

BEFORE
THE PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA

DOCKET NO. 2015-103-E - ORDER NO. 2015-661

SEPTEMBER 10, 2015

IN RE: Petition of South Carolina Electric & Gas Company for Updates and Revisions to the Capital Cost Schedule and Schedules Related to the Construction of a Nuclear Base Load Generation Facility at Jenkinsville, South Carolina)))))))	ORDER APPROVING SCE&G'S REQUEST FOR MODIFICATION OF SCHEDULES
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I. INTRODUCTION

This matter comes before the Public Service Commission of South Carolina (the “Commission”) on the Petition of South Carolina Electric & Gas Company (“SCE&G” or the “Company”) for an order approving an updated capital cost schedule and an updated construction schedule for the construction of two 1,117 net megawatt (“MW”) nuclear power units (the “Units”) to be located at the V.C. Summer Nuclear Station near Jenkinsville, South Carolina. SCE&G filed the Petition in this docket (the “Petition”) on March 12, 2015, pursuant to S.C. Code Ann. § 58-33-270(E) (Supp. 2014). Under that provision of the Base Load Review Act (the “BLRA”), a utility “may petition the commission . . . for an order modifying any of the schedules, estimates, findings, class allocation factors, rate designs, or conditions that form part of any base load review order.” S.C. Code Ann. § 58-33-270(E). Further, the statute states that “[t]he commission shall grant the relief requested if, after a hearing, the commission finds...that

the evidence of record justifies a finding that the changes are not the result of imprudence on the part of the utility.” *Id.*

A. Prior BLRA Orders

In Order No. 2009-104(A), dated March 2, 2009, the Commission approved an initial capital cost schedule and construction schedule for the Units. As approved in that order, the capital cost for the Units was \$4.5 billion in 2007 dollars.¹ With forecasted escalation, this resulted in an estimated cost for the Units at completion of \$6.3 billion in future dollars. The construction schedule approved in Order No. 2009-104(A) anticipated that Unit 2 would be completed by April 1, 2016, and the project as a whole would be completed by January 1, 2019. The South Carolina Energy Users Committee (“SCEUC”) appealed Commission Order No. 2009-104(A) to the South Carolina Supreme Court.²

In April 2009, SCE&G received its initial site-specific, integrated construction schedule from its principal contractors for the Units, Westinghouse Electric Company, LLC (“WEC”) and Stone & Webster, a subsidiary of the Shaw Group. At that time, SCE&G filed a proceeding under S.C. Code Ann. § 58-33-270(E) (an “update proceeding”) for approval of the updated construction schedule for the project and an updated capital cost schedule which reflected the new schedule of cash flows associated with the updated construction schedule. The updated schedules did not alter the total estimated capital cost for the Units of \$4.5 billion in 2007 dollars, nor did they change the

¹ Unless otherwise noted, all dollar amounts used in this Order reflect the cost associated with SCE&G’s 55% share of the ownership of the Units and are expressed in 2007 dollars.

² An appeal from Order No. 2009-104(A) was also taken by Friends of the Earth. *Friends of Earth v. Pub. Serv. Comm’n*, 387 S.C. 360, 692 S.E.2d 910 (2010).

estimated completion dates for the Units. In Order No. 2010-12 dated January 21, 2010, the Commission approved the updated schedules.

On August 9, 2010, the South Carolina Supreme Court issued its decision in SCEUC's appeal of Order No. 2009-104(A), *South Carolina Energy Users Comm. v. South Carolina Pub. Serv. Comm'n*, 388 S.C. 486, 697 S.E.2d 587 (2010) (the "Opinion"). In the Opinion, the Court ruled that contingency costs that had not been itemized or designated to specific cost categories were not permitted as a part of approved capital cost schedules under the BLRA. The effect of this decision was to require the removal of \$438.3 million in projected contingency costs from the capital cost schedules approved in Order No. 2009-104(A) and Order No. 2010-12.

In the Opinion, the Supreme Court acknowledged that S.C. Code Ann. § 58-33-270(E) allowed SCE&G to petition the Commission to update the capital cost schedule for the Units as SCE&G identifies and itemizes additional items of cost. The Court noted, "the General Assembly anticipated that construction costs could increase during the life of the project. Under § 58-33-270(E), SCE&G may petition the Commission for an order modifying rate designs." *South Carolina Energy Users*, 697 S.E.2d at 592-93.

In response to the Opinion, SCE&G filed a petition in November 2010 for approval of an updated capital cost schedule. The Commission approved SCE&G's updated capital cost schedule in Order No. 2011-345, dated May 16, 2011. In that updated cost schedule, SCE&G removed its owner's contingency, *i.e.*, costs that had not been itemized to specific capital cost categories, as required by the Opinion. Where costs could be itemized, the Company requested Commission approval to include those

additional costs in the approved capital cost schedules. Because the amount of the newly itemized costs was less than the amount of the owner's contingency that was removed from the approved forecasts, the cost schedule approved in Order No. 2011-345 showed a reduction in the total estimated capital cost for the Units from \$4.5 billion to \$4.3 billion.

On May 15, 2012, SCE&G filed a Petition with the Commission pursuant to S.C. Code Ann. § 58-33-270(E) seeking an order approving an updated construction schedule and capital cost schedule for the Units. The Company based its request primarily on the fact that the Nuclear Regulatory Commission ("NRC") had issued the Combined Operating Licenses (the "COLs") for the Units approximately nine months later than originally anticipated which resulted in a rescheduling of the substantial completion dates. Based on the information available at that time, the updated substantial completion dates reflected a delay for Unit 2 until March 15, 2017, and an acceleration of Unit 3 to May 15, 2018. The Company's request reflected a settlement agreement between SCE&G and WEC/Shaw (now WEC/CB&I)³ related to cost increases caused by the COL delay, design changes to the AP1000 Shield Building, redesign of certain structural modules, and unanticipated subsurface rock conditions for Unit 2. Additionally, SCE&G requested updated Owner's costs based on information and experience gained over the course of the project, new safety standards issued after the Fukushima event and other

³ In July of 2012, Chicago Bridge & Iron ("CB&I") announced its intention to acquire the Shaw Group. When that transaction closed in February of 2013, CB&I became a member of the Consortium and a prime contractor on the project. Tr. at 271. CB&I Lake Charles is the current name of the module fabrication unit formerly known as Shaw Modular Solutions or SMS and located in Lake Charles, Louisiana. See December 2012 SCE&G Quarterly Report at p.7.

matters. SCE&G also included three smaller change orders in its schedules of anticipated costs.

In Order No. 2012-884 dated November 15, 2012, the Commission approved updating the estimated capital cost for the Units from \$4.3 billion to approximately \$4.5 billion in 2007 dollars and a new milestone schedule tied to substantial completion dates for Units 2 and 3 of March 15, 2017, and May 15, 2018, respectively. Order No. 2012-884 was appealed to the South Carolina Supreme Court. The Supreme Court affirmed the Commission's ruling in all respects in *South Carolina Energy Users Comm. v. South Carolina Elec. & Gas*, 410 S.C. 348, 764 S.E.2d 913 (2014).

B. The Update Petition in This Docket

The updated construction schedule under review here was attached to the Petition as Exhibit 1, and entered into evidence at the hearing as a part of Hearing Exhibit No. 4 (SAB-2). It is attached to this order as **Order Exhibit No. 1**. This updated schedule delays the substantial completion date of Unit 2 by 27 months to June 19, 2019, and Unit 3 by 25 months to June 16, 2020. The updated schedule also adjusts other milestone dates to reflect current construction plans. The cause of the delay in the project to date has been delay in the production of submodules for the Units. This fact is uncontested on the record of this proceeding.

The updated capital cost schedule for the project was attached to the Petition as Exhibit 2 and entered into evidence at the hearing as a part of Hearing Exhibit No. 10 (CLW-1-P). It is attached to this order as **Order Exhibit No. 2**. This schedule increases the anticipated cost of the Units by \$698.2 million in 2007 dollars to \$5.2 billion, or

approximately 15% compared to the forecasts of \$4.5 billion approved in Order No. 2012-884. The increases in anticipated costs are related to (a) the effects of schedule delay on Engineering, Procurement and Construction (EPC) Contract costs and on the costs to be incurred by SCE&G as Owner in overseeing and supporting the project, (b) additional costs resulting from labor productivity factors and estimates of the cost of supporting direct craft labor that are less favorable than originally forecasted, (c) 10 individual change orders under the EPC Contract involving such things as improved cyber security, site physical security, and additional software systems to support the project, (d) additional labor costs identified in finalizing the design of the Units, (e) other increases in SCE&G's costs as Owner of the Units, and (f) additional Time and Materials ("T&M") costs to support amendments to the design licensing basis of the Units and construction testing of the Units. As set forth in the Petition, these costs have been reduced by the anticipated recovery of liquidated damages due to delay in the project, and by SCE&G's decision to pay 90% of the increased EPC Contract cost associated with delay and with less favorable than anticipated labor productivity factors and labor support cost. SCE&G indicates that it intends to challenge these latter costs and that 90% payments reflect terms of the EPC Contract. The updated figures also reflect a minor adjustment due to the reallocation of certain shared switchyard costs between SCE&G and its co-owner, the South Carolina Public Service Authority (also known as Santee Cooper.) Chart A details these increases:

CHART A			
COST ADJUSTMENTS REQUESTED IN PETITION			
(millions of dollars)			
	Delay Cost	Non-Delay Cost	Total Cost
ESTIMATE AT COMPLETION (EAC) COST			
Associated with Delay	\$ 228.1		
Less: Liquidated Damages	\$ (85.5)		
Net Associated with Delay			\$ 142.6
Not Associated with Delay			
Other EAC Cost			
Productivity and Staffing Ratios		\$ 154.8	
WEC Time & Materials Changes		\$ 27.4	
Total: Other EAC Costs		\$ 182.2	
Design Finalization		\$ 71.9	
Total Not Associated with Delay			\$ 254.1
TOTAL EAC COST ADJUSTMENT			\$ 396.7
OTHER EPC ADJUSTMENTS			
Ten Change Orders		\$ 56.5	
Less: Switchyard Reallocation		\$ (0.1)	
TOTAL EPC COST ADJUSTMENT			\$ 453.1
OWNER'S COST			
Associated with Delay	\$ 214.3		
Not Associated with Delay		\$ 30.8	
TOTAL OWNER'S COST ADJUSTMENT			\$ 245.1
TOTAL ADJUSTMENT	\$ 356.9	\$ 341.3	\$ 698.2
Totals may vary due to rounding.			

Under the updated schedules, the cost of the Units in future dollars is \$6.8 billion which is an increase of \$514 million, or approximately 8% more than the \$6.3 billion amount forecasted in 2009. However, the Petition states that since Order 2009-104(A) was issued the capital cost of the project to customers has been offset, in current dollars, by lower than anticipated escalation (\$214 million), lower than anticipated debt costs (\$1.2 billion), and the potential availability of additional Federal Production Tax Credits (\$1.2 billion) making the overall cost to customers comparable to what was approved in 2009. Tr. at 61-63.

The anticipated cost schedule for the Units as approved in various dockets filed under the BLRA is set forth on Chart B.

Chart B					
Summary of BLRA Cost Schedule (billions of \$)*					
<u>Forecast Item</u>	<u>Order No. 2009-104(A)</u>	<u>Order No. 2010-12</u>	<u>Order No. 2011-345</u>	<u>Order No. 2012-884</u>	<u>Current Petition</u>
Capital Cost, 2007 Dollars	\$4.535	\$4.535	\$4.270	\$4.548	\$5.247
Escalation	\$1.514	\$2.025	\$1.261	\$0.968	\$1.300
Total Project Cash Flow	\$6.049	\$6.560	\$5.531	\$5.517	\$6.547
AFUDC	\$0.264	\$0.316	\$0.256	\$0.238	\$0.280
Gross Construction	\$6.313	\$6.875	\$5.787	\$5.755	\$6.827

*Totals may not add due to rounding.

C. Notice and Interventions

In compliance with S.C. Code Ann. § 58-33-270(E), SCE&G provided timely notice of the Petition in this docket to the South Carolina Office of Regulatory Staff (“ORS”). Pursuant to S.C. Code Ann § 58-4-10 (Supp. 2014), ORS is automatically a party to this proceeding.

By letter dated March 18, 2015, the Commission’s Clerk’s Office instructed the Company to publish by April 3, 2015, a Notice of Filing and Hearing in newspapers of general circulation in the area where SCE&G serves retail electric customers (the “Newspaper Hearing Notices”). The Clerk’s Office also instructed SCE&G to provide it proof of newspaper publication by May 18, 2015. On April 20, 2015, the Company timely filed affidavits with the Commission demonstrating that the Newspaper Hearing Notices had been duly published in accordance with the instructions of the Clerk’s Office.

By letter dated July 9, 2015, the Clerk’s Office instructed the Company to publish a Notice of Public Night Hearing as a display ad in the local section of the following newspapers by July 15, 2015: *The State*, the *Aiken Standard*, *The Post and Courier*, *The Beaufort Gazette*, and *The Island Packet* (the “Newspaper Night Hearing Notices”). The Clerk’s Office also instructed SCE&G to provide proof of publication of the Newspaper Night Hearing Notices by July 17, 2015. On July 17, 2015, the Company filed with the Commission affidavits demonstrating that the Newspaper Night Hearing Notices had been duly published in accordance with the instructions of the Clerk’s Office in *The State* and the *Aiken Standard* and provided photocopy proof that the notices were timely

published in *The Beaufort Gazette*, *The Island Packet*, and *The Post and Courier* in accordance with the instructions of the Clerk's Office. On July 30, 2015, the Company provided the affidavits of publication for the *The Beaufort Gazette*, *The Island Packet*, and *The Post and Courier* which had been provided to the Company after July 17, 2015.

Timely petitions to intervene in this docket were received from the Sierra Club, SCEUC and CMC Steel South Carolina. No other parties sought to intervene in this proceeding.

D. The Settlement Agreement

On June 29, 2015, after the pre-filing of direct testimony by SCE&G and after all parties had been afforded a full opportunity to conduct discovery in this matter, ORS filed with the Commission a Settlement Agreement executed by ORS, SCE&G and SCEUC (the "Settling Parties"). The remaining parties, the Sierra Club and CMC Steel South Carolina, did not sign the Settlement Agreement. However, CMC Steel authorized ORS to state in the letter of transmittal accompanying the Settlement Agreement that it did not object to its terms. Among other things, the Settling Parties agreed that the modified construction schedule and capital cost schedule presented in the Petition were not the result of imprudence by SCE&G and agreed that the Commission should approve the updated construction schedule and capital cost schedule attached to the Petition. The Settlement Agreement was placed into the record as Hearing Exhibit No. 1 in this matter, and attached to this Order as **Order Exhibit No. 3**.

E. Hearing

The Commission conducted an evidentiary hearing on this matter on July 21 and 22, 2015, with the Honorable Nikiya M. ‘Nikki’ Hall, Chairman, presiding. SCE&G was represented by K. Chad Burgess, Esq., Matthew W. Gissendanner, Esq., Mitchell Willoughby, Esq., and Belton T. Zeigler, Esq. ORS was represented by Jeffrey M. Nelson, Esq., and Shannon Bowyer Hudson, Esq. The Sierra Club was represented by Robert Guild, Esq., and SCEUC was represented by Scott Elliott, Esq. By permission of the Commission, the attorneys for CMC Steel were excused from attending the hearing.

In support of the Petition, the Company presented the direct testimony of Kevin B. Marsh, Chairman and Chief Executive Officer of SCANA Corporation and SCE&G; Stephen A. Byrne, President for Generation and Transmission and Chief Operating Officer of SCE&G; Ronald A. Jones, Vice President for New Nuclear Operations for SCE&G; Carlette L. Walker, Vice President for Nuclear Finance Administration at SCANA; and Dr. Joseph M. Lynch, Manager of Resource Planning at SCANA. ORS presented the settlement testimony of M. Anthony James, P.E., Director of New Nuclear Development for ORS.

The Commission took statements from 21 public witnesses at the beginning of the evidentiary hearing held on July 21, 2015, at a night hearing held on the evening of July 21, 2015, and during the course of the evidentiary hearing held on July 22, 2015.

At the hearing, the Sierra Club, CMC Steel and the SCEUC did not present testimony. The attorney representing the Sierra Club made an opening statement and cross-examined witnesses for SCE&G and ORS.

II. STATUTORY STANDARDS AND REQUIRED FINDINGS

S.C. Code Ann. § 58-33-270(E) governs proceedings to update capital cost schedules and construction schedules that have been previously approved under the BLRA. Under this statute, the Commission must grant the relief requested if, after a hearing, the Commission finds “as to the changes in the schedules, estimates, findings or conditions, that the evidence of record justifies a finding that the changes [in previously approved schedules] are not the result of imprudence on the part of the utility.” S.C. Code Ann. § 58-33-270(E)(1) (Supp. 2014). In addition, under other provisions of the BLRA, determinations made in prior BLRA orders “may not be challenged or reopened in any subsequent proceeding.” S.C. Code Ann. § 58-33-275(B) (Supp. 2014).

III. REVIEW OF THE SETTLEMENT AGREEMENT

A. Overview

In the Settlement Agreement, the Settling Parties agreed that the modified construction schedule and capital cost schedule presented in the Petition “are not the result of imprudence by SCE&G and are fully consistent with the requirements of the BLRA.” Hearing Exhibit No. 1 at p. 7. The Settling Parties further agreed that the Commission should approve the updated construction schedule and capital cost schedule which were attached to the Petition as the operative BLRA schedules for the project. *Id.* The Settlement Agreement also provides that beginning with any revised rates filings made on or after January 1, 2016, and prospectively thereafter until the Units are complete, SCE&G will calculate its revised rates filings using a return on common equity of ten and one-half percent (10.5%) rather than the return on common equity of eleven

percent (11%) established in Commission Order No. 2009-104(A). The Settling Parties stipulated that the terms of the Settlement Agreement are reasonable, in the public interest and in accordance with law and regulatory policy. *Id.* at p. 8.

Pursuant to S.C. Code Ann. §58-33-270(G) (Supp. 2014), the Settling Parties asked the Commission to hold a hearing on the Settlement Agreement along with the hearing for the Petition. They asked the Commission to adopt the Settlement Agreement as part of its order in this proceeding.

Under S.C. Code Ann. § 58-33-270(G):

The commission promptly shall schedule a hearing to consider any settlement agreement entered into between the Office of Regulatory Staff, as the party representing the public interest in the proceedings, and the utility applicant, provided that all parties shall have been given a reasonable opportunity to conduct discovery in the docket by the time the hearing is held. The commission may accept the settlement agreement as disposing of the matter, and issue an order adopting its terms, if it determines that the terms of the settlement agreement comport with the terms of this act.

The Settlement Agreement here was entered after all parties had a full opportunity to conduct discovery on the matters at issue in this case, and after SCE&G had submitted approximately 253 pages of prefiled testimony and exhibits setting out in detail the reasons for the changes in the construction schedule and anticipated cost schedules for the project. In this regard, the Settlement Agreement recites the extensive time and effort that SCE&G invested in reviewing, analyzing, and challenging the information provided by WEC/CB&I before determining that it was reasonable and prudent to petition the Commission under the BLRA to update the construction and capital cost schedules.

Furthermore, the settlement testimony of the ORS's witness, Mr. Anthony James, shows that the Settlement Agreement is based on ORS's extensive oversight of costs and construction schedules for the project, oversight which has been on-going since 2009. Tr. at 706-710.

As to the latter point, a utility operating under the BLRA is required to prepare detailed quarterly status reports on its project. These status reports are filed with ORS for use in its on-going oversight and review of the project. S.C. Code Ann. § 58-33-277(A) (Supp. 2014). As to that oversight and review:

The Office of Regulatory Staff shall conduct on-going monitoring of the construction of the plant and expenditure of capital through review and audit of the quarterly reports under this article, and shall have the right to inspect the books and records regarding the plant and the physical progress of construction upon reasonable notice to the utility.

S.C. Code Ann. § 58-33-277(B) (Supp. 2014). To support this on-going monitoring, ORS has retained full-time staff, supplemented by an outside nuclear construction expert, who oversee the plant construction for ORS and ensure that the public interest is protected. *See* S.C. Code Ann. §§ 58-33-230(F), 58-33-295 (Supp. 2014).

As indicated in the settlement testimony of ORS's witness, Mr. James, ORS has discharged its duties to monitor, audit and review the cost and construction schedules related to SCE&G's Units with care and diligence. ORS personnel make at least twice-weekly visits to the Jenkinsville site, conduct regular on-site document reviews, attend on-site planning and schedule oversight meetings, conduct in-depth construction site visits, and meet monthly with SCE&G leadership to review the project status. Tr. at 707. As part of its financial oversight, ORS conducts detailed reviews of project cash flows

and cash flow variances, invoices, milestone payments, contract amendments and change orders. Tr. at 708. ORS audit staff regularly evaluates project accounting controls and conducts regulatory audits on project expenditures. In those audits, ORS audit staff selects sample invoices for detailed review to ensure accounting controls are being applied and that costs are properly charged within and to the project. Tr. at 709-10.

In reviewing the Settlement Agreement, the Commission recognizes the critical role that ORS plays in protecting the public interest in these matters. With its audit powers, a skilled staff, and access to outside experts, ORS is equipped to ensure that the terms of the BLRA are enforced to protect the public interest of the State of South Carolina in these matters.

Based on these facts, the Commission finds that the Settlement Agreement meets the statutory requirements for adoption under S.C. Code Ann. § 58-33-270(G). As S.C. Code Ann. § 58-33-270(G) requires, both ORS and SCE&G are signatories to the Settlement Agreement. More than sufficient opportunity for factual review and for discovery has been given. Within this context, in issuing the order on the merits in this proceeding, the Commission's task is to review the evidence of record presented by the utility and ORS to see that this evidence supports the Settlement Agreement and the terms it encompasses. *See* S.C. Code Ann. § 58-33-270(G).

IV. REVIEW OF THE EVIDENCE AND EVIDENTIARY CONCLUSIONS

In approving the Settlement Agreement, the Commission has reviewed the evidentiary record of this proceeding to ensure that the terms of the Settlement Agreement are supported by the facts and evidence of record and thus comport with the

operative provisions of the BLRA. Based on this review, the Commission reaches the following legal and factual conclusions:

A. Update to BLRA Approved Construction Schedule

As reflected in Order Exhibit No. 1, SCE&G seeks approval of an updated construction schedule which delays the substantial completion dates for Units 2 and 3 by 27 months and 25 months, respectively. SCE&G has not formally accepted the new schedules through a change order under the EPC Contract or other form of settlement or agreement with WEC/CB&I. Specifically, SCE&G has not agreed to revise the Guaranteed Substantial Completion dates in the EPC Contract. The testimony of SCE&G's witnesses indicates that SCE&G has not done so to avoid any risk that doing so might release WEC/CB&I from any of its existing obligations under the EPC Contract and possibly from claims for damages for failure to fulfill those obligations. SCE&G has been careful throughout these proceedings not to waive any claims or release WEC/CB&I from any of its obligations under the EPC Contract. *See, e.g.*, Tr. at 59, 96. The Commission finds that this approach is reasonable and prudent and supports the interests of the Company and its customers.

1. Causes of Schedule Delay and SCE&G's Response

The evidence of record establishes that the delay in the project schedule to date results from delay in the submodule production. Tr. at 218. The facts related to this delay are as follows.

In the design and construction plan for AP1000 reactors, key structural elements are fabricated off site as submodules which are shipped to the plant site for assembly into

modules. Once assembled, these modules are lifted and set in place in the Units. This technique allows submodule production to take place at a centralized location using automated cutting and welding equipment in a controlled environment. Modular construction has been used successfully in other construction sectors, particularly the construction of large and complex naval vessels. When used successfully, modular construction can support schedule and production efficiencies. However, modular construction is new to the commercial nuclear industry with the current AP1000 projects. Tr. at 255.

Accordingly, in the 2008 proceedings SCE&G recognized and disclosed that the schedule and production efficiencies anticipated from modular construction might not materialize in this project. SCE&G identified uncertainties surrounding this approach as an important risk factor for the project. Tr. at 255.

In 2008, SCE&G identified that a second important risk factor for the project was the challenge of establishing an effective nuclear safety culture in the supply chain for constructing the new AP1000 units. *See* Combined Application in Docket No. 2008-196-E at Exhibit J, p. 6-7. An effective nuclear safety culture is one that achieves strict compliance with design documents, material specifications, and designated construction codes for all nuclear safety aspects of the construction and fabrication process. Materials and commodities used in this work must be extensively tested. Compliance and testing must be thoroughly documented in quality control documentation accompanying all parts, equipment, assemblies or systems used. Human systems, demonstrated and

reinforced by all levels of management, must be in place to encourage reporting of quality problems by all employees and to ensure effective responses to concerns raised.

After the EPC Contract was signed, the contractors chose SMS in Lake Charles as the subcontractor to fabricate key structural submodules for the AP1000 reactor. SMS thereafter established the module production facility in Lake Charles, Louisiana, for this work. In 2010, as the facility was first going into production, SCE&G began to identify quality and efficiency problems with the fabrication activities there and disclosed those problems to the Commission, ORS and the public. Tr. at 218, *see also* March 31, 2010, Quarterly Report at p. 14. SCE&G also identified and disclosed the difficulties that the SMS leadership team was experiencing in establishing an effective nuclear safety culture at the facility. These problems were exacerbated by design changes for the modules that were emerging from WEC's design finalization.

Public records show that SCE&G discussed the seriousness of its concerns about submodule production at SMS and later CB&I-LC in each of the 21 quarterly reports filed since March 2010.⁴ SCE&G has provided information about these matters in each of the annual status reports given on the progress of construction of the Units since

⁴ *See*, March 31, 2010, Quarterly Report at p. 14; June 30, 2010, Quarterly Report at p. 16; September 30, 2010, Quarterly Report at pp. 12-13; December 3, 2010, Quarterly Report at p. 12; March 31, 2011, Quarterly Report at pp. 12-13; June 30, 2011, Quarterly Report at pp. 12-13; September 30, 2011, Quarterly Report at pp. 12-13; December 3, 2011, Quarterly Report at pp. 11-12; March 31, 2012, Quarterly Report at pp. 7, 13; June 30, 2012, Quarterly Report at pp. 8, 13; September 30, 2012, Quarterly Report at pp. 7-8, 12; December 3, 2012, Quarterly Report at pp. 7, 12; March 31, 2013, Quarterly Report at pp. 8, 11-13; June 30, 2013, Quarterly Report at pp. 2, 8-9, 13-14; September 30, 2013, Quarterly Report at pp. 2, 7, 12-13, 16; December 3, 2013, Quarterly Report at pp. 2, 8, 13-14; March 31, 2014, Quarterly Report at pp. 2, 9, 14-16; June 30, 2014, Quarterly Report at pp. 2, 8-9, 13-14; September 30, 2014, Quarterly Report at pp. 2, 9, 13-15; December 3, 2014, Quarterly Report at pp. 2, 10, 14-16, 21; and March 31, 2015, Quarterly Report at pp. 2-3, 9, 14-16.

2010.⁵

From 2010 forward, SCE&G devoted substantial time, attention and resources to identifying the root causes of these problems and urging WEC/CB&I to act to correct them. Tr. at 270. The record shows that these efforts included numerous inspection trips to the site, formal quality inspections, posting of a full time inspector at the site, and regular meetings with senior WEC/CB&I leadership to assess progress and critique results. Tr. at 270-72. In response to SCE&G's concerns and those raised by the other AP1000 owner, Southern Nuclear Company ("SNC"): (a) CB&I replaced key members of the leadership team at the Lake Charles facility, (b) WEC agreed to place full-time engineers on site to assist with design issues, (c) WEC/CB&I issued stop work orders pending quality improvements, and (d) CB&I moved certain submodule production activities from Lake Charles to the Jenkinsville site. See, *e.g.*, Tr. at 271, 552. After CB&I acquired the Lake Charles facility from The Shaw Group, WEC/CB&I offered to outsource major components of the submodule fabrication work to subcontractors other than CB&I-LC in the United States and Japan. These latter actions were taken at WEC/CB&I's sole expense.

In sum, the record shows that SCE&G identified the problems at CB&I-LC early in the construction process and provided timely and proactive oversight. SCE&G recognized the seriousness of the problems that were emerging in Lake Charles and the

⁵ Docket No. 2010-376-E, Tr. at pp. 71-72, 100-101, 191-192 (April 4, 2011); Docket No. ND-2011-24-E, Tr. at pp. 36-38 (September 9, 2011); Docket No. 2012-203-E, Tr. at pp. 62-63, 205-209 (October 2, 2012); Docket No. ND -2013-13-E, Tr. at pp. 10-15 (June 26, 2013); Docket No. ND 2014-25-E, Tr. at pp. 9-11, 26-30, 47-48, 52-54, 57-58, 60, 64-67, 74-80, 105-106 (October 15, 2014).

disruption to the project schedule that might result. The Commission finds that SCE&G's actions to respond to these problems and mitigate the resulting delays have been timely, appropriate, and prudent. The Settling Parties are correct in agreeing that there is no basis on this record to conclude that the project delays reflected in the updated construction schedule are the result of imprudence by SCE&G.

2. SCE&G's Review and Analysis of the Updated Construction Schedule

The evidence of record also shows that the updated construction schedule presented here has undergone a detailed review and assessment by SCE&G and ORS. SCE&G's witness Mr. Byrne testified that in 2013, SCE&G insisted that WEC/CB&I conduct a full review of the project schedule after it became apparent to SCE&G that delays in submodule production had made the existing project schedule unattainable. In the third quarter of 2014, WEC/CB&I produced a new Revised, Fully-Integrated Construction Schedule for the project which provided an item-by-item sequencing of the individual scopes of work required to complete the project that involved thousands of schedule activities and thousands of pages of back-up documentation. Tr. at 270, 272. The initial versions of the schedule provided by WEC/CB&I proposed several mitigation alternatives to accelerate the construction schedule, each involving specific levels of additional cost to the project. SCE&G then began an extensive review of the new Revised, Fully-Integrated Construction Schedule with WEC/CB&I to determine its reasonableness and accuracy. SCE&G convened a diverse team of accounting, project management and engineering personnel with experience in nuclear and non-nuclear power plant projects to review this data. Tr. at 614-15. This team evaluated and selected

schedule mitigation alternatives with WEC/CB&I. The review lasted for several months. It resulted in SCE&G's determination in March of 2015 that the schedules attached to the Petition in this matter were the appropriate schedules for the project given the information currently available. Tr. at 219. SCE&G's witnesses, Mr. Byrne and Mr. Jones, testified to the fact that in their opinion the construction schedule presented here represents a reasonable and prudent schedule for completing the construction of the Units. Tr. at 220, 274, 556. ORS has similarly reviewed and evaluated the schedule and supports its adoption as the anticipated construction schedule for the Units under S.C. Code Ann. § 58-33-270(B) (Supp. 2014). Tr. at 699-701.

3. Conclusion as to the Updated Construction Schedule

SCE&G notes in its testimony that WEC/CB&I's ability to fulfill the schedule presented here depends on WEC/CB&I achieving significant improvements in labor productivity and in the successful mitigation of certain forward-looking critical path items like design finalization and shield building panel production. The ability of WEC/CB&I to achieve these productivity improvements and accomplish the required schedule mitigation is not guaranteed. It is true, as Mr. Byrne testified, that construction of the Units has proceeded to a point where many of the initial risks and challenges of new nuclear construction have been overcome. Tr. at 240-253. But, as Mr. Byrne also testified, substantial risks to the project and its schedule remain from a number of factors which are listed in his testimony. Tr. at 253-263. For that reason, the construction schedule presented here is dynamic and will likely change several times before the project is complete. Tr. at 275. Nevertheless, the evidence shows that this construction

schedule, which is set forth on Order Exhibit No. 1, is a reasonable and prudent plan for completing construction of the Units given the information available at this time. It is therefore appropriate, as the Settlement Agreement provides, for the Commission to approve this schedule under S.C. Code Ann. § 58-33-270(E) as the updated schedule for construction of the Units as provided for in the BLRA.

Based on the evidence of record in this proceeding and under the terms of S.C. Code Ann. § 58-33-270(E), the Commission approves Order Exhibit No. 1 as the updated construction schedule for the project. Exhibit No. 1 to this Order shall be substituted for Hearing Exhibit 2, SAB-5 (“Exhibit E”), which was the approved construction schedule referred to on page 93 of Order No. 2009-104(A) and all subsequent versions of that schedule. Until further order of the Commission, Order Exhibit No. 1 shall serve as the anticipated construction schedule for the Units as contemplated by S.C. Code Ann. §§ 58-33-270(B) and 58-33-275(A) (Supp. 2014).

B. Update to BLRA Approved Cost Schedule

SCE&G also seeks to update the anticipated schedule of capital costs for the Units to reflect the new Revised, Fully-Integrated Construction Schedule and other changes that have occurred in the construction plan since 2012. The components of these cost updates fall into several principal categories, each of which is discussed separately below.

1. Updates to Anticipated EAC Cost

The largest component of the cost update before the Commission is the increase in the estimated at completion cost (“EAC Cost”) for the Units under the EPC Contract. Based on updated cost information provided by WEC/CB&I, SCE&G anticipates that the

EAC Cost for the Units will increase by \$396.7 million net of liquidated damages, or approximately 57% of the total change in project cost.

(a) Overview of the Additional Anticipated EAC Cost

The additional anticipated EAC Cost falls into the following categories:

- (i) Schedule delay is forecasted to increase the EAC Cost by \$228.1 million, or more than half of the total amount of additional EAC Cost;
- (ii) Increases associated with less favorable labor productivity factors and indirect and field non-manual labor factors and costs represent \$154.8 million of the increase;
- (iii) The additional labor costs identified as a result of finalizing the design of the Units is estimated to be \$71.9 million; and
- (iv) Additional support services from WEC/CB&I for licensing and testing of the Units are forecasted to add \$27.4 million to the EAC Cost.

In arriving at the \$396.7 million figure, SCE&G has reduced the EAC Cost increase associated with delay by \$85.5 million to reflect the amount of liquidated damages recoverable under the EPC Contract due to the anticipated delay. Furthermore, SCE&G is contesting WEC/CB&I's right under the EPC Contract to require SCE&G to absorb additional EAC Costs associated with delay and less favorable labor factors and support costs. Beginning May 5, 2015, SCE&G is paying WEC/CB&I 90% of invoiced amounts SCE&G determines are related to these matters. As discussed below, this 90% payment is in recognition of WEC/CB&I's position that the EPC Contract requires such payments while disputes are being resolved.

(b) Origins and Review of the Updated EAC Cost Schedule

The record shows that the costs contained in the revised EAC Cost schedule are based on the Revised, Fully-Integrated Construction Schedule for the project which

WEC/CB&I provided to SCE&G in the third quarter of 2014. Tr. at 141-142, 272. After receiving this schedule, SCE&G convened its review team which evaluated and selected schedule mitigation alternatives with WEC/CB&I, and reviewed and revised the EAC Cost data where appropriate. Tr. at 613-615. The review resulted in SCE&G's determination in March 2015 that the anticipated EAC Cost schedules attached to the Petition were the appropriate schedules of anticipated costs for the project given the information currently available.

The witnesses for the Company testified directly and affirmatively as to the reasonableness and prudence of the resulting EAC Cost estimates. Tr. at 590, 621. Witnesses for SCE&G also testified to the depth and extent of the work done by the Company in reviewing and accepting the updated EAC Cost schedule. Tr. at 613-615. ORS also reviewed the EAC Cost schedule and concluded that it was appropriate for inclusion in the BLRA cost schedule for the project, as ORS's agreement to the Settlement Agreement demonstrates. Tr. at 699-710. No party has presented any evidence to the contrary. The Commission finds that the evidence of record establishes the updated EAC Cost schedule is a reasonable and prudent forecast of the EAC cost required to complete the Units.

(c) Delay Related Updates to EAC Cost Forecasts

SCE&G has identified \$228.1 million of the increase in EAC Cost as being related to delay in the project. This delay increases the EAC Cost for completing the project since it requires supervisory and support personnel, equipment and supplies, temporary facilities, construction warehouses and other necessary services to remain

engaged in the project longer than anticipated. In some cases, subcontractors must maintain a presence on site longer than initially anticipated due to construction delay that impedes them finishing their work. Tr. at 555, 612. The costs associated with delay have been computed by recalculating EAC Cost based on the delayed construction schedule contained in the Revised, Fully-Integrated Construction Schedule. As SCE&G witnesses testified, those recalculated costs have undergone rigorous review before being accepted for filing in this proceeding. Tr. at 614-616. As discussed above, the delay which has caused these additional costs is in no way related to imprudence on the part of SCE&G. Accordingly, under S.C. Code Ann. § 88-27-270(E), the additional EAC Costs associated with delay are properly included in updated BLRA schedules as necessary costs of completing the project.

(d) EAC Cost Associated with Productivity Factors and Indirect Labor Costs

SCE&G has identified \$154.8 million of the increase in EAC Cost as costs that are related to WEC/CB&I's decision to use updated productivity factors for direct craft labor and updated factors and calculations for determining the indirect and field non-manual labor required to support direct craft labor. All of these factors and calculations are less favorable than those on which earlier schedules were based.

Direct craft labor costs are the costs of the personnel directly performing the scopes of work required to complete the Units. Indirect labor costs include the cost of the personnel who provide construction-related support for direct craft labor personnel. This includes the labor expense of worker training, safety, warehouse staffing, facilities maintenance, ongoing site cleanup and sanitation, distribution of potable water and ice,

and site equipment operators. Field non-manual labor principally reflects the cost of the field engineers, quality assurance/quality control personnel, site project management and administrative support personnel that support and direct craft labor. Tr. at 554-555.

The evidence shows that in keeping with standard practice in the construction industry, WEC/CB&I compiles direct craft labor cost estimates by applying specified direct craft labor factors to the amount of commodities that must be installed to accomplish a particular scope of work. Tr. at 256-257. The required amounts of commodities are compiled as take-offs from construction plans and involve such things as tons of rebar, concrete, or structural steel; and linear feet of pipe, wire or electrical cable. Direct craft labor factors are used to calculate how many labor hours are required to accomplish the installation of the commodities identified. Tr. at 554-555.

Once direct craft labor hours are computed productivity factors are applied to reflect the conditions anticipated at a particular job. A productivity factor of 1.0 indicates that the work is anticipated to require only the standard amount of direct craft labor for installing a unit of commodity. A labor productivity factor of 1.15 would indicate that it is anticipated that 15% more direct craft labor than the standard amount will be required on that particular job.

The indirect labor and the field non-manual labor calculations reflect the amount of supporting labor that is required for each hour of direct craft labor. These factors are applied to the final direct craft labor hours to determine the indirect and field non-manual labor costs associated with the work.

The evidence of record here shows that WEC/CB&I used a productivity factor of 1.0 in preparing past EAC Cost estimates. This is not a rate which WEC/CB&I has achieved historically. Tr. at 257. WEC/CB&I also used various indirect labor factors and field non-manual labor estimates for various aspects of the job which also have not been achieved historically.

In preparing the updated EAC Cost estimates, WEC/CB&I increased the labor productivity factor to 1.15 and made similar increases in the indirect and field non-manual labor factors and calculations. Tr. at 490-491. The result of these changes is to increase the anticipated EAC Cost by \$154.8 million.

The evidence of record supports the reasonableness and prudence of adjusting the productivity factors and indirect and field non-manual labor costs as WEC/CB&I has done. As indicated above, currently WEC/CB&I is not achieving either the original or the updated productivity assumptions. Tr. at 257. The Company's witness Mr. Byrne testified that SCE&G has challenged WEC/CB&I very directly on this point. WEC/CB&I's leadership is fully aware of the challenge it faces in improving these labor factors, and that achieving these factors is important to meeting both the cost and construction schedules under review here. In response, WEC/CB&I has assured SCE&G that it will make the required improvements. To substantiate this, WEC/CB&I points to several positive factors: (a) design finalization of the nuclear island is nearing completion which should minimize construction inefficiencies due to unanticipated design changes, (b) WEC/CB&I and subcontractor personnel have gained significant experience in nuclear safety construction since the project began, and (c) the lessons

learned on Unit 2 are being applied to the construction of Unit 3 in a way that has improved productivity on that Unit. Tr. at 257-258. In spite of these assurances, questions remain as to whether WEC/CB&I will be able to meet the updated productivity assumptions. Tr. at 258.

SCE&G's witnesses affirmatively testified that the EAC Cost calculations which reflect these revised productivity factors and support costs represent a reasonable and prudent estimate of the cost of completing the Units given the information available at this time. Tr. at 274-275, 282-283. There is no contrary evidence on the record.

Based on the evidence of record in this proceeding, the Commission finds that it is reasonable and prudent to base the labor costs anticipated to complete the project on the revised productivity factors and calculations proposed by WEC/CB&I. Given WEC/CB&I's agreement to achieve that level of productivity, it would not be appropriate or helpful for SCE&G to insist on less demanding productivity forecasts. Nor is SCE&G in a position where it can propose that an amount of contingency be added to the anticipated construction costs against the possibility that this challenging level of productivity will not be achieved. Accordingly, the evidence shows that the increase in EAC Cost of \$154.8 million representing the revised productivity factors and related support cost calculations are not the result of imprudence on the part of SCE&G. Therefore, it is appropriate to reflect those amounts in the updated BLRA cost schedules.

(e) EAC Cost Associated with Identification of Additional Labor Costs Due to Design Finalization

SCE&G has identified \$71.9 million in additional EAC Cost associated with the labor costs required to install additional commodities identified during the on-going

design finalization process for the Units. As indicated above, labor costs are calculated by compiling take-offs from design documents to determine the quantities of commodities required to be installed. Those commodities are then multiplied by the appropriate labor, productivity and indirect and field non-manual support cost factors to determine cost.

In finalizing the design documents for the Units, WEC/CB&I has identified scopes of work that will require additional volumes of commodities to be installed. Fixed and firm price provisions of the EPC Contract apply to commodities involved. Therefore, WEC/CB&I will absorb the price of the additional commodities themselves. Labor, however, is not a fixed or firm cost category and the additional direct craft labor cost to install these commodities is SCE&G's responsibility. The additional direct craft labor cost represents \$71.9 million.

In granting BLRA approval for the project in Order No. 2009-104(A), the Commission recognized that SCE&G was entering the EPC Contract and beginning work on the project prior to design finalization. Order No. 2009-104(A) at p. 73-74. Doing so is consistent with industry practice for projects of this scale. Tr. at 132. Furthermore, in 2009, the Commission recognized that SCE&G had chosen not to negotiate fixed or firm pricing as to all cost categories under the EPC Contract. As Mr. Marsh testified, the cost that customers would have paid for this level of price certainty was simply too high and that remains true even with the increases in prices being considered here. Tr. at 90-92. Accordingly, the fact that design finalization might result in the identification of additional commodities to be installed, and the fact that SCE&G as owner might be

responsible to pay the labor costs associated with those commodities, is not unusual or unexpected in this context. This was a risk SCE&G intentionally took under the EPC Contract to secure a lower EPC Contract price, which benefits SCE&G's customers. In Order No. 2009-104(A), the Commission reviewed the terms of the EPC Contract and found "that the EPC Contract contains reasonable and prudent pricing provisions, as well as reasonable assurances of price certainty for a project of this scope." Order No. 2009-104(A) at p. 74.

SCE&G's witnesses affirmatively testified that the costs associated with installing the additional commodities identified through design finalization are reasonable and prudent costs of completing the Units. Tr. at 559-560, 590-591. There is no contrary evidence on the record.

Therefore, the Commission finds that the costs associated with installing the additional commodities identified through design finalization in no way are the result of imprudence by SCE&G. Under the BLRA, these costs are properly included in the anticipated schedule of construction costs for the project as the Settlement Agreement recognizes.

(f) EAC Cost Associated with NRC Regulatory Support

Under the EPC Contract, Time and Materials (T&M) costs are costs for scopes of work undertaken by WEC/CB&I to support SCE&G in administering the Combined Operating Licenses (COLs) for the Units, among other things, and for scopes of work that are otherwise outside of WEC/CB&I's primary responsibility under the EPC Contract.

SCE&G has identified \$27.4 million of additional EAC Costs as costs WEC/CB&I anticipates billing to SCE&G as T&M charges. This amount reflects technical support that WEC/CB&I anticipates providing related (a) to the processing of License Amendment Requests (“LARs”) for the Units, and (b) to first of a kind (“FOAK”) testing on the Units as they are completed.

LARs are amendments to the COLs that authorize departures from the design basis of the Units during construction. The Units are among the first units to be built under COLs, which combine NRC construction and operating licenses for nuclear units in one license. With limited exceptions, when operating under COLs, departures or modifications from the approved design licensing basis for the Units must be approved by the NRC during construction. This approval is requested through LARs made by the owner as holder of the COLs.

As a part of design finalization and construction engineering for the Units, WEC/CB&I is initiating a number of departures from the approved design basis. When this occurs, WEC/CB&I prepares the required LAR packages and SCE&G files them with the NRC as LAR requests. WEC/CB&I takes the position that its costs of assisting in the LAR process are recoverable from SCE&G as Time and Materials costs of supporting SCE&G as holder of the COLs. SCE&G takes the position that WEC/CB&I has a fixed/firm-price obligation under the EPC Contract to provide a complete and fully-functional reactor design for the project. SCE&G understands the cost of the support given the LAR process to be part of that obligation where LARs relate to design

finalization or other problems not of its making. The resulting dispute remains unresolved at this time.

The second aspect of additional T&M costs is related to the FOAK testing that the NRC requires to be done on a new reactor design when the first several units based on that design are placed into service. WEC/CB&I had expected the NRC to accept the results of the FOAK testing that is being done on the AP1000 reactors being placed into service in China. However, it has now become clear that the NRC will not be able to accept those test results. As a commercial matter, WEC/CB&I takes the position that the costs of supporting the FOAK testing on SCE&G's units are costs it may recover from SCE&G as T&M costs. SCE&G does not accept that position, and as with the LARs issue, believes that supporting the FOAK testing is a fixed/firm-price obligation of WEC/CB&I under the provisions of the EPC Contract which require WEC/CB&I to provide a complete and fully functional AP1000 reactor design. Tr. at 558-559.

Disputes about these costs notwithstanding, it is clear that additional costs for processing LARs and FOAK testing will be incurred. SCE&G's witnesses testified without contradiction that they represent reasonable and prudent costs of completing the Units. As discussed below, given the risks of disruption and delay if it withholds payment, SCE&G is justified in paying these costs while disputes about them are being resolved. SCE&G's witnesses have testified that the estimate of the additional T&M costs provided by WEC/CB&I have been reviewed and verified and the amount of anticipated cost is reasonable. There is no contrary evidence in the record.

Therefore, the Commission finds that the evidence of record demonstrates that the \$27.4 million in T&M costs for licensing support to complete the project are not the result of imprudence on the part of SCE&G. Under the BLRA, these costs are properly included in the anticipated schedule of construction costs for the project pending a resolution of the dispute regarding them, as the Settlement Agreement reflects.

(g) Challenged Costs and 90% Payments

In May 2015, SCE&G informed WEC/CB&I by letter that it disputed its obligation under the EPC Contract to pay the additional EAC Costs related to delay and inefficient performance. The basis for SCE&G disputing these costs is SCE&G's belief that the EPC Contract contains provisions obligating WEC/CB&I to standards of timely and efficient performance that it is not meeting. Tr. at 148-149. WEC/CB&I takes the position that the disputes related to these costs fall within the EPC Contract provisions that require payment of at least 90% of properly invoiced amounts if those amounts are disputed. SCE&G does not accept WEC/CB&I's contention, but recognizes that in cases where the 90% payment requirement applies, there is language indicating that WEC/CB&I may cease work on the project and treat it as cancelled at the request of the Owner if these 90% payments are not made. For that reason, in the May 2015 letter, SCE&G indicated that it would begin paying 90% of properly invoiced amounts it determines to reflect the challenged costs. In addition, SCE&G has reserved the right to pay nothing against amounts it determines to be improperly invoiced. SCE&G has adjusted the EAC Costs reflected in the anticipated construction cost schedules contained in the Petition and in Order Exhibit No. 2 to reflect these 90% payments.

As the Company's witness, Mr. Byrne, testified, one of the most difficult challenges facing the project at this time is for SCE&G to effectively enforce its rights as Owner under the EPC Contract while at the same time maintaining an effective working relationship with WEC/CB&I. Tr. at 253-254. The Commission agrees, as Mr. Marsh testified, that maintaining an effective working relationship between SCE&G and WEC/CB&I is necessary to minimize further delay and to ensure that the project is completed in as timely and efficient way as possible. Tr. at 154-156. The Commission also agrees that in enforcing the EPC Contract, it is important that SCE&G take care not to deliberately violate the terms of the EPC Contract without justification or legal cause. Doing so could give WEC/CB&I an excuse for its own failures to meet the terms of the contract, or in the most extreme circumstances, a justification for taking retaliatory action. Tr. at 158.

Completing the project in a timely and efficient way is the goal that best serves the needs of SCE&G and SCE&G's customers. SCE&G's approach to disputes with WEC/CB&I must be balanced against that goal. As Mr. Marsh testified, at this current point in the project, the "number one priority is to complete these Units safely, on time, so that they can deliver the benefits they are expected to deliver to customers over the next 60 years." Tr. at 151. Timely completion of the Units is particularly important given the narrow gap between the current substantial completion date for Unit 3 and the date by which power must be generated by that Unit to earn the full \$2.2 billion in special Federal Production Tax Credits, net of tax, that are potentially available for the Units. The EPC Contract provisions that require the 90% payment of disputed amounts

recognize the importance of making such payments to the goal of keeping the contractor fully engaged in the work while disputes are being resolved.

In this context, the Commission finds that SCE&G's actions related to the 90% payments are appropriate in enforcing the terms of the EPC Contract. At this stage in its dispute with WEC/CB&I it would not be prudent or reasonable for SCE&G to withhold payment altogether. The risks of such a step, at this point, are too great.

The Commission has also considered carefully whether it is proper to include disputed payments in BLRA cost schedules. The costs involved in these disputes are real costs. The fact that they will be paid is not in question. What is in dispute is who will ultimately be responsible for absorbing them. Tr. at 159, 279. SCE&G's witnesses testified that it is reasonable and prudent for SCE&G to make these payments to ensure that work moves forward on the project while it pursues its claims. Tr. at 160-161, 279. These payments are made under the EPC Contract which the Commission reviewed in 2009 and found to be "reasonable and prudent." Order No. 2009-104(A) at p. 121. As Mr. Marsh testified, during calendar years 2015 through 2017, SCE&G anticipates capital spending on the Units of \$2.8 billion. Tr. at 79. During this period, SCE&G's ability to access financial markets on reasonable terms will be critically important. If this access is jeopardized, the cost of financing the Units could increase significantly.

Allowing these anticipated payments to be included in BLRA cost schedules does not allow SCE&G to recover financing costs on funds it has not or may not spend. Under the BLRA, carrying costs are only collected after funds have been spent and that spending has been audited by the ORS and approved by this Commission. Furthermore,

if SCE&G achieves a favorable resolution of its claims, and receives a refund of monies previously paid, customers will benefit at once through an immediate reduction in the capital cost of the project.

SCE&G's witnesses affirmatively testified that making these 90% payments is a reasonable and prudent cost of completing the Units. Tr. at 160, 279-281. The Commission finds this testimony to be credible and persuasive. There is no contrary evidence on the record.

Therefore, the Commission finds that pending a resolution of the EPC Contract disputes related to the 90% payments, the costs in question are properly included in the anticipated cost schedules for the project under the BLRA.

(h) Liquidated Damages

SCE&G has reduced its estimate of the anticipated increase in capital costs due to delay by \$85.5 million to reflect recovery of the liquidated damages provided for in the EPC Contract. The substantial completion dates contained in the Revised, Fully-Integrated Construction Schedule, which WEC/CB&I largely prepared, are now well beyond the date at which the full measure of liquidated damages is payable. Accordingly, the Commission will include these amounts as an off-set to the anticipated capital costs for the project under the BLRA.

(i) Conclusion as to EAC Cost Increases

As indicated above, SCE&G has provided detailed and affirmative evidence that the anticipated increase in the EAC Cost of \$396.7 million represents a reasonable and prudent cost to be paid under the EPC Contract for the completion of the Units. The

Commission finds that testimony to be credible and persuasive. It is uncontradicted on the record of this case. Therefore, for the reasons stated above, the Commission finds that the increase in anticipated EAC Cost of \$396.7 million net of liquidated damages, including the 90% payments, are not the result of imprudence on the part of SCE&G. These costs are properly included in the anticipated capital cost schedules for the Units that are set forth in Order Exhibit No. 2 as the Settlement Agreement envisions.

2. Owner's Cost

In its Petition and testimony, SCE&G has identified increased Owner's cost of \$245.1 million as necessary to complete construction of the Units. Owner's cost includes all of the cost SCE&G must bear as owner of the project to oversee construction and engineering on the project; to ensure the quality and safety of all work on-site and suppliers worldwide; to ensure compliance with the COLs and with multiple SCDHEC, FERC, and Army Corps of Engineers permits related to the project; to provide security for the site; to audit and review all invoices and requests for payment; to enforce its rights under the EPC Contract; to recruit, train, license and retain the personnel needed to operate the Units; to draft, review and approve the operating, maintenance and safety plans and procedures for the Units; to accept turnover of individual systems as they are completed by WEC/CB&I; to conduct start-up testing for the Units, to provide specific services to the construction project including builders risk insurance and workers' compensation insurance, and to provide the facilities, IT and other support required by these functions. SCE&G's new nuclear development ("NND") team is fulfilling these tasks. It numbers approximately 560 SCE&G, SCANA and Santee Cooper personnel.

The record shows that SCE&G has implemented a thorough and careful process for compiling and reviewing its budgets for Owner's cost for the project. As Ms. Walker has testified, budgeting is done annually on a cost-center by cost-center basis, with both budget requests and actual expenditures subject to careful review and challenge where costs appear unjustified. Tr. at 588-589, 625-628. SCE&G makes its detailed budgets available to ORS for audit and review and to parties wishing to conduct discovery on them. Tr. at 628.

In this case, no party has presented any testimony challenging the reasonableness or prudence of SCE&G Owner's cost estimates or the process by which Owner's cost budgets are compiled. The evidence of record clearly supports the reasonableness of the process by which these Owner's cost budgets were created and the resulting costs.

(a) Owner's Cost Increases Associated with Delay

SCE&G has identified \$214.3 million of the \$245.1 million increase in Owner's costs, or approximately 87% of the Owner's cost increase, as being the direct result of project delay. As SCE&G witness, Mr. Jones, testified, delaying the project requires SCE&G to support the cost of the NND team and related support functions as costs of the project for the duration of the delay. As Ms. Walker and Mr. Jones testified, the \$214.3 million in Owner's costs associated with delay includes the labor cost of the NND team; facilities and facilities maintenance costs during the extended project duration; owners risk and workers compensation insurance for the extended period; IT services for the NND team; license fees and updated costs related to the software systems required to support the NND team and operate the Units; and all other services necessary to support

the NND effort during the extended duration of the project. Ms. Walker and Mr. Jones have testified to the components of these additional costs in detail. They affirmatively testified as to the reasonableness and prudence of these anticipated expenditures. Tr. at 576-581, 623-633. The Commission finds their testimony to be credible and convincing.

There is a heightened value to Owner's costs since these include the costs expended to oversee the safety and efficiency of the work on the project, to audit and challenge invoices, to enforce SCE&G's rights under the EPC Contract, and to prepare for safe and efficient operation of the Units. The Commission finds that the additional Owner's costs associated with delay, in the amount of \$214.3 million, are not the result of imprudence on the part of SCE&G and are properly included in the updated schedules of anticipated capital costs for the project under the BLRA as the Settlement Agreement provides.

(b) Owner's Cost Increases Not Associated with Delay

SCE&G has identified \$30.8 million of the \$245.1 million increase in Owner's costs, or approximately 13% of the adjustment to Owner's costs, as costs which are not the result of project delay. Through its witness, Mr. Jones, SCE&G has provided a detailed breakdown of the principal cost categories comprising this \$30.8 million and the justification for them as reasonable and prudent costs of completing the project.

(i) Additional NND Staff

SCE&G has identified the need for an additional 64 Full Time Equivalents ("FTEs") for the NND Staff in the areas of Operational Readiness, Cyber Security, Training, and Industry Coordinators, among others. Tr. at 581-83. The cost associated

with these staffing changes is \$7.5 million, or approximately 1% of the total change in the capital cost schedule for the project.

Mr. Jones testified that after the Commission approved an updated NND staffing plan for SCE&G in Order No. 2012-884, SCE&G continued to review its staffing plan as new information was generated concerning requirements for operating, maintenance and safety procedures, regulatory compliance and cyber security for the plant. Tr. at 581. In evaluating its NND staffing, the Company utilized experience and information from department leaders of SCE&G's existing operating unit and interviewed the leadership of each department involved in the construction and operational readiness of the new Units. The Company also hired an industry-recognized outside consultant to assist in reviewing and evaluating SCE&G's staffing plan. In some cases, SCE&G relied on on-site reviews provided by nuclear industry standards and benchmarking groups. *Id.* The additions to the staffing plan are a result of those reviews.

**(1) Operational Readiness: Developing
Programs, Plans and Procedures**

The Operational Readiness area will add the majority of the new positions, 43 FTEs, at a cost of \$6,368,402 over the remaining life of the project. Mr. Jones explained that within the Operational Readiness group, 31 additional engineers were identified as needed to prepare the engineering programs, plans and procedures that must be drafted, reviewed and approved before nuclear fuel can be loaded in the Units for testing. Tr. at 583. The original staffing plan for the project relied on engineering staff from V.C. Summer Unit 1 to supplement the NND engineering staff in completing this work. Regulatory and other requirements at Unit 1, however, curtailed the availability of Unit 1

engineers to assist with this work. In addition, the Operational Readiness team has identified additional planning and procedural development work that will be required to support operations and the need for additional engineers to support the existing scopes of work. These developments have created the need for the additional 31 engineers as identified in the staffing studies completed since 2012.

**(2) Operational Readiness: Integrated
Operational Readiness Schedule**

The Institute of Nuclear Power Operations (“INPO”) is the principal peer-based organization for the nuclear power industry providing operational effectiveness review and operational standards setting. In 2013, INPO conducted an on-site review of SCE&G’s staffing plans for the project and recommended that SCE&G produce a more fully-developed Integrated Operational Readiness Schedule (“IORS”) to guide the transition from construction and operational readiness activities to actual operation of the Units. As a result of further elaboration of the IORS, SCE&G has identified the need to add nine positions to staff the Planning and Scheduling group and the Outage group. These groups will oversee the creation of maintenance and outage plans for the Units for use when the Units are in operation. Three additional supervisory and managerial positions have been identified as necessary to properly coordinate and integrate operations across Units 1, 2, and 3, and to provide for proper functional alignment when Units 2 and 3 go into operations. Tr. at 584-85.

(3) Cyber Security Staffing

In 2010, the NRC issued new regulations for cyber security at nuclear units. These regulations have been supplemented by new industry standards and staffing

models issued by the Nuclear Energy Institute (NEI) and approved by the NRC. Based on these new regulations and standards, SCE&G analyzed cyber security staffing requirements for the Units using the NRC approved staffing model and determined ten additional FTEs were required. The capital cost associated with these new FTEs is \$222,164 which reflects the fact that these employees will be hired late in the project. Tr. at 687-88.4

(4) Turnover in Craft and Technical Training

Technical training personnel have skills that are highly marketable across the nuclear industry and the manufacturing economy generally. Because competition is high for these individuals, the Training Department within NND has experienced a higher than anticipated turnover rate. High turnover rates increase staffing requirements because it can take several months to as long as two years to train new hires on the craft and technical training programs they must deliver. In response, SCE&G has identified the need to add six additional FTEs in the Craft and Technical Training Group. The additional cost over the life of the project is \$1,044,322. Tr. at 587.

(5) Industry Coordinators

Industry groups like INPO and NEI provide critically important operating reviews, benchmarking, standard-setting, shared analysis and information exchange functions for the nuclear industry. Industry Coordinators support the interface between operating nuclear units and the work of these groups and their other members. These coordinators also manage follow up on issues identified during operational effectiveness and best practices reviews conducted by these groups. The NND staffing plan originally

envisioned that the Unit 1 Industry Coordinators could support the strategic industry interfaces for Units 2 and 3. However, workload evaluation has shown that this was not possible and three additional FTEs are required. The cost of these FTEs to the project is \$104,309. Tr. at 587.

(6) Offsetting Staffing Changes

Mr. Jones testified that SCE&G had identified the need to increase staffing in the NND Construction and Initial Test Program by five FTEs to provide stricter oversight of WEC/CB&I's construction activities on site and increased control over the operational testing to be done as the project is completed. At the same time, SCE&G identified the ability to reduce its projected need for Organizational, Development, & Performance Specialists by three FTEs. The net effect of these changes is to add two FTEs to the staffing plan. Considering differences in salary and anticipated hiring dates, the result of these staffing changes is a net decrease in the anticipated staffing costs of NND by \$204,696 over the life of the project. Tr. at 588.

(7) Conclusion as to Changes in Anticipated Staffing Costs

Mr. Jones testified as follows concerning the changes in the proposed staffing plan for the project:

I have personally reviewed the budget forecasts presented here to ensure that the costs they include are reasonable and necessary. We are very sensitive to the need to control costs on this project. SCE&G management has been unrelenting in its review of the reasonableness of this plan and its insistence that the entire project team remain fully committed both to controlling costs and to ensuring the success of the project. Each team within NND and NND leadership has been required to justify the necessity of each

position and the timing of each hiring date. Based on my years of experience in the nuclear industry, and my involvement in these reviews, it is my opinion that these costs are reasonable and prudent and reflect a strong commitment to control costs without unreasonably putting the success of the project at risk.

Tr. at 588-89.

The Commission finds Mr. Jones's testimony in this regard to be credible and convincing. The evidence of record clearly indicates that the updated staffing costs are not the result of imprudence on the part of SCE&G and therefore are properly included in the anticipated capital cost schedules for the Units that are set forth in Order Exhibit No. 2 as the Settlement Agreement provides.

(ii) NRC Fees

As holder of the COLs for the project, SCE&G must pay the cost of the NRC's inspections and oversight of construction and fabrication activities at the site and at suppliers worldwide. The evidence shows that the NRC recently increased its estimate of fees that SCE&G must pay for this inspection and oversight by \$7.1 million over the life of the project. Tr. at 589. The new estimate includes expenses for pre-inspection preparation and off-site work following up on inspections which NRC had omitted from its previous estimates. Tr. at 635. The Commission finds that these costs are not the result of imprudence on the part of SCE&G and therefore are properly included in the anticipated capital cost schedules for the Units that are set forth in Order Exhibit No. 2 as the Settlement Agreement provides.

(iii) Other IT Costs

The Company anticipates that additional IT costs not related to the delay will add \$3.3 million to Owner's cost. Tr. at 590. These costs are for additional software and other IT resources that will be required for the safe and efficient operation of the project. Ms. Walker testified that SCE&G has worked diligently to reduce IT costs. The Company has negotiated favorable pricing for long-term contracts, relied on Unit 1's software licenses and related in-house expertise where possible, standardized software and software purchasing across all three units where possible, developed in-house software when economically efficient to do so, and managed the IT hiring plan for the Units to delay personnel costs where possible. Tr. at 636. The cost increases that have not been avoidable involve procuring additional cyber security resources for NND project personnel, additional fatigue and stress modeling software to diagnose and monitor the condition of equipment in the Units, and additional software to capture and monitor plant operating data. Ms. Walker testified, without contradiction, that these costs are reasonable and prudent costs of the project. *Id.* The Commission finds her testimony to be credible and that the \$3.3 million increase in IT costs not associated with delay are not the result of imprudence on the part of SCE&G and therefore are properly included in the anticipated capital cost schedules for the Units.

(iv) Other Owner's Cost Not Associated with Delay

The remaining \$12.9 million increase in Owner's cost is made up of a number of individual items. They include the costs of additional facilities to house the NND effort; additional on-site construction inspectors; contractors to provide oversight of

construction and component fabrication by WEC/CB&I; increased fees for participation in the AP1000 owners group, APOG, whose membership has been reduced by attrition; increased costs for updating the Probabilistic Risk Assessments related to the Units to reflect design changes and other data; the cost of maintenance equipment needed to support the project during systems testing and when in operation; and other costs. Tr. at 637. Ms. Walker and Mr. Jones testified the costs for these items are reasonable and prudent and the Commission accepts their testimony as credible and convincing. Tr. at 590-91; 636. The Commission finds that the remaining \$12.9 million increase in Owner's cost is not the result of imprudence on the part of SCE&G and therefore is properly included in the anticipated capital cost schedules for the Units.

(v) Conclusion as to Owner's Cost Not Resulting from Delay

The Commission has reviewed the testimony and evidence presented in this docket related to the update in staffing costs and other Owner's cost not resulting from delay. SCE&G has presented detailed information about these costs and the circumstances that are causing them. SCE&G has also presented affirmative and convincing testimony that these costs are reasonable and prudent and are in no way the result of imprudence by the utility. There is no contrary evidence on the record of this proceeding. Accordingly, the Commission finds, as the Settlement Agreement reflects, that these increases in the forecasted Owner's cost are not the result of imprudence on the part of SCE&G and therefore are properly included in the anticipated capital cost schedules for the Units.

3. Change Orders

The Company has identified 10 change orders and related matters that will result in an increase of \$56.5 million to the EPC Contract cost. SCE&G's witness, Mr. Jones, provided detailed testimony concerning the justification, purpose and necessity for each change order and its costs. He affirmatively testified that the costs associated with each of the 10 change orders and anticipated change orders at issue here represent reasonable and prudent costs of completing the Units. Tr. at 561, 566, 575, 588, 590-91.

(a) Plant Layout Security

Planning for the physical security of the Units takes place as plant layout and site design are completed and is based on the NRC and nuclear industry standards. These standards continue to evolve after the events of September 11, 2001, and as technology, tactics and threat levels change. The security review for the Units has progressed to the stage where SCE&G has identified the changes to site layout and security related installations and modifications that are required under current standards.

The work of making these security-related changes will take place in three phases. Phase 1 will involve the engineering, construction planning and development of estimates for Phases 2 and 3. Phase 2 will involve the construction work for the infrastructure changes, including relocation of buildings, parking, installation of underground utilities, and modifying protected-area perimeter security. Phase 2 will also involve engineering work required to prepare for Phase 3. Phase 3 will include installation of secure enclosures, specialized cameras and other security equipment.

The Company has included the costs associated with the change order for Phases 1 and 2 for Plant Layout Security in its schedule of anticipated capital costs of the Units. This change order represents a cost of approximately \$20.4 million. Once Phase 2 is completed and the final requirements and costs for Phase 3 are finalized, the Company plans to submit a Phase 3 change order. Tr. at 561-63. The Commission finds that Mr. Jones' testimony related to the need for site physical security planning and upgrades at this point in the project's evolution is credible and persuasive. His testimony is equally credible that the approach to implementing this aspect of the project is reasonable and prudent.

The evidence of record establishes that the additional costs associated with the change order for Phases 1 and 2 of the Plant Layout Security are not the result of imprudence by the Company. Therefore, these costs are properly included in the schedule of anticipated capital cost for the Units under the BLRA.

(b) Cyber Security Upgrades

In 2011, in response to the new NRC Regulatory Guide RG-5.71, "Cyber Security Programs for Nuclear Facilities," the Company and WEC/CB&I agreed on a phased approach to strengthen Cyber Security for the Units. The cost for Phase 1 of the Cyber Security Upgrade was reviewed and approved by the Commission in Order No. 2012-884. In mid-2013, SCE&G and WEC/CB&I agreed to further divide the remaining Cyber Security plan into additional phases. The scope of work for the remaining phases of the plan will be determined as Phase 2 is completed. The evidence showed the remaining phases will address supplier upgrades and redesigns, component design and

procurement, testing, quality assurance, and installation for system changes to meet the Cyber Security requirements identified in Phase 2. Tr. at 563-65.

This change order for Phase 2 of the Company's Cyber Security Upgrade focuses on development of procedures to identify and assess the critical digital assets of the Units, followed by the design and development of a Cyber Security Monitoring system, and the testing and installation of an assessment database. This change order also includes costs related to project management and onsite support of Cyber Security. Tr. at 564.

The cost of the change order for Cyber Security Upgrades, Phase 2 is approximately \$18.8 million.

The Commission finds that Mr. Jones' testimony related to the necessity of Cyber Security upgrades and the approach being taken to them is credible and persuasive. The evidence of record establishes that the additional costs associated with the change order for Phase 2 of the Cyber Security program for the project are not the result of imprudence by the Company. Therefore, these costs are properly included in the schedule of anticipated capital cost for the Units under the BLRA.

(c) Schedule Mitigation for Shield Building Panels

To increase resistance to aircraft impacts, the design of the AP1000 units was modified late in its design to incorporate modular steel panels in the construction of the Units' Shield Buildings. These panels are being fabricated by WEC/CB&I's subcontractor, Newport News Industrial ("NNI"), in Newport News, Virginia. Tr. at 565. The evidence shows that there have been delays related to the schedule for design

finalization, fabrication and assembly of the Shield Building Panels. Tr. at 255-56. WEC/CB&I estimates that the Substantial Completion Date for Unit 2 and Unit 3 could be delayed by approximately three months and five months, respectively, if the delay in the Shield Building Panels is not mitigated.

To mitigate these additional delays, WEC/CB&I has negotiated with NNI to expand its manufacturing facility to allow additional panels to be fabricated simultaneously. Tr. at 565. The costs associated with expanding this facility would be shared by SCE&G and SNC, the other active owner of an AP1000 construction project. The forthcoming change order for Schedule Mitigation for Shield Building Panels is awaiting conclusion of the negotiations between WEC/CB&I and NNI and also envisions SNC participation. The cost is approximately \$12.1 million and reflects SCE&G's share of the cost to expand the NNI facility.

The evidence shows the Company has not waived any claim it may have against WEC/CB&I for the cost associated with this expansion. Further, although the Company is still negotiating the terms of this change order, the Company's witnesses testified that given the importance of Shield Building Panels fabrication to the overall project schedule, consideration of this change order should not be delayed. Tr. at 566.

The Commission finds that Mr. Jones' testimony related to the importance to the project of Shield Building Panel schedule mitigation is credible and persuasive and the cost forecasts he presents are reasonable. The evidence of record establishes that the \$12.1 million cost associated with this change order is not the result of imprudence by the

Company. Therefore, this cost is properly included in the schedule of anticipated capital cost for the Units under the BLRA.

(d) Federal Health Care Act

The Patient Protection and Affordable Care Act (“ACA”), passed in 2010, has increased the employee health care cost for companies like WEC and CB&I. WEC and CB&I have sought recovery of their increased costs due to the ACA based on provisions of the EPC Contract which permit WEC and CB&I to pass on to SCE&G additional cost caused by a change in law.

Mr. Jones testified that through Change Order 20 WEC is seeking to recover \$206,589 for the increased employee healthcare costs in calendar years 2011 through 2013. CB&I has also recovered ACA costs for prior periods under the change order approved in Order 2012-884. The Company expects WEC/CB&I to make claims for additional cost of compliance with the ACA of approximately \$2.0 million over the remaining life of the project. Tr. at 566-67. For this reason, SCE&G has included \$2.2 million in its anticipated cost schedules for completing the Units. SCE&G’s witnesses testify that these costs are reasonable and prudent costs of the project which SCE&G intends to pay.

The Commission finds that Mr. Jones’ testimony related to WEC/CB&I’s contractual entitlement to additional healthcare costs caused by passage of the ACA is credible and persuasive. The evidence of record establishes that the additional \$2.2 million cost associated with this change order is not the result of imprudence by the

Company. Therefore, this amount is properly included in the schedules of anticipated capital cost for the Units under the BLRA.

(e) Plant Reference Simulator and Software Upgrade

The Plant Reference Simulator (“PRS”) is the software and hardware system used for training and re-qualifying licensed operator candidates and senior candidates, for developing and validating NRC license exam simulator scenarios, and for modeling plant conditions and responses during operations. Due to changes in the design of the AP1000 Main Control Room and instrumentation, the PRS hardware and software systems for the Units must be updated to better match the final design of the Units and synchronize the PRS to the design of the Main Control Room. Tr. at 568-69.

The Commission finds that Mr. Jones’ testimony concerning the need for the PRS upgrade and its utility to the project is credible and persuasive. The evidence of record establishes that the additional \$1.1 million cost associated with this change order is not the result of imprudence by the Company. Therefore, this amount is properly included in the schedules of anticipated capital cost for the Units under the BLRA.

(f) Ovation and Common Q Instrumentation and Control Maintenance Training Systems

The core Ovation and Common Q software and hardware systems manage the Instrumentation & Control (“I&C”) and Reactor Protection Systems, respectively, for the Units. SCE&G has determined that an additional basic set of Ovation and Common Q hardware, software and software licenses is required to support the training for I&C/Technicians and I&C/Digital Engineers. The cost SCE&G proposes to include in the anticipated cost schedules for the project is less than WEC/CB&I’s initial proposal

for software and equipment. The final cost of the change order is under negotiations and the amount presented by SCE&G in this proceeding, \$880,000, is based on industry standards for such costs. Tr. at 569-570.

The Commission finds that Mr. Jones' testimony related to the need for this software and its usefulness to the project is credible and persuasive. The evidence of record establishes that the cost associated with this change order is not the result of imprudence by the Company. Therefore, this amount is properly included in the schedules of anticipated capital cost for the Units under the BLRA.

(g) Simulator Development System

The evidence shows the PRS system for operator training and scenario development will be in nearly continuous use for the balance of the project. The Company's witness, Mr. Jones, testified that this level of use will not permit sufficient time for the PRS to be taken out of service for upgrades, modifications and routine maintenance of its software while the project proceeds. In response, WEC/CB&I proposes to develop a new Simulator Development System which will be a scaled down version of the PRS. It will allow the PRS software to be serviced and modified without interfering with use of the main PRS. The modified software can then be loaded to the PRS when servicing is complete. The Simulator Development System will also allow testing of new software prior to use in training and scenario development. Tr. at 570-71.

The evidence shows this new Simulator Development System will provide important support for the current training and exam schedules for new operators. Licensing of operators is a potential critical path item for the project because nuclear fuel

cannot be loaded for system testing until there is a full complement of licensed reactor operators on site. The Company has shown that the Simulator Development System is important to the successful and timely training and licensing of the operators, as well as the retention of operator license candidates. *Id.*

The cost associated with the Simulator Development System is approximately \$605,000. The Commission finds that Mr. Jones' testimony concerning the need for the PRS and its usefulness to the project is credible and persuasive. The Commission further finds that this change order is not the result of imprudence by the Company. Therefore, the cost of this change order is properly included in the schedule of anticipated capital cost for the Units under the BLRA.

(h) ITAAC Maintenance

New NRC regulations require the reopening and review of completed Inspections, Tests, Analyses, and Acceptance Criteria ("ITAAC") packages when work is done on the associated components or systems, or when non-conforming conditions are discovered after the ITAAC is closed. The evidence shows that the cost to comply with these new ITAAC review requirements will cost approximately \$59,400 for 2014 and 2015. An additional \$313,229 is forecasted for years 2016-2020. Tr. at 572-73. The associated change order, which is based on the change in law provisions of the EPC Contract, is for an anticipated cost of \$372,629.

The Commission finds that Mr. Jones' testimony concerning the regulatory requirements related to acceptance testing and the resulting need for this change order is credible and persuasive. The Commission finds that the \$372,629 cost associated with

this change order is not the result of imprudence on the part of SCE&G. Therefore, this cost is properly included in the schedule of anticipated capital cost for the Units under the BLRA.

(i) Warehouse Fire Security

The Company's risk managers have determined that it is possible to increase warehouse inventory protection at its three major on-site warehouses and mitigate the fire insurance premiums associated with those warehouses by upgrading the remote monitoring capabilities of the associated fire and security systems. These upgrades will place downward pressure on premiums and allow the Company to increase the amount of insurance on the inventory in these warehouses, which is increasing in value. Tr. at 573-74. The cost associated with this change order is approximately \$121,000.

The Commission finds that Mr. Jones' testimony demonstrates the value to the project of the improved fire and security systems purchased through this change order. Accordingly, the Commission finds that the \$121,000 cost associated with this change order is not the result of imprudence on the part of SCE&G. Therefore, this cost is properly included in the schedule of anticipated capital cost for the Units under the BLRA.

(j) Perch Guards

The evidence shows installing perch guards on transmission structures for Units 2 and 3 will increase the reliability of the transmission lines by guarding against avian interference and bird-related incidents that may occur due to the number of large

migratory and resident birds using this area. Tr. at 574. The cost associated with the change order for installing perch guards is \$14,056.

The Commission finds that Mr. Jones' testimony demonstrates the value of these perch guards to the project by safeguarding the reliability of the transmission facilities serving the Units. Mr. Jones' testimony in this regard is credible and persuasive. The Commission finds that the \$14,056 cost associated with this change order is not the result of imprudence by the Company. Therefore, this cost is properly included in the schedule of anticipated capital cost for the Units under the BLRA.

(k) Conclusion Related to Change Orders in Cost Schedule

As stated above, SCE&G's witness Mr. Jones provided detailed testimony demonstrating the reasonableness and prudence of each of the 10 change orders and anticipated change orders and their costs. The Commission finds his testimony in this regard to be credible and persuasive. For the reasons stated above, the Commission finds that the increase to the EPC Contract of \$56.5 million for the 10 change orders and anticipated change orders discussed above is not the result of imprudence by SCE&G. Therefore, these costs are properly included in the anticipated capital cost schedule for the Units that are set forth in Order Exhibit 2.

(l) Reductions to Allocations to Santee Cooper

The costs listed above are offset in part by a reduction in cost allocated to SCE&G for facilities that benefit both SCE&G and Santee Cooper. Originally, SCE&G projected that Santee Cooper would pay a 45% share of the EPC Contract cost associated with the scope of work for the Units 2 and 3 Switchyard. The parties later determined

that some of the shared cost in that scope of work benefitted one party more than the other. The parties conducted a comprehensive review of the Switchyard design and cost allocation, and recently agreed to allocate costs based on each party's respective use of the facilities. The reallocation of costs between Santee Cooper and SCE&G has resulted in an approximate \$107,000 decrease to the cost forecast for SCE&G. Tr. at 622-24.

C. ORS's Review and Analysis

The testimony of ORS's witness, Mr. Anthony James, notes ORS's statutory mandate to represent the public by balancing the concerns of consumers, the interest of the state in economic development and the preservation of the financial integrity of the state's public utilities. Tr. at 704-706. In supporting the Settlement Agreement, Mr. James testified that "based on ORS's review; SCE&G's in depth evaluation; and, SCE&G's adoption of the proposed schedule and budget, ORS finds that the cost estimates [approved in the Settlement Agreement] have sufficient support and provide a reasonable basis to proceed with the Units." Tr. at 705. The Commission has reviewed Mr. James' testimony against the record as a whole, including the extensive testimony and evidence provided by SCE&G concerning its review and analysis of the EAC Cost estimates and other cost estimates and the methodology by which they were created. The Commission finds that ORS's conclusions concerning the cost estimates presented here are fully supported by the record in this proceeding.

D. The Sierra Club's Arguments

In its Petition to Intervene, the Sierra Club raised the following objections to the relief requested by SCE&G in this proceeding:

Sierra Club is informed and believes that the construction schedule delays and the capital cost schedule increases proposed by South Carolina Electric & Gas Company are material and adverse deviations from the approved schedules which the utility failed to anticipate or avoid; and which are, therefore, the result of imprudence on the part of the utility, considering the information available at the time the utility could have acted to avoid the deviation or minimize its effect, all contrary to S.C. Code Sections 58-33-270(E) and 58-33-275(E).

At the hearing, the Sierra Club through its attorney reiterated these positions and further raised the question as to whether the changes in cost presented in this proceeding, particularly the disputed costs subject to the 90% letter, were “known and measurable.”

In formulating its challenge to SCE&G’s petition, the Sierra Club confuses the statutory standard that applies to this proceeding. In proceedings to amend cost or construction schedules that have been previously approved under the BLRA, the statutory standard is found in S.C. Code Ann. § 58-33-270(E). It requires the Commission to approve the request unless the record supports a finding that the changes in cost or construction schedules are the result of imprudence on the part of the utility. The language used by the Sierra Club in its Petition to Intervene is taken from a different part of the statute, S.C. Code Ann. § 58-33-275(E). That section applies where a utility seeks revised rates or other relief and it is shown that there has been a material and adverse deviation from the previously approved schedules.

This is not such a proceeding. The schedules themselves are before the Commission for review and revision. If the requested relief is granted, there will be new approved schedules and the current forecasts will conform to them.

In the end, however, both statutory provisions reference a common standard for judging prudence. Prudence in all cases is judged based on what a reasonable person, in

this case a utility, would do given the information available to the utility at the time it could take action to anticipate and avoid an unfavorable outcome. Where prudence is concerned, reasonableness of action is measured based on the information available at the time meaningful action is possible, not based on information that becomes available later when the unfavorable outcome has already begun to materialize.

In this case, the evidence clearly shows that SCE&G identified risks in a timely fashion and took reasonable and timely action to counter them. There is no basis for a finding of imprudence.

The Commission finds that the cost schedules proposed here fully comply with the decision of the South Carolina Supreme Court in *South Carolina Energy Users Comm. v. South Carolina Pub. Serv. Comm'n*, 388 S.C. 486, 697 S.E.2d 587 (2010). All the costs contained in these schedules are carefully itemized and represent the costs SCE&G clearly anticipates spending on specific budget items required to complete the project and place the Units into service.

As to the question of whether the costs in dispute are “known and measurable,” the Company’s witness, Mr. Marsh, testified affirmatively that they were. Tr. at 147-148. There is no contrary evidence on the record as to this point. The Commission finds that these costs are as fully known and measurable as are any of the costs that comprise the forecasts of anticipated costs that are included in BLRA approved cost schedules. All BLRA cost schedules present forecasts of the costs of future or on-going construction costs and activities. By necessity, they include the best evidence available today as to

anticipated future costs. Tr. at 135, 141. The fact that forecasted costs are involved here does not distinguish this proceeding from any other BLRA proceeding.

Instead, the Commission finds that the known and measurable standard applies when utility rates are being set based on historical test period data. That standard defines the type of out-of-period adjustments that are permitted to the actual test period data. The classic formulation of the known and measurable rule in South Carolina is that:

South Carolina rate making is based on historical data, with adjustments permitted for any known and measurable out-of-period changes such as the future effective date of a court ruling or the promulgation of not yet effective regulations. *Hamm v. Southern Bell*, 302 S.C. 132, 394 S.E.2d 311 (1990) (emphasis in original); *Southern Bell v. Public Serv. Comm'n, supra*.

S. Carolina Cable Television Ass'n v. Pub. Serv. Comm'n of S. Carolina, 313 S.C. 48, 51, 437 S.E.2d 38, 39-40 (1993); *accord, Utilities Servs. of S. Carolina, Inc. v. S. Carolina Office of Regulatory Staff*, 392 S.C. 96, 109, n.10, 708 S.E.2d 755, 762, n.10 (2011).

Under test period ratemaking methodology, an historical test period is selected to measure revenues and expenses to ascertain what rates are appropriate to allow a utility the reasonable opportunity to recover its costs of serving customers and its cost of capital. Pro forma adjustments may be allowed to the actual test period data to reflect changes that will occur after the test period but only if the events they represent are known with certainty to occur and the effects of them are measurable.⁶ The integrity of the historical test period data is a key consideration in this approach to rate making. The known and

⁶ For example, if a utility were to sign a binding wholesale contract that would take effect after the test period closes, and that contract were to be known to reduce the operating costs of the utility to be borne by retail customers, the effect of that contract could be recognized by a pro forma adjustment to actual test period results. The fact of the contract coming into force would be known and not speculative and its effects on retail expenses and revenues would be measurable and not uncertain.

measurable standard ensures that only a limited set of adjustments are made to the test-period data and that those adjustments meet a very high standard of certainty.

Making changes to the schedule of projected costs under the BLRA is not analogous to supplementing actual test year results. The BLRA specifically permits estimates of anticipated costs. Where forward-looking construction cost schedules under the BLRA are concerned, the anticipated costs are all forecasted cost, they are prospective, and in most cases have some degree of uncertainty as to timing and amount. Applying the known and measurable standard to BLRA cost forecasts would make the BLRA unworkable since few if any of the costs of prospective base load construction projects are both known and measurable as those terms are understood in historical test period rate regulation. The known and measurable concept simply does not apply in this context.

E. The Return on Equity Provision of the Settlement Agreement

In the Settlement Agreement, SCE&G has agreed that beginning with requests filed on or after January 1, 2016, it will calculate revised rates requests using a 10.5% return on equity (“ROE”) rather than the 11.0% ROE authorized in Order No. 2009-104(A). No party presented any evidence during the hearing showing that this modification is unreasonable. The Commission finds based on the Settlement Agreement and the commitments that it contains that a 10.5% ROE is just and reasonable and a 10.5% ROE is hereby approved. Under the provisions of S.C. Code Ann. Section 58-33-220(16) (Supp. 2014), the Company was permitted to apply the 11.0% ROE for the project. However, we conclude that an agreement to reduce the number to a 10.5% ROE

is in the public interest, because the Company will be allowed to earn less on its investment than what is currently allowed under the originally authorized 11.0% ROE.

V. CONCLUSION

For the reasons set forth above, the Commission finds that the construction and capital cost schedules, which are attached as Order Exhibits Nos. 1 and 2, are justified by the evidence presented by the witnesses in this proceeding and comport with the terms of the BLRA. Having carefully reviewed the record in this proceeding, the arguments of the Sierra Club, the Settlement Agreement, and the operative provisions of the BLRA, the Commission does not find any basis for concluding that changes in the project construction schedule and the \$698.2 million in newly identified and itemized costs are in any way the result of SCE&G's failure to manage the project prudently. Instead, the evidence of record shows that project delays and the \$698.2 million in newly identified and itemized capital costs are not the result of any imprudence by SCE&G.

In addition, the Commission finds that SCE&G has presented evidence establishing that the most prudent, reasonable and beneficial result for its customers and the State of South Carolina is to complete construction of the Units as proposed.⁷ The evidence shows that under the most reasonable cost scenario, cancelling the Units and switching to natural gas would increase the cost to SCE&G's customers for electric service by \$278 million per year on average over the 40 year planning horizon. The evidence further shows that the future capital costs of the Units would have to increase by

⁷ While this finding is justified by the evidence presented at hearing, this Commission also recognizes the conclusiveness of the initial finding under the BLRA. *South Carolina Energy Users Comm. v. South Carolina Pub. Serv. Comm'n*, 388 S.C. 486, 697 S.E.2d 587 (2010).

about \$3.1 billion above current forecasts to overcome the benefit of \$278 million per year from completing the Units at their current cost. Tr. at p. 539-540.

The evidence also shows that when the new Units are placed in service, 61% of SCE&G's generation capacity will be in non-emitting units. In large part because of the units, SCE&G projects that by 2021 it will have reduced its carbon emissions by 54% compared to their 2005 levels. Tr. at p. 63. There is no other source of non-emitting dispatchable, base-load generation that can replace these Units. Tr. at p. 66. Therefore, completing the Units will be a key part of South Carolina's plan to meet the CO₂ reductions required under the EPA's new Clean Power Plan regulations, to be codified at 40 C.F.R. Part 60. Tr. at 47. This makes it critically important to the economic well-being of the State of South Carolina that these Units be completed successfully and economically.

Accordingly, the Commission finds that at this critical juncture in the project, the interests of SCE&G's customers, its partner Santee Cooper, and the State of South Carolina do not support action that would unnecessarily interfere with SCE&G's ability to continue to raise financing for this project on reasonable terms, or that would impose unreasonable demand on its management of its already challenging commercial relationships with WEC/CB&I. Avoiding these outcomes is the most beneficial policy for all concerned.

In accordance with the terms of S.C. Code Ann. §§ 58-33-270(E) and 58-33-270(G), the Commission finds that the revised cost and construction schedules, as well as the Settlement Agreement should be approved.

In approving the schedules and the Settlement Agreement in this case, this Commission is holding that SCE&G's decision to pay 90% of certain disputed invoiced amounts under the EPC Contract is reasonable, and that including those payments in the anticipated cost schedule for this project is appropriate under the Base Load Review Act. The issuance of this Order and approval of the schedules and the Settlement Agreement are not intended to limit the ability of SCE&G to continue to negotiate collection of the appropriate disputed amounts from contractors. In fact, this Commission encourages and expects SCE&G to continue to take all necessary steps to collect appropriate disputed amounts from contractors, so that the Company's customers' additional expenses due to contractor-induced delay and other causes may be minimized, and reimbursed to the customers where possible. This Commission also encourages and expects the Company to take all actions available to insure that it qualifies for the Federal Production Tax Credits described previously herein.

VI. PROCEDURAL FINDINGS AND LEGAL STANDARDS

In Order No. 2009-104(A), dated March 2, 2009, the Commission approved a capital cost schedule for the construction of two 1,117 net MW nuclear power units to be located at the SCE&G's V.C. Summer Nuclear Station near Jenkinsville, South Carolina. The approved capital cost for the project totaled \$4.5 billion in 2007 dollars.

In Order No. 2010-12, the Commission approved an updated construction schedule for the project and an updated capital cost schedule that reflected the updated construction schedule. The capital cost schedule approved in Order No. 2010-12 did not alter the total estimated capital cost for the Units of \$4.5 billion in 2007 dollars.

On August 9, 2010, the South Carolina Supreme Court issued its decision in *South Carolina Energy Users Comm. v. South Carolina Pub. Serv. Comm'n*, 388 S.C. 486, 697 S.E.2d 587 (2010), concerning SCEUC's appeal of Order No. 2009-104(A). In its Opinion, the Court ruled that contingency costs which had not been itemized or designated to specific cost categories were not permitted as a part of an approved capital cost schedule under the BLRA.

In Order No. 2011-345, the Commission approved an updated capital cost schedule in response to the Opinion, which removed from approved schedules costs that had not been identified as specific capital cost items and approved \$174 million in adjustments to reflect newly itemized costs. The capital cost schedule approved in Order No. 2011-345 reduced the total approved capital cost forecast for the Units to \$4.3 billion in 2007 dollars.

In Order No. 2012-884, the Commission approved an estimated capital cost for the Units of approximately \$4.5 billion in 2007 dollars and a new milestone schedule tied to substantial completion dates for Units 2 and 3 of March 15, 2017, and May 15, 2018, respectively.

In the appeal of Order No. 2012-884 by the Sierra Club, the South Carolina Supreme Court affirmed the Commission's ruling in all respects in *South Carolina Energy Users Comm. v. South Carolina Elec. & Gas*, 410 S.C. 348, 764 S.E.2d 913 (2014).

Under S.C. Code Ann. § 58-33-270(E), a utility may petition the Commission "for an order modifying any of the schedules, estimates, findings, class allocation factors, rate

designs, or conditions that form part of any base load review order.” The Commission shall grant the relief requested if, after a hearing, the Commission finds “that the evidence of record justifies a finding that the changes are not the result of imprudence on the part of the utility.”

On March 12, 2015, SCE&G filed the Petition in this docket, pursuant to S.C. Code Ann. § 58-33-270(E) (Supp. 2014), seeking an order approving updated capital cost and construction schedules for nuclear units.

The Commission convened an evidentiary hearing on this matter on July 21, 2015, which concluded on July 22, 2015.

No party presented any testimony or other evidence sufficient to overcome the Company’s affirmative testimony supporting reasonableness and prudence of the updated construction schedule or the fact that the \$698.2 million in newly identified and itemized costs are prudent costs and are not in any way the result of SCE&G’s failure to manage the project prudently.

VII. FINDINGS OF FACT AND CONCLUSIONS OF LAW

The updated capital cost schedule contained in Hearing Exhibit No. 10 (CLW-1) reflects \$698.2 million in costs that have not previously been presented to the Commission for review and approval.

The evidence in the record demonstrates that \$698.2 million in newly identified and itemized costs are not the result of imprudence on the part of SCE&G.

As to specific components of the \$698.2 million in newly identified and itemized costs, the additional EAC Costs and costs associated with change orders are costs which

SCE&G must reasonably be expected to pay for completing the Units and preparing to operate them safely, efficiently and reliably.

The additional costs that SCE&G is incurring as Owner of the project are not the result of imprudence and are costs that are reasonable and prudent costs to ensure that the project is constructed prudently, efficiently and economically, and to ensure that the Units can be operated and maintained safely and efficiently when they are completed.

The updated milestone construction schedule contained in Hearing Exhibit No. 4 (SAB-2) reflects the delay in the substantial completion of Unit 2 until June 19, 2019, and of Unit 3 to June 16, 2020. The evidence shows that difficulties in submodule production are the effective cause of this delay and SCE&G was in no sense imprudent in its management of this aspect of the project.

SCE&G's decision to pay 90% of certain disputed invoiced costs under the EPC Contract, as discussed above, is reasonable and including those anticipated payments in the anticipated cost schedule for the project is appropriate under the BLRA.

The Settlement Agreement entered into the record of this proceeding as Hearing Exhibit No. 1 fully conforms to the terms of S.C. Code Ann. § 58-33-270(G) and its terms comport with the terms of the BLRA and are supported by the evidence.

VIII. COMMISSION ORDER

Now, therefore,

IT IS HEREBY ORDERED:

1. That the construction milestones schedule set forth in Hearing Exhibit No. 4 (SAB-2), attached hereto as Order Exhibit No. 1, shall be the approved construction

milestone schedule for the Units for purposes of the administration of the Base Load Review Act until such time as the Commission approves a substitute schedule pursuant to S.C. Code Ann. § 58-33-270(E).

2. That the capital cost schedule set forth in Hearing Exhibit No. 10 (CLW-1), attached hereto as Order Exhibit No. 2, shall be the approved capital cost schedule for the Units for purposes of the administration of the Base Load Review Act unless or until such time as the Commission approves a substitute schedule pursuant to S.C. Code Ann. § 58-33-270(E).

3. That the future quarterly reports filed by SCE&G under S.C. Code Ann. § 58-33-277 shall reflect the modified schedules approved in this Order, and shall track and report final change order costs.

4. That the Settlement Agreement set forth as Hearing Exhibit No. 1, and attached hereto as Order Exhibit No. 3, is approved and the terms therein shall be accepted and adopted by this Order pursuant to S.C. Code Ann. § 58-33-270(G).

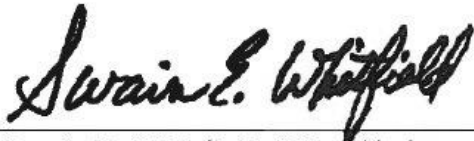
5. That this Order shall remain in full force and effect until modified by a subsequent order of the Commission.

BY ORDER OF THE COMMISSION:



Nikiya Hall, Chairman

ATTEST:



Swain E. Whitfield, Vice Chairman

(SEAL)