South Carolina Office of Regulatory Staff

Review of South Carolina Electric & Gas Company's 2015 1st Quarter Report on V. C. Summer Units 2 & 3 Status of Construction

July 30, 2015

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Executive Summary

On May 15, 2015, SCE&G submitted its 2015 1st Quarter Report related to construction of V.C. Summer Units 2 & 3 in Jenkinsville, SC. The Quarterly Report is filed in Commission Docket No. 2008-196-E and covers the quarter ending March 31, 2015. With reference to the Base Load Review Act, ORS's review of SCE&G's Quarterly Report focuses on SCE&G's ability to adhere to the approved schedule and approved budget.

Approved Schedule and Budget Review

On March 12, 2015, SCE&G filed with the Commission in Docket No. 2015-103-E a Petition seeking approval to update the construction milestone schedule as well as the capital cost schedule for the Units. In its Petition, SCE&G is requesting the Commission to modify the construction schedule to reflect new substantial completion dates of June 19, 2019 and June 16, 2020 for Unit 2 and Unit 3, respectively. SCE&G reports to ORS that the Consortium continues to experience delays in fabrication and delivery of sub-modules for the Units and that these delays are the primary purpose for issuing a Revised Schedule.

On June 29, 2015 SCE&G, ORS and the South Carolina Energy Users Committee entered into a Settlement Agreement related to the Petition. For additional details, see "Notable Activities Occurring after March 31, 2015," on page 18 of this report.

During the 1st quarter 2015, the project continued to make progress toward the completion of several major construction milestones. However, the project continues to experience delays due to design and delivery issues. The critical path work continues to be centered on Unit 2 Nuclear Island work necessary to allow additional concrete pours inside the Containment Vessel and within the Auxiliary Building perimeter walls. ORS continues to monitor this work closely.

This Petition includes incremental capital costs that total approximately $698 million (SCE&G's portion in 2007 dollars); of which $539 million are associated with these delays and other contested costs. The total project capital cost is now estimated at approximately $5.2 billion (SCE&G's portion in 2007 dollars) or $6.8 billion including escalation and allowance for funds used during construction (SCE&G's portion in future dollars). The cumulative amount projected to be spent on the Units by December 31, 2015 is $3.7 billion.

The construction schedule and budget presented in SCE&G's Quarterly Report is based on SCE&G's Petition. Therefore, until the Commission issues an order in response to SCE&G's Petition, ORS will not have the ability to provide complete updates on the status of the approved schedule or approved budget.

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Introduction and Background

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 AP1000 Units 2 & 3 (the "Units" or "Project") in Jenkinsville, SC and the Engineering, Procurement and Construction ("EPC") Contract with Westinghouse Electric Company ("WEC") and CB&I Stone & Webster, Inc. ("CB&I") (collectively "the Consortium"). The Commission's approval of the Units can be found in the Base Load Review Order No. 2009-104(A) filed in Docket No. 2008-196-E.

Subsequent to the Base Load Review Order, the Commission has held three (3) hearings regarding the Units and issued the following Orders:

- **Order No. 2010-12**: Issued on January 21, 2010 and filed in Docket No. 2009-293-E. The Commission approved SCE&G's request to update milestones and capital cost schedules.

- **Order No. 2011-345**: Issued on May 16, 2011 and filed in Docket No. 2010-376-E. The Commission approved SCE&G's petition for updates and revisions to schedules which included an increase to the base project cost of approximately $174 million.

- **Order No. 2012-884**: Issued on November 15, 2012 and filed in Docket No. 2012-203-E. The Commission approved SCE&G's petition for updates and revisions to schedules which included an increase to the base project cost of approximately $278 million.

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 currently contracted 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 and operation 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 sought partners in its 45% ownership. Santee Cooper signed a Letter of Intent with Duke Energy Carolinas, LLC in 2011. On January 28, 2014, Duke Energy Carolinas, LLC filed a report with the Commission stating that it concluded its negotiations with Santee Cooper which resulted in no change in ownership of the Units. On the day before, January 27, 2014, SCE&G announced that it had an agreement to acquire from Santee Cooper an additional 5% (110 MWs) ownership in the Units. The agreement is contingent upon the Commercial Operation Date of Unit 2. Ultimately, under the new agreement, SCE&G would own 60% and Santee Cooper would own 40% of the Units. The new agreement and the specific terms are subject to Commission approval and have yet to be presented to the Commission. The Project continues to be governed by the ownership responsibilities as established in the EPC Contract.

On May 15, 2015, SCE&G submitted its 2015 1st Quarter Report ("Quarterly Report") related to construction of the Units. The Quarterly Report is filed in Commission Docket No. 2008-196-E and covers the quarter ending March 31, 2015 ("Review Period"). The Company's Quarterly Report is submitted pursuant to S.C. Code Ann. § 58-33-277 (Supp. 2014) of the Base Load Review Act ("BLRA"), which requires the Quarterly 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, the review by the Office of Regulatory Staff ("ORS") of the Company's Quarterly Report focuses on SCE&G's ability to adhere to the approved construction schedule and the approved capital cost schedule.

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Approved Schedule Review

Milestone Schedule

On March 12, 2015, SCE&G filed with the Commission, in Docket No. 2015-103-E, a petition seeking approval to update the construction milestone schedule as well as the capital cost schedule for the Units ("Petition"). In its Petition, SCE&G is requesting the Commission to approve the revised construction schedule ("Revised Schedule") which reflects new substantial completion dates ("SCDs") of June 19, 2019 and June 16, 2020 for Unit 2 and Unit 3, respectively. SCE&G reports to ORS that the Consortium continues to experience delays in fabrication and delivery of submodules for the Units and that these delays are the primary purpose for issuing a Revised Schedule.

The construction schedule presented in SCE&G's Quarterly Report is based on SCE&G's Petition. Therefore, until the Commission issues an order in response to SCE&G's Petition, ORS will not have the ability to provide complete updates on the status of the approved schedule.

Major Structural Modules ("Big Six")

The Big Six modules for the Units are CA01 through CA05 and CA20. (See Appendix A for illustrations). The supply of these modules is specifically identified in the Fixed/Firm cost category of the EPC Contract and key components to WEC's modular design of the Units. Table 1 and Table 2 provide a summary of the status of the Big Six modules as of the end of the review period:

Table 1: Unit 2 Big Six Modules

Unit 2 Module #	Description	Vendor	Submodules Received	Certification Paperwork	Status
CA01	Houses Steam Generator/ Pressurizer and Refueling Canal	CB&I-Lake Charles, LA	47 of 47	47 of 47 on Site and Under Review	Assembly complete waiting for scheduled on Hook Date
CA02	In-Containment Refueling Water Tank Wall and Heat Exchanger Wall Module	CB&I-Lake Charles	5 of 5	Pending	Being Assembled in MAB
CA03	In-Containment Refueling Water Storage Tank Wall Module	SMCI in Lakeland, FL	1 of 17	1 of 17	Pending
CA04	Reactor Vessel Cavity	CB&I-Power (On-Site)	5 of 5	Complete	Set in Place on 10/21/13
CA05	Containment Vessel Passive Cooling System Tunnel Walls	CB&I-Lake Charles, LA	8 of 8	Complete	Set in Place on 12/6/14
CA20	Auxiliary Building and Fuel Handling Area	CB&I-Lake Charles, LA	72 of 72	Complete	Set in Place on 5/9/14

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Table 2: Unit 3 Big Six Modules

Unit 3 Module #	Description	Vendor	Submodules Received	Certification Paperwork	Status
CA01	Houses Steam Generator/ Pressurizer and Refueling Canal	Toshiba/IHI Yokohama, Japan	2 of 47	2 of 47	Pending
CA02	In-Containment Refueling Water Tank Wall and Heat Exchanger Wall Module	CB&I-Lake Charles, LA	0 of 5	Pending	Pending
CA03	In-Containment Refueling Water Storage Tank Wall Module	SMCI in Lakeland, FL	0 of 17	Pending	Pending
CA04	Reactor Vessel Cavity	SMCI in Lakeland, FL	5 of 5	Complete	Set in place on 6/29/15
CA05	Containment Vessel Passive Cooling System Tunnel Walls	CB&I-Lake Charles, LA	0 of 8	Pending	Pending
CA20	Auxiliary Building and Fuel Handling Area	Oregon Iron Works Portland, OR	16 of 72	16 of 72	Pending

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Specific Construction Activities

Approximately 4000 workers are currently on-site, 3500 Consortium (including subcontractors) and 500 SCE&G. Major construction activities during the review period are discussed below by Unit:

Unit 2

The Company reported that the critical path for Unit 2 remains the fabrication of the Shield Building ("SB") panels supplied by Newport News Industries ("NNI"). Through the end of the 1st quarter, 57 of 167 Unit 2 panels have been received. The secondary critical path continues to be the assembly of module CA01 and construction of the Annex Building. All CA01 submodules have been delivered to the site and assembly is underway in the Module Assembly Building ("MAB"). Unit 2 work continued in the Containment Vessel ("CV") with the installation of rebar, embedment plates and electrical conduit in preparation for the placing of layer 3 and 4 in the CV base. However, this work is being delayed due to resolution of the weldable coupling licensing basis code compliance issues that are further discussed in the "Notable Activities Occurring after March 31, 2015," on page 18 of this report.

Work continued on securing CA20 in place with three-quarters of the needed anchor blocks in place. It was noted that the north wall on CA20 needed realignment. This wall was removed and was in the process of being realigned.

Module CA05, which forms the chemical and volume control system tunnel and passive core cooling system walls within the CV was completed and set in place inside the CV. Assembly of CA22 module, which houses filters for the Reactor Cooling Water System was completed and is ready to be set inside the CV.

Work on Unit 2 Nuclear Island ("NI") Auxiliary Building ("AB") continued with the forming of walls to support level 2 and level 3 of the AB. The exterior walls needed to support backfilling to begin the erection of the Unit 2 Annex Building were completed and backfilling began.

Turbine Building ("TB") work continued with the installation of structural steel and work on the turbine pedestal. Condenser water boxes and the first section of permanent stairwell were installed. Work continued on installing the Service Water System, Condenser Tube Cleaning System, Condensate Draining System, and Condensate Polishing System.

Welding on the CV Ring 1 to the Containment Vessel Bottom Head ("CVBH") continues. The welding of attachment plates and ventilation fittings continued on CV Ring 2. Welding of the 3rd and final course of plates for CV Ring 3 has been completed. Assembly began on the plates that will be welded together to form the CV Top Head, which forms the crown on the CV.

Cooling Tower ("CT") 2A is substantially complete. The installation of rebar and placement of concrete for the walls of CT 2B continues, with the basin and foundation work completed and turned over to the contractor for CT erection. The Pump Basin is ready for installation of pumps.

Concrete foundations and walls for the Transformers in the High-Side Switchyard continued to be installed. The Company has experienced capacitor failures in the Switchyard and an investigation is underway to determine the cause (under warranty).

The Company reported that the Unit 2 Steam Generators A & B and the Pressurizer were received on site. Approximately 85% of the major equipment for Unit 2 has been delivered. Major equipment is considered as any equipment with a cost of $10 million or greater. Also, the Unit 2 PRHR heat exchanger was returned to the equipment manufacturer to install a Supplemental Restraint Bar that was a result of a design enhancement. The Squib Valves were redesigned and successfully passed the submergence qualification testing. Additional full flow and functional testing of other components are continuing.

Unit 3

The Company reported the critical path for Unit 3 remains the fabrication of the SB panels supplied by NNI and continues to run through successful fabrication and setting of CA20 followed by the installation and completion of CA01, CA03 and the SB.

- Rebar work continues in support of the first layer of concrete to be placed above the Unit 3 NI basemat to form the AB Walls which are in turn the SB foundation. Four of 167 SB panels have been delivered to the site from NNI.
- Four submodules forming CA04 were upended and fit issues are being corrected.
- The installation of rebar and placement of concrete continued for sections of the AB, and backfill work continued around the exterior of the NI.
- The first layer of concrete inside the CV is in place.
- Work continued on the assembly of CV Ring 1 and welding of the vertical seams of the first 3 courses of CV Ring 2 was completed.
- CT 3A is essentially complete. Structural work for 3B CT is approximately two-thirds complete. Work is underway for the Pump Basin for the CTs.
- Placement of fill concrete continued beneath the TB. Rebar, piping and other embedments were installed in the TB mudmat in preparation for pouring the TB basemat.
- The Company reported that the Core Makeup Tanks 1 and 2 were delivered to the site and that approximately 30% of the Unit 3 major equipment has been delivered to the site.

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The Company reported that several Information Technology Systems were continuing to progress. The site fiber optic cable system back bone for the Units is complete. The Configuration Management Information System ("CMIS") completed two demonstration runs to test CMIS workflow routing. Work Management System is expected to begin module testing in the second quarter of 2015.

Photographs of construction activities during the review period are shown in Appendix B.

NND Training Activities

The Company and Contractor conducted Integrated Systems Validation ("ISV") testing in support of developing the Plant Reference Simulator ("PRS"). This testing is required by the NRC to validate the simulator for use in the Operator Licensing Program. The Company is working with the NRC to certify their simulator as a Commission-Approved Simulator, ("CAS"), which will allow the early use of the simulator in the upcoming initial NRC Operator Examinations. When achieved, the CAS will be used to support the licensing of the first operator training class scheduled for later in the year.

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Transmission

In 2011, SCE&G entered into a contract with Pike Electric, LLC for the permitting, engineering and design, procurement of material, and construction of multiple transmission lines and associated facilities related to the Units.

Map 1 shows the new transmission lines and facilities supporting the Units. The transmission lines are represented by the corresponding line color indicated below:

Green Line:
VCS1-Killian Line is complete and energized.

Red Line:
VCS2- Lake Murray Line No. 2 is complete and energized.
VCS2-St George Line No. 1 will be energized when the remaining St. George segment (Purple Line) is complete.

Purple Line:
VCS2-St. George Lines Nos. 1 and 2 are currently under construction between Lake Murray and St. George. This work will progress through the build out of the Saluda River Substation which is scheduled to be completed in August 2015. The remaining segment will travel from the Saluda River Substation to the St. George switching station, which is scheduled to be complete in June 2016.

Yellow Line:
The portion of the VCS2-St. George Line No. 2 segment between VCS2 and the Lake Murray substation is complete.

Blue Line:
VCNS Lines to connect Unit 1 Switchyard with Units 2 and 3 Switchyard are complete and energized.

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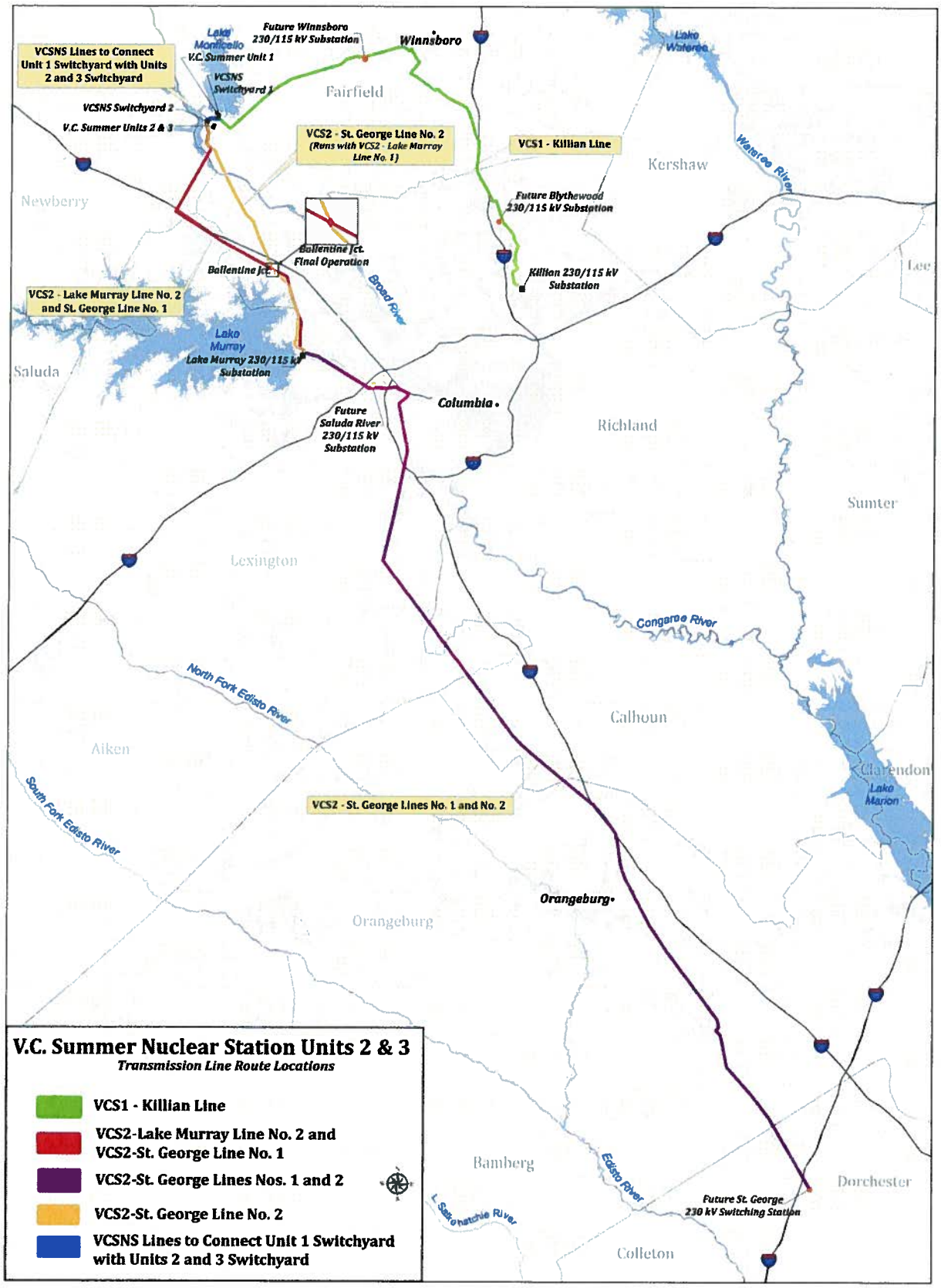
Map 1: New SCE&G Transmission Lines and Facilities Supporting V.C. Summer Units 2 & 3



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Licensing and Inspection Activities

Federal Activities

SCE&G has identified the need to submit numerous License Amendment Requests ("LARs") to the NRC. A LAR is the process by which a licensee requests changes to the COL issued by the NRC. The licensee may seek a Preliminary Amendment Request ("PAR") to accompany a LAR. PARs allow the licensee to continue with construction at its own risk while awaiting final dispensation of the LAR. The Company filed two new LARs with the NRC and two were approved. A table of LARs submitted to the NRC, and accompanying PARs, if also submitted, is attached as Appendix C.

Status of LARs

Total	Approved	Under Review
45	28	17

The NRC conducts routine site inspections to monitor construction progress. The NRC issued its 4th Quarter Integrated Inspection Report. Two Green Non-Cited Violations were documented. A Green finding is the least significant in the NRC Construction Reactor Oversight Process. Both findings were related to Design Control issues. The NRC also sent a three-member NRC Special inspection team to review the events of a coring operation that resulted in minor damage to the Unit 2 CV. Results of their investigations are provided in the "Notable Activities Occurring after March 31, 2015," on page 18 of this report.

State Activities

There were no state licensing activities during the review period.

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Approved Budget Review

ORS's budget review includes an analysis of the 1st quarter 2015 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. 2012-884, ORS evaluates 9 major cost categories for variances. These cost categories are:

1. Fixed with No Adjustment
2. Firm with Fixed Adjustment A
3. Firm with Fixed Adjustment B
4. Firm with Indexed Adjustment
5. Actual Craft Wages
6. Non-Labor Cost
7. Time & Materials
8. Owners Costs
9. Transmission Projects

On March 12, 2015, SCE&G filed a Petition with the Commission in Docket No. 2015-103-E seeking approval to update the construction milestone schedule as well as the capital cost schedule for the Units. This Petition includes incremental capital costs that total approximately $698 million (SCE&G's portion in 2007 dollars); of which $539 million are associated with these delays and other contested costs. The total project capital cost is now estimated at approximately $5.2 billion (SCE&G's portion in 2007 dollars) or $6.8 billion including escalation and AFUDC (SCE&G's portion in future dollars). The cumulative project cash flow amount projected to be spent on the Units by December 31, 2015 is $3.7 billion.

The capital cost estimates presented in SCE&G's Quarterly Report are based on SCE&G's Petition. Therefore, until the Commission issues an order in response to SCE&G's Petition, ORS will not have the ability to provide complete updates on the status of the approved budget.

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. On May 29, 2015, SCE&G filed its Annual Request for Revised Rates (Docket 2015-160-E) with the Commission requesting a retail revenue increase of approximately $70 million (or approximately 2.78%).

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Table 4 shows a summary of SCE&G's Revised Rate Filings with the Commission.

Table 4:

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%
2013-150-E	2013-680(A)	$69,671,000	($2,430,768)	$67,240,232	2.87%
2014-187-E	2014-785	$70,038,000	($3,800,000)	$66,238,000	2.82%
2015- 160-E	**Pending**	**$69,648,000**	**Pending**	**Pending**	**Pending**

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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 Construction Work in Progress
- Reviews invoices associated with the Milestone Schedule
- Performs weekly on-site review of construction documents
- Attends on-site Plan of the Day meetings with Project Managers
- Attends on-site planning and scheduling meetings with Area Managers
- Participates in monthly on-site observations of construction activities and progress
- Holds monthly update meetings with SCE&G
- Meets quarterly with representatives of the Consortium
- Attends NRC Public Meetings regarding SCE&G COL and other construction activities
- Visits vendor fabrication facilities

Milestone Invoices

The following milestones invoices were reviewed for completeness.

- Milestone 102, Unit 2 Steam Generator at Port of Entry,
- Milestone 104, Unit 3 Pressurizer Hydro Test,
- Milestone 119, Unit 3 Main Transformers Fabricator Issued Purchase Order for material.

Offsite Visits

ORS visited the CB&I Laurens Manufacturing Facility ("CBI-Laurens"), in Laurens, South Carolina which fabricates piping and mechanical equipment to be installed in Unit 2 and Unit 3. Company personnel were in attendance and an overview of the CBI-Laurens Quality and Production processes was provided. The briefing was followed by a factory tour, where we observed several components being completed and a number of units loaded and ready for delivery to the site.

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Construction Challenges

Based upon the information provided by the Company in its Quarterly Report, as well as information obtained via additional monitoring activities, ORS identifies several ongoing construction concerns that create risk to the on-time completion of the Units. ORS continues to monitor these areas closely.

Revised Schedule

The Units are proceeding based on the revised SCDs for Unit 2 of June 19, 2019 and Unit 3 of June 16, 2020, although SCE&G has not formally accepted these dates and will continue to explore mitigation and further negotiations. ORS repeats its concern that it is important to the successful completion of the Project that the schedule and cost estimates be formally finalized and fully implemented. Continued negotiations over these issues may divert management attention away from concentrating on the successful completion of the Project. This is borne out by SCE&G's statement in their Quarterly Report that the Consortium has already advised the Company that the SCDs have changed to August 10, 2019 for Unit 2 and May 28, 2020 for Unit 3.

Structural Modules

As identified in previous ORS reviews, one of the most significant issues related to the construction of the Units remains the continued inability of Chicago Bridge & Iron - Lake Charles ("CB&I-LC") and the other sub-contracted module fabricators to reliably and predictably meet the quality and schedule requirements for fabricating and delivering the submodules, including the associated quality-related documentation. However, significant progress was made in this area.

Welding on the Unit 2 CA01 module was nearing completion in the MAB and the module should be ready for setting in the CV. However, delays in pouring of concrete for Layer 3 inside the CV due to issues relating to the licensing basis code compliance of weldable couplings, as further discussed in the "Notable Activities Occurring after March 31, 2015," on page 18 of this report, may further delay the setting of CA01. Unit 2 module CA05 was set in the CV and work continues on its final alignment and installation. In addition, all sub-modules of Unit 2 CA02 are on-site and are now under assembly in the MAB with 5 of the 5 upended and ready for welding.

Metal-Tek SMCI in Lakeland, FL continued fabrication of the Unit 2 CA03 sub-modules and Unit 3 CA03 and CA04 sub-modules, and had their first delivery to the site. One of the seventeen sub-modules for Unit 2 CA03 and four of the five sub-modules for Unit 3 CA04 have been delivered to the site, along with their associated Certificates of Conformance. Work was underway to assemble and align the Unit 3 CA04 module. However, due to poor quality and schedule performance, the fabrication of Unit 3 CA03 sub-modules has been transferred from SMCI back to CB&I-LC.

Work appears to be progressing well at Toshiba/IHI on the fabrication of the Unit 3 CA01 sub-modules with 2 of 47 delivered to the site. Oregon Iron Works has now delivered 16 of 72 sub-modules for Unit 3 CA20. In addition, all sub-modules for Unit 2 CA22 from Greenberry in Oregon were delivered to the site and the floor module is fully assembled and ready for set.

Work continued on the installation of the anchor blocks for Unit 2 module CA20 in the AB with approximately three quarters of them installed. However, the north wall of the already installed module had to be removed and realigned due to concerns about the tolerances of the existing installation exceeding allowable limits. The issue dealing with the capacity of the Heavy Lift Derrick identified in ORS's 4th Quarter 2014 Report regarding the handling of the Unit 3 module CA01 has been resolved and will not impact the construction.

Although the fabrication, delivery, erection and installation still remain a critical issue on both units, progress is slowly being made, but is outside the bounds of the schedule. ORS remains concerned about this issue.

Shield Building Panels

The critical path of both units is now identified as the fabrication and delivery of the SB panels. NNI's performance continues to show improvement with 57 of the 167 Unit 2 panels and 4 of the 167 Unit 3 panels delivered to the site. The first course of Unit 2 panels have been fitted-up and aligned on the special assembly pad and detailed measurements made in preparation for their installation on the top of the AB walls. The second course has also been fitted on the assembly pad in preparation for welding two panel pairs together before installation on top of the first course SB panels. The delay in installation of the SB panels is also associated with resolution of the weldable coupling issue identified in the Structural Module section above. It is very important to the Project that installation of the SB panels begins soon if the Revised Schedule is to be met.

Plant Reference Simulator Software Testing

SCE&G has advised that the ISV testing has been completed on similar software and hardware to that of the PRS, but that certification by the NRC was not expected until the end of 2015 and this does not support the Company's operator training schedule. Therefore, SCE&G is seeking the approval of a CAS as an alternative in order to proceed with operator training and licensing. The Company expects to have NRC approval by Q3 2015.

First-of-a-Kind Testing

SCE&G has identified in its Quarterly Report that some first-of-a-kind equipment and systems testing that were to be performed on the China AP1000 new nuclear units are not acceptable to the NRC, and that additional testing will be required on the Units. This issue may impact the overall costs and schedule. No definitive information has yet been provided in this area, and ORS will continue to monitor progress.

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Manufacturing of Major Equipment

The Reactor Coolant Pumps 500 hour endurance test was underway with the modified thrust bearing design and was expected to be completed in June 2015. The Squib Valves with the modified seal design successfully completed their submergence qualification testing, and are undergoing the final environmental qualification tests which are also to be completed by June 2015. However, equipment storage and proper maintenance of stored and installed equipment continue to be a concern, especially for those items that have been on-site for an extended period of time.

Main Switchyard Capacitor Issues

Several mitigating approaches to resolve the capacitor failures and overheating issues have been identified and are being actively pursued, including additional testing by the manufacturer. Although it does not appear that this issue will challenge the plant schedule or adversely impact the overall budget, the plan for resolution needs to be schedules and expedited.

License Amendment Reviews

Numerous LARs will be required to be approved by the NRC. There have been 45 filed with the NRC thus far with 28 approved and 17 pending review. Several are approaching the required approval date which could delay construction if they are not approved by the NRC. ORS will continue to monitor LAR status and progress.

Cyber Security

The continuing issues with cyber security compliance are a source of concern for the Project and for ORS. Phase II of this program has now been well defined and an estimate of $18.8 million has been submitted by SCE&G as part of its filing to the Commission. However, this cost is contingent on sharing the cost with the Vogtle plants, and an agreement with Southern Nuclear Company has not yet been reached. In addition, the potentially significant issue of vendor compliance with cyber security requirements (now identified as Phase III) has not yet been adequately addressed and the concern is that there may be hardware or software modifications to equipment already on-site and that this may adversely impact the plant start-up schedule. Full resolution of this issue will be monitored by the ORS.

Construction Productivity

SCE&G has identified in its Petition that the low productivity of the construction work force has increased the cost of the Project. Corrective measures have been identified to improve this productivity, but the impact of these corrective measures is not yet known. ORS has been concerned with this issue for some time, but it was not definitively apparent until the revised budgets were formulated. Low productivity could also affect schedule performance.

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Notable Activities Occurring after March 31, 2015

The BLRA allows SCE&G 45 days from the end of the current quarter to file its Quarterly Report. Items of importance that occurred subsequent to the Review Period are reported below.

NRC Notice of Violation

On April 20, 2015, the NRC issued a letter (EA-14-085) to CB&I with a Notice of Violation and proposed imposition of a civil penalty of $11,200 as a result of NRC Investigation Report No. 2-2013-024. A copy of the cover letter may be found in Appendix E.

NRC Special Inspection Results

The NRC followed-up with the results of its investigation of the February 9th event where, CB&I workers were core drilling the concrete floor inside the Unit 2 CVBH. In the process, CB&I cut some safety-related rebar and damaged the Unit 2 CVBH. The damage was confirmed on February 12th when the hole was examined using a borescope. The NRC concluded the inspection with no cited violations, but indicated the potential for two Green Non-Cited Violations related to reporting and review and verification of field configuration for design control processes. The minor damage was repaired and the additional dowels that were required were properly installed to the correct depth and configuration. On June 10, 2015, the NRC issued its final report concerning the CVBH damage incident to the Company. The NRC Letter referencing the report may be found in Appendix F.

Petition Settlement Agreement

On June 29, 2015, a Settlement Agreement was provided to the Commission under Docket NO. 2015-103-E, representing an agreement between SCE&G, ORS and the South Carolina Energy Users Committee concerning SCE&G's Petition. The SCE&G Settlement Agreement announcement may be found in Appendix G of this report, and is subject to approval by the Commission under the referenced docket.

Weldable Coupling Issue

Issues regarding the licensing basis code compliance of weldable couplers have been identified and are delaying the concrete pour of Layer 3 and 4 in the CV until they can be resolved with the NRC. The licensing basis was established using the 1992 AWS Code; however, the Consortium applied AWS D1.1-2000 criterial for structural welds. A difference exists between these two welding codes, and SCE&G has advised that resolution will require a LAR submittal and a PAR from the NRC in order to reduce further delays to construction. This approval is being pursued with the NRC.

Unit 3 Completed Milestones

On July 7, 2015, SCE&G announced the completion of two major milestones on Unit 3: the setting of CA04 (Reactor Vessel Structural Module) and the delivery of the Unit 3 Reactor Vessel to the site. The announcement may be found in Appendix H of this report.

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Appendix A

Big Six Structural Modules

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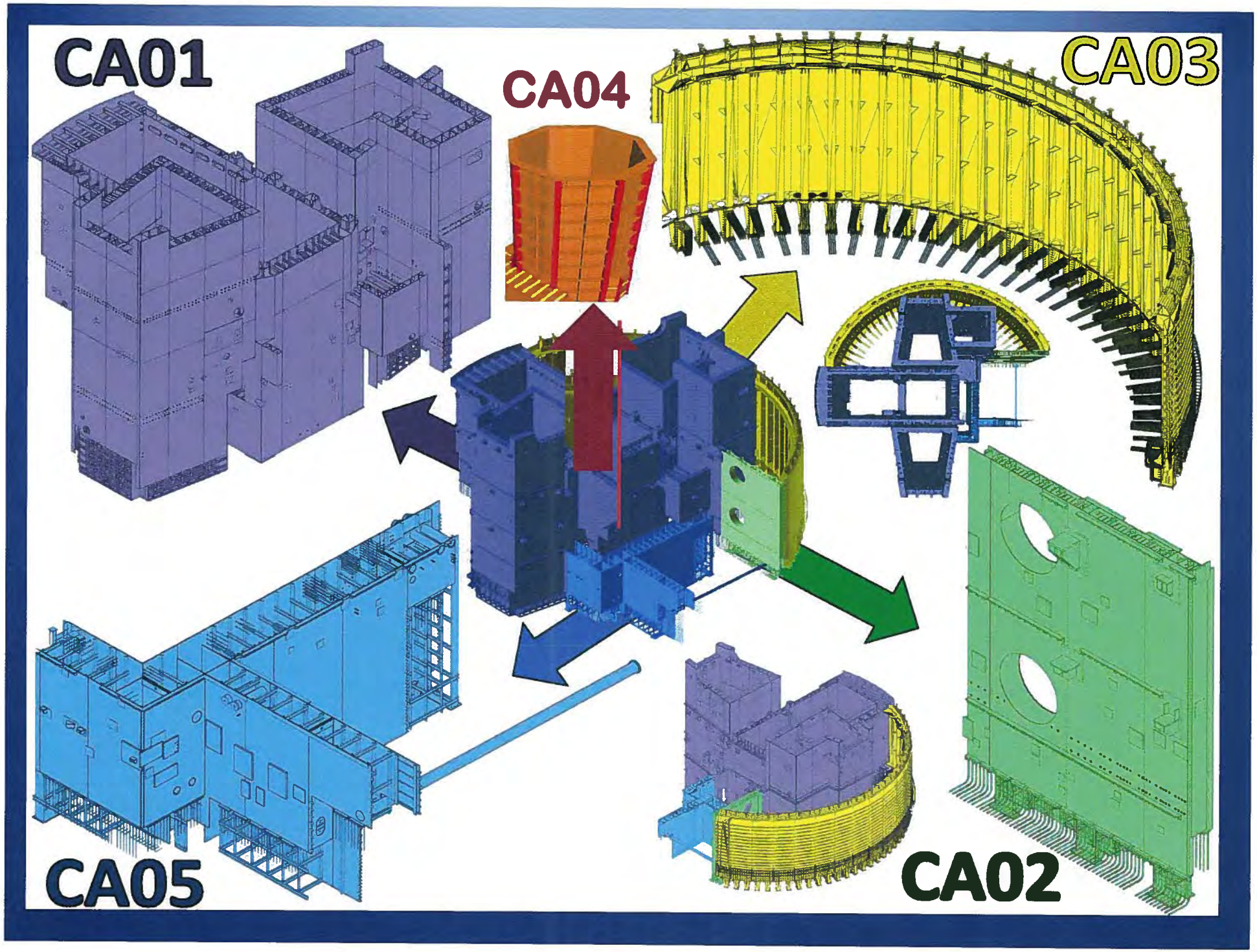
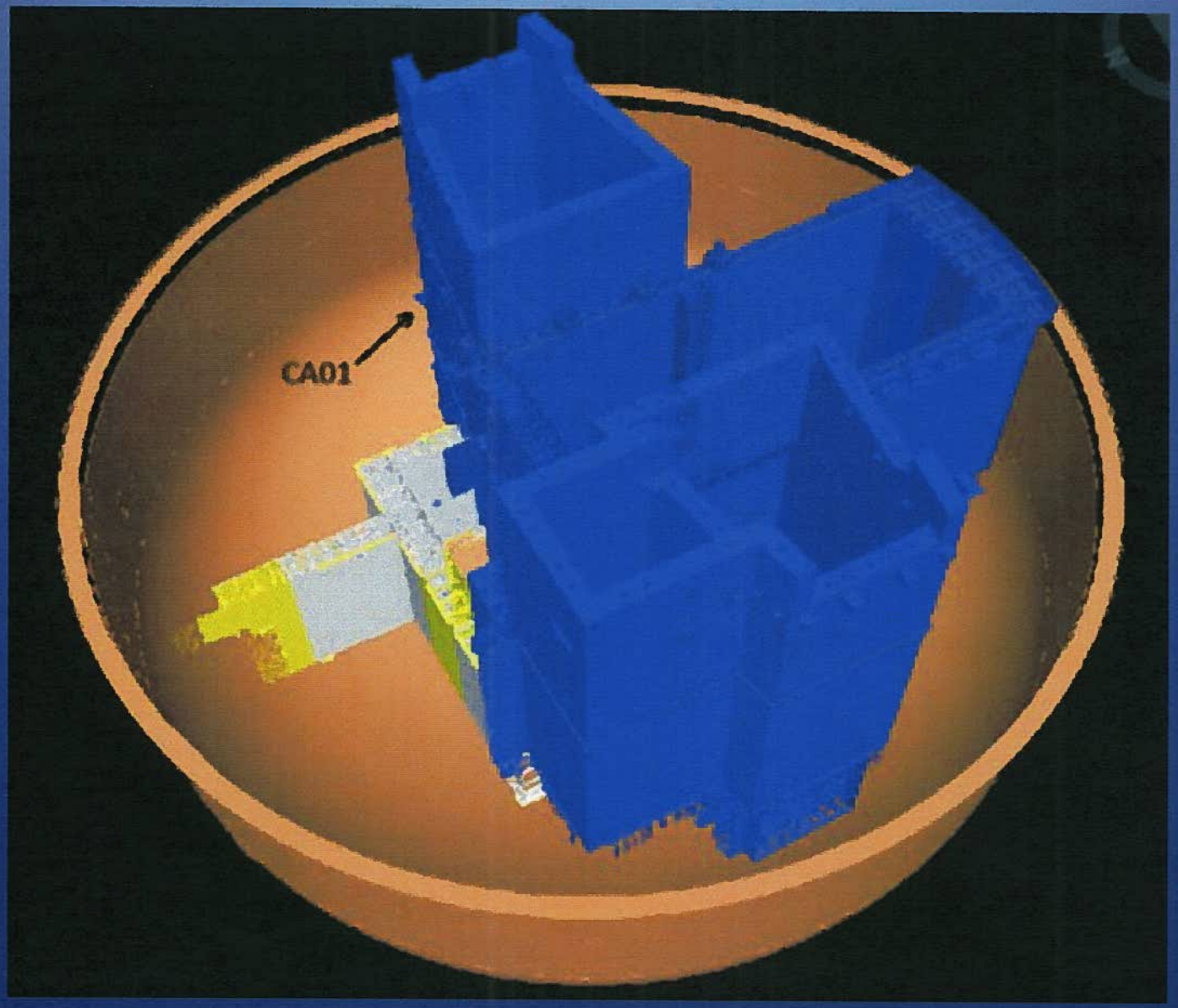

CA01
CA04
CA03
CA05
CA02

Big Six - CA01



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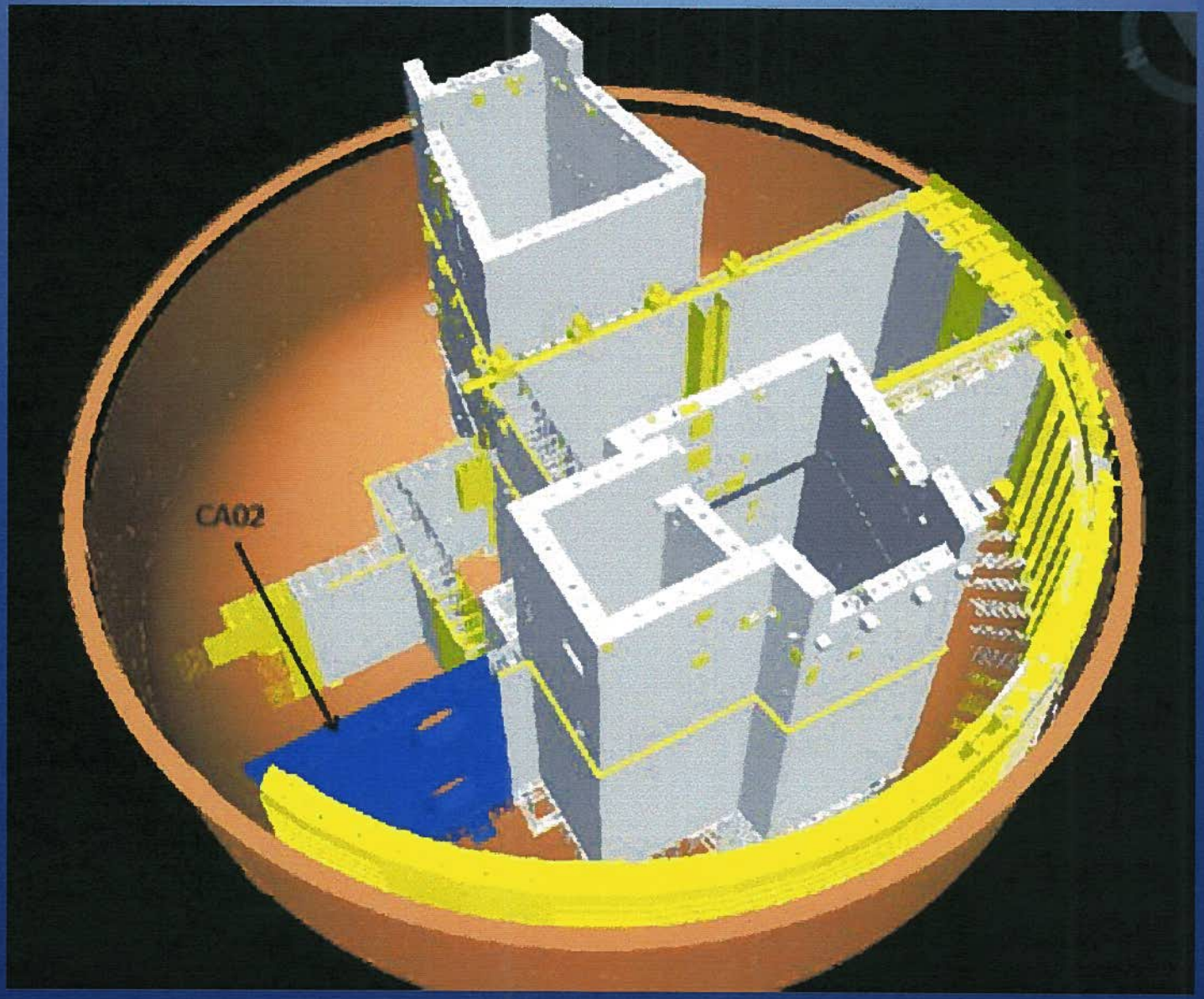
Big Six - CA02



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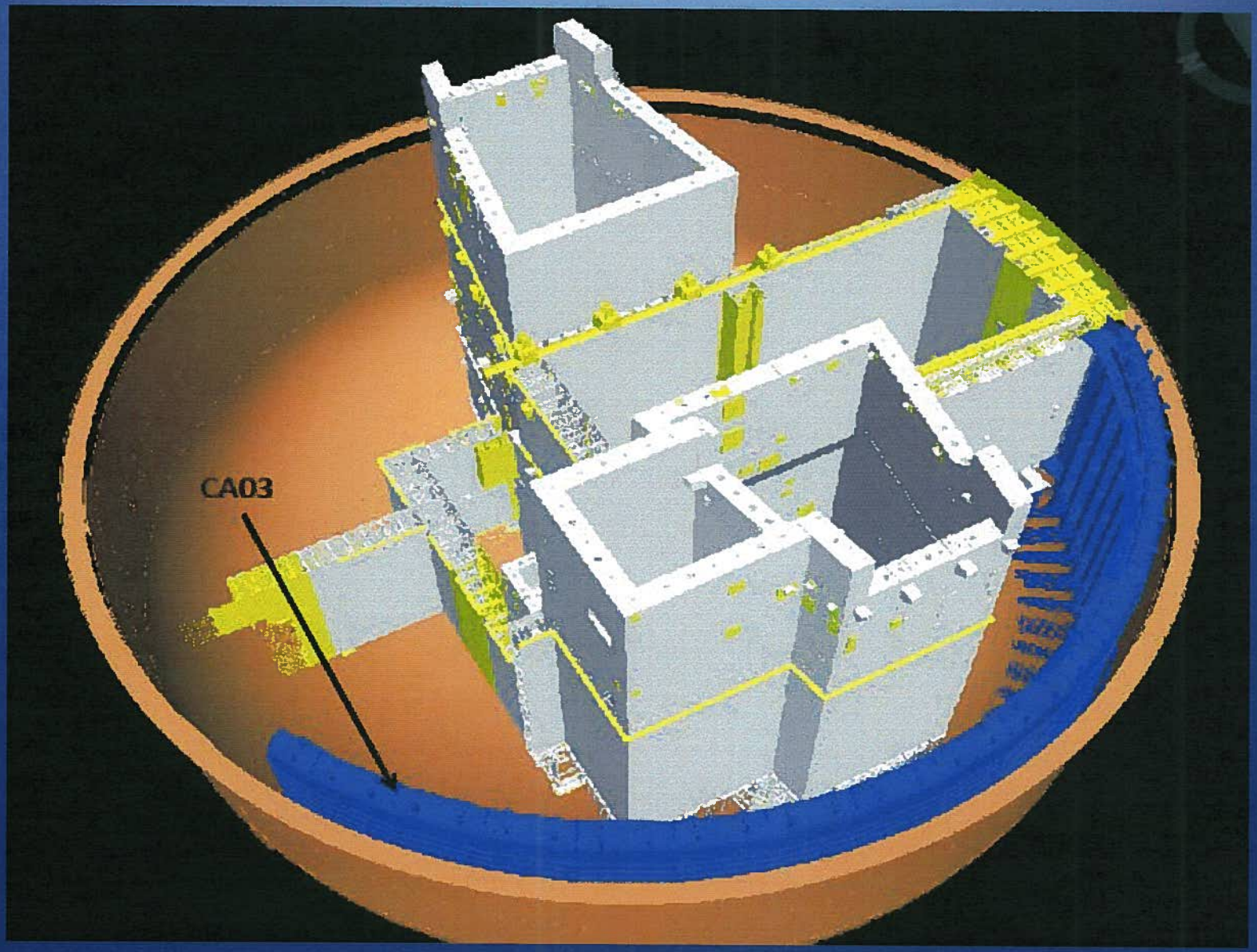
Big Six - CA03



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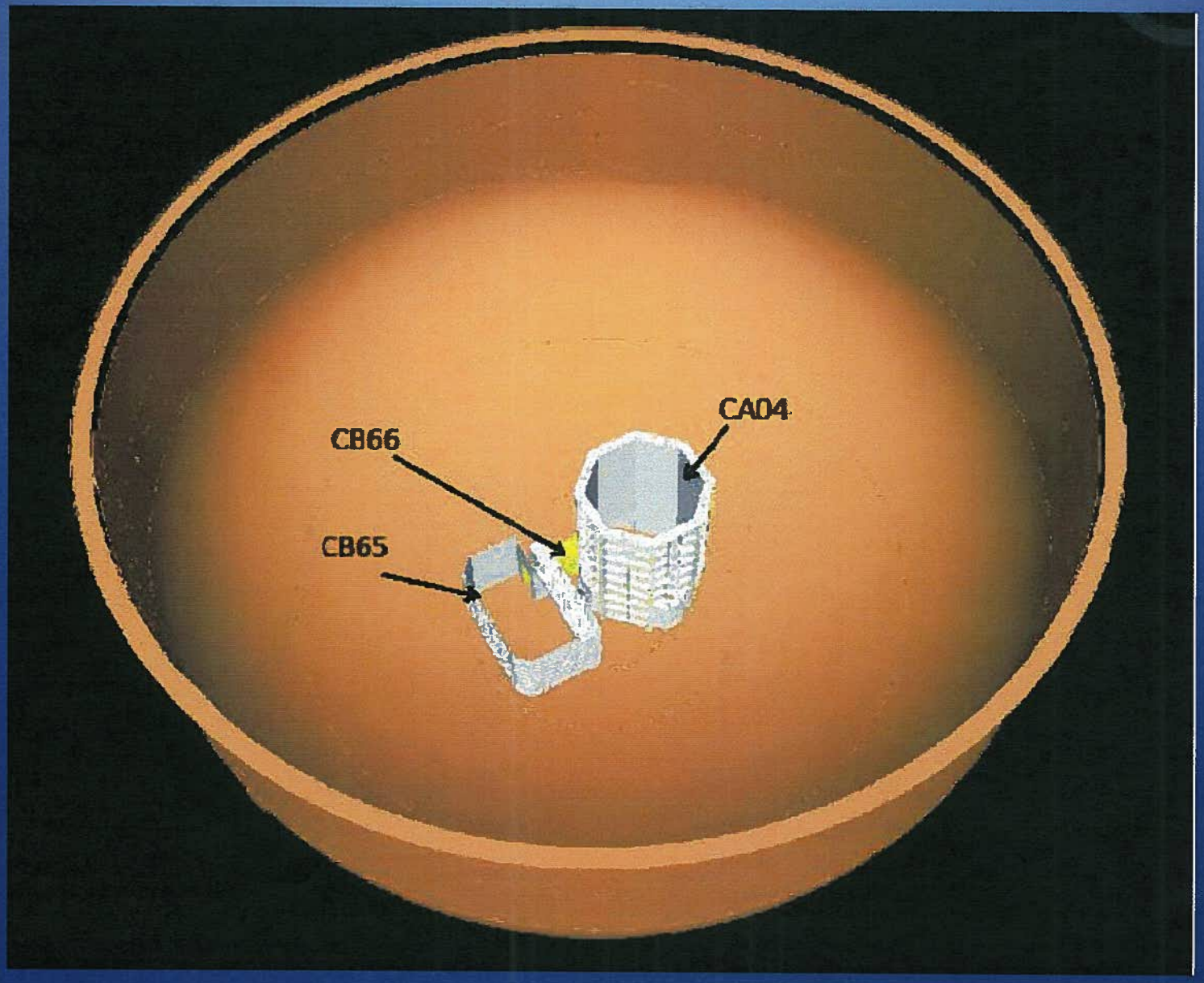
Big Six - CA04



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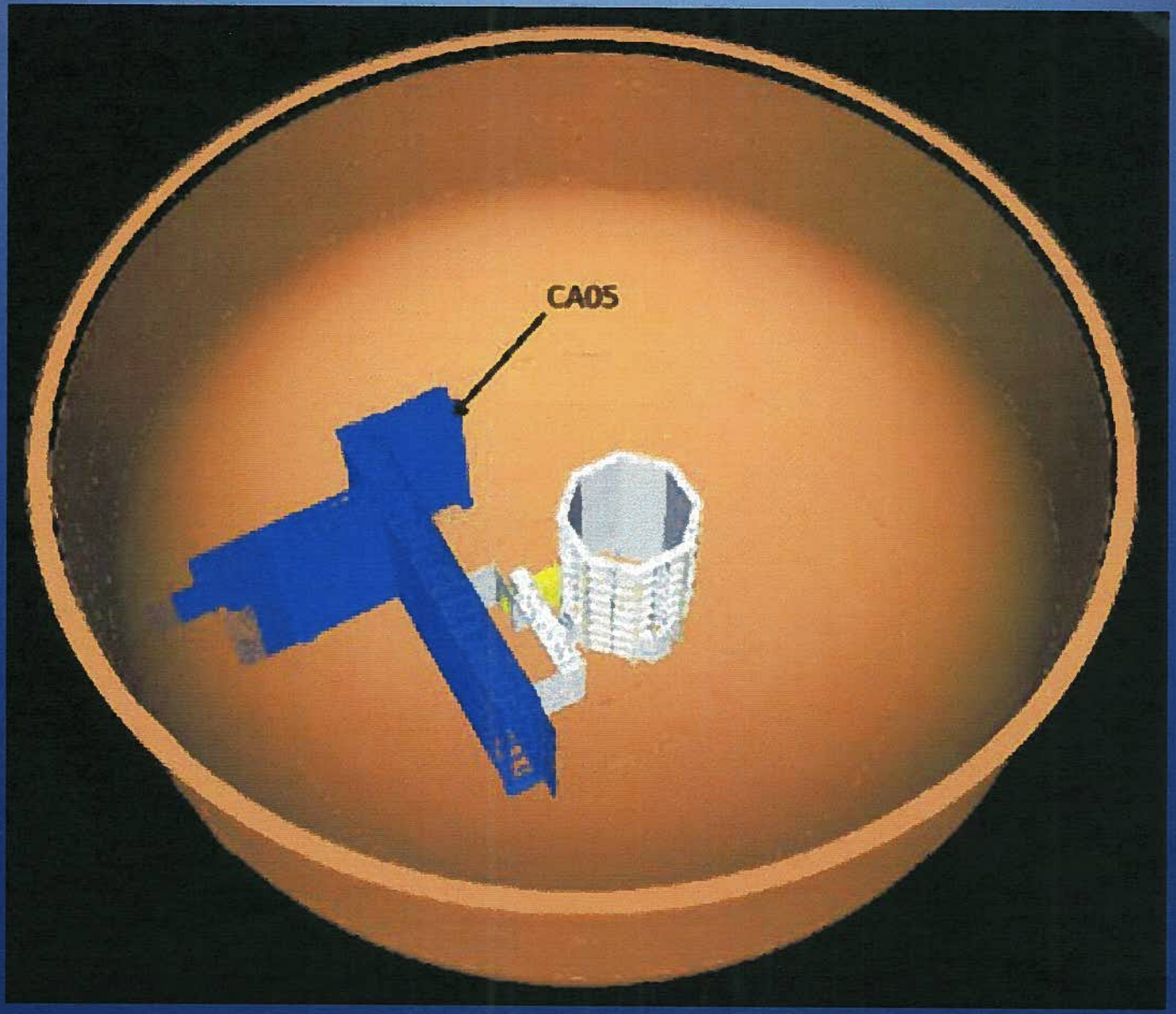
Big Six - CA05



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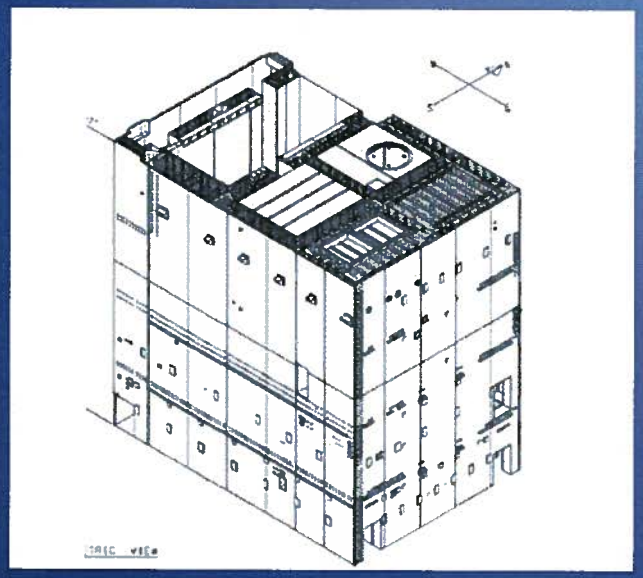
Big Six – CA20



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Appendix B

Construction Site Photographs

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VCS Construction Site End of 1st Qtr.

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Unit 2 Pressurizer

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Unit 3 Core Makeup Tank

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Unit 2 Steam Generator

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Appendix C

License Amendment Requests

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License Amendment Requests

[1]NRC LAR No.	Summary	LAR Submittal Date	LAR Status	LAR Approval Date	PAR Submittal Date	PAR Status	PAR Approval Date
12-01	Stud Spacing around Electrical Penetrations	8/29/2012	Approved	7/1/2013			
12-02	Definition of Wall Thickness in Table 3.3.1 **(PAR Requested)**	9/26/2012	Approved	5/30/2013	12/6/2012	Approved	1/16/2013
13-01	Basemat Shear Reinforcement Design Spacing **(PAR Requested)**	1/15/2013	Approved	2/26/2013	1/24/2013	Approved	1/29/2013
13-02	Basemat Shear Reinforcement Design Details **(PAR Requested)**	1/18/2013	Approved	3/1/2013	1/22/2013	Approved	1/29/2013
13-03	Turbine Building Eccentric and Concentric Bracing	2/7/2013	Approved	7/1/2013			
13-04	Reconciliation of Tier 1 Value Differences	2/7/2013	Under Review				
13-05	Structural Module Shear Stud Size and Spacing	2/14/2013	Approved	5/23/2013			
13-06	Primary Sampling System Changes	2/7/2013	Approved	8/22/2013			
13-07	Changes to Chemical and Volume Control System	3/13/2013	Approved	2/24/2014			
13-08	Module Obstructions and Details *Superseded by LAR 13-20*	2/28/2013	Withdrawn				
13-09	Annex/Radwaste Building Layout Changes	2/27/2014	Under Review				
13-10	Human Factors Engineering Integrated Plan	3/13/2013	Approved	7/31/2014			
13-11	Nuclear Island Walls Reinforcement Criteria **(PAR Requested)**	3/26/2013	Approved	6/6/2013	4/2/2013	Approved	4/10/2013
13-12	Fire Area Boundary Changes	7/17/2013	Approved	9/9/2014			
13-13	Turbine Building Layout Changes	7/30/2013	Approved	5/12/2014			
13-14	Turbine Building Battery Room Electrical Changes	10/2/2013	Approved	10/24/2014			
13-15	Operator Break Room Configuration *LAR not required*		Withdrawn	Changed to a Non-LAR Departure			
13-16	Revision to Human Factors Engineering Design Verification Plan	9/25/2013	Approved	7/31/2014			
13-17	Revision to Human Factors Engineering Task Support Verification Plan	9/25/2013	Approved	7/31/2014			
13-18	Revision to Human Factors Engineering Issue Resolution Plan	10/3/2013	Approved	7/31/2014			
13-19	Revise to Human Factors Engineering Plan	10/3/2013	Approved	7/31/2014			
13-20	Module/Stud Channel Obstructions Revisions	7/17/2013	Approved	11/19/2013			
13-21	CA03 Module Design Differences	2/2/2014	Under Review				
13-22	Annex Building Structure and Layout Changes	12/4/2014	Under Review				
13-23	Reinforced Concrete (RC) to Steel Plate Composite, Construction (SC) Connections	7/11/2014	Approved	12/16/2014			
13-25	Tier 1 Editorial and Consistency Changes	7/2/2013	Approved	7/31/2014			
13-26	Emergency Plan Rule Changes	12/17/2013	Approved	6/20/2014			
13-27	Control Rod Drive Mechanism latching Relays	10/30/2014	Under Review				
13-28	Piping Line Number Additions, Deletions, and Functional capability Re-designation	12/18/2014	Under Review				
13-29	Class 1E DC and Uninterruptible Power Supply System Removal of Spare Battery Termination Boxes	12/19/2014	Under Review				
13-32	Liquid Waste System Changes	8/30/2013	Approved	1/8/2014			

[1] Numbering may not be in sequence

Tier 2* is a NRC term to denote Tier 2 Design-Control-Document information that is subject to the change process in Section VIII.B.6. of Appendix D of Part 52 Design-Certification Rule for the AP1000 Design.

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License Amendment Requests

[1]NRC LAR No.	Summary	LAR Submittal Date	LAR Status	LAR Approval Date	PAR Submittal Date	PAR Status	PAR Approval Date
13-33	Passive Core Cooling System (PXS) Condensate Return	7/8/2014	Under Review				
13-34	Clarification of Tier 2* Material in Human Factors Engineering Documents	3/19/2014	Approved	10/8/2014			
13-36	CIM/DAS Diversity Clarification	9/11/2014	Under Review				
13-37	VCSNS Units 2&3 Tech Spec Upgrade	12/4/2013	Approved	11//12/14			
13-38	ACI Code Compliance With Critical Sections Higher Elevations - *LAR not required*	11/7/2013	Withdrawn				
13-41	Coating Thermal Conductivity- Revise DCD Tier 2 Document	11/26/2013	Under Review				
13-42	Tier 1 Editorial and Consistency Changes #2	5/20/2014	Under Review	3/10/2015			
14-01	Auxiliary Building Roof and Floor Details **(PAR Requested)**	4/3/2014	Approved	7/18/2014	4/9/2014	Approved	4/15/2014
14-03	Tier 2* Editorial and Clarification Changes	6/12/2014	Under Review				
14-05	Containment Internal Structural Module Design Details	7/17/2014	Under Review	3/12/2015			
14-06	Enclosures for Class 1E Electrical Penetrations in Middle Annulus	6/20/2014	Approved	12/30/2014			
14-07	CA04 Structural Module ITAAC Dimensions Change	9/25/2014	Under Review				
14-08	Integrated Test Program (ITP)	10/23/2014	Under Review				
14-09	Turbine Building Switchgear Room and Office Layout Changes	9/18/2014	Under Review				
14-15	Compressed and Instrument Air Supply Modification	10/30/2014	Under Review				
14-19	HFE OSA Task Update and Removal of WCAP-15847	1/27/2015	Under Review				

[1] Numbering may not be in sequence

Tier 2* is a NRC term to denote Tier 2 Design-Control-Document information that is subject to the change process in Section VIII.B.6. of Appendix D of Part 52 Design-Certification Rule for the AP1000 Design.

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Appendix D

Change Orders and Amendments

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Appendix D

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 [1]	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 (2) weeks	Fixed Price with 0% escalation	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	4/19/2011	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	2/24/2011	Approved
12	2010 Health Care Act Costs	Firm	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
16	Delay in COL, Shield Building Redesign, Unit 2 Rock, etc.	Target Price and Firm Price	Entitlement	TBD	Under Review
17	Commercial Issues	Under Review	Under Review	TBD	Under Review
18	Perch Guards on Transmission Structures	Firm Price	Owner Directed	10/7/2014	Approved

[1]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.

Appendix D

Change Orders and Amendments

No.	Summary	Cost Categories Involved	Type of Change	Date Approved	Status
19	PRS Hardware and Software Upgrade	Firm Price	Owner Directed	10/14/2014	Approved
20	WEC Costs Related to Health Care Act of 2010	Firm Price	Entitlement	1/7/2015	Approved
21	ITAAC Maintenance	T&M Price	Entitlement	3/5/2015	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

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.

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Appendix E

NRC Letter Referencing Notice of Violations to CB&I

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April 20, 2015

EA-14-085

Mr. Luke Scorsone, Executive Vice President,
Group President Fabrication Services
Chicago Bridge and Iron Company
4171 Essen Lane
Baton Rouge, LA 70809

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTY - $11,200, NRC INVESTIGATION REPORT NO. 2-2013-024

Dear Mr. Scorsone:

This refers to the investigation conducted by the U.S. Nuclear Regulatory Commission (NRC) Office of Investigations (OI) between April 13, 2013, and May 9, 2014, of activities at Chicago Bridge and Iron Company's, Lake Charles, Louisiana, facility (CB&I-LC), formerly known as Shaw Modular Solutions. The investigation was conducted to determine: (1) whether a production manager, rigging manager, and safety representative directed CB&I-LC personnel to falsify statements, and thus create a false quality record associated with a sub-module destined for the Virgil C. Summer Nuclear Station (V. C. Summer) site; and (2) whether CB&I-LC willfully failed to correct a condition adverse to quality by creating an inaccurate condition report. The results of the investigation were described in the NRC's letter transmitting the factual summary of the OI report dated December 15, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML14296A036).

A Predecisional Enforcement Conference (PEC) was conducted at NRC headquarters on January 22, 2015, with members of your staff to discuss the apparent violations, their significance, their root causes, and your corrective actions. The conference was closed to public observation because we discussed the findings of an OI report that has not been publicly disclosed.

Based on the information developed during the investigation and the information that you provided during the conference, the NRC has determined that violations of NRC requirements occurred. These violations are cited in the enclosed Notice of Violation (Notice) and the circumstances surrounding them were described in the NRC letter transmitting the factual summary of the OI report, dated December 15, 2014.

The violations occurred in March 2013, when two CB&I-LC officials deliberately instructed subordinate CB&I-LC employees to knowingly omit from an Incident Investigation Report that: (1) the V. C. Summer CA-01-20 sub-module had dropped approximately 3.5 feet; (2) improper rigging equipment (nylon slings) had been used and had broken; and (3) the sub-module had sustained damage. In addition, the CB&I-LC officials deliberately failed to promptly identify that a condition adverse to quality occurred regarding the incident and resultant damage to the sub-module. When CB&I-LC subsequently opened a corrective action report, CB&I-LC officials

deliberately withheld relevant information from members of the team evaluating Condition Report (CR) 2013-315, resulting in the team concluding that there was "no evidence . . . 1) a free-fall occurred; 2) a nylon strap was used or broke during the lift; and 3) that the module fell at all" despite the fact that the CB&I-LC officials had information to the contrary.

The actions of multiple employees deliberately submitting false information or omitting information from incident investigation reports and corrective action reports are of particular concern to the NRC because our regulatory program is based on licensees, contractors, and their employees acting with integrity. Based on the above, and in light of the interrelationship of the two violations, the NRC has concluded that the violations are appropriately characterized collectively as a Severity Level II problem in accordance with the NRC Enforcement Policy.

In accordance with the Enforcement Policy, a base civil penalty in the amount of $11,200 is considered for a Severity Level II problem. Because this action involves the willful acts of CB&I employees, the NRC considered whether credit was warranted for both *Identification* and *Corrective Actions* in accordance with the civil penalty assessment process in Section 2.3.4 of the Enforcement Policy. The NRC determined that credit was not warranted for *Identification* but it was warranted for *Corrective Actions*. Regarding the *Identification* factor, this issue was reported to the NRC as a result of concerns about the appropriateness of actions being taken by CB&I officials shortly after the incident was identified at Lake Charles. With respect to the *Corrective Action* factor, the NRC determined that credit was warranted as a result of corrective actions taken once senior CB&I managers became aware of the chilled environment at Lake Charles. As discussed during the PEC, corrective actions included the following: (1) the V.C. Summer sub-module was 100 percent re-inspected prior to being shipped and received by the licensee; (2) CB&I has established an Employee Concern Board as an alternative process to discuss disagreement between the CB&I-LC leadership and the Employee Concerns Program investigation conclusions; (3) the company has made significant and substantive improvements to its corrective action program since June 2013; and (4) the company has conducted specific training for the Rigging Department employees. As a result of these corrective actions, the actions taken as part of the September 2014 Confirmatory Order, and the observations made during an NRC inspection conducted at the Lake Charles facility in December 2014, the NRC has determined that corrective actions credit is warranted. The results of this inspection are documented in the NRC's inspection report of Chicago Bridge & Iron No. 99901425/2014-202, dated January 15, 2015 (ADAMS Accession No. ML14352A127).

As previously noted in our December 15, 2014, letter to you, the NRC staff considered whether the apparent violations warranted enforcement discretion as described in the Confirmatory Order (CO) issued to CB&I on September 25, 2014 (EA-13-196). The NRC concluded that the examples of deliberate misconduct addressed by this CO were driven by a poor understanding of nuclear safety culture, and were the result of CB&I-LC managers and workers placing production and schedule concerns ahead of safety and quality. However, the deliberate misconduct described in the Notice appear to include an understanding of the nuclear safety implications that resulted from the mishandling and damage to the sub-module; yet, the CB&I officials and employees involved in the incident knowingly disregarded requirements designed to promptly identify and correct a condition adverse to quality. Therefore, NRC staff concluded that the violations of 10 CFR 52.4 did not warrant consideration for enforcement discretion.

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Therefore, to emphasize the importance of compliance with NRC regulations, including the prompt identification of violations, I have been authorized to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalty (Notice) in the base amount of $11,200. In addition, issuance of this Notice constitutes escalated enforcement action that may subject you to increased inspection effort.

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 will also determine whether further enforcement action is necessary to ensure compliance with regulatory requirements.

In accordance with Title 10 of the *Code of Federal Regulations* 2.390 of the NRC's "Rules of Practice," 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 in ADAMS, 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. The NRC also includes significant enforcement actions on its Web site at http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/.

Sincerely,

/RA/

Patricia K. Holahan, Director
Office of Enforcement

Docket No. 99901425

Enclosures:
1. Notice of Violation
2. NUREG/BR-0254, "Payment Methods"

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Therefore, to emphasize the importance of compliance with NRC regulations, including the prompt identification of violations, I have been authorized to issue the enclosed Notice of Violation and Proposed Imposition of Civil Penalty (Notice) in the base amount of $11,200. In addition, issuance of this Notice constitutes escalated enforcement action that may subject you to increased inspection effort.

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In accordance with Title 10 of the *Code of Federal Regulations* 2.390 of the NRC's "Rules of Practice," 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 in ADAMS, 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. The NRC also includes significant enforcement actions on its Web site at http://www.nrc.gov/reading-rm/doc-collections/enforcement/actions/.

Sincerely,

/RA/

Patricia K. Holahan, Director
Office of Enforcement

Docket No. 99901425

Enclosures:
1. Notice of Violation
2. NUREG/BR-0254, "Payment Methods"

DISTRIBUTION:
See next page

ADAMS Accession No. ML15082A130 *via e-mail NRO-002

OFC	NRO/DCIP:ROE	NRO/DCIP:ES	NRO/DCIP:BC	OE/EB:ES	OE/EB:BC
NAME	ABelen	TFrye	KKavanagh	RFretz	NHilton
DATE	03/23/15	03/23/15	03/26/15	04/16/15	04/20/15
OFC	RII/OI	NRO/DCIP:D	OGC	OE	
NAME	RRzepka *	MCheok *	DCylkowski *	PHolahan	
DATE	03/27/15	04/07/15	04/13/15	04/20/15	

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Letter to Mr. Luke Scorsone from Patricia Holahan dated April 20, 2015

SUBJECT: NOTICE OF VIOLATION AND PROPOSED IMPOSITION OF CIVIL PENALTY - $11,200, NRC INVESTIGATION REPORT NO. 2-2013-024

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Mr. Ryan Zurkuhlen, Executive Vice President,
Chicago Bridge & Iron Lake Charles
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NOTICE OF VIOLATION
AND
PROPOSED IMPOSITION OF CIVIL PENALTY

Chicago Bridge and Iron Company (Lake Charles)
Lake Charles, LA

Docket No. 99901425
EA-14-085

During an investigation conducted by the U.S. Nuclear Regulatory Commission (NRC), Office of Investigations, completed on May 9, 2014, violations of NRC requirements were identified. In accordance with the NRC Enforcement Policy, the NRC proposes to impose a civil penalty pursuant to Section 234 of the Atomic Energy Act of 1954, as amended (Act), 42 U.S.C. 2282, and Title 10 of the *Code of Federal Regulations* (10 CFR) 2.205. The particular violations and associated civil penalty are set forth below:

A. 10 CFR 52.4(c)(1) states, in part, that an employee of a contractor of any licensee may not engage in deliberate misconduct that causes or would have caused, if not detected, a licensee to be in violation of any rule, regulation, or order; or any term, condition, or limitation of any license issued by the Commission.

Criterion XVI, "Corrective Action," of Appendix B, "Quality Assurance Program Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, states, in part, that "measures shall be established to assure that conditions adverse to quality, such as . . . deficiencies . . . and nonconformances are promptly identified and corrected."

Contrary to the above, between March 1 - 14, 2013, multiple Chicago Bridge and Iron Company, Lake Charles, Louisiana, facility (CB&I-LC) officials and employees engaged in deliberate misconduct that would have caused South Carolina Electric and Gas Co., the licensee for the Virgil C. Summer Nuclear Station (V. C. Summer), to be in violation of 10 CFR Part 50, Appendix B, Criterion XVI. Specifically:

1. A CB&I-LC official deliberately instructed subordinate CB&I-LC employees to knowingly omit from Incident Investigation Report statements that: (a) the V. C. Summer CA-01-20 sub-module had dropped approximately 3.5 feet; (b) improper rigging equipment (nylon slings) had been used and had broken; and (c) the sub-module had sustained damage. The CB&I-LC official also failed to promptly identify a condition adverse to quality relating to the damage that occurred to the sub-module as a result of the incident.

2. Another CB&I-LC official, with knowledge to the contrary, deliberately allowed CB&I-LC employees to knowingly omit this information from Incident Investigation Report statements after witnessing the first official's instructions. The second CB&I official also failed to promptly identify a condition adverse to quality relating to the damage that occurred to the sub-module.

3. As a result of following the CB&I-LC official's instructions, multiple CB&I-LC employees deliberately failed to promptly identify a condition adverse to quality relating to the damage that occurred to the sub-module.

The deliberate actions on the part of the CB&I-LC officials and employees resulted in a condition adverse to quality not being promptly identified and corrected.

B. 10 CFR 52.4(c)(2) states, in part, that an employee of a contractor for any licensee may not deliberately submit to the NRC, licensee, or contractor, information that the person submitting the information knows to be incomplete or inaccurate in some respect material to the NRC.

Criterion XVI, "Corrective Action," of Appendix B, states, in part, that "measures shall be established to assure that conditions adverse to quality, such as . . . deficiencies . . . and nonconformances are promptly identified and corrected."

Contrary to the above:

1. On March 1, 2013, at least six CB&I-LC employees deliberately submitted incomplete and inaccurate information related to the dropped sub-module incident. Specifically, the employees omitted information that: (1) the V. C. Summer CA-01-20 sub-module had dropped approximately 3.5 feet; (2) improper rigging equipment (nylon slings) had been used and had broken; and (3) the sub-module had sustained damage in their original statements that supported an Incident Investigation Report. The incomplete and inaccurate information is material to the NRC because relevant facts associated with a potential nonconforming safety-related component were knowingly withheld until on or about March 14, 2013, and resulted in a condition adverse to quality not being promptly identified and corrected.

2. Between March 14 and April 4, 2013, multiple CB&I-LC officials engaged in deliberate misconduct by intentionally withholding information from other CB&I-LC employees investigating a condition adverse to quality. Specifically, the CB&I-LC officials deliberately withheld relevant information about the March 1, 2013, dropped module incident from members of a team evaluating Condition Report (CR) CR 2013-315, which was initiated, in part, to ensure appropriate corrective actions would be taken following the incident. As a result, evaluation team's April 4, 2013, report concluded that "[t]here is no evidence and no written report (other than what is stated in CR 13-315 by the initiator) that: 1) a free-fall occurred, 2) a nylon strap was used or broke during the lift, or 3) that the sub-module fell at all. (There was not a statement made in any of the incident reports that said the Module fell)." The evaluation team's report was submitted despite the fact that the CB&I-LC officials had information to the contrary and knew that these conclusions were incomplete or inaccurate in some respect material to the NRC. The incomplete and inaccurate information is material to the NRC because relevant facts associated with a nonconforming safety-related component were knowingly withheld and, if not detected, would have resulted in a condition adverse to quality not being promptly identified and corrected.

This is a Severity Level II Problem (NRC Enforcement Policy, Sections 6.5 and 6.9)

Civil Penalty- $11,200 (EA-14-085)

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Pursuant to 10 CFR 2.201, CB&I is hereby required to submit a written statement or explanation to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, with a copy to the Document Control Desk, Washington, DC 20555-0001, within 30 days of the date of this Notice of Violation and Proposed Imposition of Civil Penalty (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation; (EA-14-085)" and should include for each alleged 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, the NRC may issue an order or a Demand for Information requiring you to explain why the NRC should not take other action as may be proper. Consideration may be given to extending the response time for good cause shown.

CB&I may pay the civil penalty proposed above in accordance with NUREG/BR-0254 and by submitting to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, a statement indicating when and by what method payment was made. Alternatively, CB&I may protest imposition of the civil penalty in whole or in part, by a written answer addressed to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, within 30 days of the date of this Notice. Should the Licensee fail to answer within 30 days of the date of this Notice, the NRC will issue an order imposing the civil penalty. Should CB&I elect to file an answer in accordance with 10 CFR 2.205 protesting the civil penalty, in whole or in part, such answer should be clearly marked as an "Answer to a Notice of Violation" and may: (1) deny the violation(s) listed in this Notice, in whole or in part; (2) demonstrate extenuating circumstances; (3) show error in this Notice; or (4) show other reasons why the penalty should not be imposed. In addition to protesting the civil penalty in whole or in part, such answer may request remission or mitigation of the penalty.

In requesting mitigation of the proposed penalty, the response should address the factors addressed in Section 2.3.4 of the Enforcement Policy. Any written answer addressing these factors pursuant to 10 CFR 2.205 should be set forth separately from the statement or explanation provided pursuant to 10 CFR 2.201, but may incorporate parts of the 10 CFR 2.201 reply by specific reference (e.g., citing page and paragraph numbers) to avoid repetition. The attention of the Licensee is directed to the other provisions of 10 CFR 2.205 regarding the procedure for imposing (a) civil penalty.

Upon failure to pay any civil penalty that subsequently has been determined in accordance with the applicable provisions of 10 CFR 2.205 to be due, this matter may be referred to the Attorney General, and the penalty, unless compromised, remitted, or mitigated, may be collected by civil action pursuant to Section 234c of the Act, 42 U.S.C. 2282c.

Your response will be made available electronically for public inspection in the NRC Public Document Room or in the NRC's Agencywide Documents Access and Management System (ADAMS), 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 or proprietary information. 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

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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.

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

Dated this the 20 day of April 2015.

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Appendix F

NRC Letter Referencing Special Inspection

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

June 10, 2015

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: VIRGIL C. SUMMER NUCLEAR STATION UNIT 2 – U.S. NUCLEAR REGULATORY COMMISSION (NRC) SPECIAL INSPECTION REPORT NO. 05200027/2015009

Dear Mr. Jones:

The Nuclear Regulatory Commission (NRC) conducted a special inspection from February 23 through February 27, 2015, at the Virgil C. Summer Nuclear Station, Unit 2, in Jenkinsville, SC and a subsequent in-office inspection from April 21 through April 27, 2015. The purpose of the special inspection was to assess the facts and circumstances surrounding an event involving contact with the containment vessel shell and structural rebar located within the containment vessel during concrete coring operations.

Between February 5 and February 10, 2015, ten holes were cored in the Unit 2 containment vessel layer 2 basemat in preparation for relocating vertical dowels interfering with embed plates to be placed in layer 3. The processes of determining where those holes were to be cored, and the types of dowels involved contributed to the unintentional drilling through structural rebar in three cored holes, and contacting the containment vessel shell with the drill in one cored hole.

Two NRC-identified findings of very low safety significance (Green) were identified during this inspection. These findings were determined to involve violations of NRC requirements. However, because of their very low safety significance, and because the issues were entered into your corrective action program, the NRC is treating the issues as non-cited violations (NCVs) in accordance with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest these NCVs, 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 the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector office at the Virgil C. Summer Nuclear Station Units 2 and 3.

If you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your

disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector office at the Virgil 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 made available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system Agencywide Document Access and Management System (ADAMS). ADAMS is Accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Should you have any questions concerning this letter, please contact us.

Sincerely,

/RA/

Jamie Heisserer, Chief
Construction Inspection Branch 2
Division of Construction Inspection

Docket No. 05200027
License No. NPF-93

Enclosures:
1. NRC Inspection Report No. 05200027/2015-009
2. Special Inspection Team Charter

cc: (See page 3)

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cc w/ encls:

Document Control and Records Management
P.O. Box 88
Mail Code 846
Jenkinsville, SC 29065

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Gregrey Ginyard
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Ms. Gidget Stanley-Banks
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U.S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket No.:	52-027
License No.:	NPF-93
Report No.:	05200027/2015-009
Licensee:	South Carolina Gas & Electric
Location:	Jenkinsville, SC 29065
Dates:	February 23-27, 2015 April 21-27, 2015
Inspectors:	E. Michel, Senior Construction Inspector P. O'Bryan, Reactor Operations Engineer C. Oelstrom, Construction Resident Inspector
Approved by:	Jamie Heisserer, Chief Construction Inspection Branch 2 Division of Construction Inspection

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SUMMARY OF FINDINGS

Inspection Report (IR) 05200027/2015009, 2/23/15 through 2/27/15 and 4/21/15 through 4/27/15; Virgil C. Summer Nuclear Station Unit 2, special inspection report.

This report covers a special inspection conducted by regional and headquarters inspectors. Two green non-cited violations (NCV), one associated with Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix B, Criterion III, "Design Control"; and the other associated with 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings." The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) which is determined using Inspection Manual Chapter (IMC) 2519, "Construction Significance Determination Process". Cross-cutting aspects are determined using IMC 0613, Appendix F, "Construction Cross-Cutting Areas and Aspects." All violations of Nuclear Regulatory Commission (NRC) requirements are dispositioned in accordance with the NRC's Enforcement Policy and the temporary enforcement guidance outlined in enforcement guidance memorandum (EGM) 11-006. The NRC's program for overseeing the safe 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: Construction/Installation

- Green: The NRC identified an Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings" for damage to safety related structural rebar as a result of failure by South Carolina Electric and Gas (SCE&G), through their contractor Chicago Bridge & Iron (CB&I) Power, to implement appropriate procedures for coring into concrete. No immediate corrective actions were necessary to alleviate immediate safety or security concerns. Subsequent corrective actions to evaluate damaged safety related rebar have been completed. The licensee entered this issue into their corrective action program as CR-NND-15-00539.

  The finding was associated with the Construction/Installation cornerstone. The inspectors determined the performance deficiency was more than minor following the guidance in IMC 0613, "Power Reactor Construction Inspection Reports," Appendix E, Example 16. The inspectors evaluated the finding in accordance with IMC 2519, "Construction Significance Determination Process," Appendix A, "AP 1000 Construction Significance Determination Process," and determined the finding was of very low safety significance (Green) because it was associated with a portion of a structure assigned to the intermediate risk importance column, and Row 2, of the construction significance determination matrix. The finding was determined to be an ITAAC finding because it was material to the acceptance criteria of Unit 2 ITAAC 760 (3.3.00.02a.i.a). The acceptance criteria of this ITAAC requires that a reconciliation report is completed that concludes the "as-built" construction conforms to the approved design. At the time of the inspection, this finding was associated with deviations from design requirements that would not have been reconciled by the licensee as required by the ITAAC; however, as of the writing of this report, the associated deviations have been adequately reconciled. The inspectors screened the finding for a possible construction cross-cutting aspect in accordance with Appendix F, "Construction Safety Focus Components and Aspects," of IMC 0613. This finding has a cross-cutting aspect in the area of Human Performance,

Avoid Complacency aspect because the licensee failed to adequately develop a process which would recognize and plan for the possibility of mistakes. [H.12]. (Section 2)

Cornerstone: Design/Engineering

- Green: The NRC identified a construction finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control" for inadvertently damaging the Unit 2 containment vessel bottom head (CVBH) as a result of the failure by SCE&G, through their contractors CB&I Power and Westinghouse Electric Company (WEC), to adequately verify a design change that was implemented for post-installing safety related rebar and coring into concrete. No immediate corrective actions were necessary to alleviate immediate safety or security concerns. Subsequent corrective actions to repair the CVBH have been completed. The licensee entered this issue into their corrective action program as CR-NND-15-00539.

  The finding was associated with the Design/Engineering cornerstone. The inspectors determined the performance deficiency was more than minor because it represented an adverse condition that rendered the quality of an SSC unacceptable or indeterminate, and required substantive corrective action. The inspectors evaluated the finding using the construction SDP in accordance with IMC 2519, "Construction Significance Determination Process," Appendix A, "AP 1000 Construction Significance Determination Process" and determined that the finding was of very low safety significance (Green) because it was associated with a portion of a structure assigned to the intermediate risk importance column and Row 1 of the construction significance determination matrix. The inspectors screened the finding for a possible construction cross-cutting aspect in accordance with Appendix F, "Construction Cross-Cutting Components and Aspects" of IMC 0613. This finding has a cross-cutting aspect in the area of Human Performance, Work Management aspect, because the licensee failed to adequately identify and manage risk commensurate to the work and did not adequately coordinate different groups or job activities. [H.5]. (Section 2)

B. Licensee-Identified Violations

No findings were identified.

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REPORT DETAILS

Summary of the Degraded Condition

Between February 5 and February 10, 2015, ten holes were cored in the Unit 2 containment vessel layer 2 basemat in preparation for relocating vertical dowels interfering with an embed plate to be placed in layer 3. The processes of determining where those holes were to be cored, and the types of dowels involved contributed to the unintentional drilling through structural rebar in three cored holes, and contacting the containment vessel shell with the drill in one cored hole.

4. OTHER ACTIVITIES

4OA5 Other Activities – Special Inspection (IP 93812)

.1 Develop a sequence of events, including key decision points associated with the removal and replacement of the dowels

a. Inspection Scope and Observations

The inspectors reviewed documentation including the root cause report and corrective action documents; and interviewed licensee and consortium personnel, including the root cause team, the craft and field engineers at the job site during the coring evolution, and engineering personnel, to develop a detailed sequence of events.

Sequence of Events

2014 Layer 2 of reinforced concrete was constructed inside the Unit 2 containment vessel (CV). As part of this construction, vertical rebar dowels were installed and these dowels extend up into the construction layer above layer 2 (layer 3). At the time of the NRC Special Inspection, layer 3 concrete had not been poured, but construction of layer 3 rebar and embed plates was in progress.

1/9/15 CB&I surveyors and carpenters laid out the "N line" on layer 2 concrete inside containment. The N line is the north/south bisector of the containment horizontal cross section and is used as a reference for locating layer 3 embed plates. The surveyors marked 2 points on the N line. However, the carpenters drew a line offset to the east by 1 foot off the true N line due to vertical rebar dowels interfering with the chalk line.

CB&I carpenters marked the centerlines for embed plates P1, P2, P3, and P4 on the containment concrete. However, these were different carpenters that did not realize that the chalk line for the N line was offset by 1 foot. Thus, the centerlines for embed plates P1 thru P4 were inadvertently offset by 1 foot.

1/20/15 CB&I field engineers identified that there were previously constructed rebar dowels that interfered with a planned pipe installation in layer 3 of the CV and initiated Nonconformance and Disposition report (N&D) number VS2-CR01-GNR-000259. This interference would later require a new dowel hole to be bored – one of the ten bored holes referenced in the remainder of this timeline.

1/23/15 A CB&I field engineer identified that there were previously constructed vertical rebar dowels interfering with the marked locations of embed plates P1, P2, and P3. The field engineer initiated N&D VS2-CR01-GNR-000263 for this condition. In the N&D, the field engineer specified that the interfering dowels were type 3A and 3G vertical dowels. The field engineer also listed drawing VS2-1110-CR-531 as the reference drawing that showed the location of the interfering dowels. This was an error. The correct drawing that showed the location of the interfering dowels was VS2-1110-CR-532, which shows that the interfering dowels were actually type 3B and 3L vertical dowels.

2/2/15 The Westinghouse Electric Company (WEC) responsible engineer for N&D VS2-CR01-GNR-000263 dispositioned the N&D, providing repair instructions and engineering justification for the type of repair. The WEC responsible engineer did not, however, recognize that embed plates P1 through P4 were in locations that could not potentially interfere with type 3A and 3G vertical dowels. A comparison of CV drawings would have revealed the error. Had the responsible engineer correctly identified the locations of embed plates P1 through P4, he would have realized that the interfering dowels were type 3B and 3L vertical dowels. In the N&D disposition, the responsible engineer specified that the bore holes be a minimum of 25 inches deep - a depth that could be accommodated in the type 3A and 3G vertical dowel positions without impacting structural rebar or the CVBH, but could not be accommodated in the type 3B or 3L vertical dowel positions.

2/3/15 A second WEC engineer reviewed and verified the N&D VS2-CR01-GNR-00263 disposition. This engineer also did not identify the correct location of embed plates P1 through P4 or the correct type of vertical dowels in those locations by comparing CV drawings.

WEC issued the disposition for N&D VS2-CR01-GNR-00263.

A CB&I field engineer marked seven spots on the layer 2 containment concrete. Six holes were marked for new bore holes associated with embed plates P1, P2, and P3. One hole was marked for a new bore hole associated with the piping interference from N&D VS2-CR01-GNR-000259.

2/5/15 Core drilling started.

2/6/15 Coring of 4 holes was completed.

2/7-8/15 No work was performed over the weekend.

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2/9/15 CB&I carpenters discovered the mistake in laying out the centerlines for embed plates P1 through P4 and corrected the error by laying out new embed plate centerlines.

Given the change in the location of the centerlines for embed plates P1 through P4, a CB&I field engineer marked three new holes to be cored to compensate for the new embed plate locations. The field engineer also identified that three of the four previously cored holes could not be used and required filling with grout without a replacement dowel. The field engineer designated these 3 holes as R1, R2, and R3.

2/10/15 Drilling of the remaining 6 holes was finished. The CB&I field engineer designated the 7 holes that were to have dowels installed in them as D1 through D7. These 7, along with holes R1, R2, and R3, brought the total to 10 cored holes in this timeframe.

The ten holes were filled with water to pre-soak them prior to grouting. Hole R1 would not hold water and emptied. The other 9 holes held water.

2/11/15 The pre-soaks for holes D1 through D7 were completed and they were grouted with dowels installed in them. A CB&I quality control (QC) inspector would not approve the grouting of R1, R2, or R3 because, without dowels installed in the holes, the condition of the holes differed from the specifications of N&D VS2-CR01-GNR-00263.

At the request of the CB&I QC inspector, the CB&I field engineer generated a new N&D for holes R1, R2, and R3 (N&D VS2-CR01-GNR-00275).

2/12/15 The CB&I QC inspector notified the CB&I Concrete Manager by email that hole R1 would not hold water. The CB&I Concrete Manager initiated an investigation of why hole R1 would not hold water. Borescope photographs were taken in hole R1, but initial photos were unclear.

At approximately 6:00 p.m., additional borescope photos were taken. A CB&I field engineer determined that the CV was exposed. The CB&I Concrete Manager and the CB&I Nuclear Island Construction Manager were informed of the condition of hole R1. The CB&I Nuclear Island Construction Manager also realized the potential for having cut structural rebar in hole R1.

The CB&I Nuclear Island Construction Manager directed that all core drilling be stopped until the issue was resolved.

The CB&I Concrete Manager quarantined a dumpster in which the concrete cores had been placed. Darkness and poor weather prevented an immediate examination of the contents of the dumpster. The CB&I Concrete Manager also attempted to contact the CB&I Site Director but failed to reach him.

2/13/15 At 6:00 a.m., the CB&I Concrete Manager and the CB&I Senior Construction Manager met with the CB&I Site Director and notified him that it appeared the CVBH had been contacted. The CB&I Site Director

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requested additional information for confirmation.
Sections of 9 concrete cores were retrieved from the quarantined dumpster. There was evidence that structural rebar had been cut in at least 2 sections of the cores.

2/14-15/15 No work was performed over the weekend.

2/16/15 At 6:00 a.m., the CB&I Concrete Manager and the CB&I Senior Construction Manager met with the CB&I Site Director and presented him with the evidence of contacting the CV during core drilling.

At 6:30 a.m. hours, the CB&I Site Director notified the CB&I Project Director, the WEC Site Director and acting Vice President of Construction, and the SCE&G construction organization.

(approximately 7:00 a.m.) The CB&I Project Director notified the SCE&G Site Vice President and CB&I Senior Management.

2/17/15 The CB&I Lead Field Engineer entered the issue into the CB&I corrective action program (CAR 2015-0539).

An SCE&G representative notified the NRC Senior Resident Inspector of the incident.

b. Findings

No findings of significance were identified.

.2 Review the licensee's (and CB&I's) assessment of human performance issues, procedure violations, and/or code violations. Develop an independent assessment based on the sequence of events.

a. Inspection Scope and Observations

The inspectors conducted interviews with CB&I, WEC, and SCE&G personnel; constructed a timeline of events (Section 4OA5.1); and reviewed corrective action program documents, work instructions, and procedures in order to assess human performance, procedural compliance, and potential violations of governing codes and standards. Personnel interviewed included CB&I craft workers and their supervisors, CB&I field engineers and their supervisors, WEC design engineers and their supervisors, and managers from all three organizations. Lists of personnel interviewed and documents reviewed are included in the Supplemental Information section at the end of this report.

In addition to the independent assessment described below, the inspectors evaluated how human performance was addressed in the root cause evaluation, "VC Summer Root Cause Analysis for Corrective Action Report 2015-0539", and discussed human performance issues with members of the licensee and consortium. The inspectors concluded there were no concerns with the licensee's assessment.

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i. Independent Human Performance Assessment

Inspectors used the human performance attributes in IMC 0613, Power Reactor Construction Inspection Reports, Appendix F – Construction Cross-Cutting Areas and Aspects to evaluate the performance of the personnel involved in the events related to this Special Inspection. While several cross-cutting aspects have been identified as human performance short-comings, per IMC 0613 appendix F, only the cross-cutting aspect associated with the principal cause of each of the non-cited violations listed in this report have been assigned to those non-cited violations.

Inspectors observed that the weakness associated with the human performance attributes listed below contributed to this event. Alpha numeric designators are consistent with those used in IMC 0613, Appendix F. Only cross-cutting aspects in the Human Performance cross-cutting area were evaluated.

H.1 Resources: Leaders ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety.

Although CB&I procedure NCSP 3-33, Installation of Drilled-In Concrete Anchors, is the governing procedure for core drilling, it does not provide adequate direction to perform some work steps. The procedure does not provide work steps for operating a core drill machine and core drilling is not clearly identified as an activity governed by NCSP 3-33. The title of the procedure is "Post-Installed Anchors" and the procedure provides only "suggested" methods to avoid embedded items.

H.2 Field Presence: Leaders are commonly seen in the work areas of the plant observing, coaching, and reinforcing standards and expectations. Deviations from standards and expectations are corrected promptly. Senior managers ensure supervisory and management oversight of work activities, including contractors and supplemental personnel.

Field engineers provided direction to core-drilling craft personnel with little or no additional supervision over several days of core-drilling activities. Field engineers made key decisions without input from their supervisors. Construction supervisors did not consider direct observation of the core-drilling activities to be necessary.

H.4 Teamwork: Individuals and work groups communicate and coordinate their activities within and across organizational boundaries to ensure nuclear safety is maintained.

Communications break-downs occurred between CB&I carpenters, leading to the embed plate centerlines being incorrectly marked. Additionally, CB&I field engineers failed to communicate problems with the core-drilling activities (for example having to relocate several of the holes, encountering rebar several times during drilling, and hole R1 not holding water for the pre-soak) to their supervisors.

H.5 Work Management: The organization implements a process of planning, controlling, and executing work activities such that nuclear safety is the overriding priority. The work process includes the identification and management of risk commensurate to the work and the need for coordination with different groups or job activities.

Work planning and execution was problematic in that review of potential adverse impact to structural rebar or the CVBH were not recognized and sufficient instructions,

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precautions, and oversight was not provided to avoid errors. Additionally, work instructions did not contain adequate precautions to avoid damaging these components.

H.9 Training: The organization provides training and ensures knowledge transfer to maintain a knowledgeable, technically competent workforce and instill nuclear safety values.

Neither craft nor field engineering personnel received training at the site on core drilling operations, and they were not knowledgeable of the appropriate procedures governing core drilling.

H.11 Challenge the Unknown: Individuals stop when faced with uncertain conditions. Risks are evaluated and managed before proceeding.

Field engineers did not stop core drilling when structural rebar was encountered. They were convinced that there was sufficient room to drill the holes despite abundant indications to the contrary. They did not stop the work activities to analyze these indications to ensure their assumptions were correct.

H.12 Avoid Complacency: Individuals recognize and plan for the possibility of mistakes, latent issues, and inherent risk, even while expecting successful outcomes. Individuals implement appropriate error reduction tools.

Craft personnel held pre-job briefs prior to core drilling, but the briefs only included industrial hazards and personnel safety issues. Craft personnel did not discuss potential adverse impacts on structures, systems, or components. Field engineers did not attend the pre-job brief with craft personnel.

The N&D disposition for the drilling only specified a minimum hole depth and did not specify a maximum depth, thus missing an opportunity to reinforce that the drilling could have negative consequences.

WEC Design Engineering personnel did not verify that the dowels specified in the N&D for the core drilling were correct, despite having the information needed to determine that there was an error in the N&D.

H.14 Conservative Bias: Individuals use decision making-practices that emphasize prudent choices over those that are simply allowable. A proposed action is determined to be safe in order to proceed, rather than unsafe in order to stop.

Field engineers directed that the core drilling be conducted per the N&D that they initiated. While this is allowed by site procedures, it does not ensure that all governing procedures are used and followed correctly. Had the field engineers adequately researched core drilling requirements, they would have been aware of additional precautions.

ii. Compliance with Procedures and Codes

The inspectors reviewed both implemented and existing procedures for the coring of holes in concrete and post-installation of safety-related rebar. At the time of the incident, CB&I Power had procedures in place for the post-installation of anchors in concrete, which included requirements for grouted anchors and embedments. These procedures were reviewed for applicability to the coring performed for the post-installation of safety-

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related rebar. In addition, the procedures were reviewed for conformance with the licensing basis, applicable codes, and to ensure compliance with the requirements of 10 CFR Part 50 Appendix B for corrective actions and non-conformances (e.g. encountering rebar during coring and/ or anchor installation).

The inspectors interviewed the three CB&I field engineers (one of whom was in training) directly involved in the core boring operations to understand how N&Ds were created and processed for this incident, the use of safety equipment and procedures such as ground fault interrupters, training and qualifications, and the implementation of quality assurance procedures. The inspectors observed that the field engineers performed their duties with limited supervision. For example, the field engineers were solely responsible for creating N&Ds, which describe the set of conditions from which the corrective actions for field activities are generated; and they independently developed the means and methods by which to accomplish those field activities. With respect to this incident, an error in the N&D for the selection of vertical dowel type contributed to contacting the CVBH and structural rebar during core boring operations. It was also observed that the N&D process was the favored means of dispositioning hardware issues and the 10 CFR Part 50, Appendix B corrective action program (CAP) was rarely used. While the field engineers were familiar with the CAP, they did not appear to make use of it to document conditions adverse to quality, which could result in less effective evaluations of those conditions.

The inspectors interviewed the Westinghouse civil engineer who evaluated N&D VS2-CR01-GNR-000263 to relocate dowels within layer 2 of the basemat, the Westinghouse Site Engineering Manager, and Westinghouse Lead Mechanical Engineer.

The inspectors reviewed the actions surrounding contact with the CVBH in hole R1. Specifically, the inspectors reviewed the procedures used to conduct repairs to the CVBH to ensure they were in compliance with the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, Subsection NE. The inspectors also reviewed the repair traveler and N&D report for the repair. Ultrasonic thickness measurements and visual inspection of the as-repaired area were observed and verified to confirm the repair did not reduce the CVBH wall below the ASME required minimum design thickness.

b. Findings

i. Failure to implement procedures for coring concrete and post installing anchors

Introduction: An ITAAC finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and drawings," was identified by the NRC for unanalyzed damage to safety related structural rebar as a result of the failure by SCE&G, through their contractor CB&I Power, to adequately implement procedures for post-installing safety related rebar and coring into concrete.

Description: In early February 2015, CB&I Power was installing relocated dowels in preparation for the proposed layer 3 of concrete inside the CV. The relocated dowels were being post-installed by coring into the existing concrete of layer 2 (below the proposed layer 3) and grouting the post-installed dowels in the cored holes. As stated above, ten holes were cored. To prepare for grouting, each hole was filled with water to pre-soak the hole. However, one of the holes (R1) closest to the CVBH wall did not hold water. A subsequent borescope examination of that hole revealed that the drill

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penetrated completely through the concrete and had impacted the CVBH. Subsequent inspection also revealed that the core bit had cut through safety-related rebar at this location. The contractor investigated potential rebar impacts from coring at the other nine locations and determined safety-related rebar was impacted at the D2 and D7 core locations as well.

The VC Summer Unit 2 project had procedures in place for installing reinforcing steel and post-installing rebar or anchors by coring and grouting. These procedures included corporate level procedures NCSP 3-33-1, Installation of Drilled-In Concrete Anchors, and NCSP 3-42-1, Reinforcing Steel installation; and site level instruction CSI 3-40-0, Installation of Post Installed Anchors. Both corporate level procedures and site instructions were required to be followed.

These procedures had requirements regarding contact with, or damage to structural rebar described as follows. NCSP 3-33-1, Attachment 7.1, entitled "Drilled–In Concrete Anchor Installation Attributes," was the construction quality completion (CQC) checklist which provided those attributes to be verified by a field engineer and superintendent during coring. Attribute W90 required, in part, "Rebar has not been cut unless approved (list approval documents in remarks)." NCSP 3-33-1 also required in Section 6.2.2.e that, "Discipline Construction Superintendent and responsible Field Engineer shall verify...that reinforcing steel has not been cut." Site level instruction CSI 3-40-0, Section 6.2.1 stated, in part, "post installed anchors shall not be drilled into structural rebar or embedded plates unless approved by the Engineer." Finally, NCSP 3-42-1, Section 6.8b stated, in part, "any item, condition or material which deviates from drawings, specifications or other engineering requirements and cannot be resolved within the scope of such requirements, or otherwise requires an Engineering disposition, shall be reported In accordance with, NCSP 2-8, "Nonconformance Reporting and Control"."

The contractor failed to adequately implement the above mentioned procedures for the ten cored holes. Specifically, the work was performed per the "Repair" dispositions in N&D VS2-CR01-GNR-00259 and N&D VS2-CR01-GNR-00263, but those N&Ds failed to incorporate CB&I procedures NCSP 3-33-1, CSI 3-40-0, and NCSP 3-42-1. As a result, the N&Ds provided no approvals for cutting safety related rebar, and safety related rebar was cut at three core locations (R1, D2, and D7). Coring was not stopped by the Field Engineer or Construction Superintendent when rebar was contacted. In addition, the Field Engineer or Superintendent did not contact the Engineer for approval or to report the nonconformance of the impacted rebar, as required by the procedures. Prior to grout placement on core locations D2 and D7, neither the Field Engineer nor Construction Superintendent verified that rebar was not cut. As a result ITAAC 3.3.00.02a.i.a was materially impacted because these two locations contained unanalyzed structural deviations from the original design that would not have been reconciled.

Analysis: The inspectors determined that the left in-place, damaged and unanalyzed structural rebar in core holes D2 and D7 as a result of the failure to implement the appropriate procedures as required by 10 CFR Part 50, Appendix B, Criterion V, was a performance deficiency. The performance deficiency was more than minor following the guidance in IMC 0613, "Power Rector Construction Inspection Reports," Appendix E, Example 16. Specifically, CB&I did not implement the appropriate requirements for coring into concrete and impacting safety related rebar, thereby leaving the cutting of safety related rebar unacceptable or indeterminate. The finding was determined to be an ITAAC finding because it was material to the acceptance criteria of Unit 2 ITAAC 760 (3.3.00.02a.i.a). The acceptance criteria of this ITAAC requires that a reconciliation

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report, concluding the "as-built" construction conforms to the approved design, is completed for the areas associated with the ITAAC. The structural rebar that was impacted in holes D2 and D7, and then subsequently grouted over, is included within the scope of ITAAC 760, and would not have been reconciled by the licensee as required by the ITAAC. The inspectors reviewed SCE&G Condition Report CR-NND-15-000263 and N&D No.'s VS2-1110-GNR-000011, VS2-CR01-GNR-000294, and VS2-CR01-GNR-000295 to determine whether appropriate action was taken to address the non-conforming condition of the unanalyzed cut rebar in core holes D2 and D7. The inspectors determined the dispositions and justifications of the cut rebar reconciled the unanalyzed condition with the design. The cut rebar still met the licensing basis and no longer impact the ITAAC 3.3.00.02a.i.a acceptance criteria. No additional findings were identified. NCV 05200027/2015009-01 is closed.

The inspectors concluded this finding was associated with the Construction/Installation Cornerstone. The inspectors evaluated the finding using the construction SDP in accordance with IMC 2519, "Construction Significance Determination Process," Appendix A, "AP 1000 Construction Significance Determination Process" and determined that the finding was of very low safety significance (Green) because it was associated with a portion of a structure assigned to the intermediate risk importance column and Row 2 of the construction significance determination matrix.

The inspectors screened the finding for a possible construction cross-cutting aspect in accordance with Appendix F, "Construction Cross-Cutting Components and Aspects" of IMC 0613. This finding has a cross-cutting aspect in the area of Human Performance, Avoid Complacency aspect, because the licensee failed to adequately develop a process which would recognize and plan for the possibility of mistakes. [H.12].

Enforcement: 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings" requires, in part, that "Activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings."

Contrary to the above, during coring and grouting in early February for the construction of layer 3 concrete inside the CV, the licensee, through their contractor CB&I Power, failed to implement appropriate procedures for post-installing safety related rebar and coring into concrete. Specifically, coring was not stopped by the Field Engineer or Construction Superintendent when rebar was contacted at locations R1, D2, and D7 per procedures NCSP 3-33-1, CSI 3-40-0, and NCSP 3-42-1. In addition, the Field Engineer or Superintendent did not contact the Engineer for approval, or report the nonconformance of the impacted rebar. Prior to grout placement, neither the Field Engineer nor Construction Superintendent verified that rebar was not cut. As a result, core locations D2 and D7 were grouted with an unapproved, unanalyzed and unreconciled structural defect. If left uncorrected, these unanalyzed and unreconciled defects, in this portion of the structure, had the potential safety consequence of preventing the CV foundation from meeting its intended design function per the UFSAR, Tier 1, Section 3.3.2.a). Corrective actions taken by the licensee, to date of this report, include: issuing a stop work order on all coring activities, reviewing and revising procedures for coring and post-installing anchors in concrete, training of management and craft, developing new procedures for penetrating concrete, and analyzing the impacts of the cut structural rebar.

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Because this violation was of very low safety significance (Green) and it was entered into the licensee's corrective action program as CR 15-0539, this violation is being treated as a non-cited violation (NCV 05200027/2015009-01), Failure to Implement Procedures for Coring Concrete and Post-Installing Anchors, consistent with Section 2.3.2 of the NRC Enforcement Policy and EGM 11-006.

ii. Failure to verify a design change did not adversely impact the containment vessel

Introduction: A construction finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control" was identified by the NRC for damage to the Unit 2 CV shell as a result of the failure by SCE&G, through their contractors CB&I Power and WEC, to adequately verify a design change that was implemented for post-installing safety related rebar and coring into concrete.

Description: On January 23, 2015, while making preparations for pouring layer 3 of concrete inside of the Unit 2 CV, a CB&I field engineer identified that there were previously constructed vertical rebar dowels interfering with the marked locations of embed plates P1, P2, and P3 on the installed concrete layer 2. The field engineers initiated an N&D for this condition (N&D VS2-CR01-GNR-000263). In the N&D, the field engineer specified that the interfering dowels were type 3A and 3G vertical dowels. The field engineer also listed drawing VS2-1110-CR-531 as the reference drawing that showed the location of the interfering dowels. This was an error. The correct drawing that showed the location of the interfering dowels was VS2-1110-CR-532, which shows that the interfering dowels were actually type 3B and 3L vertical dowels. Type 3B and 3L dowels are located closer to the CVBH and are shorter than type 3A and 3G dowels. Had it been recognized that the interfering dowels were actually 3B and 3L type dowels, then the potential for impacting the CVBH would have been more apparent.

WEC Design Engineering dispositioned the N&D, and also used the incorrect dowel type in the technical justification for the work. Neither the WEC Responsible Engineer nor the WEC Verifier for the N&D recognized that the CB&I field engineer specified the wrong dowel types. However, the CB&I field engineer also included as references in the N&D drawings VS2-1120-CE-011, "Concrete Embedment at EL 83' 0" and 84' 6" Overall Plan View," and VS2-1110-CR-519, "Containment Concrete Reinforcement EL 71' 6 "up to EL 83' 0"/84' 6" General Vertical Dowel Plan." These drawings showed that the location of the embed plates could not interfere with type 3A and 3G dowels, and the correct dowel types were 3B and 3L.

WEC Design Engineering specified in the N&D that the interfering dowels be cut and holes bored into the layer 2 concrete for replacement dowels. The depths of the holes were specified to be a minimum of 25 inches, but did not list a maximum depth. Drilling 25 inches into the layer 2 concrete near the embed locations resulted in drilling in close proximity to the CVBH, and the CVBH was contacted in hole R1.

Analysis: The inspectors determined that the damage to the CV, due to the failure to ensure that a design change would not adversely impact the CV, as required by 10 CFR Part 50, Appendix B, Criterion III, was a performance deficiency. Per IMC 0613, "Power Reactor Construction Inspection Reports," Appendix E, the performance deficiency was more than minor because it represented an adverse condition that rendered the quality of an SSC unacceptable or indeterminate, and required substantive corrective action. Specifically, CB&I and WEC failed to verify that a change to the design of the vertical rebar in layer 2 of the Unit 2 concrete inside of the CV did not adversely affect the CV,

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and this deficiency led to damage to the CVBH which required concrete excavation and CVBH repair.

The finding was associated with the Design/Engineering cornerstone. The inspectors evaluated the finding using the construction SDP in accordance with IMC 2519, "Construction Significance Determination Process," Appendix A, "AP 1000 Construction Significance Determination Process" and determined that finding was of very low safety significance (Green) because it was associated with a portion of a structure assigned to the intermediate risk importance column and Row 1 of the construction significance determination matrix.

The inspectors screened the finding for a possible construction cross-cutting aspect in accordance with Appendix F, "Construction Cross-Cutting Components and Aspects" of IMC 0613. This finding has a cross-cutting aspect in the area of Human Performance, Work Management aspect, because the licensee failed to adequately identify and manage risk commensurate to the work and did not adequately coordinate different groups or job activities. [H.5]

Enforcement: 10 CFR Part 50, Appendix B, Criterion III, "Design Control" requires, in part, that "Measures shall be established to assure that applicable regulatory requirements and the design basis, as described in 10 CFR Part 50, section 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."

Contrary to the above, the licensee, through their contractors CB&I and WEC, failed to specify in N&D VS2-CR01-GNR-000263 those measures be taken to avoid damage to the CV shell. Specifically, incorrect vertical dowel types were specified and thus, the incorrect core bore depth was specified in the N&D. As a result, in early February 2015, core hole drilling contacted and damaged the CV shell. The CV shell was subsequently repaired per ASME Code, Section III, Subsection NE requirements. Other corrective actions included issuing a stop work order on all coring activities, reviewing and revising procedures for coring and post-installing anchors in concrete, training of management and craft, developing new procedures for penetrating concrete, and analyzing the impacts of the cut structural rebar. This finding had the potential safety consequence of the CV not meeting its design specifications and adversely affecting its design function.

Because this violation was of very low safety significance (Green) and was entered into the licensee's corrective action program as CR 15-0539, this violation is being treated as a non-cited violation (NCV 05200027/2015009-02), Failure to verify a design change did not adversely impact the containment vessel, consistent with Section 2.3.2 of the NRC Enforcement Policy and EGM 11-006.

.3 Develop an independent extent of condition considering the 10 core bores from this event and any similar repairs made using this method

a. Inspection Scope and Observations

The inspectors reviewed N&Ds for the coring of holes in concrete and post-installation of safety-related rebar that had been issued prior to this incident at both VC Summer Unit 2 and 3. These N&D's were reviewed to determine the extent that coring and post installing safety rebar was utilized and for similarity to the coring performed for the ten cores described above.

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Based on this review, the only coring to post-install safety related rebar has occurred at the Unit 2 site. The following paragraphs summarize the N&D's used for post-installing safety-related rebar.

VS2-CR01-GNR-000062 contained information on the location of safety related rebar, to be avoided, near the surface of the basemat and the depth of hole would not reach rebar located near the bottom of the basemat. VS2-CR01-GNR-000156 provided specific instructions to prevent damage rebar. Additionally, Engineering and Design Change Request (E&DCR) VS2-CR01-GEF-000090 was created from this N&D to address the coring. The same instructions were provided in the E&DCR. Specific Instructions Sheets (SIS) were created by the Field Engineer. The SIS identified the core locations and provided instructions. In addition, a CQC was included and completed in accordance with procedure NCSP 3-33, as required and discussed in Section 2 of this report. Comparing the locations of the cores to the construction plans, the inspectors determined that neither the CVBH nor the horizontal rebar were impacted at these locations.

VS2-CR01-GNR-000252 did not contain specific instructions to prevent rebar damage. No SIS or CQC was created by the FE for the coring of the holes. However, comparing the locations of the cores to the construction plans, the inspectors determined that CVBH and horizontal safety related rebar were not impacted at these locations.

VS2-CR01-GNR-000259 and VS2-CR01-GNR-000263 did not contain specific instructions to prevent rebar damage. No SIS or CQC was created by the FE for the coring of the holes. However, comparing the location of the core D1 from VS2-CR01-GNR-000259, with the construction plans, the inspectors determined that neither the CV nor horizontal safety related rebar were impacted at the D1 core location.

b. Findings

No findings of significance were identified.

Based on a review of the N&D's for post installing rebar and coring, the location of the cores, and the construction plans it appears the extent of coring activities impacting either safety related rebar or the CV were isolated to the cores drilled per VS2-CR01-GNR-000263.

.4 Evaluate the engineering dispositions for the coring/cut rebar and the CV surface defect to determine if they meet appropriate license and code requirements

a. Inspection Scope and Observations

The inspectors reviewed N&Ds for the safety related structural rebar impacted by the coring associated with N&D VS2-CR01-GNR-000263. These N&D's were reviewed for conformance with the licensing basis, applicable codes, and to ensure compliance with the requirements of 10 CFR Part 50 Appendix B.

To disposition the potential non-conformances WEC and CB&I reviewed as-built data, construction plans, concrete cores and performed additional exploratory investigations. The exploratory investigations included excavating the area around core hole R1 using hyrdro-demolition and removing grout and grouted dowels at select locations using

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coring methods. Using the above methods, the contractor determined safety-related rebar was impacted only at the R1, D2, and D7 core locations.

The following N&Ds were generated to disposition the impacted safety-related rebar.

Hole No.	N&D for structural rebar impact
R1	VS2-1110-GNR-000011
D2	VS2-CR01-GNR-000294
D7	VS2-CR01-GNR-000295

The dispositions were use-as-is. The inspectors reviewed the justifications for the use-as-is dispositions to verify compliance with the design calculations, applicable codes, and the UFSAR. In addition, the justifications were reviewed for cumulative effects of all the impacted safety-related rebar on the containment vessel..

b. Findings

Based on the review of the N&Ds justifications, the inspectors concluded the use-as-is dispositions met the licensing basis, applicable codes, and complied with the requirements of 10 CFR Part 50 Appendix B.

No findings of significance were identified.

.5 Review the licensee's corrective actions, causal analysis and extent of condition associated with this event.

a. Inspection Scope and Observations

The inspectors interviewed the CB&I, WEC, and SCE&G personnel, including the root cause team; reviewed contractor and licensee corrective action documentation including the root cause analysis and associated SCE&G "Project Letter; and observed field conditions and equipment. The inspectors independently developed an assessment of the root and contributing causes of the event, the extent of condition, and the licensee's completed and planned corrective actions. Factors such as decision making, the design change process, the nonconformance assessment process, the use of and availability of procedures, timeliness of communication between the licensee the licensee's contractors (CB&I and WEC), and the use of construction experience (internal and external) were considered in this assessment.

Inspectors found that the licensee and its contractors correctly identified the root and contributing causes of the event. The root causes were: 1) site management failed to develop and implement a clear and effective work process for core drilling, and 2) single point vulnerabilities within CB&I Field Engineering and unclear division of roles and responsibilities of Design Engineering and Field Engineering in the Nonconformance and Disposition process.

Inspectors found that the licensee and its contractors adequately addressed the extent of condition (see Section 4 for details of the extent of condition), and assigned appropriate corrective actions. Planned or completed corrective actions include: 1) repair damage to the CVBH, 2) ensure (via disposition) cut structural rebar did not prevent the containment structure from fulfilling its design function, 3) revise procedures for core drilling, 4) revise CB&I and WEC procedures for the N&D process, 5) revise

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corrective action program procedures for initiating corrective action requests, 6) revise work management procedures for evaluating risk and conducting pre-job briefs, and 6) provide training to personnel for the process changes included in the procedure changes discussed above.

b. Findings

No findings of significance were identified.

5. Exit Meeting

The inspection scope and preliminary results from February 23-27, 2015, inspection activities were debriefed to A. Torres and other members of the licensee's staff on February 27, 2015. No dissenting comments were received from the licensee. Proprietary information was discussed but not included in the report. The inspection scope and preliminary results from April 21-27, 2015, inspection activities were presented to members of the licensee staff on April 30, 2015. No dissenting comments were received from the licensee. Proprietary information was not discussed.

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SUPPLEMENTAL INFORMATION

1. List of Persons Contacted

Name	Title
J. Arnall	CB&I Concrete Manager
Z. Ashcroft	SCE&G Construction Supervisor
K. Bridge	CB&I Field Engineer
J. Cagle	CB&I Concrete Superintendent
J. Cole	WEC Consortium Licensing
J. Comer	CB&I Performance Improvement Manager
J. Ervin	CB&I Field Engineer
A. Fleetwood	CB&I Lead Field Engineer
R. Gadson	CB&I Concrete Finisher
P. Gibbons	SCE&G Construction Engineer
K. Hollenback	CB&I Project Director
I. Johnson	CB&I Concrete Finisher
A. Jones	CB&I Concrete Finisher
J. Karmozyn	CB&I Site Engineering
D. Krebes	WEC Lead Mechanical Engineer
J. Oswald	CB&I Concrete Finisher
D. Rau	CB&I Quality Control Inspector
A. Rice	SCE&G Licensing
J. Robinson	CB&I Concrete Foreman
J. Robinson	WEC Site Engineering Manager
M. Ross	CB&I Concrete Finisher
F. Salter	SCE&G Licensing
K. Savastano	SCE&G Welding Engineer
G. Sanders	SCE&G Licensing
A. Torres	SCE&G General Manager, Nuclear Plant Construction
J. Wallace	CB&I Concrete Finisher
W. Wood	CB&I Site Director
T. Williams	CB&I Field Engineer
E. Wills	CB&I Director of Licensing and Regulatory Compliance
K. Young	SCE&G Issue Manager
W. Zhao	WEC Civil Engineer

Other licensee employees contacted included engineers, technicians, production staff, and office personnel.

2. List of Items Opened, Closed, and Discussed

Opened/Closed	NCV 2015-009-01	Failure to Implement procedures for coring concrete and post installing anchors
Opened/Closed	NCV 2015-009-02	Failure to verify a design change did not adversely impact the containment vessel

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3. Inspection Procedures Used

IP 93812, Special Inspection

4. Documents Reviewed

Codes and Procedures:

American Concrete Institute (ACI) 349-01, Code Requirements for Nuclear Safety Related Concrete Structures
APP-GW-GAP-428, Revision 4, WEC Control of Nonconforming Items for the AP1000 Program
CB&I Traveler – Nuclear (Form CMS-720-03-FM-07102) for Repair A2-CVBH at Nuclear Island Core Hole R1, 3/9/2015
CMS-830-15-PR-18010, Revision 3, General Repair Procedure Materials and Welds for Class 2 and Class MC Products
NFS-GH-43, SRE Control Program, Rev. 23
QS 15.01, Revision 05.02, CB&I Nonconformance and Disposition Report
QS 15.03, Revision 02.00, CB&I Risk Release of Unsat/Nonconforming Material/Equipment
QS 16.05, Revision 6, CB&I Corrective Action Program
QS 16.06, Revision 0, CB&I Causal Analysis Determination Procedure
NCSP 3-33, Revision 1, CB&I Installation of Drilled-In Concrete Anchors
NCSP 3-42, Revision 1, CB&I Reinforcing Steel installation
CSI 3-40, Revision 0 and 1, CB&I Installation of Post Installed Anchors
WEC 3.3.3, Revision 1.0, WEC Change Control for the AP1000 Plant Program

Drawings and Calculations:

302-F0055-D, Area A/B P&ID, Sheet 2, dated January 2, 2014
APP-1100-CCC-005, Revision 0, Design Calculations, Containment Mass Concrete Reinforcement, Elevation 71'-6" to 83'-0"/84'-6"
VS2-1120-CE-011, Revision 3, Concrete Embedment at EL 83' 0" and 84' 6" Overall Plan View
VS2-1110-CR-519, Revision 2, Containment Concrete Reinforcement EL 71' 6 "up to EL 83' 0"/84' 6" General Vertical Dowel Plan
VS2-1110-CR-531, Revision 2, Containment Concrete Reinforcement EL 71' 6" up to EL 83' 0"/84' 6" Vertical Dowel Layout at CJ 76' 6"
VS2-1110-CR-532, Revision 0, Containment Concrete Reinforcement EL 71' 6" up to EL 83' 0"/84' 6" Vertical Dowel Layout at CJ 80' 0"/80' 6"

Corrective Action Program Documents:

CAR 2015-0539, CB&I CAP entry issued due to hole R1 not holding water for pre-soak
CAR 2015-0610, CB&I CAP entry issued due to holes R1, R2, and R3 being improperly located
CAR 2015-0626, CB&I CAP entry issued due to incorrect referenced drawing in N&D VS2-CR01-GNR-000263
CAR 2015-0677, CB&I CAP entry, Human Performance – Organizational processes and cultural values associated with barriers of providing a *[sic]* appropriate Pre-Job Briefing
CR-NND-15-00263, SCE&G CAP entry issued due to the CVBH and rebar being impacted by core drilling
CR-NND-15-00352, SCE&G CAP entry related to NRC Special Inspection questions related to the CB&I General Repair Procedure
CR-NND-15-00365, SCE&G CAP entry to track CB&I CAR 2015-0677
CR-NND-15-00366, SCE&G CAP entry, Errors related to VS2-CR01-GNR-000263

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CR-NND-15-00368, SCE&G CAP entry, NRC Special Inspection Team debriefed potential Green NCV
N&D VS2-1208-GNR-000008, CB&I N&D for CVBH being impacted by core drilling
N&D VS2-1110-GNR-000008, R1 Core/CVBH Contact
N&D VS2-1110-GNR-000011, R1 Core/CVBH Contact
N&D VS2-CC01-GNR-000156, Terminator/ WLS conflict
N&D VS2-CR01-GNR-000062, 4-Line missing dowels
N&D VS2-CR01-GNR-000252, Rebar/Embed P8 Interference – layer 3
N&D VS2-CR01-GNR-000259, CB&I N&D for dowel interference with embed plate P8
N&D VS2-CR01-GNR-000263, CB&I N&D to relocate dowels due to interference with embed plates
N&D VS2-CR01-GNR-000275, Improper Core Locations Inside Containment
N&D VS2-CR01-GNR-000279, Cut Containment Rebar
WEC Issue ID #100081407, WEC CAP entry issued due to incorrect dowel types specified in VS2-CR01-GNR-000263
WEC Issue ID #100082761, WEC CAP entry issued for potential improvements to WEC procedures due to core drilling impacting the CVBH.
VC Summer Root Cause Analysis for Corrective Action Report 2015-0539, Structural Rebar Cut and Contact Made with the CV Bottom Head During Core Drilling Operations at the VC Summer Unit 2 Nuclear Construction Site, 4/10/2015
N&D VS2-CR01-GNR-000294, Indeterminate Cut Containment Bar (D2, D3)
N&D VS2-CR01-GNR-000295, Indeterminate Cut Containment Bar (D6, D7)

Miscellaneous:

CB&I Letter; dated Feb 21, 2015 to Westinghouse Electric Company, LLC; SUBJ: Unit 2 CVBH Core Drill Issue: Concrete Removal for Boring Hole R1
CB&I Presentation, CV Bottom Head (CVBH) Issue
SCE&G Letter; dated Apr 17, 2015, NND-15-0254; SUBJ: Corrective Action Report 2015-0539 – CV Bottom Head Contact

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February 20, 2015

MEMORANDUM TO: Eric Michel, Senior Construction Inspector
Construction Inspection Branch 3
Division of Construction Inspection

FROM: Victor M. McCree **/RA/**
Regional Administrator

SUBJECT: SPECIAL INSPECTION CHARTER TO EVALUATE THE INADVERTENT DAMAGE OF THE V. C. SUMMER UNIT 2 CONTAIMENT VESSEL

You have been selected to lead a Special Inspection to assess the circumstances surrounding the inadvertent damage to the V. C. Summer Unit 2 containment vessel bottom head while drilling concrete on February 9, 2015. Your onsite inspection should begin on February 23, 2013. Chad Oelstrom, RII/DCI, and Phil O'Bryan, NRO/DCIP, will assist you in this inspection.

A. Basis

On February 16, 2015, the licensee was notified by Chicago Bridge & Iron (CB&I) that during core boring activities the previous week, the core bit made contact with the CV at a location approximately 27" below the concrete surface, potentially damaging the vessel. In addition, the core bit cut into safety-related rebar in two locations. During the week of February 9, 2015, at the Summer Unit 2 construction site interferences were identified while placing embed plates in preparation for the layer 3 concrete pour inside of the CV. Seven dowels (vertical rebar) extending from the layer 2 placement were cut off and holes for replacement dowels were drilled in ten locations. It was during these activities that the CV was potentially damaged and the rebar cut.

In accordance with Inspection Manual Chapter (IMC) 2504, "Construction Inspection Program: Inspection of Construction and Operational Programs," Appendix C, "Response to Non-Performance Related Issues/Events," deterministic criteria were used to evaluate the level of NRC response to this construction event. Through review of the deterministic criteria in IMC 2504, Region II management determined that this was a significant event that, while not covered by deterministic criteria, warrants additional inspection or oversight. Specifically, the circumstances which resulted in the inadvertent damage to safety related rebar and the CV revealed several concerns regarding construction practices which warrant additional inspection. Region II determined that the appropriate level of NRC response is a Special Inspection.

CONTACT: Jamie Heisserer, RII/DCI
404-997-4451

This Special Inspection is chartered to identify the circumstances surrounding the damage to the CV and safety-related rebar, review the licensee's actions following discovery of the condition, and to evaluate the licensee's actions to address the damage.

B. Scope

The inspection is expected to perform data gathering and fact-finding in order to address the following:

1. Develop a sequence of events, including key decision points associated with the removal and replacement of the dowels.

2. Review the licensee's (and CB&I's) assessment of human performance issues, procedure violations, and/or code violations. Develop an independent assessment based on the sequence of events.

3. Develop an independent extent of condition considering the 10 core bores from this event and any similar repairs made using this method.

4. Evaluate the engineering dispositions for the coring/cut rebar and the CV surface defect to determine if they meet appropriate license and code requirements.

5. Review the licensee's corrective actions, causal analysis and extent of condition associated with this event. Considerations should include:
   - Decision making
   - Design change process
   - Nonconformance assessment process
   - Use of and availability of procedures
   - Timeliness of communication with the licensee
   - Use of construction experience (internal and external)

C. Guidance

You will use Inspection Procedure 93812, "Special Inspection," for the conduct of the inspection. Your duties will be as described in Inspection Procedure 93812, where applicable to construction activities. The inspection should emphasize fact-finding in its review of the circumstances surrounding the event. Safety concerns identified that are not directly related to the event should be reported to the Region II office for appropriate action.

You will report to the site, conduct an entrance, and begin inspection no later than February 23, 2015. It is anticipated that the on-site portion of the inspection will be completed during this week. A daily status briefing of Region II management will be provided beginning the second day on-site at approximately 4:00 PM. A report documenting the results of the inspection should be issued within 45 days of the completion of the inspection. The report should address the applicable areas specified in section 3.02 of Inspection Procedure 93812. At the completion of the inspection, you should provide recommendations for improving the Construction Reactor Oversight Process inspection procedures and the Special Inspection process based on any lessons learned.

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This Charter may be modified should you develop significant new information that warrants review.

cc: G. Tracy, NRO
M. Cheok, NRO

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Appendix G

SCE&G Settlement Agreement Announcement

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Media Contact:
Rhonda O'Banion
(800) 562-9308

Analyst Contact:
Christina Putnam
(803) 217-7512

SCE&G Announces Settlement Agreement with the South Carolina Office of Regulatory Staff and South Carolina Energy Users Committee Related to the Petition to Update Construction and Capital Cost Schedules for New Nuclear Units

Cayce, SC, June 29, 2015... South Carolina Electric & Gas Company (SCE&G), principal subsidiary of SCANA Corporation (NYSE: SCG), announced today that it has entered into a settlement agreement with the South Carolina Office of Regulatory Staff and the South Carolina Energy Users Committee (one of the three interveners) related to the Company's petition to update construction and capital cost schedules for the new nuclear units. The settlement agreement is subject to approval by the Public Service Commission of South Carolina (PSC). A public hearing on SCE&G's petition request is scheduled to begin on July 21, 2015.

This settlement agreement signifies that no contested issues exist among the settling parties and supports approval of the revised construction and capital cost schedules. In addition to supporting approval of the revised construction and capital cost schedules, the settling parties agreed to revise the allowed Return on Equity (ROE) for the new nuclear project from 11.00% to 10.50%. The revised ROE will be applied prospectively for the purpose of calculating revised rates sought by the Company under the Base Load Review Act on and after January 1, 2016, until such time as the new nuclear units are completed. If the PSC approves the settlement agreement in its entirety, then none of the settling parties may appeal the PSC's decision.

The delays to the construction schedule and related cost increases are principally due to design and fabrication issues associated with the production of submodules used in construction of the units. By accepting the terms of the settlement agreement, SCE&G does not waive any claims related to delay and other related contested costs with the Westinghouse Electric Company and Chicago Bridge & Iron.

PROFILE

SCE&G is a regulated public utility engaged in the generation, transmission, distribution and sale of electricity to approximately 692,000 customers in South Carolina. The company also provides natural gas service to approximately 342,000 customers throughout the state. More information about SCE&G is available at www.sceg.com.

SCANA Corporation, headquartered in Cayce, SC, is an energy-based holding company principally engaged, through subsidiaries, in electric and natural gas utility operations and other

energy-related businesses. Information about SCANA and its businesses is available on the company's website at www.scana.com.

SAFE HARBOR STATEMENT

Statements included in these press releases which are not statements of historical fact are intended to be, and are hereby identified as, "forward-looking statements" for purposes of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Forward-looking statements include, but are not limited to, statements concerning key earnings drivers, customer growth, environmental regulations and expenditures, leverage ratio, projections for pension fund contributions, financing activities, access to sources of capital, impacts of the adoption of new accounting rules and estimated construction and other expenditures. In some cases, forward-looking statements can be identified by terminology such as "may," "will," "could," "should," "expects," "forecasts," "plans," "anticipates," "believes," "estimates," "projects," "predicts," "potential" or "continue" or the negative of these terms or other similar terminology. Readers are cautioned that any such forward-looking statements are not guarantees of future performance and involve a number of risks and uncertainties, and that actual results could differ materially from those indicated by such forward-looking statements. Important factors that could cause actual results to differ materially from those indicated by such forward-looking statements include, but are not limited to, the following: (1) the information is of a preliminary nature and may be subject to further and/or continuing review and adjustment; (2) legislative and regulatory actions, particularly changes in rate regulation, regulations governing electric grid reliability and pipeline integrity, environmental regulations, and actions affecting the construction of new nuclear units; (3) current and future litigation; (4) changes in the economy, especially in areas served by subsidiaries of SCANA; (5) the impact of competition from other energy suppliers, including competition from alternate fuels in industrial markets; (6) the impact of conservation and demand side management efforts and/or technological advances on customer usage; (7) the loss of sales to distributed generation, such as solar photovoltaic systems; (8) growth opportunities for SCANA's regulated and diversified subsidiaries; (9) the results of short- and long-term financing efforts, including prospects for obtaining access to capital markets and other sources of liquidity; (10) the effects of weather, especially in areas where the generation and transmission facilities of SCANA and its subsidiaries (the Company) are located and in areas served by SCANA's subsidiaries; (11) changes in SCANA's or its subsidiaries' accounting rules and accounting policies; (12) payment and performance by counterparties and customers as contracted and when due; (13) the results of efforts to license, site, construct and finance facilities for electric generation and transmission, including nuclear generating facilities and results of efforts to operate its electric and gas systems and assets in accordance with acceptable performance standards; (14) maintaining creditworthy joint owners for SCE&G's new nuclear generation project; (15) the ability of suppliers, both domestic and international, to timely provide the labor, secure processes, components, parts, tools, equipment and other supplies needed, at agreed upon quality and prices, for our construction program, operations and maintenance; (16) the results of efforts to ensure the physical and cyber security of key assets and processes; (17) the availability of fuels such as coal, natural gas and enriched uranium used to produce electricity; the availability of purchased power and natural gas for distribution; the level and volatility of future market prices for such fuels and purchased power; and the ability to recover the costs for such fuels and purchased power; (18) the availability of skilled and experienced human resources to properly manage, operate, and grow the Company's businesses; (19) labor disputes; (20) performance of SCANA's pension plan assets; (21) changes in taxes and tax credits, including production tax credits for new nuclear units; (22) inflation or deflation; (23) compliance with regulations; (24) natural disasters and man-made mishaps that directly affect our operations or the regulations governing them; and (25) the other risks and uncertainties described from time to time in the reports filed by SCANA or SCE&G with the United States Securities and Exchange Commission. The Company disclaims any obligation to update any forward-looking statements.

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Appendix H

Unit 3 Completed Milestones

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For Immediate Release

Media Contact
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800-562-9308

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Susan Wright
803-217-4436

SCE&G Places Reactor Vessel Cavity, Receives Reactor Vessel for V.C. Summer Unit 3

CAYCE, S.C., July 7, 2015—South Carolina Electric & Gas Company (SCE&G), principal subsidiary of SCANA Corporation (NYSE:SCG), and its partners recently achieved two milestones within one week for V.C. Summer Unit 3: placement of the CA04 module and delivery of the reactor vessel.

CA04, which is the reactor vessel cavity that will house the Unit 3 reactor vessel and related components, was placed on the containment vessel bottom head on June 29. Just one day before, the Unit 3 reactor vessel arrived on site from the Port of Charleston. The reactor vessel was transported on a Schnabel specialty railcar, which is designed to carry heavy loads.

Standing approximately 27 feet tall and stretching 21 feet wide, CA04 is considered a super module because it is too large to transport fully assembled. Its sub-modules were fabricated at SMCI in Lakeland, Fla., and then welders completed final fabrication on the V.C. Summer construction site in the 12-story Module Assembly Building. CA04 was then lifted into place by one of the world's largest cranes—a heavy lift derrick that stands about 560-feet tall. Once CA04 is fully encased in concrete, the reactor vessel will be lowered into it and mounted on top.

These milestones and many others were previously achieved on V.C. Summer Unit 2, which continues to make progress. Follow construction progress by visiting SCE&G on Flickr and YouTube for nuclear construction photos and videos.

Approximately 3,500 Chicago Bridge & Iron and Westinghouse personnel and subcontractors are employed on the nuclear construction site in Fairfield County, S.C., where Unit 1 has operated safely and reliably for more than 30 years and Units 2 and 3 are being built. State-owned utility Santee Cooper is the co-owner.

The two 1,117-megawatt AP1000 units will add approximately 800 permanent jobs when operational. Once the two units are complete, SCE&G anticipates its generation mix will be about 30 percent nuclear, 30 percent natural gas, and 30 percent scrubbed coal, with the balance in hydro, solar and biomass.

PROFILE
SCE&G is a regulated public utility engaged in the generation, transmission, distribution and sale of electricity to approximately 692,000 customers in South Carolina. The company also provides natural gas service to approximately 342,000 customers throughout the state. More information about SCE&G is available at www.sceg.com.

SCANA Corporation, headquartered in Cayce, S.C., is an energy-based holding company principally engaged, through subsidiaries, in electric and natural gas utility operations and other energy-related businesses. Information about SCANA and its businesses is available at www.scana.com.

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Appendix I

Acronyms

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Glossary of Acronyms or Defined Terms

Acronym or Defined Term	Reference
AFUDC	Allowance for Funds Used During Construction
AB	Auxiliary Building
BLRA	Base Load Review Act, S.C. Code Ann. 58-33-210
CAS	Commission-Approved Simulator
CB&I	Chicago Bridge and Iron
CBI-Laurens	Chicago Bridge and Iron Laurens Manufacturing Facility
CB&I-LC	Chicago Bridge and Iron Lake Charles
CMIS	Configuration Management Information System
COLs	Combined Operating Licenses issued by the NRC
CT	Cooling Tower
CV	Containment Vessel
CVBH	Containment Vessel Bottom Head
EPC	Engineering, Procurement and Construction Agreement
ISV	Integrated Systems Validation
LAR	License Amendment Request
MAB	Module Assembly Building
NI	Nuclear Island (Containment Vessel, Reactor Building, Auxiliary Building)
NNI	Newport News Industries
NRC	Nuclear Regulatory Commission
PAR	Preliminary Amendment Request
PRS	Plant Reference Simulator
SB	Shield Building
SCDs	Substantial Completion Dates
SMCI	An Energy Division of Metal-Tek International
TB	Turbine Building
VCS or VCSN or VCSNS	V.C. Summer Nuclear Station
WEC	Westinghouse Electric Company, LLC.