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BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA

COLUMBIA, SOUTH CAROLINA

HEARING #16-11554 OCTOBER 12, 2016 10:30 A.M.

DOCKET NO. 2016-223-E:

SOUTH CAROLINA ELECTRIC & GAS COMPANY – *Petition of South Carolina Electric & Gas Company for Updates and Revisions to Schedules Related to the Construction of a Nuclear Base Load Generation Facility at Jenkinsville, South Carolina*

TRANSCRIPT OF TESTIMONY AND PROCEEDINGS **VOLUME 3 OF 4**

HEARING BEFORE: Swain E. WHITFIELD, CHAIRMAN; Comer H. 'Randy' RANDALL, VICE CHAIRMAN; and COMMISSIONERS John E. 'Butch' HOWARD, Elliott F. ELAM, Jr., Elizabeth B. 'Lib' FLEMING, Nikiya M. 'Nikki' HALL, and G. O'Neal HAMILTON

ADVISOR TO COMMISSION: F. David Butler, Esq.
Senior Counsel

STAFF: Joseph Melchers, General Counsel; James Spearman, Ph.D., Executive Assistant to Commissioners; Philip Riley, Doug Pratt, Lynn Ballentine, and Tom Ellison, Advisory Staff; Jo Elizabeth M. Wheat, CVR-CM/M-GNSC, Court Reporter; and William O. Richardson, Deborah Easterling, and Calvin Woods, Hearing Room Assistants

APPEARANCES:

K. CHAD BURGESS, ESQUIRE, MATTHEW W. GISSENDANNER, ESQUIRE, MITCHELL WILLOUGHBY, ESQUIRE, and BELTON T. ZEIGLER, ESQUIRE, representing SOUTH CAROLINA ELECTRIC & GAS COMPANY, **PETITIONER**

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APPEARANCES (Cont'g):

SCOTT ELLIOTT, ESQUIRE, representing SOUTH CAROLINA ENERGY USERS COMMITTEE, **INTERVENOR**

ROBERT GUILD, ESQUIRE, representing SIERRA CLUB, **INTERVENOR**

FRANK R. ELLERBE, III, ESQUIRE, and ***JOHN H. TIENCKEN, JR., ESQUIRE,*** representing CENTRAL ELECTRIC POWER COOPERATIVE and THE ELECTRIC COOPERATIVES OF SOUTH CAROLINA, **INTERVENORS**

J. BLANDING HOLMAN, IV, ESQUIRE, and ***GUDRUN THOMPSON, ESQUIRE,*** representing SOUTH CAROLINA COASTAL CONSERVATION LEAGUE, **INTERVENOR**

SANDRA WRIGHT, appearing *pro se,* **INTERVENOR**

JEFFREY M. NELSON, ESQUIRE, and SHANNON BOWYER HUDSON, ESQUIRE, representing the **SOUTH CAROLINA OFFICE OF REGULATORY STAFF**

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1 And thank you for resolving that matter with Mr.
2 Guild. It's so noted, and the Commission
3 appreciates that. And, certainly, we would welcome
4 an update on restoration efforts from Mr. Byrne or
5 whoever the company would like to update us with.
6 **MR. BURGESS**: Thank you, Mr. Chairman. Mr.
7 Zeigler is responsible for this panel of witnesses,
8 so I'll let him call them and we'll begin.
9 **MR. ZEIGLER**: Mr. Chairman, we would call Mr.
10 Steve Byrne and Mr. Jimmy Addison to the stand as a
11 panel.
12 **CHAIRMAN WHITFIELD**: Thank you, Mr. Zeigler.
13 Come forward, please.
14 [Witnesses affirmed]
15 THEREUPON came,
16 **S T E P H E N A . B Y R N E ,**
17 **J I M M Y E . A D D I S O N ,**
18 called as witnesses on behalf of the Petitioner, South
19 Carolina Electric & Gas Company, who, having been first duly
20 affirmed, were examined and testified as follows:
21 **DIRECT EXAMINATION**
22 **BY MR. ZEIGLER**:
23 **Q** Mr. Byrne, please state your name for the record.
24 **A** [BYRNE] My name is Steve Byrne.
25 **Q** And by whom are you employed and in what capacity?

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1 **A** [BYRNE] I'm employed by the SCANA Corporation. I'm
2 President of Generation and Transmission for South
3 Carolina Electric & Gas.
4 **Q** And in connection with this docket, have you prepared or
5 caused to be prepared under your supervision certain
6 direct testimony of 53 pages that has been prefiled in
7 this docket?
8 **A** [BYRNE] I have.
9 **Q** Are there any corrections to that testimony?
10 **A** [BYRNE] There are none.
11 **Q** If I were to ask you the questions contained in that
12 testimony today, would your answers from the stand be
13 the same?
14 **A** [BYRNE] They would.
15 **MR. ZEIGLER**: Mr. Chairman, I would move Mr.
16 Byrne's prefiled direct testimony into the record
17 at this time as if given orally from the stand.
18 **CHAIRMAN WHITFIELD**: Okay, Mr. Zeigler. Mr.
19 Byrne's prefiled testimony will be entered into the
20 record as if given orally from the stand.
21 [See pgs 410-462]
22 **BY MR. ZEIGLER:**
23 **Q** Mr. Byrne, are there three exhibits attached to that
24 testimony which are labeled SAB-1 through SAB-3?
25 **A** [BYRNE] There are.

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1 **MR. ZEIGLER**: Mr. Chairman, I would move those
2 exhibits also into the record at this time.
3 **CHAIRMAN WHITFIELD**: Mr. Byrne's exhibits will
4 be entered into the record as Hearing Exhibit No.
5 10.
6 [WHEREUPON, Hearing Exhibit No. 10 was
7 marked and received in evidence.]
8 **MR. ZEIGLER**: Thank you, Mr. Chairman.
9 **BY MR. ZEIGLER:**
10 **Q** Mr. Byrne, have you prepared a summary of your
11 testimony?
12 **A** [BYRNE] I have.
13 **Q** Would you please provide that to the Commission,
14 parties, and those present here?
15 **A** [BYRNE] Certainly.
16 Good morning, Mr. Chairman, and members of the
17 Commission. Before I proceed with my summary testimony,
18 I wanted to thank the Commission for suspending the
19 hearing last week. It allowed SCE&G to complete its
20 preparations for Hurricane Matthew. Our storm
21 preparation and response teams worked around the clock
22 prior to the arrival of Matthew, and have continued as
23 we restore electric service to our customers.
24 Matthw spent most of last Saturday passing just off
25 the coast of South Carolina, and actually came ashore

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for a short while at McClellanville. At the peak of the storm, we had approximately 290,000, or 40 percent, of our customers without power. Within 48 hours of the impact from Matthew, our crews had restored power to 190,000 customers and, in 72 hours, had restored power to ¼ million customers. We continue to work as expeditiously and safely as possible to restore service to the remaining 32,000 without power.

Prior to the arrival of Hurricane Matthew, we strategically pre-positioned 2000 of our system resources and an additional 1000 off-system linemen and tree-removal crews to begin restoration efforts as soon as the storm passed and work could be done safely. In addition, our customer contact center is fully staffed and has been taking calls 24 hours a day since the arrival of Matthew. Throughout this process, we've kept the Office of Regulatory Staff fully informed of our activities. Dukes Scott is our liaison to the Governor's Emergency Management Department's operations, and we'll continue to work with ORS as long as EMD remains active.

I'll do the summary now. On October 27, 2015, SCE&G and Santee Cooper reached an agreement with Westinghouse to amend the EPC contract to allow Chicago Bridge & Iron, or CB&I, to exit the nuclear project. As

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1 Mr. Marsh testified, SCE&G used this opportunity to
2 substantially restructure the EPC contract for the
3 benefit of SCE&G and its customers.
4 From the project-management perspective, the
5 amendment came at an opportune time. Prior to the
6 amendment, CB&I was experiencing problems as the
7 construction lead in improving labor productivity and
8 meeting schedule goals. SCE&G had been using what it
9 believed to be its rights under the EPC contract to put
10 financial pressure on Westinghouse and CB&I to correct
11 inefficiencies. Disputes between SCE&G and the
12 consortium of Westinghouse and CB&I were escalating and
13 moving towards litigation. Litigation would have been
14 expensive and disruptive, and, worse, it would've made
15 it difficult to agree on schedule mitigation plans and
16 for the parties to communicate openly and cooperate
17 freely in managing the project.
18 The amendment took us off that course.
19 Westinghouse is now the sole entity responsible for all
20 decisions and all costs under the EPC contract. This
21 change will streamline decision-making, reduce
22 inefficiencies, and allow any disputes to be addressed
23 more quickly. The amendment also cleared the way for
24 Westinghouse to bring the Fluor Corporation into the
25 project. Fluor has extensive megaproject experience,

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1 expensive nuclear construction experience, and strong
2 South Carolina roots. Fluor has managed major projects
3 involving practically all of SCE&G's large base-load
4 generating facilities. Our experience with Fluor has
5 been positive. There is, in our opinion, no contractor
6 better qualified for this work.
7 From a financial standpoint, the amendment results
8 in a $137.5 million increase in EPC costs. My testimony
9 is that the additional cost is amply justified. For
10 that amount, we resolved substantially all of the
11 outstanding EPC contract disputes; we raised the total
12 of liquidated damages and completion incentives to
13 approximately $1 billion on a 100 percent basis; we tied
14 liquidated and completion incentives to the new project
15 schedule and the deadline for qualifying for production
16 tax credits; we obtained new warranties for our plant
17 equipment that will run two years past the new
18 substantial completion dates; we obtained the option to
19 transfer practically all of the EPC costs, going
20 forward, to the fixed-price EPC cost category, and this
21 transfer covers all costs to be paid after June 30,
22 2015, but not including future change orders; we updated
23 the reference design to that of the DCD Rev 19 from DCD
24 Rev 15; we agreed on a Dispute Resolution Board, going
25 forward; we eliminated a bonus tied to plant capacity;

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1 and we clarified the contentious language relative to
2 change in law.
3 SCE&G has prepared a quantitative analysis of the
4 value of these items, the resolution of outstanding
5 change orders, and the disputed cost items. Mr. Kochems
6 will present those calculations in detail.
7 In that analysis, we only assigned value to claims
8 that we had received specific cost information for, from
9 Westinghouse. There were approximately 65 unresolved
10 change orders or other claims outstanding at the time of
11 the amendment. Only 12 of these met our criterion. No
12 value was given to the other roughly 53 claims. Some of
13 these 53 claims certainly would be expected to be
14 pursued by Westinghouse.
15 We also made reasonable assumptions concerning the
16 resolution of SCE&G's claims against Westinghouse
17 related to labor productivity and efficiency. In
18 addition, where SCE&G had withheld certain calendar-
19 based payments that were based purely on timing, we
20 assumed that SCE&G would be required to make those
21 payments eventually. These were payments that were in
22 the fixed or firm amounts, and it was always our
23 understanding that they would be paid.
24 Even under these conservative assumptions, the
25 value of the disputed claims resolved by the amendment

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was approximately $224 million. Had we given any value to the unquantified claims, this amount would clearly have been much greater, but this $224 million in claims, alone, is greater than the total price paid for the amendment and all the benefits it entails.

As Mr. Marsh mentioned, the fixed-price option represents an increase in the forecasted EPC costs of about $505 million. This amount is net of future change orders and certain time-and-material costs. In June of 2016, SCE&G gave notice to Westinghouse that the company and Santee Cooper had decided to exercise the option. The decision to exercise the option focused on variable labor costs. While a significant amount of the EPC contract costs were already fixed or firm, the remaining variable costs were almost entirely labor related. We concluded that it is very likely that the increase in the variable labor costs will exceed the previously approved forecast by $505.5 million, or more, over the remaining life of the project. It will be exceedingly difficult for Westinghouse and Fluor to bring cumulative productivity factors in line with those used in their own 2014 projections for EAC, or estimated completion. This is true, even if construction work becomes more productive under the new project structure.

In addition, one of Fluor's principal goals today

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is to implement mitigation plans to meet schedule goals. These mitigation plans will require more total units of labor, more shifts of workers on the site, and more supervisory and indirect labor to support those new work shifts. Westinghouse and Fluor will need to offer higher pay to attract workers who are willing to work the extended hours and these back shifts. For those reasons, we believe that the schedule mitigation will limit opportunities for improving the labor costs.

We based our decision to execute the option on our direct assessment of the project, on information from Fluor's evaluation of the project, and on Fluor's mitigation plans. In addition, we asked Dr. Lynch to model the value of the option, using multiple scenarios, and capture the reasonably foreseeable range of productivity factors. As Dr. Lynch's analysis shows, there will be savings under the option in all reasonably likely scenarios. This amount of savings could be quite large.

We are also presenting 11 change orders or anticipated change orders for inclusion in the capital-cost forecast for the units. These items involve, among other things, enhancement to the site physical security and security systems, additional support facilities and training resources. and the cost of escrowing computer

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1 codes and other intellectual property needed to operate
2 the units. These change orders are discussed in detail
3 in my prefiled testimony and that of Mr. Kochems, and
4 they're all amply justified.
5 We're also updating our owner's cost forecast to
6 extend them for an additional two and a half months.
7 These updated owner's costs also reflect additional
8 project oversight costs and the new project structure
9 being implemented by Westinghouse and Fluor. These
10 costs are discussed in detail in my prefiled testimony
11 and that of Mr. Kochems.
12 This proceeding also serves as our annual
13 construction update. While certain aspects of the work
14 present challenges to the completion schedule, overall
15 project progress continues to be made, with
16 approximately 4000 contract personnel and subcontractor
17 workers on-site daily. The majority of these jobs are
18 held by South Carolina residents, and a number of South
19 Carolina companies and contractors or subcontractors are
20 on this project.
21 I've got a set of slides now that I'd like to use,
22 to update you on the project.
23 [Reference: Byrne Presentation Slides 1-2]
24 This is the tabletop of the units. This is where
25 most of the construction takes place for Unit 2 and Unit

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3. In the foreground is Unit 2; in the background is Unit 3. And I'm going to label some of these things for you.

These are cooling towers — low-profile, forced-draft cooling towers. They don't get any taller than this. They're structurally complete.

This is our module assembly building, or MAB. This is where submodules come in from constructors or fabricators, largely around the country, or around the world, and we put them together into large structural modules.

This is the containment vessel assembly area. The containment vessel is an integral part of the passive safety systems. So, we build the containment vessel in rings; it's a modular construction format. These have been being fabricated by a company called Chicago Bridge & Iron Services, so it's a subsidiary of CB&I. They've been on this job, prior to CB&I acquiring the Shaw Group, so they've been around longer than CB&I was the constructor for the project, and, actually, are doing a very good job on making this very large tank.

That's the Unit 3 containment vessel, so you can see the first section has been placed on the Unit 3 containment vessel.

These are the condensers for Unit 3. So, big part

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1 of any plant, as you make steam, you have to then
2 condense that steam back to water, so you can pump it
3 back to the steam generator to start the cycle again, so
4 that's what happens in the condensers. These are being
5 fabricated on-site in modular fashion. These have
6 actually now been placed in the Unit 3 turbine building.
7 This is Unit 2's second ring section. So it is
8 being outfitted now with ventilation ductwork and
9 supports.
10 This is the Unit 2 containment vessel.
11 This is the annex building. The annex building is
12 where we will actually bring all the power into the
13 plant.
14 And this is the Unit 2 turbine building, and I'll
15 show you these in more detail in a few minutes.
16 And these are the transformer banks for Unit 2, so
17 all of our transformers are lined up.
18 And then in the middle, of course, is the marquee
19 heavy-lift derrick, or HLD.
20 [Reference: Byrne Presentation Slide 3]
21 Just a quick refresher on what the passive safety
22 systems are. This shows you a mockup of the plant.
23 This is the containment vessel, or CV, so everything is
24 contained within the containment vessel. It's inch-and-
25 three-quarter-thick steel, made to withstand all of the

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pressure. In the unlikely event of an accident, we actually will open up holes in the reactor coolant system; that reactor coolant system water will then flash to steam, the steam will rise; the steam will come in contact with the containment vessel, which will be cooler, and it will condense back to water and be channeled right down back into the now-depressurized reactor vessel. We'll just keep cooling it that way.

The reason the containment vessel is cooler than the reactor coolant system water or steam is that we allow air to come in through some air vents. They go down around the baffle and up the outside of this vessel, and carry the heat away out the chimney. And then, to enhance the cooling, we've got about ¾ million gallons of water in a big tank on the roof, and that will flow down the outside of the building, enhancing the cooling process.

So the containment vessel is very important to us, and it's surrounded by what I said was an air gap [indicating], and then it has the shield building on the outside. The shield building is designed to protect everything inside from things like aircraft impact. That annular gap of about four feet is very important to us, to allow the air to come in, flow around the vessel, and out the chimney.

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[Reference: Byrne Presentation Slide 4]

This is a cutaway view, so you can see some of the big structural modules in the middle. You can see the containment vessel in red; there's an annular space in white; and then we've got the shield building, which is a composite of steel, concrete, and steel on the very outside.

[Reference: Byrne Presentation Slide 5]

Here is a mockup of that containment vessel, so you can see we're building it in sections. There's a bottom head, three ring sections, and then a top head.

[Reference: Byrne Presentation Slide 6]

Now, this is the actual fabrication area on the construction site. So everything has been fabricated, save for the top heads of both units, and those are nearing completion.

[Reference: Byrne Presentation Slide 7]

This is part of the shield building. So we get these in from a company called Newport News, in Newport News, Virginia. They are welded together on-site, and they are placed on a concrete pedestal and then bolted to that concrete pedestal. And this is that first section, so we're transitioning from the concrete section, which is below grade, to this composite steel-concrete-steel section. This one happens to be about

three foot tall, and it's the shortest one because it's the transition round. After this, all these sections are going to be either eight foot or ten foot tall.

[Reference: Byrne Presentation Slide 8]

This is where it's bolted to the concrete below it, and then we fill these sections with concrete.

[Reference: Byrne Presentation Slide 9]

This is the first — sorry — the second course of that shield building, so you see this is a much taller section.

[Reference: Byrne Presentation Slide 10]

And now we're up to four courses. We put them together in 80-foot sections and lift them with the heavy-lift derrick. We've now placed four courses and filled all four courses with concrete.

[Reference: Byrne Presentation Slide 11]

This is just a schematic of what we would call the big structural modules. There are six of them; there's five here, and then one that makes up the auxiliary building. These five are inside of the containment vessel. All five of these have now been placed in the containment vessel. This is an actual picture of each one of those modules.

[Reference: Byrne Presentation Slide 12]

And this is the largest of those modules, called

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1 CA01, which was placed in July of last year. You can
2 see the weight here is about 2.4 million pounds. It's
3 fairly large; the dimensions there are 95-by-90-by-80,
4 so this is our biggest structural module.
5 [Reference: Byrne Presentation Slide 13]
6 This is one of structural modules being fabricated.
7 This shows you some of the storage issues we've got.
8 You can see this is actually being done inside of a
9 tent. So we've got a lot of tents at the site now.
10 That is not in the original plan and was a point of
11 contention between ourselves and the consortium, but
12 this fabrication went very well. This is the walls of
13 the tank inside the containment vessel.
14 [Reference: Byrne Presentation Slide 14]
15 And this is us lifting and rigging that; that's
16 last July.
17 [Reference: Byrne Presentation Slide 15]
18 This is an overhead look. You're looking down at
19 the containment vessel, and you can see where some of
20 the big structural modules are. And then, as I said,
21 all of those structural modules inside have been placed.
22 The other big structural module is near the bottom
23 left-hand side of the screen, and that's the module
24 called CA20, which is basically the auxiliary building.
25 You can also see here where the battery rooms are

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1 located on that lower right-hand side.
2 [Reference: Byrne Presentation Slide 16]
3 You can see the Unit 2 containment vessel ring two,
4 so this is basically ready to be placed. So all that
5 ventilation ductwork is in and all the supports are in,
6 and we'll be placing that soon.
7 [Reference: Byrne Presentation Slide 17]
8 These are the transformer banks. You can see we
9 line up all the transformers, and we separate by
10 concrete walls to protect one from another. And our
11 main transformers are the four on the right. We
12 actually have three single-phase transformers, as
13 opposed to a single three-phase transformer, and an
14 installed spare.
15 [Reference: Byrne Presentation Slide 18]
16 This was one of our most difficult pours. This was
17 the turbine building pedestal. Difficult because it's
18 about 100 feet up in the air; 23 cubic yards of concrete
19 and it was a 20-hour continuous pour. So our turbine
20 sits on this 10-foot-thick concrete pedestal.
21 [Reference: Byrne Presentation Slide 19]
22 This is the turbine building. You can see some of
23 the feedwater heaters that have been placed inside the
24 turbine building, and you can actually see the concrete
25 pedestal just beyond those, and then the Unit 3

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1 condensers in the background, which has now been placed.
2 [Reference: Byrne Presentation Slide 20]
3 Our most difficult logistical transport: This is
4 the deaerator. It was far too long to be transported by
5 rail, so at about 140 feet it wouldn't make some of the
6 turns that rail would need, so we had to transport it by
7 barge up to a Santee Cooper facility. We offloaded from
8 the barge, put it on this specially designed trailer.
9 We had a pushing truck, a pulling truck, and a spare
10 truck, and it took five days to traverse 160 miles
11 between the Santee lakes and our site. So this is going
12 through Camden.
13 [Reference: Byrne Presentation Slide 21]
14 And this is us placing it in August of this year up
15 on the top level of the turbine building. So the
16 turbine building is as high as it's going to be, and
17 we'll now start putting the other components in, and
18 then we'll just put the skin around the building. So
19 it's as tall as it's going to get.
20 [Reference: Byrne Presentation Slide 22]
21 Another shot of that turbine building. You can see
22 those feedwater heaters I showed you previously, and the
23 deaerator sitting on top. You can see where the annex
24 building is, in relation to the turbine building, where
25 most of the power comes into the site.

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[Reference: Byrne Presentation Slide 23]

This is the reactor vessel. We are upending the reactor vessel here for Unit 2.

[Reference: Byrne Presentation Slide 24]

And this is us placing it inside the container vessel, so we did that at the end of August.

[Reference: Byrne Presentation Slide 25]

Switching to Unit 3, now, this is the first ring section of that containment vessel.

[Reference: Byrne Presentation Slide 26]

This is the containment vessel in the background. You can see in the foreground that's the Unit 3 CA20. We actually, as a mitigation strategy, split this one. The Unit 2 CA20 we set as one piece; this one, we split it into two pieces and set the first one as soon as it was finished. That allowed us to use the building, actually, as forms for concrete so we could get to placing some floor sections inside of the building.

[Reference: Byrne Presentation Slide 27]

And here you can see Unit 3's turbine building starting to come together. As I said earlier, the turbine sections actually are now sitting inside of this turbine building.

[Reference: Byrne Presentation Slide 28]

These are some of the parts and pieces that come

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1 from disparate places around the world. We have them
2 stored or staged at the site. I'd much rather have them
3 at our site than sitting in somebody else's location, so
4 when I need them they're here. It has created some
5 storage issues for us to do that, but as I said earlier,
6 we have a lot of tents on-site now for storage. Some of
7 those tents are actually climate-controlled.
8 [Reference: Byrne Presentation Slide 29]
9 Cooling towers: four of them, two per unit. As I
10 said earlier, those are structurally complete.
11 [Reference: Byrne Presentation Slide 30]
12 Switchyard is in service; has been for a number of
13 years.
14 [Reference: Byrne Presentation Slide 31]
15 This is a water treatment facility that will supply
16 all three units, eventually. It is in the turnover
17 checkout process to us.
18 [Reference: Byrne Presentation Slide 32]
19 We have a relatively large security contingent;
20 that security contingent has to be proficient. They
21 have to be proficient in long rifles, shotguns, and
22 handguns. So we have a state-of-the-art firing range
23 for them to practice on. That's in service.
24 [Reference: Byrne Presentation Slide 33]
25 Our simulators are up and running. We gave

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licensed operator exams on the simulator about two weeks ago and had good results.

[Reference: Byrne Presentation Slide 34]

And, lastly, I'll point out the Sanmen units in China; these are AP1000 units. China's building two at Haiyang and two at Sanmen. The Sanmen unit is nearing the end of its hot functional testing, so they've gone through the plant construction, they've gone through the cold hydrostatic testing, and they're just completing the hot functional testing where the heat can go up to full temperature and pressure. We anticipate they will be loading fuel yet later this year and start up early next year.

We've got one of our startup managers seconded to the startup team at Sanmen, so that he's gaining valuable experience in what their issues are, how the startup goes, what changes we might need to make. We're looking at a similar structure with the Haiyang unit when they start that up. So when our startup engineers start up V.C. Summer Unit 2, our first unit, it will be the second or third startup they've seen on the AP1000 unit.

MR. ZEIGLER: Thank you, Mr. Byrne.

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[PURSUANT TO PREVIOUS INSTRUCTION, THE PREFILED DIRECT TESTIMONY OF STEPHEN A. BYRNE FOLLOWS AT PGS 410-462]

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DIRECT TESTIMONY OF

STEPHEN A. BYRNE

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 Stephen A. Byrne, and my business address is 220 Operation Way, Cayce, South Carolina. I am President for Generation and Transmission of South Carolina Electric & Gas Company ("SCE&G" or the "Company").

Q. DESCRIBE YOUR EDUCATIONAL BACKGROUND AND BUSINESS EXPERIENCE.

A. I have a Chemical Engineering degree from Wayne State University. After graduation, I started my nuclear career working for the Toledo Edison Company at the Davis-Besse Nuclear Plant. I was granted a Senior Reactor Operator License by the Nuclear Regulatory Commission ("NRC") in 1987. From 1984 to 1995, I held the positions of Shift Technical Advisor, Control Room Supervisor, Shift Manager, Electrical Maintenance Superintendent, Instrument and Controls Maintenance Superintendent, and Operations Manager. I began working for SCE&G in 1995 as the Plant Manager at the V.C. Summer plant. Thereafter, I was promoted to Vice President and Chief Nuclear Officer. In 2004, I was promoted to the position of Senior Vice President for Generation, Nuclear and Fossil Hydro. I was promoted

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to the position of Executive Vice President for Generation in 2008 and to Executive Vice President for Generation and Transmission in early 2011. I was promoted to President for Generation and Transmission and Chief Operating Officer of SCE&G in 2012.

Q. WHAT ARE YOUR DUTIES WITH SCE&G?

A. As President of Generation and Transmission and Chief Operating Officer for SCE&G, I am in charge of overseeing the generation and transmission of electricity for the Company. I also oversee all nuclear operations. Included in my area of responsibility is the New Nuclear Deployment ("NND") project in which Westinghouse Electric Company, LLC ("Westinghouse") is constructing two Westinghouse AP1000 nuclear generating units in Jenkinsville, South Carolina (the "Units") that are jointly owned by SCE&G and South Carolina Public Service Authority ("Santee Cooper").

Q. HAVE YOU EVER TESTIFIED BEFORE THIS COMMISSION?

A. Yes. I have testified before the Public Service Commission of South Carolina (the "Commission") in several past proceedings.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to discuss the Petition SCE&G filed as a result of the October 27, 2015 Amendment (the "Amendment") to the Engineering, Procurement and Construction Agreement (the "EPC Contract"), as well as operational, contractual and other matters related to the updates to the cost and construction schedules proposed in this proceeding. This testimony is also

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submitted in satisfaction of the requirement imposed by the Commission in Order 2009-104(A) that the Company provide annual status reports concerning its progress in constructing the Units.

CONSTRUCTION UPDATE

Q. PLEASE PROVIDE AN OVERVIEW OF THE PROJECT STATUS AS IT RELATES TO CONSTRUCTION.

A. While certain aspects of the work present challenges to the completion schedule, overall progress continues with approximately 3,700 contractor personnel and subcontractor workers on site daily. A majority of these jobs are held by South Carolina residents and a number of South Carolina companies are contractors or subcontractors on the project. We believe this to be the largest construction project in the history of South Carolina.

The critical paths for both Units run through three major milestones for the project: (1) completion of the Shield Building; (2) completion of structures and setting of equipment inside Containment; and (3) Initial Energization of the plant to support testing of equipment and systems. As of June 30, 2016, the Unit 2 primary critical path runs through the placement of reinforced concrete structures to support installing the Shield Building upper horizontal transition panels at elevation 146'. The Unit 3 primary critical path runs through the onsite assembly and completion of module CA20 sub-assemblies 1 and 2 and lifting and setting them in place in the Auxiliary Building. This will allow the setting of module CA22 and backfill activities supporting the Annex Building and Initial Energization.

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From a broader perspective, when I was before the Commission a little over a year ago, I testified that the project was passing through an important time of transition.[1] When we began the project, the most important risks we faced were related to first-of-a-kind nuclear construction activities. These are two of the first AP1000 units to be built in the United States. The NND team has worked through many first-of-a-kind activities. Those include

1. Initial licensing for the AP1000 design and licensing and permitting for the construction project at Jenkinsville.
2. Identifying and responding to unanticipated site conditions.
3. Re-establishing a nuclear-safety qualified supply chain in the United States.
4. Fabricating the major equipment for the Units.
5. Siting and right-of-way acquisition for the major upgrades to our transmission system needed to deliver power from the Units.
6. Establishing the Company's ability to finance the nuclear construction successfully under the BLRA.
7. Recruiting and hiring the construction workers for the project and recruiting the personnel to be trained to operate and maintain the Units when complete.

Since 2015, we have continued to see improvements in the nuclear supply chain. Newport News Industrial ("NNI") is consistently supplying shield building

[1] A transcript of my direct pre-filed testimony in that proceeding can be found at https://dms.psc.sc.gov/Attachments/Matter/d4fc5467-155d-141f-2316651b5306ebbf. A copy of this testimony is incorporated here by reference.

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panels that meet quality and schedule commitments. NNI's current fabrication schedules indicate that substantially all shield building panels will be delivered on site before their construction-need dates. The fabrication of the last remaining component of the shield building walls, the tension ring and air inlets, has been assigned to NNI, which is a very positive development.

At present, more than 80% of the major equipment for the Units is fabricated and stored on site. The first AP1000 units, which are being built in China, continue to progress toward successful completion and lessons learned in those projects are being applied in Jenkinsville. In mid-2016, the first of these units was undergoing acceptance testing. Initial fuel load for this unit is likely to take place sometime in 2016.

Increasingly, the risks that define the project are execution risks related to construction, fabrication and acceptance testing, along with risks associated with start-up, including training and licensing the operators and other personnel necessary to support initial fuel load.

Q. HAVE THERE BEEN IMPORTANT DEVELOPMENTS RELATED TO THE EPC CONTRACT?

A. Yes. In September of 2015, Chicago Bridge & Iron ("CB&I") asked for permission to exit the project which gave us and Westinghouse the opportunity to restructure the Consortium, hire Fluor Corporation as construction manager, resolve outstanding contractual disputes between the parties, and revise the EPC Contract to minimize future disputes. Together, these changes should make the project much

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easier for Westinghouse and Fluor to manage efficiently to conclusion, which is a major benefit to SCE&G, Santee Cooper and their customers.

Q. DO YOU HAVE PHOTOGRAPHS OR SLIDES THAT ILLUSTRATE THE STATUS OF CONSTRUCTION AND FABRICATION ACTIVITIES RELATED TO THE UNITS?

A. Yes. Those slides are attached to my testimony as Exhibit No. __ (SAB-1). Let me now review those slides with the Commission and the parties.

Q. PLEASE DESCRIBE EXHIBIT NO. _ (SAB-2).

A. Exhibit No. _ (SAB-2) is the Milestone Construction schedule based on the current construction schedule for the Units.

Q. WHAT ARE THE NEW GUARANTEED SUBSTANTIAL COMPLETION DATES FOR THE UNITS?

A. The Guaranteed Substantial Completion Dates ("GSCDs") of the Units are now August 31, 2019 for Unit 2 and August 31, 2020 for Unit 3. These dates are each approximately two months later than the projected completion dates approved in the last BLRA order.

Q. ARE THESE SUBSTANTIAL COMPLETION DATES AND THE CONSTRUCTION SCHEDULES THAT SUPPORT THEM REASONABLE?

A. Yes. The substantial completion dates and the construction schedules set forth in Exhibit No. ___ (SAB-2) are based on extensive construction data that Westinghouse has provided to SCE&G. That data includes a construction schedule which identifies and sequences the tens of thousands of specific construction

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activities that must be accomplished to complete the project. SCE&G's construction experts have reviewed this schedule and found that its scope and sequencing is logical and appropriate. As I will discuss in more detail below, the new construction manager for the project, Fluor, is conducting a full review of that schedule based on its extensive expertise in these matters. The goal of Fluor's effort is to ensure that the GSCDs can be met and that any needed mitigation plans are put in place to support the schedule. Those mitigation plans will include additional construction staffing and round-the-clock work shifts. Consistent with its responsibilities as Owner, SCE&G has carefully reviewed and evaluated all information that is available related to the project and schedule and finds it to be reasonable.

It is my opinion that Westinghouse and Fluor have a reasonable construction plan in place to achieve the GSCDs. That plan is reflected in the milestone construction schedule which is attached to my testimony as Exhibit No. ___ (SAB-2). It is my considered opinion that Exhibit No. ___ (SAB-2) represents a reasonable and prudent schedule for completing the project as envisioned by the BLRA and should be adopted as an update to the construction schedule that was initially adopted as Exhibit E to Order No. 2009-104(A).

Q. YOU MENTIONED THAT FLUOR IS CONTINUING TO REVIEW THE PROJECT SCHEDULE. COULD YOU ELABORATE?

A. Fluor continues to review the current schedule based on its construction management expertise and experience with the project. Fluor's goal is to determine

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the optimal staffing plans, resource allocations, and sequencing of work to achieve the GSCDs most efficiently. We expect there will be internal realignments and re-sequencing of work scopes within the existing schedule.

Q. IS SUCH A REVIEW UNCOMMON?

A. The construction schedule for a project such as this is dynamic by nature and is subject to constant adjustment as the project progresses. Fluor's current review of the schedule is not quantitatively different from the review and recalibrating of the schedule that is on-going continuously in this project as is standard in the industry.

Q. DOES SCE&G BELIEVE THAT THE BLRA MILESTONE CONSTRUCTION SCHEDULE PROPOSED HERE IS REASONABLE?

A. Yes. This proposed schedule is reasonable. As a result of the Amendment, we now have in place:

1. A fully restructured Consortium,
2. A new and highly-skilled mega-projects construction manager,
3. An Amendment that eliminates practically all the major commercial issues between the parties at this time,
4. An EPC Contract that has been reformulated to limit future disputes, and
5. Revised liquidated damages, completion incentives and other EPC terms that put Westinghouse at risk for approximately $1.0 billion on a 100% basis due to delay.

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All these factors support the conclusion that the construction schedule attached as Exhibit No. ___ (SAB-2) is reasonable and prudent schedule for completing the Units.

Nonetheless, this remains a very complex and challenging project. Meeting the current schedule will require a great deal of construction management skill. But Fluor appears well qualified to manage this project. Westinghouse will probably be required to invest hundreds of millions of dollars in schedule mitigation. And Westinghouse has made a corporate commitment to complete these Units successfully to protect its AP1000 business worldwide. For those reasons, I believe that Westinghouse and Fluor have both the skills and the incentive to successfully complete the project within the schedule attached as Exhibit No. ___ (SAB-2).

EPC CONTRACT AMENDMENT

Q. PLEASE DESCRIBE THE AMENDMENT.

A. The Amendment does a number of things.

1. Resolution of Current Disputes: The Amendment resolves substantially all of the outstanding EPC Contract disputes.

2. Guaranteed Substantial Completion Dates: The GSCDs of the Units have been revised to August 31, 2019 for Unit 2 and August 31, 2020 for Unit 3.

3. New Liquidated Damages Provisions: New provisions govern delay-related liquidated damages and cap liquidated damages at approximately $371.8

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million[2] in aggregate for both Units. The current maximum is $86 million. The $371.8 million amount includes $137.5 million per Unit that Westinghouse must pay SCE&G if a Unit does not qualify for Federal Production Tax Credits. Also, a bonus for megawatts in excess of the contractual amount that was included in the EPC Contract before the Amendment has been eliminated.

4. Federal Production Tax Credit Completion Incentive: The Consortium will earn a completion incentive for each Unit that is finished in time to qualify for Federal Production Tax Credits. The completion incentive is approximately $165.0 million for both Units.

5. Fixed Price Option: SCE&G has obtained the right to transfer to the Fixed Price EPC cost category practically all of EPC costs to be paid after June 30, 2015, not including future change orders. This Fixed Price amount excludes $38.3 million of work within the Time and Materials category. The Fixed Price going forward is approximately $3.345 billion.

6. Parental Guarantees: Westinghouse's parent company, Toshiba Corporation, reaffirmed its guaranty of Westinghouse's payment obligations under the EPC Contract. Westinghouse's payment obligations are joint and several obligations with Stone & Webster. SCE&G and Santee Cooper canceled CB&I's guaranty with respect to the project to allow CB&I to leave the project.

[2] Unless otherwise specified, all cost figure in this testimony are stated in 2007 dollars and reflect SCE&G's 55% share of the cost of the Units.

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7. New Milestone Payment Schedule: The parties will develop a revised construction milestone payment schedule to eliminate the contentious progress payment schedule in the existing EPC Contract. While the parties are developing the revised construction milestone payment schedule, SCE&G is making payments of $55.0 million per month which are being reconciled against the invoices that would have been issued under the prior terms of the EPC Contract and will be credited to the $3.345 billion cost to complete the Units under the Fixed Price option. Thereafter, construction milestone payments will be based on the revised construction milestone payment schedule.

8. Change in Law Definition: The Change in Law provisions of the EPC Contract have been amended to reduce the likelihood of future commercial disputes by clearly defining what legal and regulatory pronouncements constitute a change in law that entitles Westinghouse to a claim for resulting costs.

9. Design Control Document Revision 19 ("DCD Rev. 19"): The amended EPC Contract now expressly states that Westinghouse must provide Units that meet the standards of the NRC-approved design contained in DCD Rev. 19 in all respects. DCD Rev. 19 was issued approximately three years after the EPC Contract was signed and this chronology has been the basis of disputed claims between the parties.

10. No Interim Lawsuits: The Amendment eliminates any requirement or ability for the parties to sue each other before substantial completion of the project.

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11. Interim Dispute Resolution Board: A dispute resolution board and dispute resolution process is being implemented to resolve commercial claims and disputes going forward.

12. Equipment Warranties: Most equipment warranties have been extended to two years past the substantial completion dates.

Q. CAN YOU PROVIDE US WITH A COPY OF THE AMENDMENT?

A. A copy of the Amendment is attached to my testimony as Exhibit No. ___ (SAB-3).

Q. BEFORE THE AMENDMENT, WHERE DID THE PROJECT STAND IN REGARDS TO THE POSSIBILITY OF LITIGATION?

A. When CB&I became the Consortium's construction lead in 2013, there was good reason to expect positive results. An operating division of CB&I, CB&I Services, had been on site for several years fabricating the containment vessels for the Units. After some initial quality issues that were quickly resolved, CB&I Services' work was consistently timely and of high quality. In its role as construction lead, however, CB&I did not succeed as expected in improving construction productivity on the site or resolving quality issues and timeliness issues at submodule suppliers.

At the same time, problems were surfacing between the Consortium partners. Internal Consortium agreements and interactions are confidential as to us. However, by mid-2015, disputes were spilling over into the supply chain and impeding action on important issues. The disputes seemed to be about who in the Consortium was

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responsible for paying for unanticipated costs in Fixed or Firm cost categories. Important matters were being delayed while the Consortium partners worked out their differences.

At the same time, the Consortium would not engage SCE&G and Santee Cooper in meaningful negotiations about the outstanding disputes we had with them. It seemed to us that CB&I and Westinghouse were avoiding negotiating with us rather than presenting us with a divided front.

We also understood that Consortium members were coming under financial stress because of the large payments SCE&G had begun to withhold in 2015. SCE&G did so to protect its rights under the EPC Contract and to put pressure on the Consortium to improve its schedule and efficiency performance. The Consortium disputed our right to withhold these payments. But in the end, we withheld payments worth over $135 million on a 100% basis.[3] It was not clear what the Consortium would do in response. But we considered litigation to be a likely result.

When we met in September of 2015, CB&I stated that in its opinion the project was headed toward litigation, certainly between the Consortium and Santee Cooper and SCE&G, and possibly between members of the Consortium itself. Going to litigation could have been highly damaging to the project.

[3] Unless otherwise specified, all cost figures in this testimony are stated in 2007 dollars and reflect SCE&G's 55% share of the cost of the Units. The exception is the dollar amounts of liquidated damages and completion incentives, which are stated in future dollars at SCE&G's 55% share.

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Q. WHY WAS AVOIDING LITIGATION IMPORTANT?

A. Construction projects succeed where commercial issues are managed effectively and communication is open. Those things typically do not happen when a project is in litigation. In addition, schedule mitigation plans are expensive and to some degree optional with the contractor. When parties are in a difficult commercial dispute, schedule mitigation can be held hostage to the litigation or become a bargaining chip. Had the project degenerated into litigation, reaching consensus on the required mitigation plans would have been very difficult.

Apart from the safety and quality of construction, one of SCE&G's principal objectives was the completion of the Units in time to qualify for all available federal production tax credits. The projected benefit of those credits is worth approximately $2.2 billion and will be passed on directly to our customers. Litigation would put the project's ability to receive those credits at greater risk.

Accordingly, a very important benefit of the Amendment is it diverted us away from litigation and the delays and disruptions that litigation would have produced. All parties can now focus on the success of the project, not on success against each other in the courtroom. In addition, the Amendment contractually rules out litigation until the project is finished. Given where we were before the negotiations, this is a very positive outcome for the project and a very important benefit to our customers.

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Q. PLEASE EXPLAIN HOW THE AMENDMENT RULES OUT LITIGATION DURING THE PROJECT.

A. The Amendment establishes a three person dispute resolution board. All claims under the EPC Contract that the parties cannot work out go to that board. If a claim is under $2.75 million (SCE&G's 55% share, $5 million at 100%), then the decision of the board is final. If the amount exceeds $2.75 million, then the decision of the board is binding until the project is complete. After completion, a party may bring suit on the matter in court, but only then.

In addition, SCE&G is not required to pay any part of a disputed amount pending a decision of the board. Previously the EPC Contract required SCE&G to pay 90% of a disputed claim while the dispute was resolved. Instead, SCE&G will make a one-time $41.3 million deposit with Westinghouse, which will cover all disputed amounts pending the board's decision. The deposit will be credited to the final invoices at the end of the project.

Q. PLEASE EXPLAIN WHAT THE AMENDMENT ACCOMPLISHES IN TERMS OF RESTRUCTURING THE CONSORTIUM.

A. By purchasing Stone & Webster from CB&I, Westinghouse acquired full control of the project. Westinghouse is now responsible for all matters related to cost, efficiency and delay. It no longer matters whether the issues are related to design, engineering, equipment procurement, components or construction: Westinghouse is responsible. This simplifies decision-making and creates clear

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lines of accountability. Disputes among Consortium members can no longer be a source of friction and delay.

In addition, removing CB&I from the Consortium has allowed Westinghouse to hire Fluor as construction manager both for this project and for Southern Nuclear Company's ("SNC's") Vogtle project. Fluor is exceptionally well qualified for the job. Fluor's initial steps to improve productivity and schedule performance are encouraging.

Q. WHAT ARE FLUOR'S QUALIFICATIONS?

A. Fluor Corporation has been in business over 100 years and is ranked 155th among the Fortune 500. It employs 60,000 people worldwide with 2015 revenues of $18 billion.

Fluor has significant nuclear experience. Fluor has self-performed reactor construction for eight different nuclear plants, including V.C. Summer Unit 1. Additionally, the company has assisted in the construction of another ten nuclear units. Fluor has designed three nuclear plants itself. The company is part of a team decommissioning 27 nuclear reactors in the United Kingdom, and it is also the prime contractor at four Department of Energy nuclear sites, including the Savannah River Site located in Aiken, South Carolina. Through a subsidiary called NuScale, the company is also designing, developing, and marketing a next generation small modular reactor.

Fluor's non-nuclear power experience includes construction it self-performed at SCE&G's Fairfield Pumped Storage facility and engineering,

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procurement, construction and commissioning services for building the Cope and Jasper Generating Stations and for the Urquhart Plant Units 1 and 2 Repowering. Additionally, Fluor provided construction services for installing scrubbers and other major environmental upgrades on the Williams and Wateree Stations. This means Fluor has held major construction roles involving practically all of the large base-load generating facilities in SCE&G's system. Over the past five years, Fluor has managed over a dozen power sector megaprojects worldwide.

On a more subjective level, Fluor has been rated as one of the most ethical companies to do business with for ten years running. We found that very encouraging. They are good corporate citizens with deep roots in South Carolina. In its present form, the Company was created by the 1977 merger of Fluor Corporation and Daniel Construction Company of Greenville. Fluor currently has approximately 4,500 employees in South Carolina. Greenville is the headquarters for the nuclear division.

Fluor and its employees have contributed $3.3 million to community organizations, educational initiatives and programs in South Carolina. Additionally, volunteers contributed nearly 7,200 volunteer hours in the state. Fluor's commitment to municipal redevelopment in the Greenville area is one of the leading examples of corporate community responsibility in South Carolina. Fluor's Chairman and CEO is a graduate of the University of South Carolina, and the president of its power division is a graduate of The Citadel.

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Q. PLEASE DESCRIBE THE TRANSITION PROCESS FROM CB&I TO FLUOR.

A. January 4, 2016, was the first business day following the effective date of the Amendment. At that time, a transition began through which CB&I's direct craft workers on the project became employees of Fluor. A number of CB&I's field engineering and other field non-manual employees did not transition to Fluor but went instead to a new Westinghouse subsidiary corporation named WECTEC. Westinghouse wants to keep these people on a Westinghouse subsidiary's payroll so that they will be available to support future Westinghouse AP1000 projects worldwide after this project is complete.

Q. WHAT HAS FLUOR DONE TO IMPROVE THE PRODUCTIVITY AND SCHEDULE PERFORMANCE OF THE PROJECT?

A. In November of 2015, just after the Amendment was signed, Westinghouse and Fluor identified 25 key work streams as important targets for improvement at both SCE&G's site and SNC's site. They convened work stream review teams to decide how to streamline processes, eliminate inefficiencies and identify means to increase the levels of productivity and accountability. SCE&G personnel and personnel from SNC's Vogtle project were assigned to a number of these teams.

Q. WHAT CHANGES HAVE BEEN IMPLEMENTED?

A. The initial results of these reviews were implemented in the first half of 2016. They include standardized and simplified work packages for nuclear island construction, streamlined processes for equipment transfers between suppliers and

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contractors, and processes to minimize design changes for module and submodule vendors. This is an on-going process. As reviews are completed, additional work flows are being added and additional teams are being convened.

It appears to us that Fluor is identifying needed changes to the construction program and pushing them through with focus, diligence and professionalism. We are pleased with Fluor's performance in its new role to date.

Q. PLEASE EXPLAIN WHAT THE AMENDMENT ACCOMPLISHES IN TERMS OF INCREASING INCENTIVES FOR TIMELY COMPLETION OF THE PROJECT.

A. The EPC Contract caps liquidated damages. At the time the Amendment was negotiated, one of the challenges we faced was that the completion dates for the Units had been pushed past the dates at which all of the available liquidated damages under the EPC Contract would have been earned.

As a result, when we began the negotiations, the Consortium was not facing any additional liquidated damages if the project were delayed beyond the projected completion dates. This was important because the forecasted substantial completion date for Unit 3 was only six months ahead of the deadline for qualifying for federal Production Tax Credits for that Unit. The Unit 2 date was 18 months ahead of the deadline. Meeting the tax credit deadline for Unit 3 was likely to require expensive schedule mitigation. The same could be the case for Unit 2 depending on future developments. There was no direct contractual incentive for the Consortium to invest in mitigation.

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As a result, SCE&G and its customers faced the risk that the Consortium would allow the scheduled completion dates to slip past the tax credit deadlines rather than spend the additional money needed to prevent that from happening. In all, SCE&G and its customers stood to lose approximately $2.2 billion in projected benefits if neither Unit were to meet the deadline.

In the Amendment negotiations, we were able to address this problem. In those negotiations, Westinghouse told us that it recognized the great value represented by its AP1000 business and the need to complete our project successfully to protect that value and Westinghouse's reputation worldwide. Westinghouse was willing to take on substantial new commitments under the EPC Contract to accomplish those goals.

This may turn out to be a strategy for Westinghouse. In June of 2016, less than nine months after the Amendment was executed, Westinghouse announced that it is negotiating a contract to construct six AP1000 units in India. It is working on a similar proposal to construct three new AP1000 units at the Moorside nuclear power station on the west coast of England. We also understand that there is interest in AP1000 units in Europe where nuclear power is increasingly seen as an alternative to continued reliance on Russian natural gas. The AP1000 unit remains the safest, most technologically sophisticated and simplest nuclear unit available today.

In light of Westinghouse's business interests, we were able to convince Westinghouse to accept new liquidated damages that are capped at $371.8 million for the two Units. Of that amount, $137.5 million for each Unit (SCE&G's 55%

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share, $250 million at 100%) is directly tied to that Unit meeting the deadline for receiving federal production tax credits.

The Amendment also provides for completion incentives. The completion incentives are paid by individual Unit and are tied to whether the Unit produces power in time to qualify for the production tax credits. If both Units do qualify, the total completion incentives would be $165.0 million (SCE&G's 55% share, $300 million at 100%).

Since these completion incentives have not yet been earned, they are not included in current BLRA forecasts. No Commission action is requested related to them in this proceeding.

We also had included in the EPC Contract a capacity bonus that would be paid if the Units were able to generate more electricity than had been guaranteed by Westinghouse. Westinghouse's engineers had upgraded certain components for the Units after the initial capacity commitments were made. Westinghouse was confident that capacity increases were likely and meaningful payments would be earned under these provisions. In the negotiations, we convinced Westinghouse to release the potential capacity bonuses.

As a result, the total of liquidated damages and completion incentives contained in the EPC Contract went from effectively zero on an incremental basis to $536.8 million at SCE&G's 55% share and approximately $1.0 billion on a 100% basis. These are meaningful numbers. They give Westinghouse a financial incentive to spend money to mitigate delays and keep the project on schedule to qualify for

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the Production Tax Credits that will be so valuable to our customers when they are earned.

Q. PLEASE DESCRIBE THE FIXED PRICE OPTION.

A. After the 2011 Amendment to the EPC, approximately two-thirds of the EPC costs were in either Fixed Price or Firm Price categories. Fixed Price items are not subject to any adjustment. Firm Price items are fixed in 2007 dollars and subject to escalation at rates that are either contractually fixed or are reported in published indices.

The remaining non-Fixed, non-Firm costs are found in the Target and Time and Material categories. Target costs include three labor-related categories:

(a) Direct Craft Labor, which represents work done directly on the Units;

(b) Field Non-Manual labor, which includes supporting staff such as clerical, field engineering, Quality Assurance and Quality Control, supervisory and safety personnel; and

(c) Indirect Craft Labor, which is labor that directly supports craft labor in the field and handles such matters as site sanitation and cleanup, traffic control, and distribution of commodities, materials, supplies, water and ice.

Time and Materials costs items include services that the Consortium provides under the EPC Contract in support of the Owner's obligations as owner of the project, holder of the NRC licenses and environmental permits and future operator

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of the Units. The Time and Materials cost category also includes the budget for such things as the cost of local sales taxes, import duties and insurance and the cost of the initial inventory of spare parts for the Units.

In the negotiations with Westinghouse, SCE&G was able to convince Westinghouse to provide us with an irrevocable option to move all remaining Firm, Target and Time and Material costs, except for $38.3 million of the Time and Material budget, to the Fixed Price category. The Fixed Price would be approximately $3.345 billion (future dollars) for all invoices paid after June 30, 2015. Any payments made after that date are credited to the Fixed Price amount. This is a fixed cost category with no escalation or other adjustment except for future change orders, if any.

As compared to the price presented in the last BLRA proceeding, the increase in the EPC Contract price under this Fixed Price option is $505.5 million in future dollars. This is a little less than 10% of the total EPC cost.

Q. WHY DO YOU REFER TO THIS AS A FIXED PRICE OPTION?

A. My use of the term "Fixed Price option" reflects the terminology used in the EPC Contract. We are transferring costs to the "Fixed Price" category as that item has been defined in the EPC Contract since 2008. Fixed Price items are items whose cost does not change for any reason except Owner-directed change orders or contractor change orders, which are allowed under the definition of Uncontrollable Circumstance contained in the EPC Contract.

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Q. WHAT IS EXCLUDED FROM THE OPTION?

A. At SCE&G's request, the Fixed Price cost excludes several items within the Time and Materials budget that total approximately $38.3 million. Among these are import duties, sales taxes, performance bonds and warranty costs. SCE&G believes it can manage these costs as well or better than Westinghouse and thus has not sought to have Westinghouse fix a price for them.

The spare parts and equipment budget is also excluded. Westinghouse is working to create a definitive list of the spare parts and equipment inventory that must be available to ensure safe and reliable operations of the Units. The parts list has not been finalized. To reduce the cost of these parts, SCE&G is working with SNC to create a shared repository of critical parts and equipment. SCE&G was not inclined to let Westinghouse fix a price for this parts list sight unseen. Instead, SCE&G wanted to ensure that it receives all the parts and equipment it needs and at the lowest possible cost. For that reason, SCE&G asked to keep the cost of spare parts individually budgeted in Time and Materials.

Apart from these items, the Fixed Price option sets a price of $3.345 million (future dollars) for all of the remaining work under the EPC Contract. The new price will be subject to future change orders, whether due to Uncontrollable Circumstance (as defined in the EPC Contract) or for Owner's convenience. This is in keeping with standard practice in large project contracts. Fixed price contracts for a large construction project commonly provide that contractors are entitled to change orders where uncontrollable circumstances are encountered. To ask

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contractors, in effect, to insure the project against unknown risks is not standard practice and the prices involved are difficult to estimate. However, as discussed below, we have sought to tighten up the standards for establishing uncontrollable circumstances in ways that will help the project and SCE&G's customers.

The Fixed Price also does not cover SCE&G's costs as Owner. These include the cost of the NND effort, as well as Transmission costs. However, with these limitations, the Fixed Price option sets a definitive price to complete the work as currently envisioned under the EPC Contract.

Q. HAS SCE&G DECIDED TO EXERCISE THIS OPTION?

A. By letter dated May 24, 2016, SCE&G informed Westinghouse that it intended to exercise this option. There were two conditions to this approval becoming final. By its terms, the exercise of the option is subject to regulatory approvals, which would include approval by this Commission. The other is formal authorization from our co-owner Santee Cooper. Santee Cooper provided that authorization on June 30, 2016.

Q. PLEASE EXPLAIN THE BASIS ON WHICH SCE&G DECIDED TO EXERCISE THE OPTION.

A. In making the decision to exercise the option, SCE&G considered three types of information. First, we considered the information we received from Fluor during the first half of 2016 and earlier as Fluor's construction experts assessed the project and began to implement mitigation plans. Second, we considered our own experience with the project both before and after Fluor came into the picture. Third,

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we considered the sensitivity study Dr. Lynch performed related to the value of exercising the option. Each of these sources of information strongly supported exercising the option.

Q. WHAT DID YOU LEARN FROM YOUR INTERACTION WITH FLUOR?

A. Since the Amendment was signed, we have been closely following Fluor's approach to improving schedule performance and labor productivity on site. Fluor has already made very helpful changes in work flows and management. But these changes are clearly not enough to solve current schedule and productivity issues by themselves. Fluor has recognized this and is recruiting, hiring and training an expanded construction workforce to accelerate the construction schedule. Specifically, a limited-scope night shift of approximately 300 craft workers is already in place. Fluor is actively working to expand it to a full-scope night shift of more than 1,000 craft workers.

Expanding the workforce in this way shows Fluor understands that it will require more workers working more hours than forecasted to complete the project on schedule. This means higher labor costs, which absent exercise of the Fixed Price option will be passed on to SCE&G and its customers. In addition, adding a night shift, in itself, generally increases costs. Fluor's actions to date indicate that costs will rise to meet schedule commitments.

Q. WHY DOES ADDING A NIGHT SHIFT INCREASE COSTS?

A. Attracting workers to a night shift will require Fluor to pay them a premium. In addition, workers on a night shift need supervision and support just like their

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counterparts on the day shift. Therefore, adding a night shift requires staffing a night shift of Field Non-Manual personnel and Indirect Craft Labor to provide that support. These additional shifts of support personnel represent additional costs to the project.

Q. WHAT IS YOUR CURRENT EXPERIENCE CONCERNING THE PER-UNIT COST OF LABOR AT THE PROJECT AND THE POTENTIAL FOR ESCALATION THERE?

A. Demand for construction workers is increasing with the improving economy. With the ongoing retirements of coal-fired plants, and the need to deliver newly discovered supplies of shale gas to market, a number of new gas pipelines are being built. Demand for gas pipeline workers is particularly high. Pipeline projects compete with nuclear projects for many of the same workers, especially highly skilled welders and heavy equipment operators. Currently, Fluor is hiring and training new workers at an accelerating pace to mitigate schedule delays. But Fluor is also losing trained workers from the project to other opportunities in significant numbers. Work force retention is now an important limiting factor in Fluor's plan to mitigate the construction schedule.

Q. WHAT ARE THE IMPLICATIONS OF WORKFORCE ATTRITION AND RETENTION ISSUES FOR PROJECT COSTS?

A. Increased workforce attrition means increased recruiting and training costs. To improve retention of workers on-site, Fluor will likely need to offer additional pay and benefits. Absent SCE&G exercising the Fixed Price option, these

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additional costs will be passed to SCE&G and its customers as Target costs. Taking all of these factors together, I believe that the additional labor costs associated with mitigating the construction schedule are likely to significantly impact the cost to complete the project.

Q. AS TO THE VALUE OF EXERCISING THE OPTION, WHAT DID YOU LEARN FROM YOUR OWN EXPERIENCE WITH THE PROJECT?

A. The initial 2008 cost projections for the project were based on a productivity factor of 1.0. This meant that the Consortium projected that the units of labor needed to complete this project would be the same as the units of labor needed to complete similar tasks on standard, non-nuclear construction projects. The cost projection provided by the Consortium in 2014 was based on a labor productivity factor of 1.15 or 15% higher than the initial projection.

To date, the project has not been able to meet either the 1.0 or 1.15 productivity factors for any sustained period. The cumulative productivity factor since the project began is approximately 1.75.

We have computed the labor productivity factor that Fluor and Westinghouse must achieve from January of 2016 forward to have actual costs to SCE&G come in less than the Fixed Price, all other things being equal. That labor productivity factor is 1.15. We expect construction to become more efficient under Fluor and with a restructured project team. But it is unlikely that productivity will improve fast enough for the remaining work on the project to be completed at a productivity factor of 1.15 or below. Our experience with the project to date makes us believe

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that it is highly unlikely that Fluor and Westinghouse can bring the productivity factor to 1.15 or lower measured between January 1, 2016, and the end of the project. This tells us that, all other things being equal, exercising the Fixed Price option is best for the Company and its customers.

Q. PLEASE EXPLAIN DR. LYNCH'S SENSITIVITY STUDY AND THE ASSUMPTIONS UNDERLYING IT.

A. We asked Dr. Lynch to run a sensitivity analysis to show how SCE&G's costs under the EPC Contract might vary if we did not exercise the Fixed Price option. The first step was to identify the proper variables to model. We examined the cost categories in the EPC Contract for which SCE&G is at-risk and what drives costs in those categories. Based on this analysis, we determined that Dr. Lynch's analysis could focus on two critical variables: Direct Labor productivity and escalation in labor rates.

Q. PLEASE EXPLAIN WHAT THESE FACTORS MEASURE.

A. There are two factors involved in labor costs: units of labor and labor costs per unit. The equation is simple. Costs equal units of labor times costs per unit.

Anything that increases the units of labor needed to complete the project increases the labor productivity factor. Therefore, the labor productivity factor captures in one number all the things that can increase labor requirements for a project by delaying, frustrating or complicating a construction plan. For that reason, it is possible to analyze the effect of all factors that result in a change in amount of

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labor required to complete the project by varying one number, the labor productivity factor.

The second variable in Dr. Lynch's analysis is the per-unit cost of labor. As indicated above, there is reason to believe that Fluor and Westinghouse will need to increase pay and benefits to attract and retain the expanded workforce they need to mitigate schedule delays. This will increase per-unit labor costs. In Dr. Lynch's study, we sought to measure what outcomes were possible under reasonable assumptions concerning possible future changes in per-unit labor costs and productivity factors.

Q. WHY IS IT POSSIBLE FOR DR. LYNCH TO MODEL POSSIBLE FUTURE VARIATION IN EPC CONTRACT COSTS BY FOCUSING ON LABOR-RELATED VARIABLES ONLY?

A. The EPC Contract contains four principal groupings of cost for pricing purposes: Fixed Price costs, Firm Price costs, Time and Materials costs, and Target Price costs.

Costs in the Fixed or Firm Price categories are set in 2007 dollars, either with no escalation, or escalation set at a specified or indexed rate. Apart from change orders, indexed escalation is the only source of variation in these costs. Where indexed escalation applies, the current estimates of inflation are built into the existing cost forecasts in those categories. Accordingly, cost variation coming from the Fixed or Firm costs categories is not likely to be material, especially when compared with the possible changes in cost categories which are not Fixed or Firm.

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All non-Fixed or non-Firm costs are found either in the Target Price category or the Time and Material category. The Time and Material category is very small and represents 1.1% of the EPC Contract remaining to be spent. The Target price category represents the great majority of the non-Fixed or Firm costs. Approximately eighty percent (80%) of the costs within the Target Price category are labor costs. Therefore, SCE&G's cost risks under the EPC Contract, absent exercise of the Fixed Price option, are concentrated in the labor costs found in the Target Price cost category.

Q. PLEASE DESCRIBE THE LABOR COSTS CATEGORIES THAT MAKE UP THE TARGET COSTS.

A. The three specific cost categories that are part of Target Price costs are Direct Craft Labor, Indirect Craft Labor, and Field Non-Manual Labor. Direct Craft Labor is the labor directly involved in tasks that build the Units. Indirect Craft Labor and Field Non-Manual Labor are work that supports Direct Craft Labor. Because Indirect Labor and Field Non-Manual labor support Direct Craft Labor, the principal driver of changes in Indirect Labor and Field Non-Manual utilization is a change in Direct Labor productivity. Therefore, it is standard practice in the industry to measure the amount of Indirect Labor and Field Non-Manual Labor required for a project by applying a ratio of these items to Direct Craft Labor. For example, a standard measure of Indirect Labor might be that 0.6 units of Indirect Labor are required to support each unit of Direct Craft Labor. Applying such ratios to the units of Direct Labor generates the required units of Indirect Labor and Field Non-Manual

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labor. In this way, the amount of labor needed to support direct construction work varies automatically with changes in the amount of labor devoted to direct construction work.

We asked Dr. Lynch to use these same approaches in his analysis. In the model he used, the units of Indirect Labor and Field Non-Manual vary proportionally to changes in Direct Labor units. In this way, the effect of varying productivity rates for Direct Labor flows directly through to the calculation to determine the units of Indirect Labor and Field Non-Manual Labor that will be required.

Q. WHAT RANGE OF VARIABLES DID YOU ASK DR. LYNCH TO MODEL?

A. At the lower end of the spectrum (most efficient), we asked Dr. Lynch to model labor costs at a productivity factor of 1.0 which is the factor on which the initial cost projections were based in 2008. Based on our experience to date, and what we know of Fluor and Westinghouse's plans going forward, achieving a Direct Labor productivity factor as favorable as 1.0 over the remaining course of the project would be highly unlikely.

Also at the low end of the range, we asked Dr. Lynch to model the productivity factor used in the 2014 Consortium cost projections of 1.15. It is the stated goal of Westinghouse to reach this productivity factor over the remaining years of the project. That is a worthy goal. But given what we know today, it would seem unlikely that it can be reached since schedule mitigation is the predominant

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concern going forward. Schedule mitigation will likely involve additional labor and therefore less favorable labor productivity than would otherwise be the case.

At the upper end of the range of the analysis, we asked Dr. Lynch to model a productivity factor of 2.0. That value reflects an approximate doubling of the size of the construction workforce as compared to initial projections. After careful review, it is our conclusion that it is feasible for a workforce of that size to be recruited and trained and to work efficiently on site. With skillful construction management and vigilant quality assurance and quality control, and absent unforeseen challenges, we believe that a workforce of that size should be able to overcome the reasonably foreseeable challenges involved in meeting the GSCDs.

To create a representative range of values, we also asked Dr. Lynch to model each of the productivity rates which lie at 0.25 increments between productivity factors of 1.0 and 2.0.

As to per-unit labor cost rates, we asked Dr. Lynch to model scenarios assuming that the unit cost of labor varied by 0%, 2.9%, 5% or 7% cumulatively over the course of the project. It was our judgment that while labor rates will likely need to increase above current estimates (which already include an escalation factor based on current expectations), it was unlikely that these rates would increase cumulatively by as much as 7% over the life of the project. It was not at all likely that labor will remain constant over the life of the project compared to the initial projections.

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Q. WHAT IS YOUR OPINION CONCERNING THE RESULTING RANGE OF VALUES?

A. It is my judgment that a sensitivity analysis which measures costs over this band of values captures the foreseeable range of potential changes in EPC costs that SCE&G and its customers would face absent SCE&G exercising the Fixed Price option. As a result, Dr. Lynch's analysis accurately measures the potential value of the Fixed Price option to SCE&G and its customers.

Q. WHAT WAS THE RESULT OF DR. LYNCH'S SENSITIVITY ANALYSIS?

A. The resulting sensitivity analysis is attached to Dr. Lynch's testimony as Exhibit No. __ (JML-1). It is my opinion that the construction and engineering assumptions it reflects are reasonable and accurate.

The analysis compares the cost to complete the Units without the Fixed Price option to the cost if the Fixed Price option is exercised. It presents results for 24 possible combinations of factors. In only four of the 24 scenarios was it cheaper to forego the Fixed Price option. In three of these four scenarios, Westinghouse and Fluor would need to achieve a 1.0 direct labor productivity factor over the remaining life of the project for that to be the case. We believe that is practically impossible and know it to be inconsistent with the schedule mitigation plans that Fluor is putting in place today which will result in higher (less favorable) productivity rates than previously forecasted. The fourth scenario involves a productivity factor of 1.15, which is itself highly unlikely. But it also assumes that labor prices remain constant over the remaining life of the project. We are unaware of any reason to

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expect that this will occur. All indications are that per unit labor costs will be forced upward as Fluor seeks to execute its current schedule mitigation plan, which will require maintaining a greatly expanded workforce on site.

The remaining 20 scenarios show that it is cheaper for SCE&G and its customers if SCE&G exercises the Fixed Price option. Based on our experience with the project, the most likely six scenarios are those where productivity factors are in the range of 1.50, 1.75 and 2.00, and labor cost growth rates of 2.9% and 5%. Within this range of values, exercising the Fixed Price option would reduce the EPC Contract cost, net of future change orders, by between 10.9% and 29.3%.

It is my judgment that this analysis accurately reflects the key drivers of cost that are relevant to the decision to execute the Fixed Price option. The results unequivocally support the prudence of exercising the Fixed Option, and the benefit that this will provide SCE&G and its customers in the form of greater price security and ultimately a lower price.

Q. PLEASE EXPLAIN THE SITUATION REGARDING EQUIPMENT WARRANTIES AT THE TIME OF THE NEGOTIATIONS.

A. At the time of the negotiations, delays had pushed the substantial completion dates for the Units out in such a way that a number of the key equipment and component warranties would have begun to run before the Units were placed in service and could have expired before there had been sufficient time to identify any issues that needed to be corrected. At one juncture, Westinghouse had indicated that the cost of extending these warranties could be as much as $66 million. Under

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the Amendment, the equipment warranties will begin to run upon substantial completion. In the Amendment, Westinghouse agreed to provide equipment warranties related to the Units tied to the actual completion dates achieved by the project.

Q. PLEASE EXPLAIN WHAT THE AMENDMENT ACCOMPLISHES IN TERMS OF RESTRUCTURING THE EPC CONTRACT TO AVOID FUTURE DISPUTES.

A. I have already discussed the new dispute resolution board and the provisions of the Amendment that rule out litigation until after the project is complete. In addition, the Amendment makes a number of other changes in the EPC Contract to limit future disputes. Some of the most important ones are as follows:

The Change in Law Provisions. The Change in Law provisions of the EPC Contract have been the basis of a number of claims by the Consortium for change orders authorizing additional payments when they have encountered unanticipated decisions or guidance from NRC staff and inspectors that increased costs. We have disputed those claims. The Amendment revises the EPC Contract to make it clear that Westinghouse is entitled to a change order only if a change in law or regulation is embodied in a statute or a formal, written regulatory pronouncement. If the change in law is NRC-related, it must be announced through one of a specified list of formal agency pronouncements. Interpretations or staff opinions do not qualify as the Consortium had sought to assert in the past.

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Design Control Document Revision No. 19. When the EPC Contract was signed in 2008, the NRC had approved the design of the AP1000 unit through Design Control Document Revision No. 15 (DCD Rev. 15). It was understood that additional revisions would be required to meet new NRC aircraft impact rules and to incorporate other design modifications identified by Westinghouse. These changes were incorporated in DCD Rev. 19 which was issued in 2011. The COL for the Units was issued in 2012 and was based on DCD Rev. 19.

In several instances, Westinghouse has sought to argue that because of this chronology it was only contractually required to provide supporting software, documentation and other material reflecting the AP1000 design up to DCD Rev. 15. Under the Amendment, the language in the EPC Contract makes it clear that materials conforming to all changes in the design of the AP1000 unit, up to and including DCD Rev. 19, are required without additional change orders.

New Milestone Payment Schedule. As discussed above, a source of past disputes with the Consortium has been the calendar-based payment schedule for certain costs under the EPC Contract. Going forward, all payments will be tied to Westinghouse accomplishing specific construction milestones or other measures of actual progress. This not only eliminates a source of dispute, but also creates a cash-flow incentive for Westinghouse to meet the construction schedule.

During the transition to the new milestone payment schedule, SCE&G is making payments of $55.0 million per month. These payments will be trued up against invoices for work during the period and against the Fixed Price amount of

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$3.345 billion. Once the new construction milestone payment schedule is finalized, future payments will be based on that schedule. If the payment schedule cannot be produced by agreement, then the dispute resolution board will mediate the matter.

These changes in the payment schedule are very valuable from SCE&G's perspective. They will serve to minimize the claims by Westinghouse going forward and will minimize future distraction related to commercial disputes. Tying payments to construction milestones also creates a strong incentive for completing major scopes of work and improving schedule performance.

Q. PLEASE EXPLAIN WHAT THE AMENDMENT ACCOMPLISHES IN TERMS OF RESOLVING EXISTING DISPUTES BETWEEN THE PARTIES.

A. When the negotiations took place, it was clear from the perspective of the negotiating team that the project could not avoid litigation without resolving outstanding issues concerning disputed invoices, change orders, and change order notices. Nor was it likely that CB&I could leave the project with major unresolved claims on the table, and without quantifying what its costs would be in leaving. In negotiating the Amendment, we excluded only ten items, which are listed on Exhibit C to the Amendment. These items were subject to ongoing negotiations and quantification of scope and amount. They will be submitted to the dispute resolution board if the parties cannot resolve them quickly.

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Q. WHAT MATTERS WERE RESOLVED?

A. Among the matters resolved were invoices we disputed in whole or in part on productivity and efficiency grounds, payments we had withheld due to timing issues, costs we believe never should have been billed to us including costs associated with structural module delays, and disputed costs associated with change orders or their precursors, notices of changes. Mr. Kochems will provide the accounting details about these matters. I can provide a view of these matters from the negotiating team's perspective.

Q. COULD YOU PLEASE DESCRIBE THE ISSUES RELATED TO PRODUCTIVITY AND EFFICIENCY CHALLENGES?

A. One group of challenged costs involved invoices that SCE&G and Santee Cooper refused to pay based on productivity concerns. As I indicated earlier in my testimony, beginning in June of 2015, for each invoice involving Target labor, we calculated an alternative invoice by applying the labor productivity factors and labor efficiency ratios that the Consortium used in its original project cost forecasts. (Labor efficiency ratios are the ratios of Indirect Labor and Field Non-Manual labor associated with Direct Craft Labor.) We disputed the difference between the actual and alternative invoices, and withheld 10% of the disputed amount as the EPC Contract provided.

Q. WHAT WAS THE CONSORTIUM'S POSITION?

A. The Consortium argued that the productivity and efficiency ratios that it used in preparing the prior forecasts were estimates only and SCE&G and Santee Cooper

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were contractually at risk to pay actual costs. In response, SCE&G and Santee Cooper argued that the EPC Contract contained terms requiring the Consortium to construct the Units using "Good Industry Practice," which encompasses "the practices, methods, standards and acts engaged in and generally acceptable to the nuclear power industry in the United States." SCE&G and Santee Cooper asserted that the failure by the Consortium to achieve its earlier productivity and efficiency estimates was the result of the Consortium's failure to use Good Industry Practice.

The Consortium countered that it was following Good Industry Practice but was hampered by the new NRC licensing structure, the lack of an established supply chain for new nuclear construction, and first-of-a-kind issues related to the AP1000 design. Those are the principal arguments that would have been taken into litigation had the Amendment not resolved these disputes.

Q. HOW WERE THESE ISSUES RESOLVED?

A. In the end, disputing these amounts was effective in bringing financial pressure on the Consortium to correct its productivity and efficiency issues. However, there was never any assurance that if the matter was litigated a court would have attributed 100% of the disputed costs to the Consortium's failure to use Good Industry Practice. By the time the Amendment was signed, we had withheld payments of $6.7 million and disputed payments of an additional $60.6 million. All of these claims were resolved by the Amendment.

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Q. COULD YOU PLEASE DESCRIBE THE RESOLUTION OF ISSUES RELATED TO INVOICES DISPUTED DUE TO TIMING?

A. A second set of disputed items involved payments SCE&G and Santee Cooper withheld from the Consortium entirely due to timing. I mentioned these disputes earlier in my testimony. They involved $67.6 million in Fixed Price and Firm Price invoices that were tied to calendar-based payments under the EPC Contract.

SCE&G returned these invoices unpaid arguing that sufficient work on the site had not been completed to justify payment. There was no express language in the EPC Contract authorizing this although certain schedules attached to the EPC Contract did support our claim. Our principal grounds for withholding these payments were that the Consortium was in violation of the Good Industry Practices standard as to the management of the project. The Consortium vehemently disputed our approach.

In the negotiations to settle these matters, both parties recognized that these were Fixed and Firm cost items, the disputes about these costs were timing disputes only, and SCE&G would pay these costs at some point. The Amendment resolved this dispute by providing for a new, milestone-based payment schedule to replace the calendar-based schedule that applied earlier. Payments under the new milestone-based schedule will bring the payment stream in line with construction progress.

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Q. COULD YOU PLEASE DESCRIBE THE ISSUES RELATED TO IMPROPERLY BILLED COSTS?

A. Going back a number of years, SCE&G and Santee Cooper have disputed invoices which included costs billed as Target cost that SCE&G and Santee Cooper believed were associated with Fixed or Firm scopes of work or where prior change orders covered them. For example, the Consortium attempted to bill SCE&G for submodule and mechanical rework done on site using Direct Craft construction labor, even though submodule production is a Fixed Cost item. SCE&G returned the invoices unpaid. In addition SCE&G and Santee Cooper entered into Change Order 16 to resolve all costs associated with structural module delays. On that basis, SCE&G and Santee Cooper returned invoices for the cost of on-site storage of equipment that would not have been required but for the structural module delays. Similar claims were made related to the escalation-related costs that were associated with payments that were delayed due to structural module delay. The total amount of costs in this category is $13.7 million.

Q. COULD YOU PLEASE DESCRIBE THE ISSUES RELATED TO OUTSTANDING CHANGE ORDERS AND NOTICES OF POTENTIAL CHANGES?

A. A fourth group of payment disputes related to a number of change orders and notices of potential change orders that were outstanding at the time of the Amendment. These items are among the 30 specific claims, change orders or other commercial items listed as being resolved on Exhibit A to the Amendment. They

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include the costs associated with Cyber Security upgrades; Site Layout Changes Phases 1 & 2 (physical security related); support for First-of-a-Kind and First-Three-of-a-Kind AP1000 Testing; and the cost of the Schedule Mitigation for Shield Building Panels at NNI. The total value of the Consortium's claims at issue in these matters is $145.6 million. This amount includes the costs associated with the warranty extension of $66 million that is discussed above.

Q. HAS SCE&G ATTEMPTED TO VALUE THE RESOLUTION OF CLAIMS?

A. Yes. We have calculated that the Consortium's quantifiable claims against us were worth $224.4 million to the Consortium, and would be worth more if non-quantifiable claims were included. The $224.4 million figure only includes claims by the Consortium that we could quantify with reasonable certainty given the data provided by the Consortium at the time of the negotiation. The amount would be much higher if the Consortium's claims that had yet to be itemized and quantified at the time of the negotiations were taken into account. This $224.4 million figure is also a net amount. It includes an offset for the Consortium invoices we disputed. We included what we believe to be a very reasonable valuation of those claims.

Q. PLEASE ELABORATE.

A. Mr. Kochems will testify in more detail about this valuation. As to Westinghouse's claims against SCE&G, we included in the $224.4 million valuation only Westinghouse's claims that were invoiced with sufficient supporting data to be accurately quantified. Exhibit A to the Amendment lists 30 specific change orders and other claims that were resolved by the Amendment. Only twelve

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of those 30 claims met our standards for quantification, and only these twelve were included in our calculations. Although the other 18 items included potentially large claims by the Consortium, we did not quantify them in our valuation. This makes the $224.4 million valuation conservative and low. In addition, over the course of the project Westinghouse had issued to SCE&G 35 other notices of change that had not advanced to the point of being listed as definitive claims on Exhibit A. We did not quantify these claims in computing the $224.4 million valuation.

As to SCE&G's claims against Westinghouse, we gave ourselves credit for 100% of the amounts we withheld from payment due to productivity, delay or efficiency challenges, structural module delay or other causes. We assumed that the amounts not withheld, specifically the 90% of the disputed amounts related to productivity and efficiency, were resolved 50%/50%. Again, this is a reasonable assumption given the challenges of prevailing 100% on these claims.

The result of netting all of these claims and counterclaims is this: The Amendment, which resulted in a $137.5 million increase in EPC Contract price and included many other kinds of benefits, resolved quantifiable claims worth $224.4 million, and unquantified claims would have raised this amount even higher.

The total value of all of the claims resolved cannot be specifically computed, since they were resolved before the Consortium had quantified them. However, when the Amendment was signed, CB&I announced that it would take an approximately $1.0 billion charge after taxes for losses associated with its exit from the new nuclear construction business.

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Q. IS THERE A SPECIFIC PART OF THE COST OF THE AMENDMENT THAT SCE&G AND SANTEE COOPER CAN IDENTIFY AS THE AMOUNT PAID TO RESOLVE THESE CLAIMS?

A. No. There was never a point in the negotiation where we took up the disputed payments, claims and change orders separately from other issues and sought to negotiate a resolution to them in isolation. Instead, we negotiated very aggressively with Westinghouse to determine what we could convince Westinghouse to accept in exchange for SCE&G and Santee Cooper agreeing to release CB&I from the Consortium. It worked to our benefit that Westinghouse was strongly motivated to restructure the Consortium and put the project in a position in which its success would support Westinghouse's efforts to market the AP1000 unit worldwide. That motivation, in part, resulted in what we believe is a good deal for us and our customers.

Q. PLEASE EXPLAIN.

A. When the negotiations were completed, Westinghouse had subjected itself to revised liquidated damages of $676.0 million on a 100% basis, and SCE&G had secured the opportunity to move substantially all remaining costs of the project into the Fixed Cost category. Dr. Lynch's study shows that this benefit alone could be worth between approximately $363.0 million and $981.0 million before the project is concluded. We also made important changes in the EPC Contract that favor SCE&G and its customers and cut off a range of potential future claims by Westinghouse based on changes in law or the late adoption of DCD Rev. 19. We

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changed the payment schedule for the project so that going forward Westinghouse will not get cash until it completes important scopes of work. This change both protects us financially and provides Westinghouse with a strong incentive to work efficiently to get paid. We resolved critically important warranty issues. We obtained a new structure for dispute resolution that removes Westinghouse's ability to tie the project up in court if things do not go according to Westinghouse's liking. We secured the changes needed to allow the Consortium to be restructured and Fluor to be hired. And we persuaded the Consortium to settle practically all outstanding claims.

It took a great deal of negotiation to secure these benefits. But ultimately, we were able to obtain Westinghouse's agreement to this entire package of benefits for an increase in the EPC Contract price of $137.5 million (SCE&G's 55% share, $250 million at 100%). During the negotiations, there was never a point at which the disputed claims and change orders, which we quantify at $224.4 million or more, were negotiated on a stand-alone basis. The Amendment was negotiated as a package. Its costs and benefits were considered as a package. The EPC price increase was amount was negotiated as a lump sum amount.

The Amendment must be evaluated as a whole because that is how it was negotiated. From SCE&G's perspective and that of its customers, $137.5 million was a reasonable price to pay to settle these outstanding claims and to obtain the other benefits of the Amendment.

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CHANGE ORDERS

Q. PLEASE DESCRIBE HOW CHANGE ORDERS WILL BE HANDLED UNDER THE AMENDMENT.

A. As discussed previously, the Amendment resolved most of the change orders and notices of change outstanding as of December 31, 2015. But not all such items were resolved. Eleven claims or change orders that were not resolved in the Amendment have now been quantified and itemized. The costs associated with them have been added to the cost forecasts for the project under the terms of the BLRA.

Q. PLEASE DESCRIBE THE CHANGE ORDERS WHICH ARE PRESENTED HERE FOR INCLUSION IN COST FORECASTS.

A. In all, eleven potential change orders are presented here for inclusion in the capital cost forecasts for the Units. Mr. Kochems will describe all eleven. I will review the five potential change orders with the largest cost impact.

Site Layout Changes Phase 3. Part of finalizing the physical configuration of a nuclear unit is reviewing the final placement and design of buildings, site layout and other features to identify the changes and improvements that are required to support the physical security of the site. This work is being undertaken in three phases. The Amendment covered the costs of Phases 1 and 2. At the time of the negotiations, SCE&G was working with Westinghouse to quantify the costs associated with Phase 3, which includes security modifications to the structures and buildings on the site, as well as the installation of additional security equipment.

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SCE&G has now quantified the amount of the costs that will be associated with Phase 3 of this work. That amount is approximately $29.6 million.

Plant Security Systems Integration. The EPC Contract provides for independent plant security systems for each Unit. These represent the software and other systems used to provide physical security to the Units and respond to security events. SCE&G has requested that Westinghouse integrate the two plant security systems so that they operate as one single functioning plant security system. This will greatly simplify operations, improve response times and reduce the cost of maintenance and testing going forward. SCE&G has quantified the additional cost to be approximately $7.1 million.

Service Building Third Floor. SCE&G has reevaluated its facilities requirements in light of emerging data concerning anticipated staffing levels of the Units when in operation and their maintenance and operational support requirements. This reevaluation identified the need to expand the Unit 2 and 3 Service Building to provide additional shop space for the mechanical, electrical and instrumentation and control groups, as well as additional space to accommodate the site management and plant engineering support groups. This expansion will be accomplished by adding a third story to the building. SCE&G has quantified the cost of the expansion at approximately $6.9 million.

Training Staff Augmentation. SCE&G has requested a Change Order from Westinghouse for the costs of Westinghouse staff to augment the V.C. Summer Units 2 and 3 Project NND Operations Training group. The change order would

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cover the cost of a number of AP1000 Senior Reactor Operator ("SRO") certified operations training instructors. These additional personnel are required to ensure that sufficient reactor operators and other staff can be trained and licensed on a schedule that supports initial fuel load for the Units. SCE&G has quantified the cost of the additional training personnel at approximately $4.4 million.

Escrow—Software & Documentation. Under the EPC Contract, SCE&G has the right to require Westinghouse to deposit the source code associated with certain software for operating and maintaining the Units as well as certain facility documentation with a third party escrow agent. The escrow secures SCE&G's right to access the source code and documentation if needed in the future. Under the EPC Contract, SCE&G is responsible for the cost associated with establishing and maintaining the escrow. SCE&G has exercised its right to require this escrow. SCE&G has quantified the cost of establishing the escrow to be approximately $3.0 million.

These are the five largest change orders included in the cost schedule updates in this filing. There are six other change orders, which Mr. Kochems will present in his testimony. All of them represent reasonable and prudent costs of the project. These changes orders are all necessary for successful completion of the project for the benefit of our customers.

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OWNER'S COST UPDATES

Q. PLEASE DESCRIBE HOW THE OWNER'S COSTS ARE CATEGORIZED.

A. Owner's Costs include SCE&G's costs as Owner for such things as site-specific licensing and permitting of the Units; regulatory costs such as NRC fees; insurance, including workers compensation insurance for all workers on site, builder's risk insurance and transportation risk insurance; construction oversight and contract administration costs; the costs of recruiting and training of operating personnel for the Units; the costs of conducting the final acceptance testing of the Units and providing for interim maintenance of components of the Units as completed; the cost of NND facilities, information technology systems and equipment to support the project and the permanent staff of the Units; sales taxes; and other incidental costs for the site.

Q. WHAT PART OF THE COSTS INCLUDED IN THESE UPDATES ARE OWNER'S COSTS?

A. As Mr. Kochems testifies, updates in Owner's cost forecasts represent $20.8 million of the requested updates. Of these costs, $15.6 million are associated with the changes in schedule. $8.0 million are associated with the additional costs of providing project oversight under Fluor's new project management structure and the work schedule that will include a full night shift and additional scheduled overtime. Other changes in Owner's costs, positive and negative, across all of the cost centers that support the project, when netted against each other, result in a $2.8 million reversal of costs, *i.e.*, a cost decrease. The resulting Owner's cost forecast

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presented here represents the reasonable and prudent costs of fulfilling our responsibilities as the Owner of this project.

Q. WHAT ARE THE BUSINESS REASONS FOR THE OWNER'S COST INCREASE?

A. As Mr. Kochems testifies in more detail, the majority of these Owner's cost increases are a result of the delay in the substantial completion dates of the Units. Personnel costs and other support costs cease to accrue to the capital cost of each Unit when that Unit is placed in service. The delay in the substantial completion date for each Unit means that such costs will accrue to each Unit's capital cost for approximately two additional months.

Additional labor-related costs represent $11.0 million in delay-related, or approximately 71% of the $15.6 million increase in Owner's costs due to delay. Non-labor related support costs make up the balance. They include items like insurance, Information Technology support, facilities, and NRC fees. These non-labor items will increase by approximately $4.6 million due to the delay.

The Owner's cost increase also includes increases in personnel costs, facilities costs, additional software and equipment costs and other expenses that must be incurred for SCE&G to meet its obligations as Owner and COL licensee in a reasonable and prudent way. The addition of a night shift to the construction project will require SCE&G to increase its oversight expenses, since Owner's personnel will need to be on site to support and oversee an additional work shift. In addition, Fluor is implementing a new centralized construction management

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organization. SCE&G intends to field a parallel organization to provide Owner's oversight to the project on the same basis. .

A mixed group of other changes in Owner's costs results in a reduction of budgeted costs, principally related to reductions in staffing or delays in hiring. Netted together, these increases and decreases result in a new Owner's cost forecast that is $20.8 million higher than the amount previously approved.

Q. DO YOU HAVE AN OPINION CONCERNING THE REASONABLENESS AND PRUDENCE OF THESE ADJUSTMENTS TO OWNER'S COST?

A. For the reasons set forth in this testimony, as well as those set forth in Mr. Kissam's and Mr. Kochems' testimony, it is my opinion that the adjustments in the forecasts of Owner's costs for the NND project are reasonable and prudent costs of the Units. In my role as President of SCE&G for Generation and Transmission, I am familiar with the process by which these Owner's cost forecasts were created and the work that has gone into ensuring that the costs they reflect are reasonable and prudent costs of the project. It is my firm opinion that these costs reflect a necessary and valuable investment that the Company is making to protect the interest of its customers in these long-lived assets, as well as those of our partner Santee Cooper. They are prudent in every respect.

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CONCLUSION

Q. ARE THE UPDATES REQUESTED IN THIS PROCEEDING REASONABLE AND PRUDENT?

A. Yes. The updates presented in this proceeding are reasonable and prudent. As President for Generation and Transmission, I am involved on an on-going basis with all major aspects of the construction project and was directly involved in the negotiations of both the EPC Contract Amendment and the decision to exercise the fixed-price option. The adjustments requested in this proceeding include adjustments to the construction schedule as well as to EPC costs and Owner's cost. They are adjustments that I know to represent reasonable and prudent changes in the cost and construction schedules for the Units. Making these adjustments is necessary to create the anticipated cost and construction schedules for the Units as required by the BLRA. Based on my knowledge of the project, and in my professional opinion, the adjustments are in no way the result of any lack of responsible and prudent management of the project by the Company or of imprudence by the Company in any respect. I ask the Commission to approve the updated capital cost and construction schedules as presented here and in Mr. Kochems' testimony.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes, it does.

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C E R T I F I C A T E

I, Jo Elizabeth M. Wheat, CVR-CM-GNSC, Notary Public in and for the State of South Carolina, do hereby certify that the foregoing is, to the best of my skill and ability, a true and correct transcript of proceedings had and testimony adduced in a hearing held in the above-captioned matter before the PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA;

That the witnesses appearing during said hearing were affirmed by me to state the truth, the whole truth, and nothing but the truth;

IN WITNESS WHEREOF, I have hereunto set my hand and seal, on this the 21st day of October, 2016.

Jo Elizabeth M. Wheat, CVR-CM/M-GNSC
Hearings Reporter, PSC/SC
My Commission Expires: January 27, 2021.