

# Vogtle

units 3 & 4

**GEORGIA  
POWER**  
A SOUTHERN COMPANY

## Eleventh Semi-annual Vogtle Construction Monitoring Report

August 2014 • Docket No. 29849





# Vogle Units 3 and 4 Eleventh Semi-Annual Construction Monitoring Report

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# Vogtle 3&4 - Construction, July 24, 2014



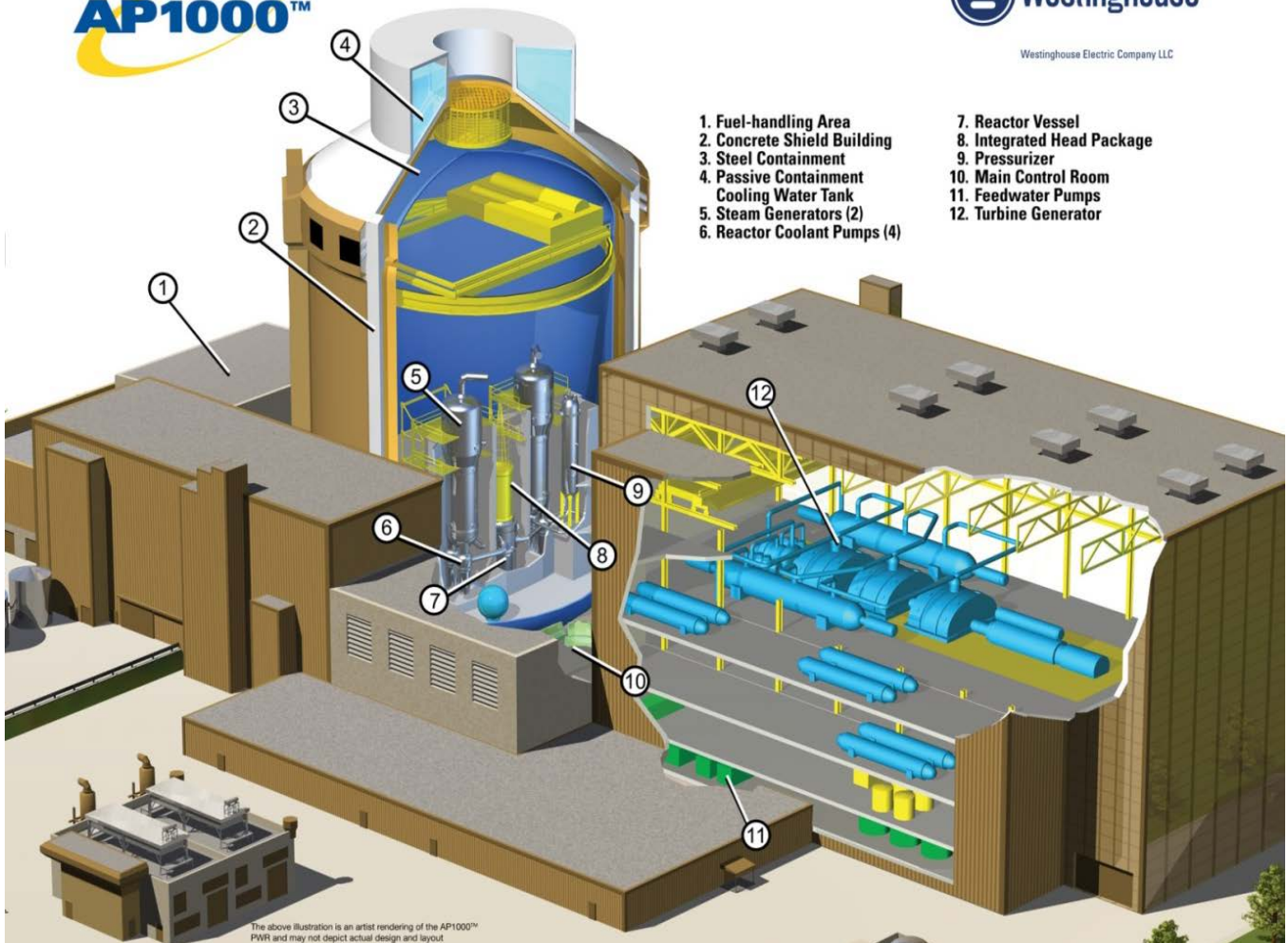
## Unit 3 Nuclear and Turbine Islands



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## EXECUTIVE SUMMARY

### I. Introduction

This Eleventh Vogtle Construction Monitoring (“VCM”) Report is submitted by Georgia Power Company (“Georgia Power” or the “Company”) to the Georgia Public Service Commission (“Commission”) for the period of January 1, 2014 through June 30, 2014 (the “Reporting Period”). The Company continues to provide proactive oversight of work performed under the Engineering, Procurement, and Construction (“EPC”) Agreement and is expertly managing the Company’s scope of construction work for the Vogtle Units 3 and 4 nuclear facility (“Facility”). The Company reports on significant milestones achieved in the first half of the year as momentum builds toward the goal of providing a safe, reliable, clean, and affordable source of electricity to customers that will bring value to Georgians for 60 years or longer.

In this Eleventh VCM Report, the Company requests that pursuant to O.C.G.A. 46-3A-7 the Commission verify and approve the expenditures made during the Reporting Period, which total **\$198 million**, as having been made in compliance with the Certificate of Public Convenience and Necessity (“Certificate”). The cumulative Construction and Capital costs for the Facility through this Reporting Period total approximately \$2.8 billion.

### II. Highlights

- **The Company continues to demonstrate its uncompromising commitment to safe, quality, and compliant construction of the Facility.** Through its compliance monitoring program, the Company’s effective oversight is evident in successful Nuclear Regulatory Commission (“NRC”) inspection results and the NRC’s annual assessment conclusion that the Facility is being constructed in a manner that preserves public health and safety and meets all construction cornerstone objectives.
- **Significant construction milestones across all areas of Units 3 and 4 were completed in the first half of 2014, including the placement of major structural module CA20 in the Unit 3 nuclear island.** Substantial progress has been made in all areas of the Facility including the nuclear islands, module fabrication, annex building, turbine islands, cooling towers, switchyard, and other permanent Facility buildings. Application of lessons learned from completed Unit 3 activities are resulting in the efficient advancement of Unit 4 construction.
- **The Company is focused on actions required for a successful transition to operations today, years in advance of start-up.** Construction of the units will be “mechanically complete” prior to fuel load and operations start-up activities. After mechanical completion, the NRC will verify that all Inspections, Tests, Analyses, and Acceptance Criteria (“ITAACs”) have been met with the issuance of the 103(g) finding letter, which will allow for subsequent fuel load. After fuel is loaded and generating energy, the Facility will begin transmitting electricity to the grid at which point the Facility will begin providing service to customers. The Company is proactively planning for the

execution of the effort associated with the ITAAC process. Operator training is on track for fuel load and planning efforts are ramping up for the initial test program, start-up, and integration into a four unit site as we prepare to connect to the grid and begin full operation.

- **The Company is working with the Contractor to establish the most detailed and comprehensive integrated schedule to date.** In May 2014, the Contractor completed a major update to the Integrated Project Schedule (“IPS”) for activities through 2015. As a result, the Contractor has communicated challenges to meet certain long-term schedule activities, including fabrication, assembly and installation of structural modules and shield building modules. The EPC Agreement is nearly 100 percent fixed or firm; therefore, the Contractor is strongly incentivized to complete construction of the Facility as expeditiously as possible. The Company expects the Contractor to employ all possible means to meet the current schedule targets; however, schedule pressures continue to challenge the project. The Company will continue its transparent reporting to this Commission, the Construction Monitor and the PSC Staff as the Contractor completes its schedule analysis for activities beyond 2015.
- **The Total Construction and Capital Cost forecast remains unchanged since the previous reporting period.** The cost forecast is based on the current target in-service dates for Units 3 and 4 of fourth quarter 2017 and 2018, respectively. This forecast represents the amount that, if deemed prudent by the Commission, will be put into rate base when the Facility goes into service. The Company believes all expenditures to date have been necessary, prudent and in the best interest of customers.

(in Billions)	9 <sup>th</sup> /10 <sup>th</sup> VCM	11 <sup>th</sup> VCM	Δ
Total Construction and Capital Cost	\$ 4.8	\$ 4.8	\$ 0

- **Customers will experience minimal or no additional impact on rates as a result of the Facility transition into service.** The recovery mechanism put into place by the Georgia legislature and approved by the Commission allows for gradual impacts to rates during construction and eliminates a significant change in rates at the in-service dates. The customer’s maximum rate impact from the construction of the Facility is projected to be about 6 to 8 percent. With 4 percent already in rates, the remaining additional projected rate impact for customers is 2 to 4 percent.

	Currently in Rates	Remaining Impact
Rate Impacts to Customers	4 %	2 – 4 %

**The life-cycle fuel savings from nuclear generation significantly lessen the rate impacts in future years.** In addition, the overall rate impact has been further reduced by other benefits to customers through interest savings, including securing the Department of Energy (“DOE”) Loan Guarantee, and the Company’s earned eligibility for Production Tax Credits (“PTCs”). Without



these savings and benefits, the certified capital investment would have resulted in a higher rate increase when the units go into service.

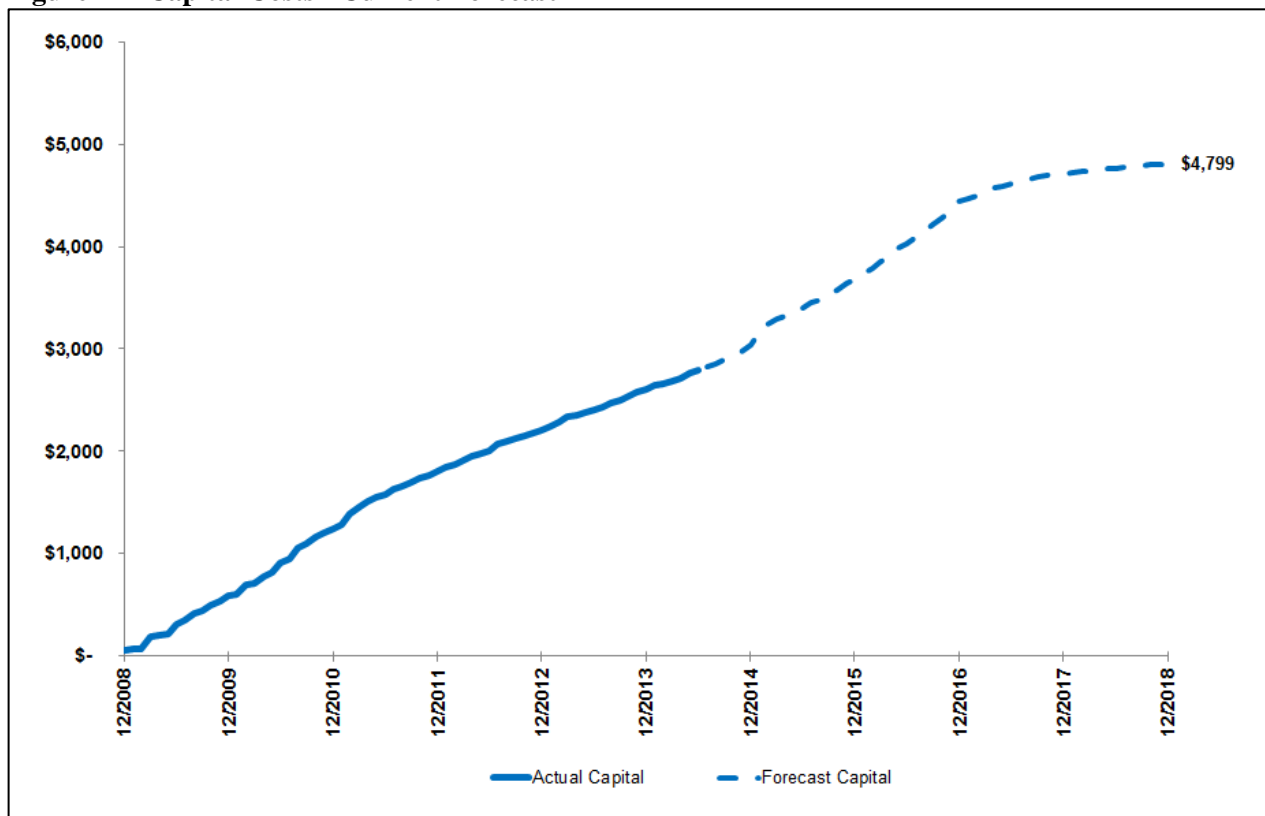
- The Company continues to identify and report \$2.3 billion in customer benefits that are a result of federal government incentives, constructive regulation, and a proactive Company financing strategy.** The DOE Loan Guarantee program and the PTCs were put into place by Congress to offset potential cost impacts that may arise when constructing a first-of-a-kind nuclear facility and help lead to a resurgence of new nuclear generation in the United States. By offsetting unforeseen cost increases in the more than decade-long development and construction of this first-of-a-kind project, these incentives are providing exactly the support they were conceived and designed to do. Included in the Company’s current cost forecasts are the benefits of the inclusion of Construction Work in Progress (“CWIP”) in rate base and Amendment No. 3 to the EPC Agreement. The Company has also proactively identified and captured significant additional interest savings that are being passed to customers. These customer benefits are being identified and reported to the Commission because they reduce the overall cost to customers for the Facility. These cost savings are derived directly as a result of the Company pursuing the project and otherwise would not have been attained.

	Capital Cost Change	Customer Benefits (Revenue Requirements)
(in Billions)	\$0.38	\$2.3

The current forecasted capital cost is \$381 million above the original forecast at the time of Certification. The customer benefits, stated on a 2018 present value basis to reflect the current target in-service dates, will more than offset the equivalent revenue requirement impacts arising from the increase in costs projected for the successful completion of the Facility.

- The protections included in the EPC Agreement are working to mitigate cost risks that were typical in the previous generation of nuclear construction projects.** Actual expenditures to date are below the original capital cost forecast contemplated at Certification. The Company acknowledges that spending is lower than the original forecast because milestones have shifted due to schedule challenges. However, the milestone structure of the EPC Agreement protects customers from significant cost risks associated with professional and craft labor, equipment, and materials that would typically arise from schedule extension. While the Company has experienced cost increases related to oversight labor and financing costs due to schedule extension, customers are not exposed to the additional schedule-related construction costs that would result from a different contract structure; instead, these costs are borne by the Contractor.

**Figure A – Capital Costs - Current Forecast**



The incremental capital costs since Certification are primarily associated with federal regulation changes, taxes, schedule extension, owner’s quality and compliance, and operational readiness. These costs have resulted from risks that were identified and discussed in the Certification proceeding, during which it was deemed that the “the level of risk is reasonable.” The Company has taken a proactive approach in identifying savings for customers by managing capital spending and minimizing the realization of cost risks. While some of these identified risks have become reality and led to increased capital cost relative to that contemplated at the time of original Certification, the value the Facility brings to our customers over at least 60 years remains significant.

- **The value to customers of completing the Facility remains overwhelmingly positive.**

In order to meet future energy needs of our customers, the Commission, whose role is to review and certify necessary capital investments for new plants, together with the Company recognized the need to bring safe, clean, affordable energy through construction of a new base-load generation source. The economic analysis, performed by the Company and reviewed and approved by the Commission during the Certification proceeding, demonstrated the Facility was the most economic choice when compared to the next best alternative generation source. This analysis recognized fuel savings over the 60 year life-cycle that are associated with investing in nuclear generation. Since that time, the Commission and the Company’s actions have decreased the impact this important capital investment will have on customers.

Economic analyses by the Company continue to demonstrate that completing this Facility represents the best cost option for our customers by an overwhelming margin. Similar analyses by the Staff of the Commission through the Ninth/Tenth VCM Report have also demonstrated that completing the Facility represents the best cost option for our customers. Under the Company's current assumptions, **completing the Facility provides approximately \$5.1 billion in value to customers as compared to alternative generation.** Even in extended delay scenarios and cost increase sensitivities performed at the Commission's request, the Facility remains the most economic option. The Company notes that last winter's short-term natural gas price volatility underscores the need for fuel diversity, especially new nuclear, with its historically stable fuel prices.

The Facility represents at least a 60-year investment in Georgia's critical energy infrastructure. As one of the largest and most capital-intensive infrastructure projects currently underway in the United States, the Facility continues along a path to success that is vital to the local and state economy. The Facility work force is growing with approximately 5,000 workers on the Vogtle 3 and 4 site today. The Facility has increased the tax base of Burke County as well as the state of Georgia and will continue to do so by creating over 800 full-time, highly skilled and highly paid careers, which will have a compounding effect on the local economy. Georgia's electric supply will continue to have diverse generation, helping to keep prices stable and competitive for many decades to come, thus providing the foundation for a strong, vibrant, and attractive economy.



## STATUS OF THE FACILITY

### **III. Safe, Quality, Compliant Construction**

Oversight and alignment with the Contractor have facilitated notable achievement at the Facility in the first six months of 2014 with the safe and compliant completion of many critical milestones. The Company and the Contractor are continuing efforts to foster the safety conscious work environment at the site, ensure quality oversight of all safety-related construction activities, and maintain compliance with the NRC.

In April 2014, the NRC reported in its 2013 annual assessment of Vogtle 3 and 4 that both units were being constructed in a manner that preserved public health and safety and met all construction cornerstone objectives. In the first two quarters of 2014, the Facility had no significant findings from the NRC Construction Reactor Oversight Process as the NRC continues its oversight through daily inspections at the site as well as in off-site facilities fabricating safety-related components. The Company is assessing compliance with quality and regulatory requirements for construction and fabrication activities through its quality assurance audits and surveillances and compliance monitoring program, at both the site and at vendor locations.

During the construction process, the Company, as the Licensee, and the NRC achieve alignment on the determination that the Facility is built in accordance with its design and licensing basis through the 10CFR52 ITAAC program. Currently, 15 ITAAC closure notifications (“ICNs”) have been submitted with 13 verified as complete by the NRC. The Company and the Contractor are maintaining a positive, collaborative culture through the development of ITAAC closure packages and submittal of ICNs to the NRC to ensure regulatory compliance is continually achieved during construction.

In January 2014, the Operations Control Center (“OCC”) was instituted at the site as a central location to manage near term or in-process critical construction activities by Contractor personnel. The OCC serves as a focal point for up-to-date reporting, analysis, and resolution of emerging issues that could potentially affect quality and construction progress. The OCC is staffed continuously (twenty-four hours per day, seven days per week) and is equipped with the latest Information Technology to facilitate immediate access to needed documentation and construction personnel, to quickly assemble issue response teams and to ensure quality construction is maintained. The Company has a representative stationed in the OCC and the Company’s management team provides oversight and input to the Contractor as needed for OCC activities as well as communication to Company leadership.

The Company has experienced an increased level of cooperation and transparency with the Contractor as a major update was completed for the IPS in May 2014. The Contractor has completed the integration of the Engineering Completion Schedule into the IPS and this effort has resulted in the most detailed and comprehensive schedule the Company has reviewed to date for activities through 2015. The Contractor has communicated challenges to meet certain long-term schedule activities and continues its analysis of long-term schedule activities after 2015. The Company has not yet received schedule information for those activities. The Contractor is evaluating schedule pressures to ensure all

possible mitigating options are pursued in order to meet their obligation of constructing these units as efficiently as possible. The Company continues its oversight of the IPS updates and will continue to report Contractor updates to the Commission as they occur.

## A. Unit 3 Construction Activities

### Nuclear Island

Major activities in the nuclear island represent the near-term critical path for the completion of construction of Unit 3. In order to allow for Shield Building assembly to begin, reinforcing steel (“rebar”) installation and concrete placements must be completed to the 100 foot elevation around the Containment Vessel. Several layers of concrete are required to be placed both inside and outside of the Containment Vessel to reach the major milestone of the final placement of concrete at ground level, typically referred to as elevation 100 feet, which is currently forecast for early 2015.

The Company’s nuclear island construction compliance group has continually maintained focused oversight of each milestone activity and concrete placement that has occurred within the nuclear island to

ensure that all quality requirements are being met. The Company’s compliance and project controls personnel also participate on Major Milestone Teams that the Contractor has established to monitor and oversee planning, execution and issue resolution for major project evolutions.

After successful mock-up testing with self-consolidated concrete (“SCC”) was completed at the start of 2014, the SCC placement process and lessons learned were implemented in February with the first safety-related SCC placement at the Facility above the nuclear island basemat. Approximately 5,300 cubic yards of SCC were placed under the Containment Vessel Bottom Head (“CVBH”) to reach elevation 78 feet 6 inches within the nuclear island. No quality or safety issues arose during the 35-hour continuous SCC placement. The Company provided focused oversight during the placement to ensure quality and compliance were maintained.

A significant milestone for the Facility was reached when structural module CA20 was set in the nuclear island in March 2014. CA20 consists of 72 sub-modules, is the largest module to be assembled

**Photo 1 - Unit 3 Nuclear Island and Turbine Island**



in the Modular Assembly Building (“MAB”), and was the heaviest lift by the Heavy Lift Derrick to date, weighing over 1,100 tons. The module towers more than five stories tall and has a footprint of approximately 67 feet long by 47 feet wide. The massive structure was set on location to a 3/8 inch tolerance. This level of required precision in fabrication, assembly and installation of large structures is indicative of the rigorous nature of nuclear construction standards.

**Photo 2 - Unit 3 CA20 transported from MAB**



CA20 will house areas of the Auxiliary Building, including spent fuel storage and is installed adjacent to the CVBH inside the nuclear island. Ongoing work in CA20 consists of installing basemat attachments, welding floors and overlay plates, and preparation for concrete placement within the steel walls and floors.

In May 2014, the first safety-related concrete placement inside the CVBH was accomplished. Approximately 760 cubic yards of concrete was placed to elevation 76 feet 6 inches inside containment and around modules CA04 and CB65, which were set inside the CVBH in December 2013.

**Photo 3 – Unit 3 CA20 Lifted into Nuclear Island**



The safety-related concrete placements continued on June 23, 2014, as concrete under the CVBH was placed to elevation 82 feet 6 inches. Each placement follows careful and complex installation of safety-

related rebar that provide structural reinforcement for the concrete. As of the end of June 2014, installation of rebar and embedded drain piping was ongoing to support the next concrete placement inside the CVBH to elevation 80 feet 6 inches.

Successful completion of numerous Auxiliary Building concrete wall placements for below ground level rooms was accomplished during the first six months of 2014 as well.

**Photo 4 – Unit 3 Nuclear Island**



### **Containment Vessel Assembly**

The Company maintains regular oversight of containment vessel ring assembly. All containment vessel fabrication and assembly is on schedule to meet project needs. Assembly and coating work of the Unit 3 containment vessel lower ring is complete and the module is expected to be installed onto the CVBH later in 2014. The middle ring is nearly complete with some external coating work remaining. Welding has begun onsite for the second course of the containment vessel upper ring and the containment vessel top head plates have been delivered to the Facility. The installation of the middle and upper containment vessel rings in the nuclear island is forecast to be completed in 2015.



**Photo 5 - Unit 3 Containment Vessel Lower Ring Coating Activities**



### **Structural Modules**

Structural module fabrication and assembly activities continue to undergo surveillances and oversight activities by the Company’s supplier compliance group as well as the quality assurance organization. The supplier compliance group oversees daily module activities and related issues to monitor proper and prompt resolution and performs periodic activity assessments to ensure quality requirements are being met in preparation for and during certain activities.

The primary Unit 3 structural modules currently being assembled on-site are CA05, CA01, and CA03. CA05 is a large structural composite wall and access tunnel module to be placed inside containment. The module will provide separation between different trains of safety-related equipment. CA01 will also be placed inside containment and comprises the compartments that house the steam generators, pressurizer, and refueling canal. CA03 forms the southwest wall of the in-containment refueling water storage tank.

All eight sub-modules that form CA05 have been delivered to the site from the CB&I-Lake Charles facility and seam welding has been completed. The assembled CA05 module is currently outside of the MAB where minimal remaining work will be completed prior to transporting the module to the nuclear island. During the Reporting Period, the Contractor worked through several engineering issues and has completed a modification to the base of the module, installed additional rebar and plates and reapplied coating to comply with licensing requirements. Some of these changes resulted in the need for a license amendment request (“LAR”) that included similar impacts to CA01 and CA02. The Company submitted a request for the associated preliminary amendment request (“PAR”) and has received a “no

objection” from the NRC, which allows for the setting of CA05, CA01 and CA02 prior to the approval of the LAR. Due to resolution on the engineering and licensing challenges described above, CA05 is expected to be placed in the nuclear island in the third quarter of 2014.

**Photo 6 - Unit 3 CA05 Transported Outside the MAB**



Structural module CA01 is being assembled in the MAB. The large CA01 module is comprised of 47 sub-modules. CB&I-Lake Charles facility has fabricated and delivered 42 of the 47 sub-modules to the site and welding of the sub-modules began in June 2014. The Contractor continues to perform hardware inspections, document package reviews and repairs at the Lake Charles-Vogtle facility or in the MAB, which are challenging the assembly schedule. The placement of CA01 is the next major step for progress inside the containment vessel and represents the parallel critical path with long-term shield building activities. To date, eight have been set on the platen in the MAB and welding has begun. Quality reviews and assembly of the module will continue through 2014, and CA01 is expected to be set in the first quarter of 2015.

The Contractor has assigned fabrication of some structural and mechanical modules to different vendor facilities while CB&I-Lake Charles continues its current fabrication activities in support of the Facility. Specialty Maintenance & Construction, Incorporated (“SMCI”) is fabricating the CA03 sub-modules and has delivered three of the 17 sub-modules to the site and onsite pre-assembly has begun. The Contractor is performing rigorous and detailed inspections of CA03 sub-modules prior to delivery to the site. These thorough reviews are currently putting pressure on the delivery schedule. SMCI has increased its shop capacity to improve its production.

**Photo 7 - Unit 3 CA03 Pre-Assembly**



Shield Building structural wall panels are being fabricated at the Newport News Industrial facility and 24 panels have been delivered to the site with no significant quality issues. However, the Contractor has reported schedule challenges with meeting production levels for the Shield Building panels to meet long-term project needs for panel assembly. The Contractor is considering multiple options to increase the rate at which panels are fabricated and delivered. Installation of the Shield Building panels is forecast to begin at the end of 2014 or early 2015.

**Photo 8 - Unit 3 Shield Building Panels Delivered to the Facility**



### **Turbine Island**

The Company has continued to provide compliance and schedule oversight of the Unit 3 Turbine Building construction and component installation. Erection of structural support steel up to 70 feet above ground is ongoing to form the framework of the Turbine Building. The upper and lower shells for all three condensers (A, B, and C) have been installed and welding is in process to attach the upper and lower shells. Installation of the main feedwater pumps, feedwater heater drain tanks, and auxiliary boiler feedwater pumps is complete. The first bay concrete mud mat extending from the Turbine Building to the Auxiliary Building north external wall was completed in April 2014. To date, rebar installation for the Turbine Building first bay is near completion and half of the concrete floor slab has been placed.

**Photo 9 - Unit 3 Turbine Building**



### **Annex Building**

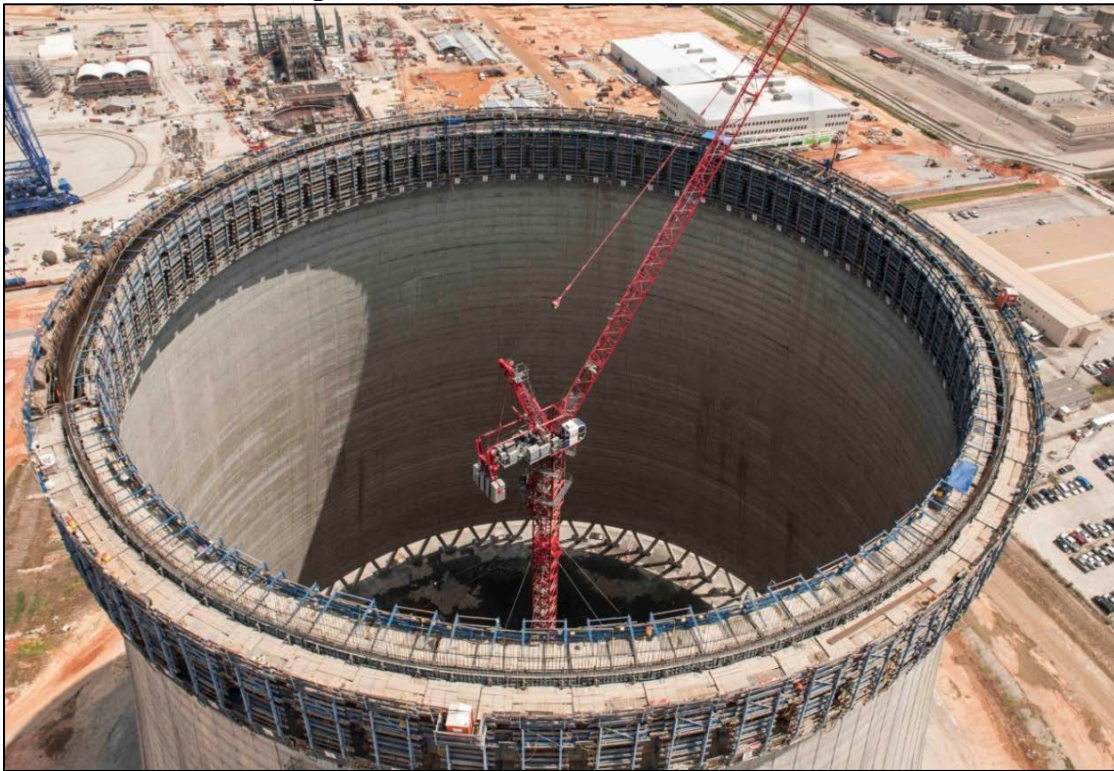
Because the Facility is at ground level, the Contractor was able to begin the foundation work for the Unit 3 Annex Building in 2014, which is necessary to ensure readiness for long-term initial energization activities. The Annex Building will house switchgear equipment, heating, ventilation and air conditioning equipment, and personnel offices. The Company is overseeing ongoing activities including: soil backfill, concrete mud mat placements, and rebar installation in preparation for the basemat placement.

### **Cooling Tower**

The Company is monitoring the steady progress made with Unit 3 cooling tower construction, which has risen to an elevation of 468 feet above ground. Through June 2014, over 6,600 tons of rebar have

been installed and over 58,000 cubic yards of concrete have been placed in the cooling tower. The veil concrete placements and pre-cast concrete activities continue with no issues.

**Photo 10 - Unit 3 Cooling Tower Aerial View**



**Photo 11 - Unit 3 Cooling Tower Ground View**



## B. Unit 4 Construction Activities

Lessons learned from the construction of Unit 3 are being effectively implemented in the construction of Unit 4. The Company is performing daily monitoring and surveillances on the Unit 4 work both on and off-site.

### Nuclear Island

After completion of the nuclear island basemat in 2013, the assembly of the steel CR10 cradle was completed in February 2014. The CR10 module that sits under the containment vessel was subsequently lifted and set in the nuclear island. The CVBH pedestal concrete was placed on April 10, 2014 in the nuclear island. The placement of safety-related pedestal concrete consisted of a continuous pour of approximately 585 cubic yards of concrete. The CVBH pedestal concrete is the first placement between the nuclear island basemat and containment vessel.

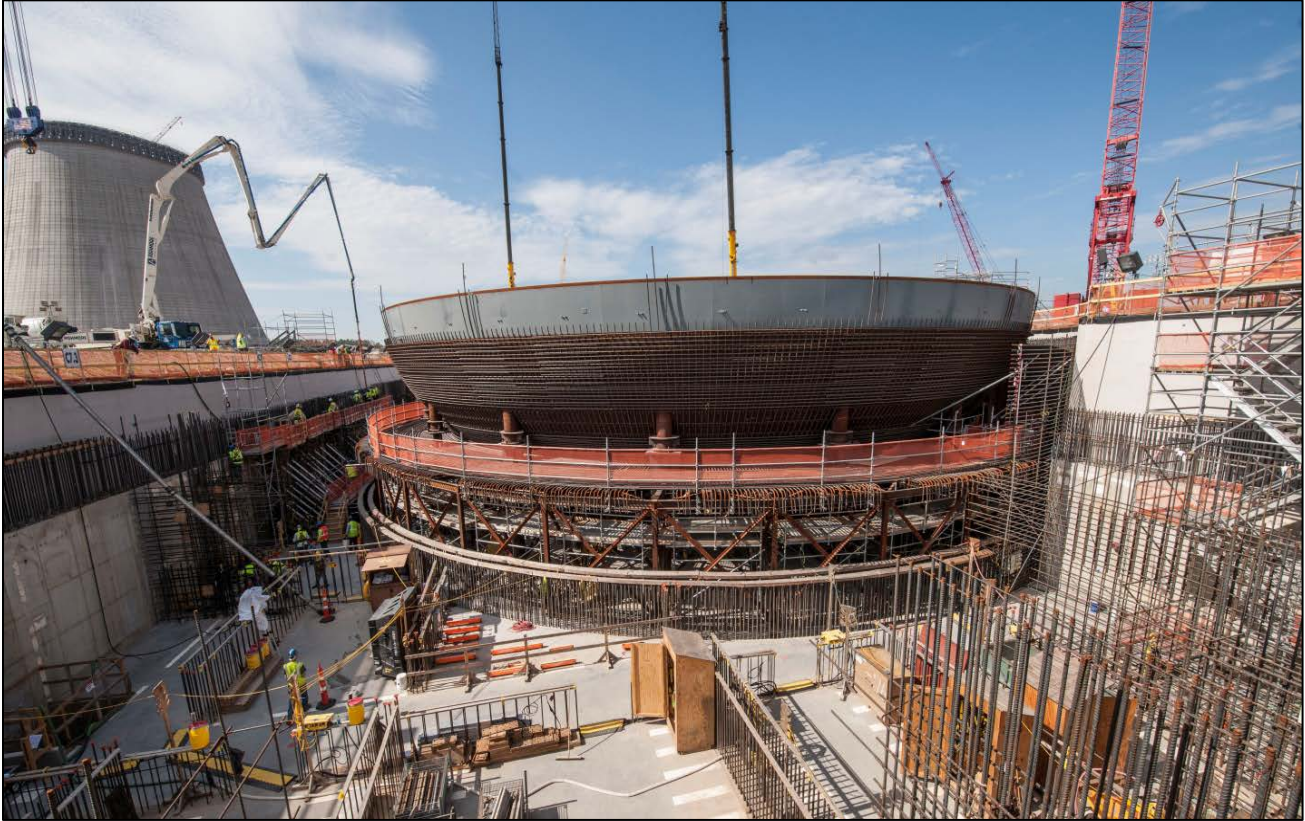
The assembled CVBH was lifted and set by the Heavy Lift Derrick in the nuclear island on May 8, 2014, only 11 months following the placement of the Unit 3 CVBH. The installation of the 900-ton CVBH was a significant construction milestone achieved for Unit 4. This massive modular structure was set in its location within one half inch tolerance, demonstrating the high quality work required to meet stringent nuclear standards.

In April 2014, the first Auxiliary Building wall placement was completed, only eight months following the first Unit 3 Auxiliary Building wall placement. The placement consisted of 189 cubic yards of concrete and was the first vertical wall placement in the nuclear island. Since that time, all exterior Auxiliary Building wall placements have been completed up to elevation 82 feet 6 inches. Interior wall placements for the Auxiliary Building up to elevation 82 feet 6 inches as well as exterior wall placements up to elevation 100 feet will continue through 2014.

**Photo 12 - Unit 4 Nuclear Island and Turbine Island**



**Photo 13 - Unit 4 CVBH and Auxiliary Building Wall Construction**



Modules CA04 (the reactor vessel cavity) and sump modules, CB65 and CB66, are expected to be set inside the CVBH in the third quarter of 2014.

### **Containment Vessel Assembly**

The Contractor continues to produce high quality work on the containment vessel assembly activities with Company oversight. The containment vessel lower ring has been assembled, each course of steel plates has been welded together and non-destructive examination has been successfully completed. Final preparation work consisting of welding internal attachments to the ring, applying the external coating, and completing equipment hatches is currently ongoing.

**Photo 14 – Units 3 and 4 Containment Vessel Assembly**



### **Structural Modules**

While CB&I-Lake Charles is fabricating some Unit 4 CA20 sub-modules, structural module fabrication for certain Unit 4 modules has been contracted to Oregon Iron Works, SMCI, IHI, and Toshiba. Oregon Iron Works is currently fabricating structural sub-modules that form CA20. Resources from the Company's supplier compliance organization regularly monitor activities occurring at the new vendor locations and maintain communication with the Contractor on vendor developments to support construction of the Facility. As of June 2014, two sub-modules for CA20 were in progress with no quality issues identified. The floors, ledger angles and other miscellaneous parts for CA20 will be fabricated by SMCI. CA20 is scheduled to be installed in the nuclear island in 2015. Structural modules CA03 and CA04 for Unit 4 will be fabricated by SMCI as well.

Structural module CA01 is being fabricated by IHI and Toshiba in Japan and manufacturing of the CA01 sub-modules has begun.

### **Turbine Island**

The Company continues its oversight of Unit 4 turbine island construction and will maintain a focus on the erection of the Unit 4 Turbine Building as well as effective fabrication and installation of equipment. In the first six months of 2014, all sub-grade turbine island activities were successfully completed including placement of the remaining three external turbine building walls to elevation 94 feet, placement of the condenser concrete pedestals, installation of all necessary underground piping to elevation 94 feet, and completion of the below-ground concrete sumps.

Currently, the turbine island is undergoing extensive foundation work as well as fabrication of the large A, B, and C condensers. There will be ten basemat concrete placements made at elevation 100 feet (ground level) for the floor level of the Turbine Building. Rebar and embedded piping work is currently being performed in three basemat placement areas in preparation for the concrete placements. The first basemat slab placement for the Turbine Building occurred in July 2014 and turbine island basemat work at elevation 100 feet is ongoing. Backfill activity continues on the west side of the turbine island to support the foundation and the duct bank is being installed in the northeast corner of the Turbine Building foundation.

Multiple fit-up and welding activities have been accomplished and are continuing on the A, B, and C condensers in 2014. Additionally, structural steel beams are on-site to be erected on the elevation 100 feet turbine island basemat.



**Photo 15 - Unit 4 Condenser Assembly**



### **Cooling Tower**

The Unit 4 cooling tower construction work is making continued progress, but the focus is to first complete the Unit 3 cooling tower before devoting significant resources to the Unit 4 tower. All five center riser concrete placements have been completed, and the riser stands over 60 feet tall. Concrete placement work above the capital columns began in 2014 as did the first three veil placements completed through June 2014. As of June 2014, over 5,000 tons of rebar have been installed and over 45,000 cubic yards of concrete have been placed on the cooling tower. It currently stands at over 54 feet above ground.

### **C. Common Construction Activities**

#### **Balance of Plant**

Construction work is currently ongoing for 335,000 square feet of permanent buildings located at the plant site, and the Company continues daily oversight of all permanent building construction and readiness activities.

Plant support and permanent buildings needed for Vogtle 3 and 4 operations are on track to meet schedule. The Office Building (Building 301) is now over 90 percent complete with site utility work, parking lot, and documentation turnover remaining. The Pumphouse Switchgear Building (Building 315) is completely constructed, and the installation of internal systems is ongoing. The Material and Equipment Storage Building (Building 322) is 90 percent complete with fire water system, permanent utility installation, and document turnover remaining to be performed. Similarly, the Rotor Storage

Building (Building 324) is over 90 percent complete and remaining work includes railroad track installation, permanent utilities, and documentation turnover.

The Engineering and Administrative Building (Building 302) will serve as office space for plant personnel for all four units and is approximately 30 percent complete. The Maintenance Support Building (Building 303) is over 40 percent complete. The Receiving Warehouse (Building 306) and Main Warehouse (Building 307) have their designs complete with site clearing and grading work underway to prepare for the foundations.

### **Units 3 and 4 Transmission/Switchyard**

Transmission and switchyard construction activities are being performed by the Company, and the experienced Georgia Power transmission and switchyard construction personnel are meeting schedule needs to support initial energization of the Facility. The Company has performed all work to date with zero personnel safety incidents.

The construction of new switchyards, tie lines, transmission lines, and modifications to the existing unit switchyards has progressed significantly in the first half of 2014. Above-ground construction for the two Unit 3 Reserve Auxiliary Transformer (“RAT”) 230kV lines were completed and installation of one of the overhead supply lines is underway. Foundation work for the Unit 4 500kV switchyard is currently in progress and termination structures are being erected. Modifications to the existing Units 1 and 2 switchyard include the installation of tie line termination structures, and Units 1 and 2 500kV bus modifications are ongoing along with the installation of the 500kV breakers.

**Photo 16 - Unit 3 230kV Switching Station**



**Photo 17 - Unit 4 500kV Switchyard**



The new 55-mile Thomson-Vogtle 500kV line construction is progressing well. All engineering is complete and as of June 2014, 25 percent of right of way clearing had been completed. Twenty-five percent of tower pad construction is complete and all construction activity is on track to be completed in late 2017 to meet project needs.

**Photo 18 - 500kV Thomson-Vogtle Line Construction**



## **D. Engineering**

The Company's construction engineering and design oversight organizations are providing technical oversight and review of Contractor design changes, field change requests and non-conformances to ensure compliance with the approved design and licensing basis is maintained.

The Contractor's timeliness in response to construction issues and resulting design changes has improved during the Reporting Period. The comprehensive review performed by the Contractor in 2012-2013 of all previously issued design and design changes has resulted in a reduced number of compliance issues with the licensing basis. An increase of Contractor design and field engineering resources to perform and review design and licensing basis change packages has also contributed to improvement in timeliness of the design packages. While the Contractor's performance in engineering has improved, the Contractor continues to work through emergent engineering issues that are impacting construction activities.

## **E. Procurement**

Fabrication of all major components continues to meet project needs. Arrival of various major components during the first half of 2014 at the Facility continues to showcase the successful procurement and production of significant components all over the world with adequate time before their respective needed installation dates into the Facility. Schedule margin between delivery and installation dates allows for issues that arise to be properly addressed and corrected. The Company continues its oversight of the fabrication of major equipment at international and domestic vendor locations and directs close attention to challenges associated with design and/or testing to ensure those are adequately resolved before installation. The Company and its subject matter experts involved with vendor oversight remain confident in the Contractor to provide functional, reliable, and quality equipment while also supporting the construction schedule.

### **Doosan Components**

The Unit 4 reactor vessel arrived at the site in May 2014. With its arrival, both Units 3 and 4 reactor vessels are now being stored onsite.

Fabrication of both Unit 3 steam generators is complete and all quality documentation has been reviewed. Welding of the steam generators to the reactor coolant pump casings is soon to begin after non-destructive examination of similar welds proves to be successful. Fabrication of the Unit 4 steam generators is complete with hydrostatic testing complete for one of the steam generators. Diligent oversight by the Company for these components remains a priority given their safety significance.

**Photo 19 - Unit 4 Reactor Vessel Arrival at the Facility**



### **Mangiarotti Components**

The Unit 4 accumulator tanks arrived at the site in January 2014, and each unit's set of accumulator tanks are now being stored at the Facility. Final quality documentation package review for each of the tanks is being conducted by the Company currently.

The core makeup tanks for Unit 3 remain stored on-site currently, and the Unit 4 core makeup tanks are being modified at Mangiarotti to ensure their licensed volume requirements are being met. The Company is providing oversight at the vendor location during these modifications to ensure they achieve the required results.

Company subject matter experts are performing oversight of the assembly and testing of the Units 3 and 4 passive residual heat removal heat exchangers, which are scheduled for delivery in the fourth quarter of 2014 and the first quarter of 2015, respectively. The Unit 3 pressurizer has completed testing, received final coatings, and was shipped from Mangiarotti in July 2014. The Unit 4 pressurizer is in the final stages of assembly and it is scheduled to arrive at the site in early 2015.

### **Other Major Components**

During testing of the Unit 3 reactor coolant pumps, issues with pump performance were found. A causal analysis determined the reasons for the issues and the needed design modifications of certain pump components. Design modifications have been incorporated into the pump components and validation testing is underway with endurance tests to follow to prove successful resolution. The Unit 3

reactor coolant pumps are needed for installation in the Facility in 2016, and delivery of the pumps after successful testing and documentation review is scheduled for 2015.

Additionally, the material traceability issue discovered in 2013 with critical passive core cooling valves, named squib valves, is being resolved with replacement parts that have been procured. Testing of the squib valves revealed issues with their design, and the re-design of the suspect areas within the valves is near completion. Additional testing will be performed after the design modifications are implemented into the valves to ensure they will perform their intended function.

The Company continues to perform focused oversight to ensure that resolution of these component issues is completed to meet all quality and licensed requirements prior to shipment.

Other major component deliveries at the Facility during the Reporting Period include the Unit 3 integrated head package, the Unit 4 reactor coolant surge line piping, and the Unit 4 turbine generator.

#### **IV. Transition to Operations**

The Company continues to develop personnel, processes, and procedures to ensure readiness for pre-operational testing, start-up testing, and plant operations as soon as construction is completed.

##### **A. Building the Operational Organization**

The Company is building the operational organization with diversely experienced personnel. An accredited training program has been established for licensed plant operator candidates, and four classes comprising a total of 90 reactor operator and senior reactor operator candidates have completed various phases of rigorous classroom and simulator training to prepare them for NRC certification. The NRC will provide an initial examination to a portion of the candidates beginning in May 2015 in order for them to receive their operator licenses. The current schedule projects the second class of operator candidates will take the NRC license examination in November 2015, the third class in October 2016, and the final class of candidates in July 2017. Approximately 24 licensed operator candidates will sit for each examination.

Additionally, the first non-licensed system operator class has completed its comprehensive training program and is now ready to support the Facility's Initial Test Program ("ITP"). Training has also continued for engineering personnel and maintenance instrumentation and controls technicians in order for them to support the ITP and operations.

The Company continues to effectively manage resources by using operational readiness personnel for augmented construction compliance oversight and startup activities. The use of the operational readiness personnel for these activities increases knowledge retention about the Facility's construction and installed components to be used in future operations and maintenance activities.

##### **B. Digital Instrumentation and Controls**

To date, two on-site limited scope simulators have been utilized for the licensed plant operator training program. These simulators are currently being upgraded to the full Plant Reference Simulators. Through the employment of the Company's digital systems oversight organization, the Company has provided focused oversight of this evolution and has had a frequent presence in the Contractor's facilities to ensure a success path was developed and executed. The Contractor performed factory acceptance testing on the Plant Reference Simulator beginning in February 2014 and testing was satisfactorily completed on schedule in June marking a major milestone for the Facility.

Although outside the Reporting Period, the upgrade to one of the Plant Reference Simulators was recently completed and site acceptance testing is underway. The upgrade for the second simulator is scheduled for the third quarter of 2014. Once site acceptance testing is completed, the simulators will be transferred to the Company's ownership to train operator candidates on the Plant Reference Simulator for final preparation for their NRC examinations.

Additionally, the Distributed Control and Information System software testing has been performed and was successfully completed in July 2014. The Protection and Safety Monitoring System factory testing results are being validated. Testing requirements that are precursors to the Integrated System Validation scheduled for the end of 2014 have been completed and results are in review and validation.

Alignment with the NRC was reached in May 2014 for the planned milestone schedule leading to the NRC initial license training examinations for operator candidates in May 2015. The schedule to meet those first operator license examinations is now in place and being successfully tracked to completion.

### **C. Programs, Processes and Procedures to meet Combined Construction and Operating License Requirements**

The Company has developed an Integrated Operational Readiness Schedule (“IORS”) that contains over 50,000 activities representing training, program development, and procedure development. This detailed information has been aligned with the testing, turnover, and startup activities within the Contractor’s IPS where applicable. Approximately 50 percent of the required programs that govern testing and maintenance of major components have been developed in accordance with the IORS schedule. Thousands of operations and maintenance procedures are being developed by both the Contractor and the Company for testing and operations. When possible, existing procedures from the operating fleet are being adopted.

In preparation for initial system turnover during the ITP, scheduled activities are progressing that will ensure readiness for systems transition (maintenance rule scoping, equipment classifications, maintenance predictive and preventative strategies), design transition (configuration management and digital/software strategy), and licensing basis transition (probabilistic risk assessment and risk informed strategies). Additionally, the training necessary to support ITP with trained and qualified engineers is underway.

### **D. Testing, Turnover, and Startup**

The Company’s ITP organization continues to augment its plan to implement component testing, integrated system testing, and startup testing. The ITP organization is working with the Contractor to develop turnover processes between CB&I and Westinghouse and ultimately to the Company. The Contractor will turn the first significant building (Administrative Building) over to the Company in late 2014 that will serve as an early opportunity to exercise the turnover process. Testing, start-up, flushing, and first-of-a-kind technology procedures are being developed and divisions of responsibilities are being defined for the Contractor and the Company. Currently, over 25 percent of needed ITP procedures have been approved. Alignment documents between the Contractor and the Company on division of responsibility have proven beneficial in the effort to better inform the overall project schedule. Additionally, meetings with the NRC have been beneficial in discussing test procedure development, first plant challenging tests, satisfying certain ITAAC through component and pre-operation tests, and NRC testing inspection plans.



## **E. Integrate the Four Unit Site**

Collaborative efforts are underway to ensure a smooth transition from a construction site to an operational site with no adverse impacts to the existing units 1 and 2 while fully supporting the new units 3 and 4. A significant milestone to the Facility's integration into a four unit site was achieved in 2014 with the creation of a Site Integration organization, which integrates the Vogtle Units 1, 2, 3, and 4 Emergency Planning and Security departments to ensure their functional responsibilities meet all safety and security requirements. Such responsibilities include, but are not limited to, coordination of physical security changes, implementation of a new protected area boundary, and emergency planning procedures to remain compliant with all regulatory requirements.

Twenty-two sub-strategies have been developed to guide transitional planning in the following five major strategic areas:

- Operational Organization
- Regulatory Margin
- Testing and Turnover Execution
- Multi-Unit Integration
- Sustained Operational Excellence

These strategies are being used to inform and align the organization around the necessary process, program, and procedure work to advance the project through the initial test program and ultimately full operation, while achieving all industry standards for excellence in safety and reliability.



## V. Facility Capital Cost Overview

### A. Status of the Facility Capital Cost

**The Total Construction and Capital Cost forecast for the Facility remains \$4.799 billion, which is unchanged from the previous reporting period.** The Company is not requesting a change to the certified amount at this time per the stipulation approved by the Commission on September 3, 2013. The cost projected at Certification was based on the best available information at the time for items that were variable, such as escalation indices, financing interest rates, government regulations, and necessary oversight organizational structure. The cost forecast was built around a schedule defined in the EPC Agreement. During the Certification proceeding, risks to both schedule and cost were discussed and found to be reasonable by the Commission. The Company has worked to mitigate risks to minimize impacts to our customers. Cost changes over a multi-year construction period, for a complex and first-of-kind project, are not unexpected and changes have occurred.

#### **Federal Regulation Changes and Taxes - \$82 million**

There are certain costs that have arisen from changes in NRC regulations and other government requirements for which the Company and the Contractor are obligated to comply. The NRC has bolstered requirements for physical security at the site to ensure the highest level of protection for the public and Facility personnel. As cyber security requirements are being expanded across all industries, the NRC has also imposed additional requirements that will further strengthen the security of the Facility, during both construction and operations. While most of the nuclear safety requirements are already included in the AP1000 design, added costs will be incurred to adhere to NRC orders related to Fukushima lessons learned. Costs for increased NRC requirements in the Fitness for Duty program ensure the Facility will employ the highest standards for personnel. Local government changes will also impact the Facility cost. For example, the Central Savannah Region in Georgia has approved a Transportation Special Local Option Sales Tax (TSPLOST) that results in an increase the cost forecast. In addition, since the last reporting period, the Georgia Environmental Protection Division has included a requirement for the installation of an oxygen injection system in the Savannah River in the Vogtle 3 and 4 draft Surface Water Withdrawal Permit. The cost of the development and installation of this injection system has been included in the Company's capital cost forecast in anticipation of the final permit issuance. The costs described above will be incurred to meet our obligations to the U.S. and local government as well as our obligation to provide the safest operating facility.

#### **Operational Readiness - \$91 million**

Consistent with Institute of Nuclear Power Operations ("INPO") Principles for Excellence in Nuclear Project Construction, the Company is transitioning to plant operations early in the project. While planning for an efficient transition from construction to startup and full operations, the Company has identified additional costs that are necessary to execute the highest standards for safe and reliable operations. These costs include items such as hardware and software required for simulator development and plant operations, additional permanent plant equipment and development of the Probabilistic Risk Assessment that informs proper plant processes, programs and procedures. This cost

category also reflects an increase associated with an accounting reclassification for certain activities previously forecast outside of the capital budget.

**Transmission - \$19 million**

The capital cost also reflects changes in the Company's original transmission forecast for additional modifications to the existing switchyards, additional breakers between the existing and new switchyards and installation of station service power to the new 500kV switchyard. These changes are necessary to ensure construction is completed safely without impacting reliability of Vogtle Units 1 and 2 as well as to provide appropriate isolation and protection for future maintenance on Units 3 and 4.

**Legal/Environmental Permit/Misc. - \$12 million**

The cost forecast for legal fees has increased for ongoing representation of the Company in the current litigation activities as we strive for an outcome that is in the best interest of our customers. The Company is also projecting additional costs needed to maintain our commitment to compliance with environmental requirements.

**Power Block and Support Structure Construction - \$24 million**

The protections of the EPC Agreement put into place by the Company and reviewed and found reasonable by this Commission, are effectively working to mitigate and control project costs. The EPC Agreement provides for some events, such as changes in law and project scope changes, to entitle the Contractor for additional compensation. Cost changes have been acknowledged by the Company as necessary to complete certain activities in a safe, quality and compliant manner such as additional backfill work, major evolution mock-ups, first plant only testing, and permanent buildings. These cost changes have been partially offset by the cost savings realized through Amendment No. 3 to the EPC Agreement.

**Owner's Quality and Compliance - \$153 million**

There are additional owners' costs that are necessary to complete the owners' scope of work and to ensure Contractor compliance with the NRC-approved licensing basis. At the time of Certification, the Company projected costs for its oversight organization based on the information known in the early stages of the project. As the project has progressed, the Company has adjusted its organizational structure to ensure appropriate resources are in place to monitor and verify that quality is being built into the Facility. Other cost changes have resulted from the full development of regulatory processes including ITAAC closure documentation preparation and submittal as well as the need for an Interface of Corrective Action Programs. These adjustments were necessary for the Company to meet its obligation as Licensee to comply with NRC regulations.

**Schedule Extension**

A large portion of the change in forecasted owners' costs is associated with extending the in-service dates to the fourth quarter 2017 and 2018 for Units 3 and 4, respectively. Costs associated with the schedule extension are primarily related to Company labor but also include paying fees for a longer

period of time to the NRC as well as to the industry group, INPO, to fund regulatory oversight activities. The forecast for Ad Valorem taxes also increased upon extension of the schedule. These types of costs are examples of costs that would be passed to customers through rates no matter when the Facility is placed into service.

The Company's responsibility for ensuring compliance with NRC requirements and the safety of the Facility remains in place through the end of construction and start-up, regardless of the original forecast for in-service dates.

As the license holder and as co-owner of the Facility, the Company is committed to fulfilling our role of providing appropriate oversight in every applicable facet of this Facility. The Company recognizes that capital costs that exceed the current certified amount will have to be approved by the Commission before inclusion in rate base.

### **B. Status of Major Dispute with the Contractor**

The Company continues to report to the Commission on the status of the Contractor's major claim. On August 30, 2013, the District Court for the District of Columbia granted the Owner's motion to dismiss the Contractor claim in that Court, thereby allowing the litigation to proceed in the Southern District of Georgia. The Contractor filed an appeal of the District of Columbia Court's decision on September 27, 2013. Briefing on Contractor's appeal before the U.S. Court of Appeals for the District of Columbia Circuit has concluded, and oral argument has been set for October 2014.

On May 22, 2014, the Contractor amended its counterclaim in the Southern District of Georgia, updating its original claims relating to the structural modules and adding a claim related to delays in rebar installation which occurred in 2012. While discovery and other pre-trial preparation in the Southern District of Georgia remain ongoing, and the Company is vigorously asserting its positions and defending against Contractor's claims, the Company expects negotiations with the Contractor to continue with respect to cost and schedule. It is possible that during these negotiations the parties may reach a mutually acceptable compromise of their positions.

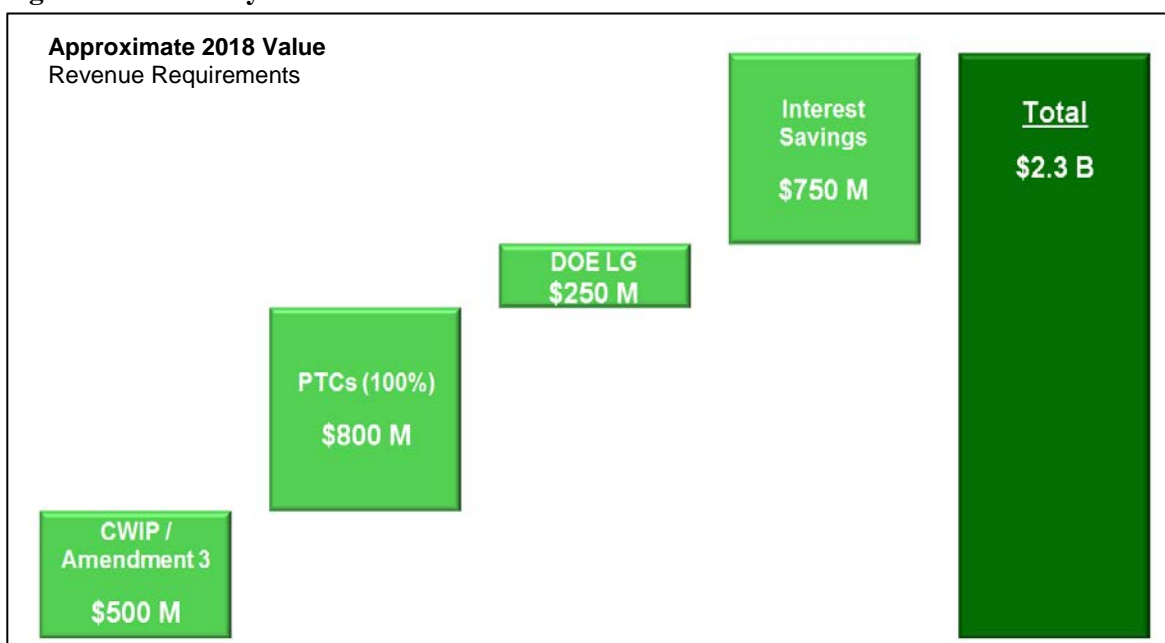
**The Company is not proposing any change to the certified capital cost for settlement of the Contractors' claims that are currently subject to litigation in federal courts.**

### C. Customer Benefits

The Company continues to identify and report \$2.3 billion in customer benefits to the Commission because they reduce the overall cost to customers for the Facility. These customer benefits are derived directly as a result of the Company pursuing the project and otherwise would not have been attained. Therefore, the true cost to customers for the Facility includes the impact of these benefits.

A portion of these customer benefits has already been incorporated into the current Total Capital and Financing Cost of the project. The remaining customer benefits are expected to put significant downward pressure on rates, effectively offsetting a portion of the cost of the units. **The impact of these benefits to customers is significantly greater than the impact of project cost increases since Certification.**

**Figure B - Summary of Customer Benefits**



These customer benefits are described below and are reported in 2018 present value dollars to reflect the current target in-service dates.

#### **CWIP and Amendment No. 3**

Approximately \$300 million of customer benefits are associated with the inclusion of CWIP in rate base, as authorized by the Georgia Nuclear Energy Financing Act as well as the Commission. The effectiveness of Amendment No. 3 to the EPC Contract, which shifted more of the EPC costs from market-based indices to fixed escalators, as approved by the Commission, also provided approximately \$200 million in cost savings to customers relative to original Certification. These customer benefits are included in the Company's capital cost and financing forecast discussed in this VCM Report.

### **Federal Government Incentives**

These customer benefits are the product of the Company's effective pursuit and utilization of federal government nuclear incentives which, as passed along to customers, reduce the overall cost of the Facility to customers. These incentives were established by the Energy Policy Act of 2005 as "Incentives for Innovative Technologies". As such, the PTCs and the DOE Loan Guarantee were put in place by Congress to offset potential cost impacts that may arise when constructing a first-of-a-kind nuclear facility and help lead to a resurgence of new nuclear generation in the United States. By offsetting unforeseen cost increases in the decade-long development and construction of this first-of-a-kind project, these incentives are providing exactly the support they were conceived and designed to do.

***Production Tax Credits (PTCs)*** - The benefit of the PTCs is earned over an eight year period following the in-service date for each unit and totals approximately \$800 million on a 2018 present value basis. The Energy Policy Act of 2005 provides PTCs for companies that apply for a Combined Construction and Operating Licensing ("COL") by the end of 2008, begin construction on new nuclear reactors prior to 2014 and bring them into service before 2021. The first two requirements have been met for both units with the application for the COLs in 2008, which were subsequently received in 2012, and the placement of first nuclear concrete in 2013. The Company has completed all requirements to date and has filed its application for approval with the Internal Revenue Service.

***DOE Loan Guarantee*** - The projected interest cost savings resulting from the DOE Loan Guarantee Agreement are approximately \$250 million on a 2018 present value basis. Pursuant to the loan guarantee program established under Title XVII of the Energy Policy Act of 2005 the Company and the DOE entered into a loan guarantee agreement on February 20, 2014, under which the DOE agreed to guarantee the obligations of the Company under a note purchase agreement ("FFB Note Purchase Agreement") among the DOE, the Company, and the Federal Financing Bank ("FFB") and a related promissory note ("FFB Promissory Note"). The FFB Note Purchase Agreement and FFB Promissory Note provide for a multi-advance term loan facility, under which the Company received an initial \$1 billion draw, and may make additional borrowings through the FFB for an aggregate amount up to the lesser of 70 percent of the total eligible costs, or \$3.46 billion. Execution of the DOE Loan Guarantee Agreement took approximately five years of diligent negotiations on multiple fronts to secure this benefit for customers. It was an arduous process that other potential recipients have chosen not to pursue.

### **Interest Savings**

In addition to the DOE Loan Guarantee, the Company has been able to capture debt cost savings of approximately \$750 million, on a 2018 present value basis, as compared to interest rates assumed during the original Certification proceeding. These savings were made possible by a decline in long-term interest rates in recent years but were captured for customers through proactive and strategic financing policies and actions on the part of the Company. As a result, Georgia Power currently has one of the lowest average costs of debt relative to length to maturity compared to its peers in the electric utility industry. These interest savings have already been put into place through debt issuances

made through this Eleventh VCM Reporting Period. As current market rates remain low compared to the assumption at Certification, the ultimate savings could be even greater. These interest savings lower financing costs on all Company investments, not just the Facility, and are being passed on to customers through lower base rate revenue requirements during the Facility's construction period, which includes the NCCR tariff, as well as into the Facility's operating life.



## RESPONSES TO STIPULATED QUESTIONS

As agreed in the Stipulation that was incorporated into the Certification Order, the Company responds below to the 15 specified items in the order in which they appear in Section 2(d)(1-15) of the Stipulation. In this Eleventh VCM Report, and in accordance with the Commission's Order on the Ninth/Tenth VCM Report, the Company has omitted Items 4, 10 and 13.

### **1. The reasons for any additional change in the estimated costs of the units since the process began.**

There has been no change to the Total Construction and Capital Cost of the Facility since the previous reporting period. This forecast represents the amount that the Company is spending to complete the Facility and, if deemed prudent by the Commission, will be put into rate base when the Facility goes into service.

The current cost and forecast reports are provided in Tables 1.1 and 1.1a and reflect shifts in timing of costs and minor movement between cost categories that typically occur in management of a project. Changes to the total estimated costs of the Facility since original Certification are discussed in the Status of the Facility section of this Eleventh VCM Report.

Shown separately in Table 1.1 are the Total Project Schedule Financing costs projected to be recovered during construction through the NCCR tariff, along with \$22 million of AFUDC that will be accrued on CWIP above the original certified cost. Of the amount to be recovered through the NCCR tariff, a portion of the total financing costs has already been passed onto customers and the remaining financing costs will be fully recovered by the time the Facility is put into service. This recovery mechanism was put into place by the Georgia legislature and approved by the Commission, which allows for gradual impacts to rates during construction and reduces the immediate impact to customers at the in-service dates. With \$642 million already incurred through June 2014, the current forecast for the remaining financing cost is \$1.26 billion.

The Total Project Schedule Financing cost forecast has decreased since the Ninth/Tenth VCM Report, due to lower cost of capital and changes in the timing of project cash expenditures.

**Table 1.1**

Vogtle 3&4 Facility  
 Georgia Power Company Cost - **Subject to Commission Verification and Approval**  
 Project To Date  
 Through Period Ending June 30, 2014

	Total Project Capital				Project to Date Capital			
	Certified Cost (\$ millions)	Total Current Forecast (\$ millions)	Variance (\$ millions)	Footnote	Budget To Date (6) (\$ millions)	Actual To Date (\$ millions)	Variance (\$ millions)	Footnote
<b>Construction &amp; Capital Cost</b>								
EPC Base								
Fixed Semi Annual Escalation	1,978	1,976	-2	1	1,314	1,308	-6	
Indexed Escalation	468	470	2		140	125	-15	
Other Fixed Escalation	670	674	4		633	628	-5	
Total EPC Base	3,116	3,121	4		2,088	2,062	-26	
EPC Escalation								
Fixed Semi Annual Escalation	431	355	-76		152	151	-1	
Indexed Escalation	142	117	-25		18	15	-4	
Other Fixed Escalation	108	110	2		93	91	-1	
Total EPC Escalation	681	582	-99		263	257	-6	
Quality Assurance, Compliance and Operations & EPC Scope Change Ad Valorem	507	930	423	2	422	420	-2	
Test Fuel Offsets	111	159	48		24	24	0	
Transmission Interconnection	-34	-49	-15		0	0	0	
	37	56	20	3	35	34	0	
	621	1,096	476		481	478	-2	
<b>Total Construction &amp; Capital Cost</b>	<b>4,418</b>	<b>4,799</b>	<b>381</b>		<b>2,831</b>	<b>2,797</b>	<b>-34</b>	
<b>Other Capital Cost</b>								
Certification & Independent Evaluator Fees	0	0	0		0	2	2	
Construction Monitor	0	6	6		3	3	0	
<b>Total Other Capital Cost</b>	<b>0</b>	<b>6</b>	<b>6</b>		<b>3</b>	<b>5</b>	<b>2</b>	

Vogtle 3&4 Facility  
 Georgia Power Company Financing Cost - **Recovered Pursuant to O.C.G.A. 46-2-25 (c.1) <sup>4</sup>**  
 Project To Date  
 Through Period Ending June 30, 2014

	Total Project Financing				Project to Date Financing			
	Estimated at Certification (\$ millions)	Total Current Forecast (\$ millions)	Variance (\$ millions)	Footnote	Budget To Date (6) (\$ millions)	Actual To Date (\$ millions)	Variance (\$ millions)	Footnote
<b>Project Schedule Financing</b>								
Return on CWIP in Rate Base	1,545	1,796	251	4	537	534	-3	
AFUDC - Accrued through Dec 2010	111	91	-20		91	91	0	
Return on Unamortized AFUDC Balance	39	18	-21		16	16	0	
<b>Total Project Schedule Financing</b>	<b>1,695</b>	<b>1,905</b>	<b>210</b>	<b>5</b>	<b>644</b>	<b>642</b>	<b>-3</b>	

Footnotes:

1. Includes \$28 million for EPC Joint Use Buildings (that benefits Vogtle 1&2).
2. Includes Dues and Fees \$32 million, Regulation Changes \$35 million, and Owner's Cost for Training Facility \$4 million.
3. Includes of \$23 million for Transmission as a result of transfer costs to Units 1 and 2.
4. The Total Current Forecast for Return on CWIP in Rate Base includes \$22 million of AFUDC accrued on CWIP above the original certified cost.
5. The Total Current Forecast for Total Construction Schedule Financing decreased due to timing of EPC milestones and the lower projected cost of capital.
6. The Budget to Date includes actual costs through the previously filed report, plus budgeted costs through the Eleventh VCM Reporting Period.

Note: Details may not add to totals due to rounding.

**Table 1.1.a (Trend)**

Vogtle 3&4 Project  
Georgia Power Company Cost Forecast - **Subject to Commission Verification and Approval**  
Through Period Ending June 30, 2014

	Certified Cost (\$ millions)	Jun 2009 Forecast (\$ millions)	Dec 2009 Forecast (\$ millions)	Jun 2010 Forecast (\$ millions)	Dec 2010 Forecast (\$ millions)	Jun 2011 Forecast (\$ millions)	Dec 2011 Forecast (\$ millions)	Jun 2012 Forecast (\$ millions)	Dec 2012 Forecast (\$ millions)	Dec 2013 Forecast (\$ millions)	Jun 2014 Forecast (\$ millions)
<b>Construction &amp; Capital Cost</b>											
EPC Base											
Fixed Semi Annual Escalation	1,978	1,978	1,976	1,976	1,976	1,976	1,976	1,976	1,976	1,976	1,976
Indexed Escalation	468	468	470	470	470	470	470	470	470	470	470
Other Fixed Escalation	670	670	674	674	674	674	674	674	674	674	674
<b>Total EPC Base</b>	<b>3,116</b>	<b>3,116</b>	<b>3,121</b>	<b>3,121</b>	<b>3,121</b>	<b>3,121</b>	<b>3,121</b>	<b>3,121</b>	<b>3,121</b>	<b>3,121</b>	<b>3,121</b>
EPC Escalation											
Fixed Semi Annual Escalation	431	431	336	336	337	344	343	353	355	355	355
Indexed Escalation	142	142	142	142	142	119	118	120	117	117	117
Other Fixed Escalation	108	108	109	109	109	110	110	111	110	110	110
<b>Total EPC Escalation</b>	<b>681</b>	<b>681</b>	<b>586</b>	<b>587</b>	<b>589</b>	<b>573</b>	<b>572</b>	<b>585</b>	<b>582</b>	<b>582</b>	<b>582</b>
Quality Assurance, Compliance and Operations & EPC Scope Change											
Ad Valorem	507	507	576	589	582	675	675	727	930	930	930
Test Fuel Offsets	111	111	111	111	111	111	111	125	159	159	159
Transmission Interconnection	-34	-34	-34	-34	-34	-60	-60	-60	-49	-49	-49
	37	37	37	40	40	40	40	41	56	56	56
	621	621	689	706	699	766	766	833	1,096	1,096	1,096
<b>Total Construction &amp; Capital Cost</b>	<b>4,418</b>	<b>4,418</b>	<b>4,395</b>	<b>4,414</b>	<b>4,408</b>	<b>4,460</b>	<b>4,459</b>	<b>4,539</b>	<b>4,799</b>	<b>4,799</b>	<b>4,799</b>
Other Capital Cost											
Certification & Independent Evaluator Fees	0	0	0	0	0	0	0	0	0	0	0
Construction Monitor	0	5	5	5	4	4	4	4	4	5	6
<b>Total Other Capital Cost</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>5</b>	<b>6</b>

Vogtle 3&4 Facility  
Georgia Power Company Financing Cost Forecast - **Recovered Pursuant to O.C.G.A. 46-2-25 (c.1)**  
Project To Date  
Through Period Ending June 30, 2014

	Estimated at Certification (\$ millions)	Jun 2009 Forecast (\$ millions)	Dec 2009 Forecast (\$ millions)	Jun 2010 Forecast (\$ millions)	Dec 2010 Forecast (\$ millions)	Jun 2011 Forecast (\$ millions)	Dec 2011 Forecast (\$ millions)	Jun 2012 Forecast (\$ millions)	Dec 2012 Forecast (\$ millions)	Dec 2013 Forecast (\$ millions)	Jun 2014 Forecast (\$ millions)
<b>Project Schedule Financing</b>											
Return on CWIP in Rate Base	1,545	1,507	1,505	1,546	1,553	1,524	1,516	1,552	1,942	1,851	1,796 *
AFUDC - Accrued through Dec 2010	111	97	99	99	91	91	91	91	91	91	91
Return on Unamortized AFUDC Balance	39	32	33	33	31	19	19	18	18	18	18
<b>Total Project Schedule Financing</b>	<b>1,695</b>	<b>1,636</b>	<b>1,637</b>	<b>1,678</b>	<b>1,675</b>	<b>1,635</b>	<b>1,626</b>	<b>1,662</b>	<b>2,051</b>	<b>1,960</b>	<b>1,905</b>
<b>Total Remaining Financing</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,263 *</b>

Note: No reforecast was filed in June 2013.

Details may not add to totals due to rounding.

\*The total current forecast for return on CWIP in rate base includes \$22 million of AFUDC accrued on CWIP above the certified cost.

**2. A description of any cooperative actions between other builders of nuclear units in the southeast to address labor, crafts, engineering and management requirements.**

There has been no change in the status of this item since the last reporting period.

**3. An explanation of how the indices used in the EPC contract are tracking.**

There has been no change in the status of this item since the last reporting period.

**4. Omitted.**

**5. The status of the Company's loan guarantee application at the Department of Energy and to the extent that application is granted, then the Company shall also report on the impact it has or would have on the final expected in-service cost of the units.**

Pursuant to the loan guarantee program established under Title XVII of the Energy Policy Act of 2005, the Company and the DOE entered into a loan guarantee agreement on February 20, 2014. The projected interest cost savings to customers resulting from the Loan Guarantee Agreement are approximately \$250 million on a 2018 present value basis. These savings will be realized to customers through a decrease in base rate revenue requirements including the NCCR tariff. See the Customer Benefits section of this report for additional information on the DOE Loan Guarantee savings to customers.

The DOE Loan Guarantee will have negligible positive impact on the in-service cost of the units. The in-service cost represents the cost that will go into rate base at the time the Facility goes into service, which is the current capital cost forecast of \$4.8 billion.

The DOE Loan Guarantee will impact the financing costs of this Facility, which are being recovered during construction. The portion of the estimated net benefits of the loan guarantee that is allocated to the Facility has been reflected in the financing cost sections of Tables 1.1, 1.1a, and 8.1. Since the DOE Loan Guarantee Agreement is now in place, the impact of the DOE loan guarantee is also reflected in the economic analysis in Item 14.

**6. Whether the Company is using trust preferred financing and the impact it has or would have on the expected in-service cost of the units.**

There has been no change in the status of this item since the last reporting period.

**7. The extent to which the Company is using short term debt and the impact it has or would have on the expected in-service cost of the units.**

There has been no change in the status of this item since the last reporting period.

**8. An update of the estimated in-service cost and projected date of commercial operation of both units.**

There is no change to the total forecasts for the in-service cost or the in-service dates since the last reporting period.

**9. A description of all major sources of changes (both increases and decreases) to the in-service cost and sources of change in commercial operation dates, if any.**

There is no change to the total forecasts for the in-service cost or the in-service dates since the last reporting period.

**10. Omitted.**

**11. The status of all other significant permits and licenses required from other governmental agencies.**

All other required permits and licenses have been approved or are on track to be approved to meet construction need dates as shown in the Permits Update filed monthly with the Commission. There has been no change in the status of this item since the July 2014 Monthly Status Report was filed.

**12. The status of procurement, engineering, fabrication, transportation and erection of major equipment.**

The status of procurement, engineering, fabrication, transportation and erection of major equipment is reported in the Status of the Facility section of this report.

**13. Omitted.**

#### **14. An updated comparison of the economics of the certified project to other capacity options.**

The relative economic value of the Facility can be determined by comparing the costs associated with completing, operating, and maintaining the Facility over its expected 60-year useful life with the costs to build, operate, and maintain a combined cycle (“CC”) natural gas alternative, which is the next most viable generation alternative, over a comparable time period. The economic analysis performed for this Eleventh VCM Report has relied on the methodologies used in all previous economic evaluations conducted in Docket Nos. 27800 and 29849.

The economic evaluation presented in this Eleventh VCM Report is based on the same underlying major planning assumptions used in the Ninth/Tenth VCM Report. Consistent with the original Certification filing and all previous VCM reports, a range of planning scenarios was used to evaluate the possible impacts of varying fuel prices and carbon costs. The Company identified four distinct, useful views of future North American natural gas supply and demand conditions in its 2014 fuel forecast – “Low”, “Moderate”, “Restrained” and “High”.

The Company notes that despite lower long term natural gas price forecasts, largely due to shale gas developments, the gas markets are still experiencing significant short term price volatility as recently as early 2014 due to extreme cold weather. In addition to price volatility in the supply regions, there has also been extreme volatility in delivered prices to natural gas markets across the eastern half of the United States this winter. This reflects transportation constraints to areas where gas is needed. For example, on January 22, 2014, daily gas prices reached over \$100/MMBtu in some of the eastern regions. While the effects of short-term volatility are not directly reflected in our long-term forecasts or the Vogtle economics, they are felt by our customers. This underscores the need for fuel diversity, especially new nuclear, with its historically stable fuel prices.

The carbon cost scenarios are the same as those in the Ninth/Tenth VCM and are: “Existing”, “Moderate” (\$10, beginning in 2018 and escalated), “Substantial” (\$20, beginning in 2022 and escalated).

The estimate of the capital cost to complete the Facility has been updated from the Ninth/Tenth VCM Report along with post-in-service Operations and Maintenance (“O&M”) and projected post-in-service ongoing capital additions. Pre-in-service O&M, nuclear fuel, decommissioning costs, spent fuel storage cost estimates and the assumed operating characteristics of the Facility have not changed. The long-term marginal financing rates for debt and preferred stock have been updated to reflect current expectations. It should be noted that these marginal financing costs are higher than the current estimate of embedded average financing costs, which are used in all other references to financing costs in this report.

Consistent with the Ninth/Tenth VCM Report, the current economic evaluation assumes 50 percent of potentially available PTCs and the expected interest savings of the DOE loan guarantee. The in-service dates of the gas-fired CC units have been updated from the Ninth/Tenth VCM Report to reflect Georgia Power’s need for capacity in a hypothetical scenario where the Vogtle units were not completed.

“Sunk costs” (non-refundable capital and financing costs already incurred or projected to have been incurred as of August 31, 2014) are excluded from this forward-looking analysis. The current forecast of construction and capital costs as shown in Table 1.1, net of sunk costs, is used as the basis to determine “cost to complete.”

The relative economics of the Facility, when compared to the gas-fired CC alternative, vary depending on the assumptions for future fuel prices as well as with the projected carbon costs associated with potential future carbon regulation. Table 14.1 below shows the difference between the lifetime costs of building, operating, and maintaining the gas-fired CC alternative and the Facility, with positive savings meaning the Facility is less expensive to customers than the gas-fired CC alternative. All twelve scenarios show positive benefits to customers for completing and operating the Facility.

**Table 14.1**

**Relative Savings of the Facility versus CC as of August 31, 2014**  
**“Incremental Cost to Complete”**  
(In 2016 Dollars)  
(Net present value of lifetime costs of CC minus the Facility)

Fuel \ CO <sub>2</sub>	Existing CO <sub>2</sub>	Moderate CO <sub>2</sub>	Substantial CO <sub>2</sub>
High	\$7,131,000,000	\$6,641,000,000	\$8,008,000,000
Restrained	\$4,905,000,000	\$5,445,000,000	\$6,839,000,000
Moderate	\$3,063,000,000	\$4,403,000,000	\$5,053,000,000
Low	\$1,469,000,000	\$3,673,000,000	\$4,164,000,000

Positive number means the Facility is less costly than the gas-fired CC alternative.

The Company continues to use equal weighting of these scenario outcomes given the difficulty in assessing the outcome of a vast range of key variables such as future environmental regulations, possible climate change regulation, fuel prices, demand levels, potential federal portfolio requirements, federal policies toward new nuclear, the breadth and rate of expansion of new nuclear in the United States, and the interplay of other market forces. As such, the weighted average expected value of the relative savings for completion

of the Facility as compared to the gas-fired CC alternative is \$5.1 billion based on the results provided in Table 14.1.

Alternatively, the results of the updated economic evaluation can be expressed in terms of the “breakeven capital cost to complete.” Table 14.2 below shows the results of the breakeven analysis that calculates the maximum capital expenditure that could be spent to complete the Facility and maintain lifetime costs that are equal to the cost of the gas-fired CC alternative. In all of the scenarios, the maximum capital cost to complete the Facility exceeds the Company’s current estimate of the cost to complete the Facility (including marginal construction financing costs) of \$2.4 billion.

**Table 14.2**

**Relative Savings of the Facility versus CC as of August 31, 2014  
“Break-Even Cost to Complete”**

(In 2016 Dollars)

(Maximum Capital Costs to Complete the Facility and Remain Economic)

Fuel \ CO <sub>2</sub>	Existing CO <sub>2</sub>	Moderate CO <sub>2</sub>	Substantial CO <sub>2</sub>
High	\$7,537,000,000	\$7,187,000,000	\$8,163,000,000
Restrained	\$5,947,000,000	\$6,332,000,000	\$7,329,000,000
Moderate	\$4,631,000,000	\$5,588,000,000	\$6,052,000,000
Low	\$3,493,000,000	\$5,067,000,000	\$5,418,000,000

If the value is higher than the current estimated cost to complete of \$2.4 billion of in-service and construction financing costs, the Facility benefits customers. On an expected value basis, the Company’s results indicate that the cost to complete the Facility could increase by \$3.6 billion over the current estimated cost to complete the Facility before becoming uneconomic. (This value can be derived by averaging the results from the twelve scenarios above and then subtracting the current estimated cost to complete).

The analyses provided in Tables 14.1 and 14.2 are based on an economic assessment from an “incremental cost to complete” perspective, which ignores any potential cancellation fees or other costs that would be incurred if the project were stopped, as well as any fully-committed construction costs that would not be avoidable in the event the project is cancelled. If the results from the incremental cost to complete evaluation showed it was no longer cost-effective to pursue completing the Facility, a second cancellation assessment would be performed to determine the economic value of canceling the Facility. A cancellation assessment can provide the most appropriate perspective for deciding whether to cancel the Facility as it would include the impacts of any cancellation fees or other costs associated with cancelling the Facility in the economic analysis. However, because Tables 14.1 and 14.2 both



reflect significant savings and benefits to customers from the incremental cost to complete perspective across a wide range of possible future fuel and carbon prices, a cancellation assessment is not warranted at this time.

In the Eighth VCM proceeding, the Commission ordered that delay scenarios of 24, 36 and 48 months be performed using the latest in-service dates for the Units in future VCM filings. The Company has performed economic analysis in which the in-service dates are delayed by 24, 36 and 48 months from December 2017 and December 2018 for Units 3 and 4, respectively. These scenarios include additional capital costs and financing costs related to the delay scenarios, and the results are provided in Table 14.3, 14.4 and 14.5.

**Table 14.3**

**Relative Savings of the Facility versus CC as of August 31, 2014  
December 2019 / December 2020 In-service (24 Month Delay) Scenario  
“Break-Even Cost to Complete”**

(In 2016 Dollars)

(Maximum Capital Costs to Complete the Facility and Remain Economic)

Fuel \ CO <sub>2</sub>	Existing CO <sub>2</sub>	Moderate CO <sub>2</sub>	Substantial CO <sub>2</sub>
High	\$7,590,000,000	\$7,257,000,000	\$8,265,000,000
Restrained	\$6,122,000,000	\$6,423,000,000	\$7,462,000,000
Moderate	\$4,855,000,000	\$5,712,000,000	\$6,270,000,000
Low	\$3,725,000,000	\$5,172,000,000	\$5,622,000,000

If the value is higher than this scenario’s estimated cost to complete of \$3.1 billion of in-service and construction financing costs, the Facility benefits customers.

**Table 14.4**

**Relative Savings of the Facility versus CC as of August 31, 2014  
December 2020 / December 2021 In-service (36 Month Delay) Scenario  
“Break-Even Cost to Complete”**

(In 2016 Dollars)

(Maximum Capital Costs to Complete the Facility and Remain Economic)

Fuel \ CO <sub>2</sub>	Existing CO <sub>2</sub>	Moderate CO <sub>2</sub>	Substantial CO <sub>2</sub>
High	\$7,505,000,000	\$7,202,000,000	\$8,222,000,000
Restrained	\$6,117,000,000	\$6,384,000,000	\$7,441,000,000
Moderate	\$4,879,000,000	\$5,690,000,000	\$6,289,000,000
Low	\$3,758,000,000	\$5,143,000,000	\$5,630,000,000

If the value is higher than this scenario’s estimated cost to complete of \$3.4 billion of in-service and construction financing costs, the Facility benefits customers.

**Table 14.5**

**Relative Savings of the Facility versus CC as of August 31, 2014  
December 2021 / December 2022 In-service (48 Month Delay) Scenario  
“Break-Even Cost to Complete”**

(In 2016 Dollars)

(Maximum Capital Costs to Complete the Facility and Remain Economic)

Fuel \ CO <sub>2</sub>	Existing CO <sub>2</sub>	Moderate CO <sub>2</sub>	Substantial CO <sub>2</sub>
High	\$7,457,000,000	\$7,162,000,000	\$8,190,000,000
Restrained	\$6,138,000,000	\$6,384,000,000	\$7,429,000,000
Moderate	\$4,937,000,000	\$5,704,000,000	\$6,308,000,000
Low	\$3,811,000,000	\$5,147,000,000	\$5,639,000,000

If the value is higher than this scenario’s estimated cost to complete of \$3.8 billion of in-service and construction financing costs, the Facility benefits customers.

**Economic Analysis Conclusion / Summary of Results**

In summary, all scenario studies indicate that the Facility would remain economic despite the additional costs associated with the delay scenarios. In the delay scenarios, the Facility remains less costly than the next best fuel alternative and will continue to benefit customers. These scenarios do not represent the Company’s projection for the ultimate outcome of the project but instead represent the delay scenarios ordered by the Commission in the Eighth VCM proceeding.

15. **The Company will be under a continuing obligation to supplement its response to PIA Staff DR STF-TN-1-2 by ensuring that the financing data reflected in the schedules attached to that DR response reflect the most current and updated information at the time of each semi-annual monitoring report. In addition, the Company will provide the most current information shared with each of the Rating Agencies.**

Simultaneous with this filing, the Company has filed supplemental PIA Staff DR STF-TN-1-2, and has included in that filing the most current information shared with each of the Rating Agencies.