DIRECT TESTIMONY

OF

KEVIN B. MARSH

ON BEHALF OF

SOUTH CAROLINA ELECTRIC & GAS COMPANY

DOCKET NO. 2016-223-E

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND POSITION.
A. My name is Kevin Marsh and my business address is 220 Operation Way, Cayce, South Carolina. I am the Chairman and Chief Executive Officer of SCANA Corporation ("SCANA") and South Carolina Electric & Gas Company ("SCE&G" or the "Company").

Q. DESCRIBE YOUR EDUCATIONAL BACKGROUND AND BUSINESS EXPERIENCE.
A. I am a graduate, magna cum laude, of the University of Georgia, with a Bachelor of Business Administration degree with a major in accounting. Prior to joining SCE&G, I was employed by the public accounting firm of Deloitte, Haskins & Sells, now known as Deloitte & Touche, L.L.P. I joined SCE&G in 1984 and, since that time, have served as Controller, Vice President of Corporate Planning, Vice President of Finance, and Treasurer. From 1996 to 2006, I served as Senior Vice President and Chief Financial Officer ("CFO") of SCE&G and SCANA. From 2001-2003, while serving as CFO of SCE&G and SCANA, I also served as
President and Chief Operating Officer of PSNC Energy, a SCANA subsidiary, in North Carolina. In May 2006, I was named President and Chief Operating Officer of SCE&G. In early 2011, I was elected President and Chief Operating Officer of SCANA, and I became Chairman and Chief Executive Officer of SCANA on December 1, 2011.

Q. HAVE YOU EVER TESTIFIED BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA (“COMMISSION”)?
A. Yes. I have testified in a number of different proceedings.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?
A. In the Petition, the Company requests that the Commission approve an updated construction schedule and schedule of forecasted capital costs for the project to construct V.C. Summer Nuclear Units 2 and 3 (the “Units”). Those schedules are based on the October 27, 2015 Amendment (the “Amendment”) to the Engineering, Procurement and Construction Agreement (the “EPC Contract”) under which the Units are being built. My testimony explains the unique commercial opportunity that led to the negotiation of that Amendment and certain key terms that we were able to secure from Westinghouse Electric Company, LLC (“Westinghouse”) at that time. I also support the request contained in the Petition that the Commission approve the exercise of the option granted in the Amendment to transfer nearly all the remaining scopes of work to be done under the EPC Contract to the Fixed Price category as that term is used in the EPC Contract. I also
discuss the value of the Units to SCE&G’s customers and to its plan for creating a balanced generation portfolio to supply its customers’ electric demands for the coming years.

Q. WHAT OTHER WITNESSES ARE PRESENTING DIRECT TESTIMONY ON BEHALF OF THE COMPANY?

A. The other witnesses presenting direct testimony on behalf of the Company are Mr. Stephen A. Byrne, Mr. Jimmy E. Addison, Mr. W. Keller Kissam, Dr. Joseph M. Lynch, and Mr. Kevin R. Kochems.

1. Mr. Byrne is the President for Generation and Transmission and Chief Operating Officer of SCE&G. His testimony reviews the current status of the construction of the Units. He presents the updated construction schedule that incorporates the new Guaranteed Substantial Completion Dates (“GSCDs”) for the Units and analyses of the key provision of the Amendment. His testimony also discusses the transition from Chicago Bridge & Iron (“CB&I”) to Fluor Corporation (“Fluor”) as construction manager for the project. Mr. Byrne further testifies concerning the most significant change orders that are incorporated in the updated cost schedules for the Units as well as the changes in Owner’s costs associated with the Amendment.

2. Mr. Addison is Executive Vice President and Chief Financial Officer for SCANA and SCE&G. He will testify concerning the reaction of the financial markets to the project and to the Amendment, SCE&G’s experience in financing the
Units and how this proceeding fits within the structure of the Base Load Review Act ("BLRA").

3. Mr. Kissam is President, Retail Operations for SCE&G. Mr. Kissam will provide an update on the construction of transmission facilities needed to integrate the Units onto SCE&G’s grid and to deliver the power from them safely and reliably to customers.

4. Dr. Lynch is Manager of Resource Planning at SCANA. He will testify concerning two studies. One is a sensitivity study showing that under the great majority of foreseeable circumstances, exercising the option to transfer nearly all the remaining scopes of work under the EPC Contract to the Fixed Price cost category will reduce the cost of the project to SCE&G’s customers and its partner, Santee Cooper. The second study updates previous studies showing that even considering historically low natural gas prices, completing the Units remains the lowest cost option for meeting the future generation needs of SCE&G’s customers.

5. Mr. Kochems is Manager of Nuclear Financial Administration at SCANA. He sponsors the current capital cost schedule for the project and presents accounting, budgeting and forecasting information supporting the reasonableness and prudency of the adjustments in cost forecasts. Mr. Kochems also testifies in further detail concerning change orders contained in the current cost forecasts and the key drivers of the changes in the Owner’s cost forecast.

All Company witnesses testify in support of the reasonableness and prudence of the updated construction schedule and the related schedule of capital costs it
represents. From my knowledge of the project and my perspective as SCE&G’s Chief Executive Officer, I can affirmatively testify, as I have testified in prior proceedings, that SCE&G is performing its role as project owner in a reasonable, prudent, and cost-effective manner. The other witnesses are providing similar testimony about the project from their particular areas of expertise.

Q. PLEASE PROVIDE AN OVERVIEW OF THE REGULATORY HISTORY OF THE PROJECT.

A. In 2005, SCE&G began to evaluate alternatives to meet its customers’ need for additional base load capacity in the coming years. In this evaluation, the Company took account of its aging fleet of coal-fired units, the volatility in global fossil-fuel markets, and the increasingly stringent environmental regulations being imposed on fossil-fuel generation. In its evaluation, the Company sought proposals from three suppliers of nuclear generation units. The evaluation of all alternatives resulted in the Company signing an EPC Contract on May 23, 2008, after two and one-half years of negotiations. The EPC Contract was with a consortium (the “Consortium”) comprising Westinghouse and the Shaw Group, which was subsequently acquired by CB&I.

On May 30, 2008, the Company filed a Combined Application under the BLRA seeking review by the Commission and the South Carolina Office of Regulatory Staff (“ORS”) of the prudency of the project and the reasonableness of the EPC Contract. The cost schedule presented to the Commission in 2008 also included a reasonable forecast of owner’s contingency for the project. SCE&G’s
share of the total anticipated cost was $6.3 billion in future dollars.¹ In December 2008, the Commission held nearly three weeks of hearings and took evidence from 22 expert witnesses about the project, the contractors, the EPC Contract and risks of construction.

Q. **WHAT WAS THE RESULT OF THOSE PROCEEDINGS?**

A. On March 2, 2009, the Commission issued Order No. 2009-104(A) approving the prudency of the project and the schedules presented by the Company. The South Carolina Supreme Court reviewed the Commission’s determinations and ruled that “based on the overwhelming amount of evidence in the record, the Commission’s determination that SCE&G considered all forms of viable energy generation, and concluded that nuclear energy was the least costly alternative source, is supported by substantial evidence.” *Friends of Earth v. Pub. Serv. Comm’n*, 387 S.C. 360, 369, 692 S.E.2d 910, 915 (2010). In a related case, *S.C. Energy Users Comm. v. S.C. Pub. Serv. Comm’n*, 388 S.C. 486, 697 S.E.2d 587 (2010), the Court ruled that costs which were not identified and itemized to specific expense items—specifically, owner’s contingency costs—could not be included in the Commission-approved cost schedule for the Units. In denying contingencies, the Court recognized that the BLRA allows the Company to return to the Commission to seek approval of updates in cost and construction schedules as the Company is doing here.

¹ Unless otherwise specified, all cost figures in this testimony are stated in 2007 dollars and reflect SCE&G’s share of the cost of the Units.
Q. PLEASE DESCRIBE THE COST AND SCHEDULE UPDATES SINCE ORDER NO. 2009-104(A) WAS ISSUED.

A. Since 2009, SCE&G has appeared before the Commission four times to update the cost and construction schedules for the Units.

1. In 2009, the Commission updated the construction schedule to reflect a site-specific integrated construction schedule for the project which the Consortium had recently completed. The 2009 update changed the timing of cash flows for the project, and did not change un-escalated costs in 2007 dollars. However, due to changes in escalation, the total forecasted cost for the Units in future dollars increased from $6.3 billion to $6.8 billion.

2. A 2010 update removed un-itemized owner’s contingency from the cost schedule in response to the decision in S.C. Energy Users Comm. v. S.C. Pub. Serv. Comm’n, supra. The Company also identified approximately $174 million in costs that previously would have been covered by the owner’s contingency. The approved cost of the project dropped from $6.8 billion to $5.8 billion in future dollars.

3. In 2012, the Commission updated the capital cost forecasts and construction schedule. The cost forecasts were based on a settlement between SCE&G and the Consortium for cost increases associated with:

   a. The delay in the Combined Operating License (“COL”) issued by the Nuclear Regulatory Commission (the “NRC”);
b. Westinghouse’s redesign of the AP1000 Shield Building;

c. The redesign by the Consortium of certain structural modules to be used in the Units; and

d. The discovery of unanticipated rock conditions in the Unit 2 Nuclear Island (“NI”) foundation area.

The Commission also updated the anticipated cost schedules to reflect more detailed operations and maintenance planning; new safety standards issued after the Fukushima event; several specific EPC Contract change orders and other matters. The anticipated cost for the Units, however, remained relatively unchanged due to an off-setting decline in escalation rates. The South Carolina Supreme Court affirmed the resulting order in all respects. *S.C. Energy Users Comm. v. S.C. Elec. & Gas*, 410 S.C. 348, 764 S.E. 2d 913 (2014).

4. In 2015, the Commission updated the construction and cost schedules to reflect new completion dates for the Units of June 19, 2019, and June 16, 2020, and an updated construction cost estimate of $6.8 billion in future dollars. No party appealed this order.

Chart A, below, summarizes the history of these adjustments.

[Chart A begins on the following page]
**Q. PLEASE DESCRIBE THE ELEMENTS OF THE INCREASE IN THE CAPITAL COST FORECAST AND CONSTRUCTION SCHEDULE FOR THE UNITS THAT ARE PRESENTED IN THE PETITION.**

**A.** The changes proposed in the Petition fall into four principal categories:

a. Changes in construction schedule and costs associated with the Amendment and with exercise of the option to transfer nearly all remaining scopes of work to the Fixed Price cost category under the EPC Contract;

b. Updated Owner’s costs associated with new GSCDs for the Units, certain Unit 2 and 3 switchyard costs and other changes principally associated with the changes in the project due to the Amendment; and

c. Costs associated with eleven change orders that were not resolved through the Amendment.
These cost forecasts also reflect the reversal of the liquidated damages credits that were included in the prior capital cost schedule approved by Order No. 2015-661. The Amendment substitutes a new schedule of liquidated damages that are tied to the new GSCDs.

Chart B shows the breakdown of the changes in capital cost that are reflected in the Petition:

| CHART B |
|-----------------|--------|
| **SUMMARY OF COST ADJUSTMENTS ($000,000)** |        |
| EPC Contract Cost |        |
| 1 Amendment | 137.5 |
| 2 Fixed Price option | 505.5 |
| 3 Liquidated Damages (LDs) (Reverse Credit) | 85.5 |
| 4 Change Orders | 52.5 |
| 5 Total EPC Cost Changes | 781.1 |
| Owner’s Costs |        |
| 6 Principally Associated with Amendment | 20.8 |
| 7 Total Request (EPC and Owner’s Costs) | 801.9 |
| 8 Escalation | 2.3 |
| 9 AFUDC | 42.4 |
| 10 Increase in Gross Construction Cost (Current $) | 846.6 |

Note: Totals may not add due to rounding
Q. HOW DOES THE CURRENT ANTICIPATED COST OF THE PROJECT
COMPARE TO THE ORIGINAL ANTICIPATED COST OF THE
PROJECT?

A. As shown in Chart A, the current anticipated capital cost of the project has
increased by $1.361 billion in future dollars compared to the original anticipated
cost of the project approved in Docket 2008-196-E.

THE 2015 EPC CONTRACT AMENDMENT

Q. PLEASE DESCRIBE THE EVENTS LEADING UP TO THE SIGNING OF
THE AMENDMENT TO THE EPC CONTRACT.

A. Over the last several years, SCE&G and its partner, Santee Cooper, have put
increasing pressure on the Consortium to improve construction efficiencies and
correct supply chain problems particularly as related to submodule fabrication and
fabrication of other components. Initially, we sought to increase pressure on the
Consortium through techniques such as increased Quality Assurance and Quality
Control (QA/QC) staffing and heightened levels of QA/QC inspections and audits
on-site and at key suppliers’ locations worldwide. SCE&G posted full-time QA/QC
inspectors at the most important suppliers’ off-site facilities. We conducted regular
oversight meetings with the Consortium. We regularly and very emphatically
escalated issues of concern to senior levels within the Consortium and followed up
on those issues. We were supported in this effort by our partner, Santee Cooper,
and Southern Nuclear Company (“SNC”) which is constructing two AP1000 units at its Vogtle site in Georgia.

However, in the years leading up to the Amendment negotiations, we became increasingly frustrated with the results the Consortium was achieving. In July 2014, we began to withhold large payments for calendar-based EPC payments where we did not believe sufficient progress had been made to support the amount of the required payments. We also returned invoices unpaid where they reflected additional costs caused by delay or other inefficiency (like additional storage and maintenance cost for equipment stored on site).

Furthermore, under the EPC Contract, SCE&G and Santee Cooper were required to pay actual prices for Craft Labor and supporting indirect labor (i.e., on-site labor to support direct craft workers) and associated materials and supplies. As the project progressed, we became very concerned with poor labor productivity and poor efficiency ratios for indirect labor costs. In June 2015, we began re-computing invoices for these expenses as if the project had met projected productivity and efficiency factors on which earlier project budgets had been based. We disputed the amounts that exceeded the recomputed invoices based on the assertion that the failure to meet the initial projections constituted a failure to use “Good Industry Practices” as required by the EPC Contract. The Consortium countered that the additional costs were the inevitable result of the first-of-a-kind nature of the Units, the lack of a mature nuclear supply chain for new construction at the start of the project, and the cost of building nuclear units under the new NRC regulatory
structure which requires strict adherence to the letter of pre-approved design
documents, and formal license amendment requests to justify even minor
deviations. The Consortium asserted its right to payment on these grounds. We
nonetheless held our position.

In our last proceeding before this Commission, we committed to you that we
would continue to negotiate with the Consortium to reduce these costs and to resolve
these matters. After the July 2015 BLRA update hearing, we continued our efforts
to negotiate a resolution with the Consortium. At that time, it became increasingly
apparent that disagreements between Westinghouse and CB&I were impeding our
attempts to negotiate a settlement with them jointly. In our discussions, we sensed
a distinct lack of cooperation and agreement between the Consortium partners. It
became obvious to us that there were commercial disputes between those two
companies that were causing relationships to deteriorate. But because the
Consortium documents are confidential to us, we did not have a window into those
disputes. However, it was clear that the Consortium was not unified in addressing
the challenges facing the project.

Outside of our direct negotiations with the Consortium, it became clear that
the Consortium partners were in dispute about key matters, such as who was
responsible to pay for the schedule mitigation plans of certain subcontractors and
who would pay the subcontractors’ costs for making late-in-the-process design
changes in certain components and submodules. These disputes were threatening
efforts to maintain and improve the project schedule.
During the first week of September 2015, Westinghouse and CB&I requested a meeting with us and Santee Cooper. At the meeting, CB&I communicated to us its desire to exit the project and refocus its business on other areas. Under its new direction, CB&I would continue to offer nuclear maintenance and refueling services to the industry, but they no longer wanted to be in the nuclear-power-plant construction business. CB&I further stated its belief that the negotiations between the Consortium, SCE&G and Santee Cooper had stalled and we were headed toward litigation over the costs that SCE&G and Santee Cooper were disputing. The Consortium representatives told us that the litigation related to the two AP1000 units SNC is constructing at the Vogtle site in Georgia had been very expensive, time-consuming, and distracting to the orderly progress of the project. CB&I expressed its belief that it would be in the best interest of all parties if CB&I were to exit the project and a different path forward could be found.

At that juncture, Westinghouse and CB&I told us that they had tentatively resolved their internal disputes through an agreement which would allow CB&I to exit the Consortium. As they explained further, for CB&I to exit the Consortium, SCE&G, Santee Cooper, SNC and the other owners of the Vogtle project, would need to agree to release CB&I from its parental guarantees to the AP1000 projects. As part of the agreement, Toshiba, as the parent company of Westinghouse, would remain responsible for the full parental guarantee for the projects.

At that point, CB&I was excused from the meeting, and SCE&G and Santee Cooper continued the meeting with Westinghouse. Westinghouse explained the
value of the AP1000 unit to its business plans and its need to successfully complete
our project and the Georgia project to protect their opportunities to market the
AP1000 unit in the United States and around the world. To that end, Westinghouse
told us that they had negotiated with CB&I for the purchase of Stone & Webster
and all of its nuclear construction assets. Stone & Webster is the specific corporate
entity within CB&I that holds CB&I’s membership in the Consortium.

Westinghouse further explained that Fluor had expressed an interest in
developing a long-term business relationship with Westinghouse related to AP1000
projects and other nuclear construction. Once the acquisition of Stone & Webster
was complete, Westinghouse said that it planned to engage Fluor as a subcontractor
to Westinghouse to manage the two existing U.S. construction projects.

This was very welcome news to us. Fluor is a company with deep South
Carolina roots and is imminently respected for its ability to manage electric
generation construction projects and other mega-projects. As Mr. Byrne will testify,
SCE&G has had extensive and very positive experience with Fluor.

Q. WHAT OPPORTUNITY DID SCE&G SEE TO ADVANCE THE
INTERESTS OF ITS CUSTOMERS IN THESE NEGOTIATIONS?

A. As I described earlier, for Westinghouse and CB&I to proceed with their
plans, it was necessary for SCE&G and Santee Cooper to provide a release of the
CB&I parental guarantee of the EPC Contract. At this point, we realized we had a
unique, short-term opportunity to negotiate significant benefits for our customers.
Clearly, part of that negotiation needed to be a resolution of the existing contractual disputes so that CB&I could exit the project. But we also saw the opportunity to push for other changes in the EPC Contract to reduce price risk, reduce opportunities for future disputes, and focus Westinghouse very clearly on the need to finish the Units in a timely manner. All of these things, along with the restructuring of the Consortium, would provide great value to our customers.

From the first week of September 2015 until we announced our agreement to amend the EPC contract on October 27th, the senior leadership team of SCE&G and Westinghouse were involved in intensive negotiations. They often lasted more than 12 hours a day, and often carried through seven days a week. We were in constant communication with our partner, Santee Cooper. These were complex negotiations in which multiple parties had to reach an agreement simultaneously.

Q. PLEASE DESCRIBE SEVERAL OF THE KEY POINTS BENEFITING YOUR CUSTOMERS THAT YOU WERE ABLE TO NEGOTIATE WITH WESTINGHOUSE.

A. Mr. Byrne will testify as to the specifics of what was negotiated. Three principal benefits stand out.

**New Liquidated Damages:** The federal tax credits that are available to the project are worth a total of $2.2 billion to customers. Both of our plants must produce power before the end of 2020 to qualify for the full amount of these credits. The GSCD for Unit 2 is now 16 months ahead of that deadline and the GSCD for
Unit 3 is four months ahead of it. These are tight windows, so we wanted to focus Westinghouse very keenly on meeting these deadlines.

In the negotiations, we secured from Westinghouse new liquidated damages that are four times larger than those contained in the original EPC Contract. Westinghouse is now at risk for up to $371.8 million or $185.9 million per Unit. The prior contract included a capacity bonus that would have been paid to Westinghouse if the Units were able to produce more power than was contractually guaranteed as measured by production during the first 18 months of operation. We were able to eliminate that capacity bonus. The new completion incentives are tied directly to the receipt of the federal Production Tax Credits for the Units.

**Price Certainty:** The EPC Contract contains four categories of prices. A Target Price applies in categories where SCE&G pays the Consortium’s actual cost for labor, services and materials provided. These categories include direct and indirect construction labor. The Time and Materials category includes the costs of material and services that Westinghouse provides to support SCE&G in its role as the Owner of the project with responsibility for things like license fees, sales taxes, import duties, and stocking of spare parts. Firm Price items have prices that are fixed in 2007 dollars but are subject to escalation at stated or indexed rates. Costs in the Fixed Price category are fixed without escalation or other adjustment apart from change orders.

Westinghouse did not initially present us with a Fixed Price option, but during the negotiation we asked them, “What would it cost us to fix the remaining
costs on the project?” We were successful in the resulting negotiations and obtained the right to transfer the remaining costs in the Target, Time and Materials and Firm categories to the Fixed Price category. This right applies to invoices to be paid after June 30, 2015. Future change orders would be in addition to these amounts. The only exception is approximately $38.3 million in Time and Materials costs which SCE&G believes it can more economically manage itself rather than have Westinghouse set a price.

The resulting cost increase, in future dollars, is approximately $505.5 million. We think that was a very good result for our customers because it minimizes SCE&G’s exposure to future cost increases and shifts multiple categories of price risk to Westinghouse.

Mr. Byrne and Dr. Lynch provide detailed testimony concerning the value of the Fixed Price option and the magnitude of likely savings it will provide for our customers over the remaining life of the project. With Santee Cooper’s authorization in hand, we executed the option documents on July 1, 2016, subject to Commission approval in this proceeding. In making the decision that SCE&G would proceed to exercise the Fixed Price Option, my management team and I carefully evaluated the same data and information that is referenced in the Company’s testimony in this proceeding. We concluded that it convincingly confirmed the value of executing the option.

**Reduction in Future Disputes:** Resolving current disputes with the Consortium is important. But limiting the opportunity for future disputes that might
disrupt the project is equally as important. The Fixed Price option has reduced the
opportunities for disputes by providing a clearly stated price for the remaining work.
In addition, calendar-based payments are being eliminated. Going forward, the
payment of these Fixed Price invoices will be tied to Westinghouse accomplishing
specific construction milestones. The combination of these two changes will greatly
reduce the likelihood of disputes over future invoices.

Westinghouse may still be entitled to change orders where changes are
directed by SCE&G and Santee Cooper as the Owner, or are the result of changes
in circumstances beyond Westinghouse’s control. This is very common in EPC
contracts for large projects. Several categories of uncontrollable circumstances are
listed in the EPC Contract. Change in law, which includes changes in regulation, is
one of those categories. Several major commercial disputes have been due to
Westinghouse trying to take a very expansive view of what constitutes a change in
law or regulation. SCE&G has resisted that interpretation.

To avoid future disputes, the Amendment establishes that to justify a change
order, a change in law or regulation must be embodied in a formal, written
regulatory pronouncement, not in an interpretation or ad hoc NRC staff
determination. This may seem like a small change, but it will go a long way to
reduce future disputes. Similarly, the Amendment also makes it clear that all
changes in the design of the AP1000 unit, up to and including the 19th revision to
the Design Control Documents (DCD Rev.19), which was issued in 2011, are not
the subject of potential change orders. In addition, the creation of a dispute
resolution board, and the elimination of the right to bring suit on any disputes until after the project is complete, further reduces the likelihood that future disputes will distract or derail the project. Together, these changes will make the commercial aspects of the project much easier to manage going forward.

Effectively and efficiently managing a project of this magnitude requires candid and transparent communication between all of the parties on the site and in the supply chain. People across the project need to be able to raise difficult issues and discuss them openly. When commercial disputes and the risk of litigation hang over a project, they stifle the candor and transparency needed for success. In negotiating the Amendment, we sought to reduce the likelihood of future disputes and dispel entirely the threat of litigation while the project was on-going. The terms we were able to obtain will greatly improve our ability to successfully manage this project going forward which in turn will create enormous benefits for the project and our customers.

Q. WHAT DID SCE&G PAY FOR ALL OF THESE BENEFITS?

A. The increase in EPC Contract cost that was required to secure all of these benefits and to resolve practically all outstanding disputes between the parties was $137.5 million. As Mr. Byrne and Mr. Kochems testify, we have computed a reasonable estimate of the value to the Consortium of the quantifiable claims that the Amendment resolved. The value of the Consortium’s quantifiable claims, net of a reasonable estimate of the value of our claims against the Consortium, is $224.4 million. In making this calculation, we did not estimate the value of claims by the
Consortium against us which were not readily quantifiable based on the information available from the Consortium. For that reason, the $224.4 million figure only quantifies the value of 12 of the 30 specific change order requests or other commercial issues that were listed on Exhibit A to the Amendment. In addition, at the time of the negotiations, Westinghouse had issued 35 additional notices of change or other claims that were not included among the 30 items specifically listed in Exhibit A. The potential value of these claims was significant and would increase the value of the Consortium’s claims against us if they were quantified. However, because we did not have data to definitively quantify these claims, they were not assigned a value in our computation.

Q. GIVEN THAT CHANGE ORDERS REMAIN POSSIBLE UNDER THE OPTION, WHY DO YOU REFER TO THIS AS A FIXED PRICE OPTION?

A. Referring to this as a Fixed Price option follows the language used in the EPC Contract and the Amendment. The Amendment specifically grants us the option to transfer practically all remaining EPC costs to the “Fixed Price” cost category. This language is in keeping with standard nomenclature in the construction industry. A fixed price contract does not mean a contract where change orders entitling the contractor for additional compensation for uncontrollable circumstances are disallowed. Such change orders are an accepted feature of fixed price provisions in large construction contracts.
Q. WHERE DO THINGS STAND TODAY WITH REGARD TO THE FIXED PRICE OPTION?

A. Eight months have elapsed since we negotiated the option. During that time, NND staff, supported by the Santee Cooper staff and SNC personnel, have worked closely alongside Fluor to evaluate the project work flows and review the mitigation plans that will be required to meet the construction schedule for the Units. Those mitigation plans will involve expanding the production capabilities at component suppliers, increasing the work force on site in Jenkinsville, adding overtime, and adding a full night shift with over 1,000 workers. These mitigation plans will come at a cost, particularly in additional direct and indirect labor expenses over the life of the project. But for the option, those expenses would be Target Price costs and would be passed directly on to us.

As Mr. Byrne and Dr. Lynch will testify, based on what we have learned during the months since the Amendment was signed, and based on careful analysis of likely cost shifts, we believe it is very much in our customers’ interests that we execute the option to fix certain prices within the EPC Contract. Fixing these costs will bring great value to the project and to our customers. For that reason, on May 24, 2016, we gave notice to Westinghouse that SCE&G intended to exercise the option to move substantially all EPC Contract cost into the Fixed Price category. On June 30, 2016, we received formal authorization from Santee Cooper’s board to execute the option and immediately gave notice to Westinghouse as the Amendment requires. Regulatory approval by the Commission is also a condition of the option
and Santee Cooper has conditioned its authorization to exercise that option on that approval.

**BENEFITS FROM CONSTRUCTING THE UNITS**

Q. **PLEASE EXPLAIN THE BENEFIT TO SCE&G’S SYSTEM AND CUSTOMERS FROM CONTINUING CONSTRUCTION OF THE UNITS.**

A. SCE&G and Santee Cooper decided to build these Units to capture the value of adding 2,234 MW of efficient and non-emitting, base-load generation to serve the people of South Carolina. With the Units in service, SCE&G projects that it will have reduced its 2021 carbon dioxide ("CO₂") emissions by 54% compared to their 2005 levels, and 34% compared to 1995 levels. Chart C shows the forecasted reduction in CO₂ emissions in millions of tons.

[Chart C begins on the following page]
There have also been immediate environmental benefits from the decision to build the Units. In 2008, the Company committed to evaluate whether building the Units might allow it to retire smaller coal units. The Company has followed through on this commitment. Since 2008, SCE&G has retired or converted to natural gas 730 MW of smaller coal generating facilities. Canadys Units 1, 2 and 3 have been taken out of service. Urquhart Unit 3 has been converted to gas generation only. McMeekin Units 1 and 2 have been repowered with natural gas as of April 15, 2016. They may be taken out of service altogether when the Units come on line. SCE&G plans to bridge the gap between these retirements and the completion of the new nuclear Units through interim capacity purchases.
Q. HOW DOES THE ENVIRONMENTAL PROTECTION AGENCY’S (“EPA”) CLEAN POWER PLAN AFFECT THE VALUE OF THE UNITS?

A. EPA’s proposed Clean Power Plan was issued in June 2014. The accompanying Clean Power Plan regulations were published on August 3, 2015, but were stayed by order of the United States Supreme Court pending judicial review.

The Clean Power Plan is based on Section 111(d) of the Clean Air Act which governs existing generating units. In that plan, EPA has computed a target carbon intensity rate for each state’s fleet of existing large power plants. The Clean Power Plan leaves it to the states to decide how to achieve mandated reductions and how to allocate those reductions among plant operators.

Under the Clean Power Plan as originally proposed, EPA treated the Units as if they were fully operational during the baseline year of 2012, providing carbon-free generation at a 90% capacity factor. EPA then computed carbon emission reduction targets for South Carolina based on that artificially reduced level of baseline emissions. SCE&G, Santee Cooper, the Electric Cooperatives of South Carolina, Inc., Central Electric Cooperative, Inc., and others sought to have this changed so that the reductions in carbon emissions from the Units would be available to be counted as part of the State’s action plan for meeting its carbon reduction targets. This approach was consistent with SCE&G’s purposes and justification for building the Units and the Commission’s acceptance of that justification as reflected in Order No. 2009-104(A). The Commission’s language in Order No. 2009-104(A) was key for supporting the South Carolina position with
EPA. Using that language, a broad-based effort by South Carolina’s public, private and electric cooperative energy providers, elected officials and business leaders was successful in convincing EPA to reverse its original position. EPA’s change in position provided a major benefit for all of the people of the State of South Carolina. If the Clean Power Plan is implemented as currently formulated, the construction of the Units will reduce CO₂ compliance costs for the State dramatically.

Q. WHAT ARE THE SPECIFIC LIMITS BEING PROPOSED FOR SOUTH CAROLINA?

A. That target carbon intensity rate is expressed in pounds of carbon per megawatt hour of electricity generated (lb/MWh). EPA is proposing that South Carolina reduce its discharges from its actual 2012 carbon intensity of 1,791 lb/MWh to 1,156 lb/MWh, a 35% reduction. Compliance would be phased-in beginning in 2022. How these statewide targets will be allocated among generators is undecided. However, we believe that the new Units will make a decisive contribution to the ability of SCE&G and the State to comply with these goals.

Q. HOW DOES THE CLEAN POWER PLAN AFFECT THE VALUE OF THE UNITS TO SCE&G’S CUSTOMERS?

A. It is not clear how the proposed EPA regulations may change through litigation, or how the State will allocate the required reductions among affected power plant owners. However, for South Carolina to meet its targets efficiently, it will be critically important to complete the Units. There is no other source of non-emitting, dispatchable, base load power available to replace the generation
represented by the Units. Generation sources that produce any air emissions are now
under intense regulatory pressure. There is no reason to assume that this trend will
not continue over the long term. Adding non-emitting nuclear generation has
tremendous value in the current environmental context to all electric customers in
the State.

Q. WHAT ABOUT OTHER NON-EMITTING TECHNOLOGIES?

A. Solar and renewable resources and energy efficiency will play an
increasingly important role in SCE&G’s generation mix going forward. SCE&G
was an active participant in the group that formulated the South Carolina Distributed
Energy Resources (“DER”) Act and advocated the adoption of it. The Act sets
legislatively-approved targets for utility scale and customer scale DER installations
by January 1, 2021. Although it is now less than a year after the Commission
approved the Company’s initial DER programs, SCE&G has already signed
contracts or is finalizing contracts that will meet the full target for utility-scale DER
as soon as construction of the new solar farms they envision are complete. The
Company has also approved reservations for individual customer solar installations
that represent 25% of the customer-scale DER target.

The achievement of the legislatively-established DER goals is fully reflected
in all of our capacity and generation forecasts. The same is true of the energy
efficiency goals established in SCE&G’s Demand Side Management (“DSM”)
program as approved by this Commission. However, with current technologies,
renewable resources and energy efficiency cannot displace the need for reliable, dispatchable base load generation.

Because of EPA regulations limiting carbon discharges, it is practically impossible to permit new coal generation. The only dispatchable, base load alternative to nuclear generation today is combined-cycle natural gas generation. Natural gas generation involves lower levels of CO₂, NOₓ, and SOₓ emissions than coal. However, nuclear generation remains the only base load resource that is entirely non-emitting with respect to these air emissions.

**Q. WHAT IS SCE&G’S PLAN TO REDUCE ITS CO₂ EMISSIONS?**

**A.** As the Company’s witnesses testified in 2008, one of SCE&G’s long-term goals in choosing to use new nuclear generation was to create a system with a majority of its energy being supplied from non-emitting sources. Chart D shows how that plan stands today.

[Chart D begins on the following page]
In 2015, 24.5% of SCE&G generation of energy was from non-emitting facilities. (Approximately one-half of the Alternative Resources listed in Chart D are non-emitting. The remainder is biomass.) In 2021, which is the first full year that both Units 2 and 3 will be on line, we estimate that 60% of the energy serving SCE&G’s customers will come from non-emitting sources. SCE&G is on track to
achieve its goal to create a generating system with markedly reduced levels of CO₂ emissions and reduced exposure to the risk and costs associated with them.

Q. IN 2008, DIVERSIFICATION OF FUEL SOURCES WAS AN IMPORTANT GOAL FOR SCE&G. IS THAT TRUE TODAY?

A. The Company testified in 2008 that diversification of fuel sources was an important reason why adding nuclear generation would provide value to SCE&G’s customers. That continues to be the case today.

SCE&G’s current capacity mix is weighted 71% towards fossil fuel, with coal representing 33% of that capacity, and natural gas representing 38%. In large part because of the addition of nuclear generation, SCE&G will have a well-balanced generation system in 2021 with 26% of its capacity in coal units, 30% of its capacity in natural gas units, 29% of its capacity in nuclear units and 15% of its capacity in hydro/biomass/solar facilities. In 2021, the three principal fuel sources, nuclear, coal and natural gas, will each represent a significant and balanced component of capacity. Chart E shows this capacity mix in a graphic form.

[Chart E begins on the following page]
Creating this balanced mix of capacity will give SCE&G operating flexibility to respond to changing market conditions and environmental regulations. I am not aware of a cost effective way today to create this long-term flexibility other than by adding new nuclear capacity. This is particularly true now that adding new coal
capacity is no longer feasible. If SCE&G were to meet its 2020-2021 base load generation needs by adding new natural gas generation, then fossil fuels (natural gas, oil, and coal) would account for approximately 75% of SCE&G’s generation in 2021, with gas alone representing 49% of its generation. Given the increasing environmental pressures on coal and the technological limitations on relying on renewables for base load capacity, under any reasonable scenario the system’s reliance on natural gas is likely to go up steadily in the years following 2021. Without the new nuclear capacity represented by the Units, SCE&G’s system would likely be locked into a significantly unbalanced generation portfolio with increasing reliance on natural gas generation today and in the decades to come.

On the other hand, adding nuclear capacity creates a balanced generation portfolio. As was the case in 2008, this continues to be an important reason that building these Units provides value to our customers.

Q. DO CURRENT LOW NATURAL GAS PRICES CHANGE THE VALUE THAT THE UNITS WILL PROVIDE TO CUSTOMERS?

A. Hydraulic fracturing, or “fracking,” has reduced the cost and increased the supply of natural gas. This will likely be the case for some years in the future. However, there are efforts underway to limit fracking based on environmental concerns. Predictions of future natural gas prices are notoriously unreliable over the long-term and can be impacted by many factors. The planning horizon for determining the value of a nuclear unit is 60 years or more. The lesson of history is that fossil fuel prices will change dramatically and unexpectedly over that long a
time. Therefore, prudent utility generation plans seek to create balanced systems
that can respond as prices fluctuate over time and are not overly dependent on any
one fuel source. As discussed above, that is what SCE&G’s generation plan seeks
to do.

Volatility has been the hallmark of natural gas prices over the course of my
career in the energy industry. I am unaware of any reason that would cause me to
believe that the volatility of natural gas has the potential to change or that gas prices
will not be equally volatile over the 60 years or more that the Units will be in service.

At present, low prices are leading to increasing reliance on natural gas as a
fuel throughout our economy. There are limits to the amount of new load that can
be met economically through renewables, and those limits will one day be reached.
Practically all new base-load demand is being met through a single fuel, natural gas.
Moreover, low domestic prices and political risks related to supplies of Russian
natural gas to Europe and the Baltic States are leading to increased natural gas
exports in the form of liquefied natural gas (“LNG”). World markets continue to
value exportable LNG at approximately double the domestic price of natural gas in
the United States. Low natural gas prices are resulting in reduced drilling for new
sources of supply which eventually will limit supply.

It is difficult to determine how long natural gas prices can remain so low. But
there is every reason to expect that U.S. natural gas prices may begin to respond in
the coming years to the pressures of increased domestic demand, reduced drilling
and exploration activity, increased LNG exports and potential environmental limits
on the industry. When that happens, natural gas prices may look quite different than they do today.

Furthermore, gas supplies are not economically relevant if they cannot be delivered to the plants and customers that need them. A record number of new pipeline projects have been proposed to supply fracked gas to the markets where it is needed. These projects are attracting intense and well organized opposition from environmentalists and landowners. Several important projects have been abandoned. This level of opposition will limit effective gas supply and raise delivery prices which are a significant component of the burner-tip price of natural gas. If they are completed, the cost of these projects will greatly increase the cost of new gas transportation capacity.

SCE&G continues to believe that over the long planning horizon that is involved when procuring base load generation units, the unbalanced reliance on any single fuel source is dangerous from both a cost and a reliability standpoint. In past BLRA proceedings, I have testified that over the long-term, fossil fuel prices will change unpredictably.

**Q. HOW ARE THESE ISSUES PLAYING OUT NATIONALLY?**

**A.** What I hear from my colleagues in the industry is that they are increasingly aware of the gap between their state’s environmental strategy and its generation strategy and that the gap is expanding.
Q. PLEASE EXPLAIN.

A. Across the country, environmental strategy is causing the early retirement of coal plants and pushing the industry into almost exclusive reliance on natural gas to replace them. In some cases, short-sighted market structures are causing early retirements of nuclear stations which adds to this problem. As a result, generation portfolios are becoming subject to highly concentrated risks related to the supply, costs and CO₂ impacts of natural gas. These risks include the regulatory and environmental risk associated with the extensive new pipeline infrastructure that must be built to deliver the natural gas supplies where they are needed. Furthermore, exclusive reliance on natural gas generation may be of increasingly limited value for reducing baseload CO₂ emissions long-term, particularly once the older coal plants available to be retired have been retired. It was interesting to note that these realizations seem to be causing some environmental groups to reassess the need to close existing nuclear plants. See the article in the Wall Street Journal, on June 16, 2016, “Environmental Groups Change Tune on Nuclear Power: Focus on climate change has raised profile of reactors, now viewed as reliable, carbon-free source of energy.”

For these reasons, there is increasing realization in the industry of the risks that result when generation portfolios become imbalanced in just the way that ours would have become imbalanced without construction of the Units. My counterparts in the industry are fully aware of the challenges of nuclear construction and the costs
involved. What is changing is that the long-term costs of not investing in nuclear are becoming more apparent as the industry evolves.

For these reasons, there is an increasing recognition that South Carolina and its regulatory structure have gotten it right. We are creating a balanced generation portfolio for this state which integrates our environmental and generation strategy by adding 2,234 MW of efficient and non-emitting, nuclear generation to the state’s base-load fleet. This is possible due in large part to South Carolina’s BLRA, a statute which has few counterparts nationwide. In addition, our DER statute provides a reasonable and well-structured path for adding additional solar and other alternative generation sources to our supply mix. It is a well-thought out statute that was drafted and adopted consensually, one of the few if not the only such statutes in the nation. Our DSM programs are providing for appropriate and significant investments in energy efficiency programs.

For these reasons, there is a growing recognition that South Carolina is on the path to achieve a level of alignment between environmental and generation strategy that is not seen in most states. We are increasingly seen by others as building our state’s energy infrastructure in the right way for the long-term.

Q. WHAT IS YOUR CONCLUSION AS TO THE VALUE THAT NEW NUCLEAR GENERATION BRINGS TO YOUR CUSTOMERS AND TO THE STATE OF SOUTH CAROLINA?

A. SCE&G continues to pursue the generation plan that it presented to this Commission in 2008. That strategy remains fundamentally sound. When SCE&G
came before the Commission in 2008, we presented a detailed overview of the risks and challenges of building a nuclear plant. We showed then that the benefits to our customers from new nuclear capacity far outweighed these risks and challenges.

We are now nine years into a thirteen year construction project. The project team has overcome many of the first-of-a-kind challenges presented by this project. Furthermore, the environmental imperatives of reducing CO₂ emissions are greater than ever. The risks of building a system with an imbalanced reliance on fossil fuels for dispatchable base load capacity is certainly no less than it was in 2008.

As Dr. Lynch testifies, the Company has updated its modeling of the cost of completing the Units compared to other alternatives. That modeling demonstrates that even with today’s low natural gas prices—which I believe are not sustainable over the long run—completing the Units remains the lowest cost alternative for meeting the pressing need of SCE&G’s customers for base load generating capacity. Accordingly, the financial benefits of completing the Units are clear.

In light of these facts, we believe that the logical and prudent choice is to proceed with the construction plan and apply the BLRA as written. As Mr. Addison will testify, the BLRA is the basis on which the project has been successfully financed to date. It will be the basis for all future financings. The BLRA is the basis on which SCE&G maintains the creditworthiness necessary to continue this project. Deviating from the consistent application of the BLRA would put the financial plan for completing the Units at grave risk. As a result, the financial community could deny SCE&G access to capital on reasonable terms, which would increase the cost
of the project to customers dramatically. Such a result could make completing the
Units financially impossible which would be a great loss to our customers, to our
partner, Santee Cooper, and to our state.

My senior management team and I are directly involved in the management
and oversight of the project and in interacting with Westinghouse and Fluor and
their senior leadership teams. We are dealing with the issues aggressively and at the
highest levels. The challenges we are facing are consistent with the risk we
identified in our filings in 2008. The important point is that these challenges do not
in any way outweigh the long-term benefits of adding this new nuclear capacity to
our system.

The construction phase we are in today is temporary. If we stay the course
with construction and with regulation, I am confident that the Units will be built and
will provide reliable, non-emitting base load power to our customers for 60 years or
more. It is my opinion based on 38 years of experience in this industry that the value
of the new nuclear capacity under construction today remains much greater than any
challenges we have encountered, or are likely to encounter during construction of
the project.

Q. WHAT ARE YOU ASKING THE COMMISSION TO DO?

A. SCE&G is asking the Commission to approve the updated cost forecast and
construction schedule for the Units as presented in the Petition in this matter and in
the testimony of Mr. Byrne and Mr. Kochems. SCE&G requests that the
Commission find that the Amendment reflects a reasonable and prudent revision of
the EPC Contract which the Commission reviewed and affirmed as reasonable and prudent in Order No. 2009-104(A). SCE&G requests the Commission to rule that the exercise of the Fixed Price option is reasonable and prudent and approve it as such. Moreover, SCE&G requests that the Commission find that SCE&G’s management and development of the project continues to be reasonable and prudent in all respects.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes. It does.