DIRECT TESTIMONY

OF

DR. KENNETH PETRUNIK

ON BEHALF OF

SOUTH CAROLINA ELECTRIC & GAS COMPANY

DOCKET NOS. 2017-207-E, 2017-305-E

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND POSITION.

A. My name is Dr. Kenneth “Ken” Petrunik. My business address is 2183 Shawanaga Trail, Mississauga, Ontario. I am a consultant in the nuclear power industry with a range of international clients and currently am a non-executive board member of Horizon Nuclear Power in the U.K.

Q. DESCRIBE YOUR EDUCATIONAL BACKGROUND AND BUSINESS EXPERIENCE.

A. I grew up in Sault Ste. Marie, Ontario, and have a Ph.D. in Chemical Engineering from the University of Windsor in Canada. I have worked in the nuclear power industry since completing my Ph.D. in 1973 and have nearly 45 years of experience in nuclear power and nuclear power plant construction. From 2009 to 2014, I served as Chief Program Officer for Emirates Nuclear Energy Corporation (ENEC) and led oversight of Korea Electric Power Corporation’s construction and delivery of four APR 1400 nuclear power plants built in the United Arab Emirates. Prior to that,
beginning in 1974, I worked for Atomic Energy of Canada, Limited (AECL) in a variety of positions and ultimately served as Chief Operating Officer and also President of the CANDU Reactor Division. In that role, I was responsible for AECL’s commercial CANDU nuclear reactor business including marketing and delivery of new-build nuclear reactors and services to nuclear operating stations. During my time with CANDU Reactor Division, I began as a design engineer and before becoming COO and President of AECL CANDU worked on all of AECL’s CANDU new build projects namely Darlington, Bruce, Pickering, Lepreau and Gentilly in Canada and internationally Embalse, Argentina; Cernavoda, Romania; Wolsong, Korea; and Qinshan, China. As COO and President of AECL CANDU, I was ultimately responsible for the overall commercial business of the enterprise.

Q. DESCRIBE ANY ADDITIONAL PROFESSIONAL CERTIFICATIONS OR DISTINCTIONS YOU POSSESS THAT SUPPORT YOUR TESTIMONY.

A. Before leaving Canada in 2009, I was a Registered Professional Engineer in the Province of Ontario, Canada and a Fellow of the Canadian Academy of Engineering, a group of Canadian engineers and related professionals elected based on their distinguished service and contribution to society, to Canada and the engineering profession. I was also a member of the Canadian Nuclear Society and the Canadian Nuclear Association
where I received a leadership award from the Canadian Nuclear
Association for the successful completion of the Qinshan Nuclear Power
Plant in China. In addition, I received the K. Y. Lo medal from the
Engineering Institute of Canada for contribution to international
engineering and the Friendship Award from the Chinese government for
technical support to China. The Friendship Award is the highest award
given by the Chinese government to a foreign expert.

Q. HAVE YOU EVER TESTIFIED BEFORE THE PUBLIC SERVICE
COMMISION OF SOUTH CAROLINA (“COMMISSION”) BEFORE?

A. No, I have not previously testified before the Public Service
Commission of South Carolina (the “Commission”).

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The primary purpose of my testimony is to address the direct
testimony of Elizabeth Warner and Anthony James. I will also provide the
Commission with my conclusions regarding the prudency of SCE&G’s
oversight of the construction of the Summer Nuclear Units 2 and 3 (the
“Units”) located in Jenkinsville, South Carolina (the “Project”) and the
sufficiency of SCE&G’s many disclosures to the Office of Regulatory Staff
(ORS) and the Commission.

Q. WHAT INFORMATION HAVE YOU REVIEWED REGARDING
THE PROJECT?
A. I have read and analyzed the key reports and documents related to the Project, including, but not limited to, SCE&G Quarterly Reports to the Commission, Monthly Reports from Westinghouse (“WEC”) and its consortium partner for the Project, first the Shaw Group and later Chicago Bridge and Iron (CB&I), monthly reports prepared by SCE&G’s new nuclear development (“NND”) team, direct testimony of SCE&G witnesses in proceedings before the Commission related to the Project, direct testimony of ORS witnesses in such proceedings, the resulting Commission orders, legislative reports made by ORS, other documents issued by ORS, and various documents related to or prepared by the Bechtel Corporation. In addition, I have interviewed SCE&G employees and I have visited the Project site. A partial list of the documents I have reviewed is attached as Exhibit___, (KP-1).

Q. HAVE YOU READ AND ANALYZED THE BECHTEL REPORT(S)?

A. Yes, I have read the Preliminary Results of Bechtel Assessment dated October 22, 2015, marked “DRAFT” and attached to Mr. James’ testimony (the “Bechtel Presentation”), the Project Assessment Report dated November 19, 2015 and marked “DRAFT” (the “Draft Bechtel Report”), and the Project Assessment Report dated February 5, 2016 (the “Bechtel Report” and collectively the “Bechtel Reports”).

Q. HAVE YOU READ ELIZABETH WARNER’S DIRECT TESTIMONY?
A. Yes, I have read Elizabeth Warner’s direct testimony. Ms. Warner does not appear to offer any pertinent or relevant facts or opinions in her testimony. Her testimony instead merely attaches documents labeled as Exhibits A.1-A.7 and asserts that these documents are consistent with documents in possession of her employer, the South Carolina Public Service Authority or Santee Cooper. I have also read and analyzed Exhibits A.1-A.7 attached to Ms. Warner’s testimony for any insight they might contain.

Q. HAVE YOU READ ANTHONY JAMES’ DIRECT TESTIMONY?

A. Yes, I have read Anthony James’ direct testimony.

Q. WHAT IS THE SUBSTANCE OF THAT TESTIMONY?

A. Mr. James contends that revised rates related to the Project should be suspended because 1) the South Carolina Attorney General has questioned the constitutionality of the statutory basis for the revised rates; 2) SCE&G has stopped construction of the Project; and 3) SCE&G has withheld material information from the Commission. The only material information which Mr. James specifically asserts SCE&G withheld is a schedule contained in the Bechtel Presentation and Draft Bechtel Report.

Q. HOW DO YOU RESPOND TO THE POINTS MADE BY MR. JAMES IN HIS TESTIMONY?

A. I am not a lawyer and express no opinion regarding Mr. James’ first two assertions. However, Mr. James is simply incorrect when he asserts
that SCE&G withheld material information from the Commission and ORS.

The reports and other documents that were made available to ORS contained all of the material information that someone familiar with nuclear construction, specifically ORS’s construction experts, would need to understand the status, schedule and challenges of the Project.

While the Bechtel Reports contained a number of reasonable and useful suggestions for improving the efficiency of the Project, those suggestions are made in response to challenges and problems that were well known and clearly identified in other documents. The Bechtel Reports did not identify any undisclosed issues or challenges. The issues and challenges discussed in the Bechtel Reports were the same issues and challenges that had been discussed and disclosed in numerous reports and other documents provided to ORS. The Bechtel Reports did not provide any material information about those issues and challenges that was not disclosed in other documents and well known to those following the Project.

The documentary record shows that ORS, as the state regulatory agency charged with direct oversight in these matters, had all the information necessary to understand where the Project stood and the challenges it faced without reference to the Bechtel Reports.

In addition, as I explain below, the construction schedule contained in the Bechtel Presentation and Draft Bechtel Report was based on
inadequate information, did not reflect key Project data and was properly excluded from final Bechtel Report.

Q. WHAT IS YOUR UNDERSTANDING OF THE ROLE OF ORS IN PROTECTING THE PUBLIC INTEREST RELATED TO THIS CONSTRUCTION?

A. As indicated above, it is my understanding that ORS represented the public interest in these matters and reported its conclusions about the Project to the Commission and the public. It did so through the monthly and quarterly reports that ORS issued on the Project, the testimony and reports it provided in proceedings before the Commission over the course of the Project, the settlement agreements it adopted and other reports and public statements. I have reviewed a number of ORS’s reports, documents and public statements related to the Project. They show that ORS understood the challenges faced by the Project very well. I do not see any relevant and material facts discussed in the Bechtel Reports that ORS did not understand or failed to acknowledge in its reports and public statements.

Q. WHAT DO YOU CONCLUDE BASED ON YOUR REVIEW OF THE INFORMATION PROVIDED TO ORS CONCERNING SCE&G’s DISCLOSURE OF THE PROJECT STATUS?

A. Mr. Young and Mr. Kochems testify concerning the information that was provided to ORS which included practically all the information
available to SCE&G as owner of the Project. I have reviewed the monthly
construction reports issued by WEC/CB&I and SCE&G, other construction
reports, as well as the quarterly reports that were prepared and filed with
ORS and the Commission and made available to the public.

The monthly construction reports that ORS reviewed are standard
reports used in managing projects of this sort. The monthly reports for this
Project were quite comprehensive and very detailed. They included
information concerning milestones, delays, problems, schedule issues,
inspections, and critical paths. They ran over 100 pages in length often and
included a great deal of supporting documentation. They were the basis on
which monthly project review meetings were conducted and the individuals
who contributed to them were questioned about what they reflected.

To anyone reasonably experienced in nuclear construction, these
reports communicated a clear picture of where the Project stood month-to-
month and quarter-to-quarter. They clearly communicated the challenges
being faced by the Project and the difficulties the Project was encountering
in meeting the substantial completion date commitments which
WEC/CB&I made.

In addition, SCE&G also produced quarterly reports specifically for
ORS which summarized and expanded on the material provided in the
monthly reports. These in turn were supplemented by annual construction
updates conducted either in formal hearings before the Commission or in allowable ex parte information briefings.

I have reviewed all these documents and they clearly indicate that ORS had all the information needed to understand where the Project stood and what challenges it faced, specifically as to the completion schedule, but also concerning the other important challenges involved. The Bechtel Reports did not include material information that was not otherwise disclosed to ORS.

Q. **IN YOUR OPINION WAS ORS IN A POSITION TO UNDERSTAND THE INFORMATION THAT WAS PROVIDED TO IT ABOUT THE PROJECT?**

A. Absolutely. ORS also had at its disposal the expert advice necessary to review and understand the information provided and to interpret it for ORS and the public. Specifically, ORS was advised in these matters by Mr. Gary Jones whose resume shows him to have sufficient training and practical experience in nuclear construction to understand the information provided, which was extensive. Mr. Jones’ work was supplemented by ORS employees assigned to this Project who also had experience in technical and construction matters.
Q. DO ORS’S PUBLIC STATEMENTS SHOW THAT ORS IN FACT UNDERSTOOD THE SCHEDULE CHALLENGES FACED BY THE PROJECT?

A. Yes. The record clearly shows that ORS understood the schedule challenges faced by the Project and was in no way misled by any withholding of information. For example, in its August 2016 report to the Public Utility Oversight Committee of the South Carolina General Assembly, ORS stated the following:

However, the project has been plagued by challenges including, among others, the dissolving of the project’s consortium; exit of CB&I; arrival of Fluor; new engineering, procurement and construction contract; increase in the budget; and a further delay in the construction schedule.

The ORS believes it is possible that Unit 2 may still be able to qualify for the Federal Production Tax Credits (FPTC) that expire on December 31, 2020, even though it is unlikely that it will meet the August 2019 substantial completion date requested in SCE&G’s most recent filing. Completing Unit 2 in time to receive the FPTC will require improvements to the current construction methodology. It is less likely that Unit 3 can be completed in time to meet its current FPTC deadline of December 31, 2020.

In October of 2016, Mr. Jones testified in Docket No. 2016-223-E as follows:

In its Petition, SCE&G states the revised GSCD [Guaranteed Substantial Completion Dates] are August 31, 2019 for Unit 2 and August 31, 2020 for Unit 3 per the [2015 EPC Contract] Amendment. . . . ORS finds that the completion dates for the Units will be extended to at least these dates, and, in all likelihood, will extend beyond the revised GSCDs. . . .
Although the basic logic and sequencing of precursor and successor events and the level of detail presented in identifying the tasks and work scope in the current revised schedule appear sound, the assigned durations and the labor hours assigned to these tasks are highly questionable in that they appear to be too low. . . . Targeted productivity has not been achieved and the performance factors for each of the crafts have been significantly below expectation and goals. . . . This basically means that the Project will either (1) take longer, or (2) will require significant improvements in efficiency and productivity and/or more resources than are currently anticipated.

Transcript of Hearing, Docket No. 2016-223-E at pp. 27-28. These are just two examples of an extensive record of statements and reports indicating that ORS fully understood the risks and challenges faced by the Project and was not in any way kept in the dark by non-disclosures. ORS did not choose to present any testimony by Mr. Jones in this proceeding. Nonetheless, his testimony in prior dockets and the statements ORS has made publicly are very clear. ORS was not in any way ignorant or misled about the status of the Project. In the quarterly reports, the monthly construction reports, and the other information that SCE&G provided, ORS and its experts had the information they needed to understand the schedule concerns faced by the Project. And they did understand those concerns.

Q. CAN YOU PROVIDE EXAMPLES OF SCE&G’S PRIOR DISCLOSURE TO THE COMMISSION AND ORS OF THE ISSUES DISCUSSED IN THE BECHTEL REPORTS?

A. Yes. Attached to my testimony as Exhibit __, (KP-2) is a compilation of specific instances of disclosures that are found in the
reports, testimony, and other public disclosures associated with the Project. This compilation organizes those statements and disclosures around the key challenges identified in the Bechtel Reports.

This compilation is an expanded and revised version of a compilation assembled by SCE&G and previously filed in Docket No. 2017-305-E in support of a motion to dismiss the petition in this matter filed by SCE&G. My version of this compilation includes citations to additional documents which have been produced during discovery and goes beyond what was submitted earlier. It shows that each of the major challenges to the Project that were discussed in the Bechtel Reports were fully understood by ORS and disclosed to the public. As mentioned above there is no failure of disclosure related to this Project.

The source documents in which Exhibit ____, (KP-2) is based are attached as Exhibit ____, (KP-3). They include hearing and ex parte information and briefing transcripts, quarterly reports filed by SCE&G, quarterly reports filed by ORS, monthly reports by ORS to the General Assembly of the State of South Carolina, presentations made by ORS to the South Carolina Energy Users Committee and in one case, the notes of a presentation by ORS to the General Assembly made on November 29, 2016. These ORS reports and other documents were provided directly by ORS or in response to discovery requests in this matter or filed by ORS in docket no. 2008-196-E.
Q. HAVE YOU READ AND ANALYZED THE PROFESSIONAL
SERVICES AGREEMENT UNDER WHICH BECHTEL
CONDUCTED ITS REVIEW?
A. Yes. I have.

Q. FOR WHAT PURPOSE WAS BECHTEL HIRED AND BY WHOM?
A. Bechtel was hired by the law firm of Smith, Currie & Hancock LLP, which represented SCE&G and Santee Cooper, to assist those lawyers and the project owners “in better understanding the current status and potential challenges of the Project in anticipation of litigation and to ensure the Project is on the most cost-efficient trajectory to completion.” Bechtel’s work was specifically intended to be directed by an attorney from Smith Currie & Hancock. The scope of work was set forth in detail in that document. As Mr. Addison and Mr. Kochems testified, at the time, there were escalating payment and other disputes that seemed to be leading toward litigation or other forms of legal dispute resolution.

Bechtel was asked to conduct a review of the owner’s organizational charts and structure, the Consortium’s organizational charts, the monthly construction progress reports, the milestone management schedules, the integrated engineering, procurement and construction schedules, cost and schedule forecasts, staffing projections, supply chain and module fabrication information and other documents. Bechtel was to supplement
this documentary review with meetings with key Consortium personnel, site walk downs and interviews with owners’ leadership team.

Q. DID YOU FIND ANY MATERIAL INFORMATION IN THE BECHTEL REPORTS THAT HAD NOT BEEN OTHERWISE DISCLOSED?

A. No. I found no material undisclosed information or other surprises in the Bechtel Reports. The issues raised in the Bechtel Reports had been acknowledged and described in detail in quarterly reports to ORS, the monthly construction reports and other material made available to ORS, and in the testimony and other filings before the Commission.

Furthermore, as a general matter, the problems that were identified in the Bechtel Reports were generally known in the nuclear construction industry to be problems faced by the two U.S. AP 1000 projects. Members of the industry, myself included, were well aware of the nature of these problems, including the schedule problems.

In addition, I also did some review work for WEC in the setting up of the Moorside AP1000 project in the UK and on the WEC bid to construct multiple AP1000 units in India and was aware of challenges in the existing AP1000 projects which were a matter of concern and discussion for the potential owners of these proposed projects. In addition, on my own initiative, some time ago I visited the Sanmen site in China where the AP1000 units were under construction but behind schedule.
Considering what I knew about the Project prior to being retained by SCE&G, there was nothing new or surprising about what I saw in reading the Bechtel Reports.

As shown in Exhibit ___, (KP-2), the issues and challenges confronted by this Project were clearly disclosed.

Q. WAS THE BECHTEL REPORT CURRENT WHEN ISSUED?


- Scrapped the Consortium structure,
- Released CB&I from the Project,
- Allowed Fluor to be hired as construction contractor under WEC,
- Allowed for a fixed price guarantee for completing the EPC Contract work,
- Increased liquidated damages and completion incentives,
- Limited future change orders, and
- Restructured other commercial terms of that Agreement.

As the Bechtel Reports indicate, many of the individual recommendations –by most counts a majority of them– were negated by these changes in the Consortium structure and other changes made by the
2015 EPC Amendments. This made the report largely outdated before it was issued.

In addition, immediately after the 2015 EPC Amendments were signed Fluor began to conduct reviews and other initiatives to create new staffing plans, streamline work packages, resolve engineering bottlenecks, formulate mitigation plans, and revise the Project construction schedule. In addition, a new project management oversight structure was imposed in late 2015, which negated yet another recommendation contained in the Bechtel Report. Many of the actions represented recommendations of the Bechtel Report that were already in process before the report was issued.

For these reasons, the Bechtel Report was essentially outdated when issued and became more outdated with each passing month.

Q. HAVE YOU FORMED ANY OTHER OPINIONS REGARDING THE BECHTEL REPORTS?

A. Yes, based on my review I have reached two primary conclusions regarding the Bechtel Reports. First, as stated above, the Bechtel Reports do not contain material information that was not previously known to SCE&G and disclosed to the ORS. Second, the schedule estimate contained in the Bechtel Presentation and Draft Bechtel Report is derived from a limited access to the Project and is unreliable. The decision not to include that schedule estimate in the final version of the report was entirely logical and supportable.
Q. WAS BECHTEL RETAINED OR AUTHORIZED TO GENERATE ITS OWN PROPOSED SCHEDULE FOR THE PROJECT?

A. No. According to the scope of work for the Project, Bechtel was not hired or authorized to generate a proposed schedule for the Project nor was it given access to the information required to do so, as Bechtel itself admits in the report.

Q. IN WHAT WAYS WAS THE SCHEDULE INFORMATION IN THE BECHTEL REPORTS FLAWED AND UNRELIABLE?

A. Given its scope of work under which Bechtel was hired, and the limitations under which it operated, Bechtel did not have sufficient information to create an accurate schedule for completion of the Project. Most importantly, as Bechtel freely admitted, it did not have access to the Level 3 Schedule\(^1\) for the Project. It was simply impossible for Bechtel to accurately evaluate schedule and milestone delays and to revise and predict future completion dates without access to a Level 3 Schedule for the Project.

Q. WERE YOU SURPRISED THAT BECHTEL WAS NOT GIVEN THE KIND OF ACCESS TO DATA THAT IT WOULD HAVE NEEDED TO COMPILE ITS OWN PROJECT SCHEDULE?

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\(^1\) The Level 3 schedule spans the whole of a project and includes all major milestones, major elements of design, engineering, procurement, construction, testing, commissioning and/or start-up.
A. No, not at all. There was no reason to give Bechtel the sort of access to data required to create a new project schedule. Bechtel was never authorized to create a new project schedule. In fact, there is no indication in the documents that SCE&G was even aware that Bechtel was preparing an alternative project schedule until one appeared in the presentation materials at the end of Bechtel’s work.

Q. WHAT SORT OF DATA ACCESS LIMITATIONS DID WESTINGHOUSE AND CB&I IMPOSE ON BECHTEL AND WHY?

A. Bechtel is a direct competitor of CB&I and Fluor and at the time could be considered a potential competitor of Westinghouse in the areas of project management and delivery. These companies were understandably reluctant to provide Bechtel with data that Bechtel could compete against them for future business. For that reason, WEC and CB&I required Bechtel to review data in secure reading rooms and not copy that data into Bechtel’s systems and programs. These limitations did not prevent Bechtel from conducting review and critique of the existing project schedule that it was tasked to do. But these limitations did prevent Bechtel from exporting the data and information needed to compile its own project schedule into its own computer systems. This prevented Bechtel from using the existing construction schedule and other site-specific data and information, including information about mitigation plans, to create its own schedule. As a result, the Bechtel schedule was more qualitative than quantitative.
Q. **DID THE UNAUTHORIZED NATURE OF THE BECHTEL SCHEDULE LIMIT IT IN OTHER WAYS?**

A. Yes. Because the creation of this schedule was unauthorized, Bechtel could not seek WEC/CB&I’s help in incorporating into Bechtel’s scheduling software information about the specific mitigation efforts that were underway, the evolution of the Project and its critical path, and the effect of the experience curve on the future productivity and schedule compliance. Going it alone as it did, Bechtel was required to create a schedule based on generic information from other nuclear projects, general productivity and staffing trends, and similar non-specific resources. For that reason, the draft schedule included in the Bechtel Presentation and Draft Bechtel Report was unreliable and incomplete. The report itself indicates as much. The decision not to include this schedule in the final report was entirely justified for those reasons.

Q. **WAS ANOTHER, BETTER INFORMED SCHEDULING EFFORT UNDERWAY AT THE TIME THE BECHTEL REPORT WAS ISSUED?**

A. Yes. At the time the Bechtel Report was issued in early 2016, Fluor was engaged in creating a new fully resource loaded construction schedule based on access to all relevant data, mitigation plans, and other information. This is another reason why it made sense not to proceed publicly or otherwise with the Bechtel schedule. In addition, SCE&G had reached a
settlement agreement with WEC in 2015 which was eventually approved by
the Commission in 2016 and which transferred substantial risk to WEC in
project completion costs and revised completion dates. These dates were
from WEC with Fluor, the vendor who had all of the project information
and very importantly commercially took on these completion risks and
dates which were challenging. In other words, they put their money on their
words. This was an appropriate schedule to rely on.

Also, SCE&G’s approach was right in a project management sense.
The delayed Bechtel dates were factually unsupported. But acknowledging
them as reasonable would have taken pressure off of WEC and CB&I to
meet the existing and more challenging schedule commitments WEC and
CB&I had made. It would have removed the urgency around the existing
dates. This is not a theoretical issue. I have seen this happen before. Also
in my experience, projects in delay have recovered, most notably in
Qinshan, China where the units I led were about four months late at the
mid-point but recovered. It took a combined vendor-owner partnership
committed to the earlier dates to recover those delays and even resulted in
completion one month early. I also experienced the learning curve on the
project which helped to bring the second unit into service some four months
early.
Q. WHAT OTHER LIMITATIONS IMPAIRED BECHTEL’S ABILITY TO ACCESS THE PROJECT?

A. Several other circumstances hindered Bechtel’s ability to prepare an accurate schedule for the Project. Notably, Bechtel did not have any experience with the new U.S. Nuclear Regulatory Commission (NRC) regulatory standards which applied to the Project. The Project is subject to Part 52 - LICENSES, CERTIFICATIONS, AND APPROVALS FOR NUCLEAR POWER PLANTS of the NRC regulations (“Part 52”). To my knowledge, Bechtel has never been a vendor or builder of a project subject to Part 52 until it supplanted Fluor Corporation as the contractor for the Vogtle project in late 2017. At the relevant time, therefore, Bechtel lacked the institutional knowledge necessary to understand the value of prior Part 52 project lessons learned and to transform those lessons learned into schedule efficiencies. Similarly, Bechtel did not account for SCE&G formal collaboration with the firms building AP1000 units in China and SCE&G and the Consortium’s ability to incorporate lessons learned from AP1000 construction in China into the Project going forward. Each of these circumstances hindered Bechtel’s ability to access the Project and its ability to quantitatively predict a completion schedule for the Project.

Q. WHY WOULD A COMPANY LIKE BECHTEL CREATE A PROJECT SCHEDULE THAT THE CLIENT DID NOT REQUEST?
A. It is well recognized in the nuclear construction industry that firms like Bechtel have an economic reason to use one-off consulting opportunities to develop new or expanded assignments. There is nothing wrong with this practice, which is well recognized in the industry. It is referred to as “leaving a trail of bread crumbs” and the bread crumbs lead to more work for the consulting firm. People with experience in the construction industry understand and expect that consulting firms may do this. And sometimes when they do they play up negative findings to create a sense of urgency around the need to hire the firm to fix the problems identified. Generally speaking, there is nothing wrong with this as long as it is recognized and the findings are not misinterpreted. Reports produced in these circumstances need to be read with this fact in mind.

Q. YOU INDICATED EARLIER THAT YOU HAD AN OPINION CONCERNING THE PRUDENCY OF SCE&G’S ACTIONS RELATED TO THE PROJECT. CAN YOU SHARE THAT OPINION WITH US?

A. SCE&G’s role in the Project was largely defined by the EPC Contract which it entered into with the Westinghouse Consortium so that it could access the AP1000 Advanced Passive Safety technology. The AP1000 technology was clearly a good choice in light of Westinghouse’s experience and standing in the industry, and the technology of the AP1000 design itself. Another very important consideration was that SCE&G was
already operating a Westinghouse pressurized water reactor at the Jenkinsville site and had been doing so safely and effectively for approximately 30 years. For a number of reasons, it is best to have comparable reactor designs on a given site.

I know the attractiveness of the AP1000 Advanced Passive Safety design from direct experience in competing against it. My former company AECL was a competitor of WEC in China. In the end, China chose AP1000 technology over our design and over the existing, domestic Chinese reactor design. I understood why the Chinese selected the WEC AP1000 over the other designs. The AP1000 passive safety design is a major advance in the technology and WEC was a very well respected design firm.

As a practical matter, choosing the AP1000 technology for the Project entailed choosing Westinghouse and its consortium partner to construct the Units under an EPC Contract. Those were the terms on which the technology was offered and bid. As is the case with all projects being delivered under an EPC process, the EPC Contract defined SCE&G’s role as owner and set the limits within which SCE&G could effectively operate.

The documents that I have reviewed show that SCE&G set a tone and culture of openness and communications in undertaking its role as owner of the Project. I fully appreciate the value of this approach as it is the same model that helped my success in China in completing two units ahead
of schedule and under budget. SCE&G’s approach is quite clear in the documentary record. At every stage of the Project, SCE&G appropriately and consistently focused on finding constructive and practical resolutions to issues as they arose.

The documentary record also shows that SCE&G understood its role as an owner operating under an EPC Contract. Its job was to demand performance from the EPC contractors without directing the means or methods used to accomplish the work, or usurping the role of the contractors to manage the work. Under an EPC Contract, the choice of means and methods are exclusively the contractors’ responsibility. And that was spelled out in the EPC Contract. When owners seek to dictate means and methods, the contractor can treat all owners’ directives as change orders and this can dramatically increase the cost of the project and lead to conflict and disputes. SCE&G’s actions show that it understood the line between demanding performance and directing means and methods. SCE&G exercised its authority as owner appropriately and effectively.

In addition, SCE&G wisely adopted a graded approach to oversight of the Project. By that I mean that SCE&G calibrated its level of oversight and resources committed on an area-by-area basis to reflect the seriousness of the problems in each area of the Project and risks those problems posed. SCE&G identified in a timely and effective way the areas where problems were emerging that posed a threat to the Project and its schedule. And then
SCE&G focused its efforts and attention on those areas and enhanced its oversight and commitment of resources to match the difficulty of the problems and the potential consequences if they were not corrected as they developed. I would also note that SCE&G disclosed those focus areas in its quarterly reports in a timely fashion as they emerged. I successfully used the same graded approach in my oversight role over the Korean APR 1400 units under construction in Barakah, UAE.

The documentary record also shows that SCE&G understood the danger of an owner overplaying its hand related to commercial issues. SCE&G quite properly identified its challenge to be that of vigorously enforcing its rights under the EPC Contract while not destroying the working relationships necessary to successfully complete a project of this scope. SCE&G took constructive action at multiple stages of the Project to resolve and mitigate the destructive effects of commercial disputes. SCE&G actively worked to avoid a confrontational culture with the Consortium and to promote efficient and effective problem solving as long as it was possible to do so. Adopting a confrontational culture early in the Project most certainly would have resulted in higher costs and longer delays.

However, SCE&G was not afraid to push commercial issues hard when it saw no other alternative for motivating the Consortium to solve problems that threatened the successful completion of the Units. I would
specifically note SCE&G’s actions taken in 2014 and 2015 to place commercial pressure on the Consortium by disputing or refusing to pay millions of dollars of invoices that it asserted were the result of delay, poor productivity or inefficiency. In taking this action, SCE&G took a calculated risk. Its actions could have caused a breakdown of the Project and very nearly did. The Consortium threatened in writing to walk off the job in response. But in light of the seriousness of circumstances, taking such risks was justified at that time.

It has been my experience, over many such projects, that the approach SCE&G took as owner was the most prudent and constructive approach available to an owner under the EPC Contract. It is my opinion that SCE&G discharged its functions as an owner with great insight and care.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.