work being inspected.

The inspectors also witnessed NDE activities. They observed personnel performing the activities, verified the associated light meters and temperature meters were calibrated, the chemicals were correct and within the expiration date, and reviewed the associated Procedure QP-NDE-PT-01, "Liquid Penetrant Testing Procedure," Revision 9, and Procedure QP-NDE-VT-01, "Visual Examination Procedure," Revision 6.

Module No. CA20-29 for V.C. Summer, Work Order No. 1933408, required removing two sections of backing bar protruding past the leak chase of the module and installing leak chase end caps. The section of backing bar was removed and the affected area was ground down to base metal. The QC inspector performed the inspection in accordance with the requirements of Procedure QP-NDE-PT-01. However, the results of the penetrant test indicated that the welds were not sufficiently ground down. The area was subsequently wire-brushed, and a penetrant test was performed again. The area of removed backing bar was found to be acceptable. However, an adjacent weld indicated insufficient fusion of the weld. The engineer was initially going to allow excavation of the weld area in question. However, the QC inspector noted that supplemental work instructions were needed for expansion of the work scope. Supplemental work instructions were subsequently developed to allow for excavation of the problem weld area, re-welding, and NDE of the replacement weld segment.

Module No. CA20-25 for V.C. Summer, Work Order No. 1907249, required removing a corner plate that had piping holes oriented incorrectly. The corner plate was removed and the affected area was ground down to base metal. The inspectors identified that the supplemental work instructions in NCR No. 12000894 did not identify the location of the area to be inspected by a drawing. The personnel involved in the inspection stopped work and had the supplemental work instructions revised to reflect the drawing. An initial visual test identified that several spots had been ground down below the base metal surface of 1/32 inch. In accordance with Procedure QP-NDE-VT-01, the areas were marked, the drawing revised to reflect the area, and a supplemental work instruction was developed to fill in the affected area. The QC inspector also did a penetrant test of the areas to ensure there was no exposed surface cracking as a result of the grinding. The inspectors verified that the removed corner piece was appropriately identified as "scrap."

b.3. Inspection of Temporary Bracing

During fabrication of AP1000 modules, SMS engineering determined there are instances in which installation of temporary welded attachments (i.e., temporary fabrication bracing) is necessary to facilitate construction and to ensure all necessary contractual quality requirements are met. The purpose of this policy was to define SMS's process for the treatment of temporary bracing and construction aids. SMS developed five categories of temporary bracing:

- Temporary bracing and construction aids that are welded to safety-related products designed by Westinghouse Electric Company and that will not remain as part of the permanent plant. Temporary bracing falling into this category may be removed by SMS or at the job site.

- Temporary bracing and construction aids that are welded to other temporary bracing. Construction aids and that are utilized for engineered structural integrity but will not remain as part of the permanent plant. Temporary bracing falling into this category will be removed at the job site.

- Temporary jigs and fixtures that are welded to other temporary bracing and construction aids for the sole purpose of aiding in the module fabrication process. Temporary bracing falling into this category will be removed by SMS prior to shipment.

- Temporary bracing and construction aids that are issued in an E&DCR as part of the AP1000 design, by request of SMS (leave in-place bracing that will be part of the permanent plant).

- Vertical lifting frames engineered for lifting submodules into place at the job site.

If the temporary attachment is removed, then it is classified as nonsafety-related, nonseismic and does not have special QA requirements. However, SMS must select and use material for the temporary attachment that meets the requirements of the approved WPS that documents the welding. The supplemental work instructions are documented in accordance with SMS Procedures QP-PE-10, "Development of Shop Traveler," and QP-PC-06, "Implementation of Shop Traveler." If the temporary attachment is removed, the welding engineer stated that the area is inspected by a QC inspector to ensure the base material was unaffected.

The welding engineer stated that Category 4 bracing will meet the requirements specified in the corresponding E&DCR; therefore it will be inspected by QC. Category 5 bracing will meet the same quality requirements for safety-related fabrication including full material, weld traceability and QC inspection. The inspectors reviewed the requirements in AWS D1.1 and did not identify any deviations from practices specified in the code.

c. Conclusions

The inspectors concluded that the implementation of the SMS program for inspection is consistent with the regulatory requirements of Criterion X, of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and observation of ongoing inspection activities at the SMS facility, the inspectors also determined that SMS is effectively implementing its QAM and the associated inspection procedures. The inspectors identified no findings of significance.

3. Control of Manufacturing Activities

a. Scope

The inspectors reviewed SMS's policies and procedures that govern the control of manufacturing processes to verify compliance with the requirements of Criterion III, "Design Control," of Appendix B to 10 CFR Part 50. The inspectors reviewed work

orders for a sample of eight structural submodules currently in fabrication, conducted interviews with responsible SMS personnel, and reviewed fabrication documents to determine if SMS performed fabrication activities were in accordance with the applicable design, quality, and technical requirements imposed through design drawings, specifications, procedural requirements, and changes made through E&DCRs. The attachment to this inspection report lists the documents reviewed by the inspectors.

b. Observations and Findings

The inspectors verified that SMS established and implemented processes and procedures to ensure that design, specification, and procedural requirements were adequately translated into documents used to support the fabrication of the AP1000 structural submodules. Documents reviewed included shop travelers, project instruction sheets, supplemental instructions, weld logs, traceability logs, and associated drawings used for fabrication. While the inspectors found the processes and procedures used to develop documents to be adequate, the inspectors also observed that difficulties were encountered during their implementation and use during fabrication. Specifically, inspectors identified several instances in which personnel did not document inspections in the appropriate location, did not properly log supplemental instructions in the shop traveler, and had not yet performed required inspections on completed welds. These issues were not identified as nonconformances because these packages were considered in-process with the final reviews incomplete.

The inspectors also verified the process and procedures for implementing clarifications and changes to fabrication documents through the use of redlines and E&DCR's. During this review, the inspectors compared SMS's E&DCR tracking log to corresponding work orders, clarifications, and changes to drawings or work instructions incorporated through either drawing revisions or redlines as required by E&DCRs. In addition, inspectors also reviewed SMS CR Nos. 2012-703 and 2012-559, which identified that a redline was improperly made to the CA20-28 submodule and that improper implementation of changes made through an E&DCR led to missing studs on the CA20-04 submodule for Vogtle. These CRs were reviewed to help inspectors further understand recent issues related to the E&DCR and redline processes.

c. Conclusions

The inspectors concluded that the implementation of the SMS program for control of manufacturing activities is consistent with the regulatory requirements of Criterion III of Appendix B to 10 CFR Part 50. Based on the limited sample of documents reviewed and observation of ongoing inspection activities at the SMS facility, the inspectors also determined that SMS is effectively implementing its QAM and the associated procedures for control of manufacturing activities. The inspectors identified no findings of significance.

4. Traceability

a. Scope

The inspectors reviewed the SMS policies and procedures that govern traceability to verify compliance with Criterion VII, "Identification and Control of Material, Parts, and Components," of Appendix B to 10 CFR Part 50. The inspectors reviewed the PIC

tickets and parts lists associated with Module No. KB37 for Vogtle and CA20-25 for V.C. Summer to ensure material traceability was maintained and could be identified in the modules. The inspectors reviewed the associated Procedure QP-WH-01, "Material Control," Revision 9, to ensure that material traceability was maintained per SMS's requirements. The inspectors also conducted an inspection of a sample of material in the modules to ensure no uncontrolled material was present. The attachment to this inspection report lists the documents reviewed by the inspectors.

b. Observations and Findings

The inspectors reviewed the PIC tickets and parts lists associated with Module Nos. KB37 for Vogtle and CA20-25 for V.C. Summer to ensure that material that had been currently used for fabrication in the assembly could be traced to the associated module. The inspectors identified that PIC Ticket No. 12-1718 was missing for Module No. CA20-25 for V.C. Summer. SMS was subsequently able to produce a copy, and the PIC ticket was placed back in the Work Order Package No. 2355750. The inspectors also conducted an inspection of a sample of material in the modules to ensure no uncontrolled material was present.

c. Conclusions

The inspectors determined that the implementation of SMS's program for traceability was consistent with the regulatory requirements in Criterion VIII of Appendix B to 10 CFR Part 50. Based on the limited sample of PIC tickets and parts lists reviewed and the observation of activities on the shop floor at SMS related to traceability, the inspectors determined that SMS is effectively implementing its QAM and the associated nonconformance procedures. The inspectors identified no findings of significance.

5. Training and Qualification of Personnel

a. Inspection Scope

The inspectors reviewed SMS's policies and procedures to verify that SMS was implementing training activities in a manner consistent with regulatory requirements and industry standards. The inspectors reviewed the personnel training and qualification process for QC personnel, as well as the training and qualification records of 14 QC inspectors and foremen to verify conformance with the requirements in Criterion II, "Quality Assurance Program," of Appendix B to 10 CFR Part 50. In addition, the inspectors discussed the personnel training and qualification process with SMS management and staff, attended a safety meeting, interviewed QC personnel, and observed them during the performance of their work. Particular attention was placed on SMS's training of QC personnel performing quality activities associated with the fabrication of structural submodules being supplied to U.S. commercial nuclear power reactors as part of Westinghouse's AP1000 design. This included SMS's QC program commitments and controls for the qualification and certification of the QC personnel responsible for conducting (1) NDE, including visual, liquid penetrant, magnetic particle, ultrasonic (excluding pre-service), radiography, and leak testing, (2) non-NDE-related inspections and tests for acceptance of items per the SMS QA program, and (3) coating inspections related to and testing for acceptance of Level III or PIC II and Coating Service Level II safety-related coating modules. The attachment to this inspection report lists the documents reviewed by the inspectors.

b. Observations and Findings

The inspectors verified that SMS has programs and procedures in place for the qualification and training of QC personnel performing activities that affect quality, and these programs and procedures are consistent with regulatory requirements and with the American Society for Nondestructive Testing, Inc. (ASNT), Recommended Practice No. SNT-TC-1A 2006, "Personnel Qualification and Certification in Nondestructive Testing." The programs and procedures also take into account the need for special skills to attain the required quality and the need for verification of quality by inspection and testing. In addition, the programs and procedures provide for the indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained.

To verify effectiveness, the inspectors reviewed a representative sample of training and certification records for QC staff members (14 of 48), including nine QC inspectors, three QC foremen, the current QC ASNT Level III, and the previous QC Level III. This sample represented seven SMS employees and seven contract employees (three from Quality Inspection Services, Inc. (QISI); two from Project Assistance Corporation (PAC); one from Industrial Testing Laboratory Services, LLC (ITLS); and one from Legacy (LEG)). QISI and ITLS were both on SMS's approved suppliers list for NDE services. The sampled QC staff member training and certification records also included the following certifications: eight visual testing certifications, eight liquid penetrant testing certifications, eight magnetic particle certifications, five ultrasonic testing certifications, three radiographic testing certifications, two certified welding inspector certifications, one coating (paint) inspector certification, and four receipt inspector certifications. The inspectors verified that qualification, training records, and certifications exist for the QC foremen and QC inspectors and that these records are maintained in accordance with SMS's program requirements and consistent with industry standards.

The inspectors interviewed the QC Foreman, a QISI Visual Level II QC inspector, a welding foreman, a PAC QC inspector, a customer QCR inspector (SNS QC), and an SMS trainee. As stated in Section 2, "Inspection," of this inspection report, the inspectors also observed QC personnel during the performance of their work, including those jobs with customer quality representative hold and notification points for a fit and tack inspection for mechanical Module No. KB37 for Vogtle, a final weld-out inspection for Module Nos. R1-06 for both Vogtle and V.C. Summer, and material verification inspection for Module No. CA20-76 for V.C. Summer. The interviewed individuals were knowledgeable of their job requirements, and the QC inspections were performed by qualified personnel other than those who performed or directly supervised the work being inspected.

c. Conclusions

The inspectors concluded that SMS's program requirements for training and qualification of personnel are consistent with the requirements of Criterion II of Appendix B to 10 CFR Part 50. The inspectors also concluded that SMS's quality assurance manual and associated training and qualification procedures were adequate and effectively implemented. The inspectors identified no findings of significance.

6. Entrance and Exit Meetings

On September 10, 2012, the inspectors discussed the scope of the inspection with Mr. Joseph Ernst, SMS's Executive Vice President, and with the SMS management and staff. On September 14, 2012, the inspectors presented the inspection results and observations during an exit meeting with Mr. Ernst and other SMS staff. The attachment to this report lists the entrance and exit meeting attendees, as well as those interviewed by the inspectors.

ATTACHMENT

1. ENTRANCE AND EXIT MEETING ATTENDEES AND INDIVIDUALS INTERVIEWED

Name	Title	Affiliation	Entrance	Exit	Interviewed
Samantha Crane	Inspection Team Lead	U.S. Nuclear Regulatory Commission (NRC)/Office of New Reactors (NRO)	X	X	
Aixa Belen	Inspector	NRC/NRO	X	X	
Paul Prescott	Inspector	NRC/NRO	X	X	
Leigh Trocine	Inspector	NRC/NRO	X	X	
Steven Smith	Inspector	NRC/ Region II	X	X	
Daniel Adams	Quality Assurance (QA) Manager	Shaw Modular Solutions (SMS)	X	X	X
Joseph Ernst	Executive Vice President	SMS	X	X	X
Richard Fay	QA	SMS	X	X	X
Cecilia Gayle	QA Specialist	SMS	X	X	X
Janet Gray	Document Control Manager	SMS	X	X	
Lee Gros	Assistant General Manager	SMS	X	X	
Jack Martin	Senior Vice President Operations	SMS	X	X	
Jeffrey Randles	Quality Control (QC) Manager	SMS	X		X
Roy Rehkugler	Director Turnover	SMS	X	X	X
Ashley Taylor	Corrective Action Program (CAP) Manager	SMS	X	X	
Gregory Core	Construction Engineer	The Shaw Group	X	X	
Chris Fordham	Engineer	SMS		X	
Jack Gallagher	Employee Concerns	SMS		X	
Daniel Grannan	Director of QA	SMS		X	X
Mary Hart	Executive Assistant	SMS		X	
Cayla Johnston	CAP Coordinator	SMS		X	X
Michael Moser	General Manager	SMS		X	X
David Portus	Project Manager	SMS		X	X

Name	Title	Affiliation	Entrance	Exit	Interviewed
Al Taylor	CAP Manager	SMS		X	X
Dennis Dreyfus	Vice President QA	Shaw Nuclear		X	
Elvin Dumas	QA	Shaw Nuclear		X	
Keyes Niemer	Director of Modules	Shaw Nuclear		X	
Ronald Andrews		Southern Nuclear		X	
Charles Pierce	Director of Regulatory Affairs	Southern Nuclear		X	
Michael Hunt		V.C. Summer		X	
Levi Marcus	Resident Engineer	Westinghouse Electric Company		X	
Greg Boben	Scheduling Manager	SMS			X
David Bosell	Procedure Writer	SMS			X
Kenny Catchot	QA Supervisor	SMS			X
Matthew Celestine	Welding Foreman	SMS			X
Lawrence Fruge	QC Inspector	SMS			X
Armond Jones	QC Inspector in Training	SMS			X
David Marcentel	QC Foreman	SMS			X
Scott Matthews	Assistant Production Manager	SMS			X
Robert Pinell	American Society for Nondestructive Testing, Inc. (ASNT) Nondestructive Examination Level III	SMS			X
Nick Toti	Lead Bay Planner	SMS			X
Melissa Wilson	Project Business Administrator	SMS			X
Jesus Caro	QC Inspector	SMS/Project Assistance Corporation			X
Ken Shirey	Visual Test Level II	SMS/Quality Inspection Services, Inc.			X
Doug Percle	Customer Quality Representative	Shaw Nuclear			X

2. INSPECTION PROCEDURES USED

Inspection Procedure (IP) 43003, “Reactive Inspections of Nuclear Vendors,” dated April 25, 2011

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

The following items were found during this inspection:

Item Number	Status	Type	Description
99901401/2011-201-09	Discussed	NON	Criterion XVI
99901401/2012-201-01	Open	NON	Criterion XVI

4. DOCUMENTS REVIEWED

a. Procedures – Including Forms, Manuals, and Other Related Guidance Documents

- ASNT Recommended Practice No. SNT-TC-1A 2006, "Personnel Qualification and Certification in Nondestructive Testing"
- Quality Assurance Manual (QAM), Revision 7, dated February 29, 2012
- Quality Procedure (QP) QP-DC-301, "Document Review," Revision 0, issued on August 1, 2012
- Section 2, "Quality Assurance Program," of SMS Quality Procedure QP-G-02, "Training," Revision 10, issued February 29, 2012, and implemented March 1, 2012
- Procedure QP-G-03, "Shop Travelers," Revision 10, dated December 6, 2011
- Procedure QP-G-05a, "Managing Detail Drawings," Revision 01, dated January 31, 2012
- Procedure QP-G-06, "Document Control," Revision 5, issued September 13, 2012
- Procedure QP-G-10, "Inspection," Revision 7, dated June 28, 2012
- Procedure QP-G-15, "Control of Nonconforming Items," Revision 6, dated June 28, 2012
- Procedure QP-G-16, "Corrective Action Program", Revision 6, dated June 28, 2012
- Procedure QP-G-17, "Quality Assurance Records," Revision 06, issued and implemented August 24, 2012
- Procedure QP-DC-05, "Shop Travelers Control," Revision 2, dated August 10, 2011
- Procedure QP-PC-06, "Implementation of Shop Travelers," Revision 8, dated February 9, 2012
- Procedure QP-PC-09, "Rework/Repair of Welds and Effective Weld Area," Revision 4, dated August 3, 2012

- Procedure QP-NDE-WP-01, “Certification of NDE Personnel,” Revision 09, issued August 14, 2012, and implemented August 15, 2012

    - Form FRM000027, “Nondestructive Examination of Personnel Qualification Record,” Revision 09, issued August 14, 2012, and implemented August 15, 2012

    - Form FRM000028, “Eye Exam Record,” Revision 09, issued August 14, 2012, and implemented August 15, 2012

    - Form FRM000029, “NDE Experience Log,” Revision 09, issued August 14, 2012, and implemented August 15, 2012

    - Form FRM-000061, “Annual Technical Evaluation,” Revision 09, issued August 14, 2012, and implemented August 15, 2012

    - Form FRM-000180, “NDT Practical Worksheet,” Revision 09, issued August 14, 2012, and implemented August 15, 2012

- Procedure QP-PE-01, “Impact Reviews,” Revision 04, dated May 3, 2012

- Procedure QP-PE-10, “Development of Shop Travelers,” Revision 1, dated June 14, 2012

- Procedure QP-PE-08, “Innovative Steel Detailing Detailed Drawing Models,” Revision 02, dated January 11, 2011

- Procedure QP-QA-01, “Qualification of Auditors,” Revision 06, issued May 9, 2012, and implemented May 10, 2012

- Procedure QP-QC-306, “Qualification and Certification of Inspection and Test Personnel,” Revision 00, dated on August 3, 2012

    - Form QP-QC-306-F-1, “Annual Physical Examination Record,” Revision 00, dated on August 3, 2012

    - Form QP-QC-306-F-2, “Experience Evaluation Records,” Revision 00, dated on August 3, 2012

    - Form QP-QC-306-F-3, Certificate of Qualification/Certification,” Revision 00, dated on August 3, 2012

    - Form QP-QC-306-F-4, “Coatings Inspector Examination of Personnel Qualification Record Certificate of Qualification,” Revision 00, dated on August 3, 2012

- Procedure QP-WI-01, “Welding Inspection Procedure,” Revision 9, dated July 18, 2012

b. Work Orders – Including Shop Travelers, Weld Logs, Project Instruction Sheets, Material Traceability Log, and Drawings

- Drawing APP-CA20-S5-77-000-7702, Revision 0
- Drawing APP-KB37-13-37-000-3708, Revision 0
- Drawing APP-R106-13-106-000-10603, Revision 0, dated July 27, 2012
- Traveler and welder sign-off sheet for Module No. KB37, Job No. 430013, Work Order No. 2169867
- Traveler and welder sign-off sheet for Module No. R1-06 for Vogtle, Work Order No. 2169859
- Traveler and welder sign-off sheet for Module No. R1-06 for V.C. Summer, Work Order No. 2169869
- Traveler for Submodule No. CA05-01-200, Job No. 430001, Work Order No. 2542328
- Traveler for Submodule No. CA20-05-200-220, Job No. 430001, Work Order No. 2256946
- Traveler and welder sign-off sheet for Submodule No. CA20-28-200 , Job No. 43001, Work Order No. 2349562
- Traveler and welder sign-off sheet for Submodule No. CA20-76, V.C. Summer
- Traveler and welder sign-off sheet for Submodule No. CA20-77, Job No. 43001, Work Order No. 1907628
- Work Order No. 1907252, for Submodule No. CA20-28, Project No. 430001
- Work Order No. 1933394, for Submodule No. CA20-16, Project No. 430011
- Work Order No. 1933395, for Submodule No. CA20-17, Project No. 430011
- Work Order No. 2256944, for Submodule No. CA20-05-200, Project No. 430001
- Work Order No. 2349556, for Submodule No. CA20-28-100, Project No. 430001
- Work Order No. 2349562, for Submodule No. CA20-28-200, Project No. 430001
- Work Order No. 2544257, for Submodule No. CA05-04-200, Project No. 430001
- Work Order No. 2542328, Revision 0, for Module No. CA05-01-200 Vogtle Shop Traveler, Project No. 430001

c. Engineering and Departure Change Requests

- APP-CA00-GEF-035, Revision 0, Engineering and Departure Change Request (E&DCR) to Modify Module General Note Clarification
- APP-CA00-GEF-038, Revision 0, E&DCR to revise Module General Notes
- APP-CA01-GEF-199, Revision 0, Module No. CA01-23 Additional Studs
- APP-CA01-GEF-200, Revision 0, Module No. CA01-24 Additional Studs
- APP-CA05-GEF-015, Revision 0, Module No. CA05 Overlay Plate Hole Interface

d. Reports – Including Corrective Action Reports, Condition Reports, Nonconformance Reports, and Other Pertinent Documents

- Condition Reports (CRs) Related to Significant Conditions Adverse to Quality (SCAQs): CR Nos. 11-006, 12-076, 12-177, 12-272, 12-543, 12-250, 12-333, and 12-559
- CRs Not Related to SCAQs: CR Nos. 12-597, 12-206, 12-166, 12-358, 12-784, 12-327, 12-345, 12-356, 12-356, 12-401, 12-504, 12-938, 12-346, 12-704, 12-705, and 12-924
- Condition Report (CR) No. 2012-559, "SNS Notified SMS CA20-04 Submodule Shipped to Vogtle Site had Several Missing Studs"
- CR No. 2012-703, "Incorrect Redlining of Drawing"
- Nonconformance Report (NCR) No. 12-000914
- NCR No. 12-000916
- QAM Form FRM-000058-06, "Approved Suppliers List," Revision 59, dated July 31, 2012
- QC Departmental Training Matrix – Record of Assigned Reading (ROAR)

5. APPLICABLE INSPECTIONS, TESTS, ANALYSES, AND ACCEPTANCE CRITERIA (ITAAC) FROM AP1000

This inspection was not performed as part of the NRC's overall strategy for inspecting targeted Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) related to the functional and type testing of safety related components being supplied by Westinghouse Electric Company and their sub-suppliers as part of the AP1000 certified reactor design.