THE OFFICE OF REGULATORY STAFF

DIRECT TESTIMONY & EXHIBITS

OF
ELIZABETH H. WARNER

AUGUST 14, 2018

DOCKET NO. 2017-305-E

Request of the Office of Regulatory Staff for Rate Relief to South Carolina Electric & Gas Company's Rates Pursuant to S.C. Code Ann. § 58-27-920

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DIRECT TESTIMONY & EXHIBITS OF

ELIZABETH H. WARNER

DOCKET NO. 2017-305-E

IN RE: REQUEST OF THE OFFICE OF REGULATORY STAFF FOR RATE RELIEF TO SOUTH CAROLINA ELECTRIC & GAS COMPANY'S RATES PURSUANT TO S.C. CODE ANN. § 58-27-920

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

A. Elizabeth H. Warner, 1 Riverwood Drive, Moncks Corner, SC 29461, Vice President, Legal Services and Corporate Secretary.

Q. PLEASE STATE YOUR EDUCATIONAL BACKGROUND AND EXPERIENCE.

A. I received a Bachelor of Arts in Political Science from the University of South Carolina and a Juris Doctorate from the University of South Carolina School of Law. I have worked at Santee Cooper for 18 years, the past five of which have been in my current role.

Q. HAVE YOU TESTIFIED BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA ("COMMISSION" or "PSC")?

A. NO

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to certify that the documents included in Exhibit A to my testimony are Santee Cooper records. A list identifying the documents is included in the chart below:

Bates Number
ORS_00002007
ORS_00005741

ORS_00005773
ORS_00006138
ORS_00008356
ORS_00008486
ORS_00316370

Q. ARE YOU THE CORPORATE SECRETARY FOR SANTEE COOPER?

A. Yes.

Q. IN THAT CAPACITY ARE YOU EMPOWERED TO CERTIFY THAT THESE DOCUMENTS ARE OFFICIAL RECORDS OF SANTEE COOPER?

A. Yes.

Q. HAVE YOU EXAMINED THE DOCUMENTS CONTAINED IN YOUR EXHIBIT A FOR AUTHENTICITY?

A. Yes. I have examined all 373 pages of the 7 documents contained in my Exhibit A. I am familiar with those records and have personal knowledge of how the documents are stored in their regular course of business. I can verify that all pages of all the documents contained in Exhibit A are true and authentic reproductions of the documents in Santee Cooper's possession.

Q: DID GOVERNOR HENRY MCMASTER REQUEST SANTEE COOPER TO PROVIDE ORS ACCESS TO THESE DOCUMENTS?

A. Yes, I received an email from Governor McMaster's office on March 31, 2018, directing Santee Cooper to provide ORS with access to these documents.

Q: DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

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Exhibit A

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Exhibit A.1

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Crosby, Michael

om: Carter, Lonnie
Sent: Wednesday, September 03, 2014 2:14 PM
To: Crosby, Michael; Baxley, Mike; Pelcher, Steve; Armfield, Jeff
Subject: Fwd:

Let's discuss.

Begin forwarded message:

From: "MARSH, KEVIN B" <KMARSH@scana.com>
Date: September 3, 2014 at 2:06:00 PM EDT
To: "Carter, Lonnie" <lonnie.carter@santeecooper.com>

Lonnie,

I met with my team this morning on a number of nuclear matters and wanted to share our thoughts with you:

1. We discussed the preliminary number given to us late last week by the consortium for delay costs associated with the revised baseline schedule. As you and I discussed last week, this number is very preliminary and will be the basis for lengthy negotiations that will take place over the next several months. I am confident that the number will change as we work to secure a more definite commitment from the consortium with more of their "skin in the game". Since we have already disclosed that we expected to receive a preliminary number, that there would be negotiations around it, and that we plan to complete those negotiations by year end, we don't believe any additional disclosures about the dollar amount of the preliminary cost delay number are necessary. I know that you are planning a bond financing later this month, so I wanted share our thoughts with you and your team with the goal of making our financial disclosures consistent.

2. Our team will begin a review of the delay cost financial information as part of the overall evaluation of the revised baseline schedule. We welcome the assistance of your team in this process. Once we have reviewed the numbers and the schedule, we will be in a position to develop our strategy for negotiations with the consortium that will begin on October 13th.

3. We are ready to move forward with hiring/engaging an additional resource with significant construction expertise to assist us with evaluating the construction schedule and project status. I believe having this person on our staff vs. working as a consultant will avoid conflicts with the consortium on proprietary matters. I would recommend that Jeff Archie work with Mike Crosby to help identify potential candidates for this role.

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4. Your legal team asked George Wenick Redacted - Privileged

Redacted - Privileged

I would be pleased to discuss any of these issues further as we both continue to work hard keep our project moving in the right direction. I appreciate and welcome your thoughts.

Kevin

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Exhibit A.2

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Crosby, Michael

From: Albert, Craig <cmalbert@Bechtel.com>
Sent: Thursday, February 05, 2015 6:00 PM
To: Carter, Lonnie; Crosby, Michael; Crosby, Michael; Carter, Lonnie
Cc: Adams, Mike A. (BGI); Troutman, Tyrone; Watson, Marty
Subject: DRAFT Proposal from Bechtel
Attachments: VC_Summer_Assessment_Draft_Proposal.pdf; ATT00001.htm

Lonnie, Michael,

Attached is a draft of the proposal we committed to providing, and below is a draft of the text I would include in a letter transmitting the final/formal proposal. Please advise of any changes you would like us to make.

Look forward to hearing from you.

Craig

Dear Lonnie and Michael,

Thanks again for meeting with Mike Adams and me on January 24 to discuss the status of the V.C. Summer project. Successful delivery of this project is obviously essential for Santee Cooper, SCANA, and your contractors, but it is also vitally important to our industry and to Bechtel. We understand how important it is to you that the project be executed in the most prudent manner possible and that the new units be delivered at the earliest possible completion date.

Bechtel has supported a number of owners in performing independent assessments of complex EPC projects and we are committed to making a team of senior Bechtel personnel available to support such a review on V.C. Summer. We are very knowledgeable of the AP1000 design basis and our broad experience with world-wide supply chain management, grass-roots nuclear construction, and executing mega projects that leverage large scale modularization provides us with the insight needed to understand the complexities and challenges to deliver this project.

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Given the importance and magnitude of this project, I handpicked Bechtel Senior Vice President Mike Lewis to lead our proposed assessment team. Mike is one of our very best project managers for complex, mega projects and is currently serving as our corporate Manager of Construction, the most senior construction manager in Bechtel. In addition, we have included other senior managers on the team who have very successful history working at V.C. Summer.

In terms of the assessment, we propose that our team focus on understanding the current status and forecasted path to completion through various aspects of the project including: design; supply chain management, with emphasis on module fabrication; construction; and startup. With WEC's support, we can focus on getting a clear picture of the status of the WEC design and licensing efforts and evaluate how those activities may impact the future path to completion. Our team will review project metrics and reports; interview select owner and contractor personnel; and visit the site and key fabrication facilities to evaluate the health of the project execution plan and the thoroughness of the current forecast – from both a schedule and cost performance perspective.

Note that our review will focus on the methods and tools being used to manage project execution, changes, and risks, but will not review the attribution of past impacts or validity of any pending or future claims. Beyond the numbers, we plan to assess the degree to which all parties are aligned in a positive project culture focused on the quality and efficiency of project delivery. We will also look for potential opportunities to tailor contractor oversight given the current project status and circumstances.

As part of our assessment, we will provide you with our initial conclusions and recommendations focusing on the most prudent path forward, and what that means in terms of cost and schedule to improve the trajectory of the project. We are confident, based on our experience in the industry and with assisting owners in completing complex projects that we can provide recommendations that will help you and your current contractors with delivery of your project.

The effort for an assessment of this magnitude will require approximately 10 senior managers, will last 8 weeks in total, and will cost $1 million. Attached is a **DRAFT** proposal that outlines and further defines the details for how the assessment will be executed, key members of the team, commercial considerations, documents and data that are needed from the project to support the assessment, and the proposed topics for the assessment report. Additional information on Bechtel's experience with the AP1000 technology and other relevant projects is also included.

We look forward to supporting you in this endeavor and are prepared to start at your request. I suggest we quickly set up a follow-on meeting with some of our key team leaders to further discuss this effort in detail and answer any of your questions. We are prepared to formally issue this proposal if it meets your expectations and can obviously incorporate any changes you would like. I would be happy to help finalize our proposal. Ty

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Troutman, our General Manager for Nuclear Power, who is copied on this email and can be reached at 703-429-6284, can also help coordinate this follow on discussion. Please let me know of any questions.

Best regards,

Craig

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Assessment Objective and Overview:

The objective of this assessment is to assist the owners of the V.C. Summer Nuclear Generating Stations Units 2 & 3 in better understanding the current status and potential challenges of the project as a first step in helping ensure the project is on the most prudent and cost efficient trajectory to completion. Bechtel proposes to assemble a team of senior subject matter experts experienced in the various aspects of nuclear and large scale complex project execution to perform this assessment. This team will be supported by the institutional knowledge of Bechtel's 4,400 person strong Nuclear, Safety and Environmental business unit that is the home of Bechtel's full-scope nuclear capabilities — i.e., "cradle to grave" experience from research and development and EPC project execution through commissioning and operations and decommissioning.

The team will evaluate the current status and forecasted completion plan through the design, supply chain, and construction aspects of the project. There will be focus on understanding the issues that have caused impacts to date, assessing the effectiveness of the mitigation plans put into place to address those issues, and reviewing the project management tools and work processes being employed to plan and execute the project, including change management, through completion and turnover of the units. For clarity, this team will not evaluate the ownership of past impacts or validity of pending or future claims. To accomplish this, we will leverage the lessons learned from helping owners assess and complete nuclear projects over the last 30 years, including ongoing work on the Watts Bar Unit 2 Completion and Olkiluoto 3 projects. The assessment will take place at the V.C. Summer site, select module fabrication facilities, and the design office (if supported by your contractors).

Outlined below are additional details for how the assessment will be executed, key members of the team, commercial considerations, documents and data that are needed from the project to support the assessment, and the proposed topics for the assessment report. Additional highlights of Bechtel's relevant project experience and with the AP1000 technology are also included.

As this project is one of the frontrunners in the next wave of new nuclear generation in the United States, the efficient execution of these units will set the tone for future efforts in the industry. Bechtel is confident we can apply our experience and lessons learned on complex nuclear projects to add value to the owners of the V.C. Summer plant as they assess their most prudent path to completion.

Execution Approach:

Initially, a small team of senior Bechtel subject matter experts, experienced in mega project construction, nuclear new builds, and project management, will seek to gain a better understanding of the current state of the project. This "data validation phase" will last approximately one (1) week, will take place at the V.C. Summer site with your organization, and ideally include input from both WEC and CB&I. The goal during this phase of the assessment will be for our team to better understand the available project progress data and metrics and see how they compare to our project standards (i.e., the

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level of detail included, who it is produced by, and the frequency with which it is published). The team will also gain insight into the execution control processes and seek to confirm some of the drivers of the current status. This phase would conclude with a validation of the path forward to complete the assessment, including denoting the required level of cooperation necessary by your contractors to produce the optimal evaluation and recommendations for the assessment. A list of the topics to be covered during this phase, along with the documents that should be provided as pre-read material to Bechtel is provided in Attachment 1.

With the completion of the data validation phase, the remainder of the assessment team will mobilize at the V.C. Summer site. Upon arrival, the Bechtel team will complete the required site access training (as necessary) to reduce the administrative burden on your team during our assessment. After completion of training, a kick-off meeting will be held between SCE&G/Santee Cooper and Bechtel to ensure alignment of goals and expectations as well as needed support. Following the kickoff meeting, a walk down of the V.C. Summer site including temporary facilities and laydown areas for material and equipment, will be necessary in order for the team to gain familiarity with the site layout before beginning the interview process with the SCE&G/Santee Cooper team.

Following the site walk down the assessment team will interview the SCE&G/Santee Cooper leadership team members. The list of the leadership team members in question will be provided at the conclusion of the data validation phase. The interviews will take place at the appropriate locations — namely at the site, WEC's design office or module fabrication facilities. The entire Bechtel team typically participates in each of the interviews as they are intended to provide the Bechtel team with a broad overview of each function/department and the major issues or concerns for each area. This information will assist the Bechtel team in understanding how the contractors are organized and managed and in gauging the current EPC culture and potential impacts to the execution approach on the project. Armed with this information the team will then focus its efforts on specific areas of concern during the functional breakout sessions. Should WEC/CB&I choose to participate, this same process will be performed with their leadership team.

With the completion of the leadership interviews, the Bechtel team will proceed to the functional breakout sessions. During this period, the Bechtel team will break out by their assigned functional area and work directly with your and WEC/CB&I's team managers responsible for their respective functions. The Bechtel team will focus on a review of the various tools, documents, and reports and their ability to support the efficient and timely planning, management and completion of the project. Because the Bechtel team members have cross-functional experience and expertise, it may become necessary for short periods of time for Bechtel team members working in other areas to temporarily redirect their efforts to specific issues as appropriate.

The completion of the assessment will take approximately seven (7) weeks following the initial data validation phase. The proposed table of contents for this report is provided in Attachment 2 below. Following your review of this report, Bechtel will meet with your team to discuss any questions you may have.

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Key Team Members:

The senior Bechtel subject matter experts proposed for the assessment team are listed below, and the resume for each individual is provided in Attachment 4:

- Mike Lewis – Executive Management
- Mike Robinson – Project Management and Construction
- Ron Beck – Project Management and Engineering
- Randy McCarraher – Project Management and Project Controls
- Ed Sherow – Design and Licensing
- Steve Routh – Design and Licensing
- Bob Exton – Supply Chain Management

Commercial Considerations:

This assessment will be completed by approximately ten (10) senior managers, last eight (8) weeks in total, and will cost $1 million.

This scope of work can be performed under a simple consulting agreement. We propose 25% of the cost be paid on mobilization with the balance due upon delivery of the report and recommendations.

Any confidentiality agreements required by you or your contractors can be completed on an expedited basis.

Attachments:

1 – Initial Data Validation Phase
2 – Assessment Report Table of Contents
3 – Bechtel Background and Relevant Experience
4 – Assessment Team Resumes

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ATTACHMENT 1
Initial Data Validation Phase

The following documents are needed for the initial data validation phase and we request this information be provided at least one week in advance of our initial visit to the V.C. Summer site.

- Owners organization structure that oversees the V.C. Summer project
- Contractor organization chart(s) for the V.C. Summer project (down to the department/functional lead level)
- Recent monthly progress report(s)

Activities during the initial data validation phase:

- Review project reports and documentation available to SCE&G/Santee Cooper, including, but not limited to the following:
  - Project execution plans and/or procedures
  - Owner and contractor organizational charts
  - Project schedule hierarchy — e.g., milestone management schedule, supported by increasing levels of detailed, integrated EPC schedules
  - Monthly progress reports
  - Cost and/or schedule forecasts, including staffing projections
  - Supply chain information, including module fabrication/production schedules for each facility and quality findings
  - Action item/issue management lists
- Meet with key owner personnel to understand the following:
  - Discuss the evolution of the project to date, including impacts and changes
  - The current state of relations between owners and contractors
  - Understand any financing time constraints, lender commitments or lender rights that could influence the path to completion
- Hold discussions with contractors to gain an understanding of the challenges facing the project to date
- Discuss options for securing contractor cooperation and engagement during completion of the assessment
- Verbal report out to owners on progress during this phase and confirmation on the path forward for the remainder of the assessment

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ATTACHMENT 2
ASSESSMENT REPORT - TABLE OF CONTENTS

- Executive Summary
- Project Management/Project Controls
  - Project EPC Culture
  - Project Execution Approach/Organization
  - Contractor Oversight
- Engineering
- Licensing
- Supply Chain Management
- Module Fabrication
- Construction
- Startup
- Recommendations for a Path Forward
- Appendices

Note: the various departmental/topical focus assessments above will contain the following information:

- *Summary*
- *Current Status*
- *Risks to Project Completion*
- *Observations and Recommendations*

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ATTACHMENT 3
BECHTEL BACKGROUND AND RELEVANT EXPERIENCE

Nuclear, Security, & Environmental

All nuclear specialists in Bechtel are now consolidated into a single business unit named Nuclear, Security & Environmental (NS&E). This 4,400 employee company comprises all of Bechtel's 60+ years of experience in the nuclear industry including best practices, lessons learned, systems, tools, and processes.

This expertise includes engineering, procurement, and construction (EPC); commissioning and operational support; upgrades; and decommissioning and cleanup of nuclear power plants; naval nuclear propulsion systems; facilities for nuclear weapons research and development, manufacturing, production, assembly, disassembly, refurbishment, testing, and general stewardship; nuclear waste treatment and disposal facilities; and government facility decontamination.

Annually, we perform approximately $6 billion worth of these services for our commercial and government customers. This diversity of nuclear projects has enabled Bechtel to maintain the broadest contractor nuclear expertise and capacity in the industry.

Nuclear Power

Bechtel continues to be a global leader in the design, procurement, and construction of nuclear power plants, whether it is modifications to existing facilities, new build, or next generation technology development. Bechtel has been an integral player in the nuclear power industry since its inception over 60 years ago, and we remain at the forefront by providing a range of services and offering technical expertise that no other contractor can match. We have been involved on more than 150 nuclear power plants worldwide and have been a major architect/engineer (A/E) participant in most nuclear reactor technologies, including the AP1000. Moreover, we constructed 42 plants and were the A/E for 71 plants, with involvement ranging from conceptual engineering, plant layout, design certifications, early site permit (ESP) and combined license (COL) applications, constructability reviews, estimating, and owners engineering to full construction and commissioning services as part of consortia, in joint ventures, or as a turnkey provider.

Bechtel's ability to manage complexity on projects large and small is enhanced by a wide variety of services including our adaptive approach to managing labor, a worldwide procurement organization and operation, effective use of information technology, proactive community and regulatory relations, and the US engineering industry's largest research and development staff. This unique experience brings an unparalleled portfolio of expertise to our client projects around the world, on assignments of different sizes and complexities, with one underlying theme — an ability to deliver what others cannot, on time and to budget.

Nuclear Plant Completion, Recovery, and Restart Experience

Bechtel has unparalleled experience in successfully completing nuclear power plants at various stages of construction and in performing recoveries and restarts of nuclear plants that have experienced interrupted operation or performance problems. In addition to designing and constructing more U.S. nuclear power plants than any other company,

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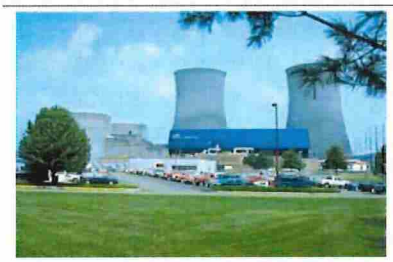
Bechtel has earned a well-deserved reputation for responding to owner requests for support on nuclear power plant projects already underway. A number of utilities that had to halt projects for safety, quality, or cost reasons later turned to Bechtel to help finish their plants in a variety of capacities.

On each plant recovery, Bechtel uses proven and effective design, engineering, and construction tools and processes. We staff each recovery with qualified and experienced personnel, and we approach the work with a positive "can-do, make it happen" attitude. Our flexibility, innovation, and adaptability to changing conditions enable us to overcome challenges without affecting established completion schedules. In several cases, Bechtel validated the existing contractor engineering and design and proceeded forward with the design completion.

Currently, we are completing the EPC scope on Watts Bar Unit 2, as well as supporting Finnish utility TVO on its Olkiluoto 3 unit by providing seasoned project management, construction, and project controls personnel to baseline the project's current status and develop the best path forward for completing the unit.

Highlights of some of these projects are provided below:

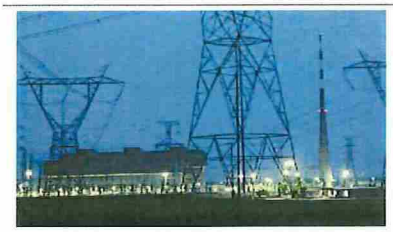


Watts Bar Unit 2 Completion

(2007 to present)

In 2007, Bechtel was selected to perform a detailed scoping, estimating, and planning phase and later was selected to perform the project's detailed engineering, procurement, and construction scope. Engineering activities have included detailed walkdowns, assembly and evaluation of original design documents, development of Corrective Action Programs, and performance of detailed design for systems interfacing with Unit 1 and for new plant construction.

Currently, construction work is proceeding well as the project has over 21 million manhours without a lost time accident (LTA) and is experiencing 98% first time quality installation inspections. The unit recently passed Cold Hydro Testing on the first try. Project completion is scheduled for the end of this year when Watts Bar 2 will provide the first power to the grid in the U.S. from a new nuclear source this century.



Browns Ferry Unit 1 Restart (2003 to 2006)

Bechtel provided engineering services to produce a detailed scope, cost estimate, schedules, and planning for the recovery of Browns Ferry Unit 1. Bechtel deliverables included walkdown packages, conceptual designs, development of detailed cost estimates and schedules for recovery programs and design change notices, the Unit 1 integration database, and risk evaluation. This effort correctly led to the conclusion that it was economically viable to initiate the next phase of the program to bring this plant, which had been out of service for 15 years, back on line.

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Bechtel prepared all necessary plant modification packages and engineering deliverables to conform the plant to committed licensing requirements and to prepare the plant for restart. Activities included all engineering design and the management activities necessary for Plant Operating Review Committee (PORC) approval of the required modification packages. Included with the recovery effort was an EPU, which Bechtel took over to ensure that the recovery completion schedule remained on schedule. The Bechtel team worked closely with the TVA design and construction team to develop the necessary modifications to minimize actual construction activities. The engineering portion of the project, Bechtel's responsibility, was done well within schedule and under budget. The total project was completed essentially within budget and schedule. This project was selected as the Project of the Year by *Power Engineering*.

Yucca Mountain Project (2001 to 2009)

Bechtel led the team that managed and operated the large, complex Yucca Mountain Project for the U.S. Department of Energy (DOE), selected to replace the previous contractor. We conducted the scientific, engineering, and technical work necessary to determine the mountain's suitability as a repository for U.S. spent nuclear fuel and high-level radioactive waste. Our work culminated in preparation of the 8,600-page license application, along with 70,000 pages of supporting references that DOE submitted to the Nuclear Regulatory Commission (NRC) for a deep geologic repository. Among its many challenges, the licensing effort required us to integrate nearly three decades of scientific study and engineering design work.

Other accomplishments included:

- Completing a fast-track transition nearly $3 million under budget
- Assisting DOE in addressing all 293 NRC-DOE Key Technical Issue Agreements
- Managing and maintaining the 230 square-mile site's infrastructure, including all onsite and offsite structures, 7 miles of tunnel, a potable water system, and 50 miles of paved and unimproved roads, as well as managing an average of 1,200 personnel
- Preparing a conceptual design for more than 1,000 miles of possible rail corridor and identifying millions of dollars in potential cost savings

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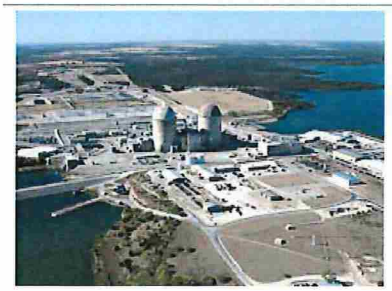

Comanche Peak Units 1 & 2 Completion (1990 to 1993)

Comanche Peak is an example of Bechtel's project management succeeding where other contractors failed. Construction of Comanche Peak was years behind schedule, almost $9 billion over the original estimate, and stopped by court order when Bechtel was asked to assume management responsibility for completing the facility. Key Bechtel managers worked with the customer to complete construction of Unit 1. In addition to normal project management activities, we assisted the customer in obtaining all necessary licenses and establishing credibility with stakeholders in the operation of a nuclear facility. In only two years, Unit 1 reached commercial operation.

Because of our management performance and the credibility we established with the stakeholders on Unit 1, the customer asked Bechtel to complete design, construction, and startup of Unit 2. Our management of this effort resulted in 2.5 million safe job hours and NRC characterization of Unit 2 management as "excellent."

South Texas Project (STP) Units 1 & 2 Completion (1981 to 1989)

After the NRC shut down construction because of quality noncompliance by a previous contractor, Bechtel completed the project, meeting all NRC design, construction, safety, and quality licensing requirements ahead of schedule. In late 1981, the owners of STP were faced with some very grim statistics and a tough decision. The project was 4 years behind schedule, and project costs had risen considerably from the original $974 million estimate. In addition, an NRC Show Cause order seriously impeded construction. The combined factors of schedule and cost, the regulatory atmosphere so soon after Three Mile Island, and difficulties with design and construction could have led to the complete cancellation of the project, as was the case with other U.S. plants in the same time frame.

Bechtel assumed management responsibility for engineering, procurement, and construction management of STP in 1981. The transition to Bechtel management was complex, requiring the transfer of over 200,000 documents. In August 1982, less than 1 year after assuming responsibility, Bechtel submitted a cost estimate and schedule for completing the project. The previous 8-month schedule delay due to temporary shutdown of construction was recovered, and an additional 11-month saving was achieved. The $5.5 billion budget for total project cost and the construction completion dates established were achieved, with Units 1 and 2 going into complete commercial operation in mid-1987 and mid-1989, respectively.

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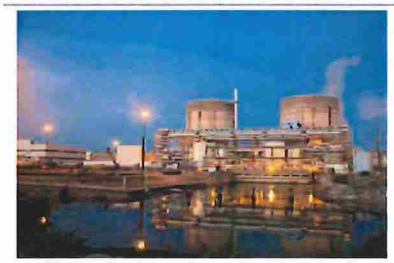
Major Modification Experience

In addition to providing services to new nuclear projects in the U.S. and around the world, Bechtel has honed both its resources and processes and procedures on a number of large scale nuclear plant modification projects, including Extended Power Uprates and Steam Generator Replacements. Bechtel has been very successful in delivering these highly complex projects, and they have given our personnel recent, relevant experience in nuclear power plant engineering, procurement, and construction.



Extended Power Uprates (EPU)

Most, if not all, of the skills learned and knowledge brought to bear on EPUs are transferable to new build nuclear projects. EPUs are particularly challenging as personnel are working in the tight, cramped corners of an operating nuclear facility.

Bechtel recently completed highly successful EPU programs at Turkey Point Units 3 & 4 (in 2013), St. Lucie 1 & 2 (in 2012), and Point Beach 1 & 2 (in 2011). These were major engineering, procurement, and construction efforts valued at over $2.5 billion with in excess of 12 million jobhours, increasing each unit's output by over 100 MW — the largest uprate outages in U.S. nuclear history. These mega-projects required significant technical resources, including feasibility studies and engineering evaluations and analyses. There was also significant integration required with the plant outage schedules as the plant modifications had to be performed over several outages. All of the extensive modifications were designed, installed, and tested in discrete work packages meeting INPO good practices guidelines, as well as customer quality and procedural guidelines.

The program also received numerous industry awards, including the Nuclear Energy Institute's Top Industry Practice (TIP) award for U1R33 outage performance for Point Beach and supported the owner's recognition under OSHA's Voluntary Protection Program (VPP) Star by logging over 1 million jobhours without an LTA or recordable injury. Turkey Point was recognized as *Power Magazine's* 2013 Project of the Year—Best Nuclear Project and logged over 7 million jobhours without an LTA.

While SGRs and RPVHRs are not the same as new build nuclear plants, they share many of the same design, planning, procurement, construction, and safety aspects. Bechtel has performed 35 SGRs, more than any other contractor.

Bechtel successfully completed the SGR at Davis-Besse on

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Steam Generator & Reactor Pressure Vessel Head Replacements	an EPC basis in 2014 and was awarded the SGR at Beaver Valley Unit 2, which is now in the early planning phase. Further, Bechtel innovation and continuous improvement has set and re-set industry records including: • Shortest overall replacement schedule ever achieved • Lowest US SGR accumulated radiation exposure • First US one-piece replacement • First US replacement using a through-wall replacement • First replacement using the channel-head cut method • Largest and heaviest steam generators ever replaced in the US

AP1000 Experience

Bechtel is very familiar with the WEC AP1000 design and has provided support through the preparation of design criteria, development of cost estimates, preparation of BOP conceptual design, and provision of licensing support.

In the 1990s, Bechtel participated in the design of the AP600, the AP1000's precursor design. Our support to WEC included overseeing the base design and analysis of the Nuclear Island as lead A/E; preparing equipment specifications, plant overall design criteria and sections of Standard Safety Analysis Report; providing licensing support and ITAAC development; and providing input to construction schedules and cost estimates.

A brief overview of Bechtel's recent experience with the AP1000 is provided below:

- Bechtel was WEC's original EPC partner for AP1000 units at Sanmen and Haiyang; however, we did not proceed due to nuclear liability concerns.
- In 2012, Bechtel worked closely with WEC (including a site visit to Sanmen in China) to potentially enter into a consortium to bid two AP1000 units in Poland, which has subsequently been put on hold by the Polish government.
- Over the past two years WEC has asked Bechtel for specific expertise (e.g. containment design) on several occasions when they have had difficulty resolving design issues or defending design criteria with the NRC.
- Bechtel led the preparation of a Dominion-DOE cost shared study to evaluate construction technologies, schedules, and decommissioning costs of advanced reactors, including the AP1000.
- Bechtel developed AP1000 site layouts for the River Bend and Grand Gulf sites for Entergy when they were looking at new nuclear.

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In addition to the experience described above, Bechtel has performed the following licensing activities for the AP1000 design:

- **V.C. Summer Units 2 & 3** – Bechtel was the COL prime contractor and prepared the entire COL application, including the FSAR, Environmental Report, Emergency Plan, and Security Plan, along with all supporting engineering and analyses and support for NRC review.
- **Vogtle Units 3 & 4** – Our project responsibilities included site evaluations, cost and schedule estimates, preparation of the ESP application and COL application, and support of the NRC review. Bechtel is currently providing some limited engineering support to Southern for the construction effort.
- **Turkey Point Units 6 & 7** – Bechtel prepared the entire COL application, including the FSAR, Environmental Report, Emergency Plan, and Security Plan, and we are currently supporting the NRC review. Bechtel also prepared the Site Certification Application (similar in content to the COL application Environmental Report) that was recently approved by the State of Florida.

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ATTACHMENT 4
ASSESSMENT TEAM RESUMES

Resumes for the proposed Assessment Team are provided on the following pages.

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Michael J. Lewis

Executive Management

Education

- BS, Civil Engineering, North Carolina State University
- Construction Executive Management Program, Texas A&M University
- Program for Manager Development, Duke University

Mike Lewis is a Bechtel Senior Vice President—one of only about 35 such senior managers in a company of nearly 55,000 employees—who has managed various first-of-a-kind and highly complex projects, including civil projects, power plants, weapons managment facilities , and a high-level nuclear waste vitrification plant. Mike has been with Bechtel for his entire 38-year career, distinguishing himself as a problem solver and safety champion in increasingly responsible positions. He has a strong record of building close-knit, integrated teams and initiating time-saving, practical solutions to increase safety, meet milestones, and enhance productivity. He has successfully managed large construction projects with workforces exceeding 10,000; multiple subcontractors; complicated logistics; and significant security concerns.

Manager of Construction

2014–Present: Currently, Mike provides functional and operational oversight to construction personnel located in various Bechtel global execution units including all of our nuclear projects. He is responsible for the successful completion of activities related to construction. He ensures effective overall administration and technical direction, coordination, and direct line responsibilities. Mike controls construction operations in the field and office construction-related activities through subordinate managers within large, complex business operations and business units.

Proposal Manager, Keeyask Generating Station—General Civil Works

2013–2013: As the Proposal Manager, Mike was responsible for the development, approval, and finalization of the winning $1.4 billion general civil contract award. Using his extensive management and construction background, he established standards to meet organization objectives in proposal activities, assisted in the preparation and review of the proposal, and directed proposal development. The Keeyask Generating Station project involves development and construction of a 695-MW hydroelectric generating station at rated capacity (630 MW at firm capacity) on the lower Nelson River approximately 460 miles northeast of Winnipeg, Manitoba, Canada. The project includes the General Civil Works contract for all temporary and permanent structures and related works, including the spillway, dams, dykes, channels, excavations, and roads, as well as the generating station itself and the construction of the camp and other related infrastructure.

Project Manager, Oman Airport Expansion

2012–2013: Mr. Lewis was the Project Manager for a Bechtel-led consortium designing and building a new $1.8 billion passenger terminal complex at Muscat International Airport in Oman. The airport, which was handling about 6 million passengers per year, at terminal expansion completion in 2014 had a capacity of 12 million passengers. The project also included two office buildings, a four-star hotel, two five-level parking garages, and other support structures and roadwork.

Operations Manager, Bechtel Civil

2009–2011: Mike provided executive level oversight to a wide range of infrastructure projects in North America, Europe, and the Middle East, including hydro and rail projects and airports. His responsibilities include oversight of the Kemano Backup Tunnel Project, a 10-mile-long power

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tunnel, and an eight-unit underground powerhouse with 850 MW capacity. He was responsible for ensuring that projects met customer expectations and had the necessary resources.

Manager of Construction, Bechtel Australia Pty, Ltd

2007–2009: Mike was responsible for oversight of global construction activities for Bechtel's Mining and Metals Global Business Unit. Specific duties included field non-manual staffing, industrial/employee relations, craft hiring and staffing, developing and promoting standardized construction work processes, training, and employee development.

Manager of Construction, Hanford Waste Treatment and Immobilization Plant (WTP) Nuclear Project

2005–2007: Mike was responsible for managing the construction portion of this $12.2 billion facility to process and stabilize 53 million gallons of nuclear and chemical waste. The construction site encompasses 64 acres and includes four major nuclear facilities, the largest of which, the Pretreatment Facility, has a footprint equivalent to four football fields (about 753,000 ft^2) and will be 12 stories tall when completed. Mike was also responsible for relationship management with the Union Building Trades performing work to NQA-1 standards.

Project Manager, Pueblo Chemical Agent-Destruction Pilot Plant

2002–2005: As the Project Manager, Mike was responsible for providing overall leadership and strategic planning/guidance to the customer and the project team on this $1.2 billion EPCC plant to neutralize and biodegrade 2,535 tons of mustard agent stored at the Pueblo Army Depot in Colorado. He led a diverse integrated team that included Washington Group, Parsons, and Battelle.

Project Operations Manager, Bechtel National, Inc. Defense and Space Projects

2001–2002: Mike provided support and oversight for business sector project managers; developed customer relationships; and implemented feedback systems to monitor project performance and customer satisfaction.

Project Manager, Anniston Chemical Agent Disposal Facility

1998–2001: Mike was responsible for overall financial and technical performance and execution of engineering, procurement, construction, and testing of this $314 million fixed-price grassroots plant designed and constructed to dispose of chemical weapons stored at the Anniston Army Depot in eastern Alabama.

Manager of Construction, Nevada Test Site

1995–1998: Mike managed a large workforce performing underground and aboveground construction work, environmental remediation, facilities modifications, and new facilities construction at this 1,375 square mile National Nuclear Security Administration facility that includes over 1,100 buildings, 398 miles of paved roads, and 200 miles of unpaved roads.

Construction Manager, Nuclear Weapons Storage and Security Systems Project

1995: Mike managed construction on this 10-year, $206 million program to install 16 weapon vault systems at 15 NATO bases in 7 countries.

Construction Manager/Project Field Engineer/Contract Administrator, Cowlitz Falls Hydroelectric Project

1991–1995: As the Project Manager during the operations and maintenance phases of this $50 million contract, Mike directed construction and operation of a 70 MW dam and powerhouse in west-central Washington State.

Project Manager/Plant Manager/Field Engineer, New Martinsville Hydroelectric Plant

1986–1990: Mike supervised the operations and maintenance of this 34 MW low head run-of-river bulb turbine hydroelectric plant attached to the U.S. Army Corps of Engineers Hannibal Lock and Dam on the Ohio River in West Virginia.

Field Engineer/Plant Engineer, Bechtel

1976–1985: Mike learned his skills while working on numerous nuclear, government, and mining projects.

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Michael S. Robinson

Project Management and Construction

Education

- BS, Mechanical Engineering, Brown University
- Graduate Studies, Environmental Engineering, Penn State University

Mike Robinson has more than 23 years of experience in project and construction management, business development, and proposal development and estimating. His expertise encompasses management of projects and teams with a range of technologies, and contract structures with focus on operating facilities. He was elected a Bechtel Principal Vice President in 2013.

Project Manager

2015–Present: Currently, Mike supports the Nuclear, Security and Environmental Business assisting owners on ongoing projects and developing new opportunities.

Project Manager, Panda Temple Combined Cycle Project

2013–2014: Mike served as the consortium lead and had overall EPC execution responsibility for Bechtel on a lump sum 2x2x1 combined-cycle project located on a greenfield site in Texas. After taking over the project at approximately 50 percent complete, he oversaw the completion of engineering design, globally sourced equipment and material delivery, construction, and commissioning. The project was completed and turned over to the customer 2 weeks ahead of schedule with plant performance better than guarantee. The project staff peaked at over 1,000 craft, subcontractors, and non-manuals who worked more than 2.5 million job-hours without a lost-time accident (LTA). Mike also served as project manager for Temple II CC project, a replicate plant adjacent to the Temple project, during the first 8 months of execution before focusing solely on the commissioning and completion of the Temple project.

Project Manager, Turkey Point Extended Power Uprate (EPU) Project

2012–2013: Mike was responsible for managing key execution activities on a complex uprate project at an operating two-unit nuclear facility in southern Florida that included two of the largest planned uprate outages in U.S. nuclear history. He took over as the project manager immediately before the U3R26 outage, which experienced a 30 percent increase in jobhours after breaker open because of design evolution and emergent conditions. He focused on implementing lessons learned and other improvements during an abbreviated period between outages. This led to significant improvements in cost and schedule execution for the final U4R27 outage—Bechtel completed the critical path work 1 week ahead of schedule and finished 8 percent under the scope-adjusted pre-outage budget. The project's first-time quality and execution performance earned special recognition from the customer. Bechtel's portion of the project was approximately $900 million and was staffed with upwards of 400 non-manuals and 1,600 craft and subcontractors onsite during the outages. The project worked over 7 million jobhours without an LTA; was recognized as *Power Magazine*'s 2013 Project of the Year—Best Nuclear Project; and earned Bechtel's 2013 Project Management Excellence Award.

Site Manager, Point Beach EPU Project

2009–2011: Mike managed the field execution of the Point Beach EPU project in Wisconsin, Bechtel's first large-scale EPU project in the construction phase. Principal duties included managing construction personnel staffing, coordinating craft resources and labor relations, implementing the Bechtel safety and quality programs, and interfacing with senior customer personnel. The project worked over 1 million jobhours without an LTA or OSHA recordable injury.

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Executive Assistant

2008–2009: Mike assisted the president of Bechtel Power on commercial, execution, and personnel issues by developing draft policies, presentations, and executive letters. He also supported estimate reviews, project execution reviews, and corporate and business line policy discussions.

Business Development Manager

2006–2008: Mike managed the development of fossil power projects, including proposals, with emphasis on solid fuel and emissions retrofit projects. He negotiated services agreements and engineering, procurement, and construction (EPC) contracts. Bechtel was initially awarded two large projects (a $1 billion greenfield coal plant and a $1 billion multi-project site air quality control upgrade program) that Mike supported before they were cancelled because of changes in market conditions.

Startup Engineer, Springerville Expansion Project

2005–2006: Mike undertook a rotational assignment as a startup engineer on a lump-sum, 400 MW, pulverized coal-fired project in Arizona. He was responsible for commissioning the AQCS systems.

Project Estimating/Proposal Development Manager

2002–2005: As an Estimating Manager, Mike coordinated estimating activities for power projects worldwide. He represented the Estimating department during customer discussions and internal management reviews. He developed budgets and schedules for estimates and proposals under his sponsorship; prepared, reviewed, and presented lump sum, indicative, and order of magnitude estimates as necessary to support the Power business line; and supervised and trained new project estimators. As a proposal development manager, he worked with the Business Development department to define proposal strategies. He coordinated and managed engineering, procurement, construction, contracts, and estimating activities during the proposal process and reviewed proposal documents, including scope books, schedules, and contracts.

Estimating Supervisor, Project/Mechanical Estimator

1997–2002: As a supervisor, Mike supervised Power's Mechanical Estimating group and coordinated estimating efforts in the Asia-Pacific region and for solid fuel projects worldwide. He assigned work tasks, monitored progress with respect to quality, oversaw schedule and budget compliance, and reviewed completed work products. He represented the group and the Estimating department during planning meetings, management reviews, and open book reviews with customers. As an estimator, Mike was responsible for the preparation of lump-sum grassroots construction, modification, and demolition of fossil and nuclear power plants world-wide.

Construction/Resident Engineer – Various Refineries

1994–1997: During this period, Mike was assigned to three refineries and performed a variety of activities. At the Sun Oil Girard Point Refinery, he developed work scopes and provided detailed engineering for capital projects, determined mechanical equipment specifications, ordered materials, and qualified vendor bids. He also supported cost estimate development and monitored project installation to ensure technical and budget compliance. For the BP Oil Refinery, he developed a pressure vessel inspection program using specifications provided by the customer to bring the refinery into compliance with OSHA 1910. He supervised the daily activities of the group during implementation, tracked project scheduling, and interfaced with customer supervision. He performed walkdowns of process piping to support the Chevron USA Refinery reliability program, determined as-built configuration of piping systems, and calculated inspection points for affected systems.

Superintendent/Field Engineer – Various Commercial Nuclear Facilities

1991–1993: At the Hope Creek/Salem nuclear plants, Mike supervised the installation of an environmental spill containment for the emergency gas turbine unit. He also managed pipefitters during two service water piping replacement projects.

From June to November 1992, Mike supervised the installation of piping and instrumentation at Turkey Point Nuclear Plant. He interfaced with customer engineering to resolve constructability concerns, testing piping systems, and assisted in the recovery efforts following Hurricane Andrew.

From October 1991 to June 1992, Mike reviewed and completed pipe, hanger, and mechanical equipment design change packages for the Comanche Peak Generating Station.

In an earlier assignment at Turkey Point from June to September 1991, he monitored the installation of pipe, hangers, and instrumentation tubing. He also tested pipe and instrument lines and turned over assigned systems to Startup.

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Ronald L. Beck

Project Management and Engineering

Technical Qualifications

- Over 40 years of nuclear experience, including 17 in design engineering and licensing, 18 on SGR and RVHR projects, and 5 in next-generation nuclear (EPR, SMR) project management
- Registered Professional Engineer in Maryland (retired); inactive in Mississippi, South Carolina, Tennessee, Texas, and Virginia
- Member of ASCE
- Author of several published technical papers (available on request)

Education

- ME, Civil Engineering, Virginia Polytechnic Institute (Structural Engineering Major)
- BS, Civil Engineering, Virginia Polytechnic Institute
- Bechtel Certification, Project Manager Level II

Ron Beck has spent his entire career in the nuclear power industry. He has a strong civil engineering background and many years of design engineering and field experience, with a solid foundation in the details of work planning and execution. He was project manager for three steam generator replacement (SGR) projects, assistant project manager for one SGR project, and shift outage manager for two reactor vessel head replacement (RVHR) projects. His background also includes civil design work on Grand Gulf, South Texas Project, and Watts Bar. He is a highly dedicated leader with strong technical skills, effective management capabilities, and the ability to motivate teams to successful outcomes.

Project Manager

2010–Present: For the Generation mPower small modular reactor (SMR) project, Mr. Beck has been responsible for all aspects of Bechtel's scope and project execution and for interface with Generation mPower LLC and Babcock & Wilcox (B&W), as well as potential customers, Industry Advisory Council members, management committee members, and regulatory agencies. His responsibilities include overall management of 230+ professionals, including engineering, licensing, project cost and schedule, procurement and contract functions.

Mr. Beck also managed the Bechtel engineering team and the integration of Bechtel's scope with B&W's Nuclear Island scope and participated in a due diligence assessment as project manager, civil/structural reviewer, construction reviewer, and overall report preparer. The report outlined the results of the assessment regarding investing in a specific new generation nuclear technology.

2008–2010: Mr. Beck was the responsible project manager for the Bell Bend US EPR nuclear power plant project. He supported AREVA's preparation of responses to the NRC's requests for additional information in conjunction with the design certification process; managed an optimization study; participated in construction schedule development; worked with PPL on updating the site utilities plot plan for its Combined License application; and oversaw the development of budgets, schedules, and reports.

2008: Mr. Beck oversaw the development of the long-range strategic plan for the SONGS SGR project. The work involved developing the preoutage schedule encompassing Bechtel's work from 2008 through 2010 and the Cycle 15 and Cycle 16 (SGR) outage schedules for Bechtel's work and integrating these schedules into the client's online and outage work schedules.

2007: Mr. Beck assisted in developing the long-range construction plan for completing the Watts Bar Nuclear Station Unit 2 reactor building structures, systems, and components as part of the restart project.

2007: For the Palo Verde Nuclear Generating Station Unit 1 SGR project, Mr. Beck managed all aspects of removing and relocating the V651 valve in the reactor coolant system ASME Class 1 shutdown cooling line to support long-term plant operability and reliability.

2006–2007: As plan coordinator for the SONGS SGR project, Mr. Beck managed the development and submittal to the client of 50-plus management, engineering, and construction plans and 30-plus specific contract deliverables describing the methods and approaches Bechtel would employ to

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execute its SGR work scope. He also supported the project manager on project commercial and technical issues.

2005: For the Palo Verde Unit 3 SGR project, Mr. Beck managed the installation of a vortex elimination plate in the reactor coolant system ASME Class 1 shutdown cooling line. The plate was later removed as a result of system testing.

2004–2005: Mr. Beck managed or supported proposals for the Turkey Point Units 3 and 4 and St. Lucie Units 1 and 2 RVHR projects; the Crystal River Unit 3 SGR project; the Bruce A Units 1, 2, 3, and 4 SGR projects; the Diablo Canyon Units 1 and 2 SGR projects; the SONGS Units 3 and 4 SGR projects; the SONGS Units 2 and 3 and Palo Verde Units 1, 2, and 3 RVHR studies; and the Palisades RVHR project.

Shift Outage Manager

2003: For the Surry Power Station Units 1 and 2 RVHR project, Mr. Beck interfaced with client, subcontractor, and Bechtel personnel to develop the schedule; attended client/Bechtel plan-of-the-day meetings; interfaced with client and Bechtel personnel on day-to-day operations, including action item meetings and task reviews; and managed Bechtel's day shift containment work during each unit's replacement outages.

Project Manager

2002: Mr. Beck managed several SGR project proposals, an RVHR project study for two nuclear units, and an independent third-party SGR project cost estimate study review for a nuclear utility.

2000–2001: For the Shearon Harris SGR project, Mr. Beck directed all aspects of engineering, construction, procurement, quality, cost, and schedule; coordinated interfaces with the client and subcontractors; and interfaced with Bechtel senior management, global and regional industry unit and execution unit management, and home office functional departments.

1996–2000: For the South Texas Unit 1 SGR project, Mr. Beck had the same duties as for the Harris project.

1995–1996: Mr. Beck developed generic SGR project core team operations and was a member of the team that developed a Bechtel/Westinghouse teaming agreement for SGR projects. He also developed competitively bid SGR projects and sole-source negotiated SGR awards, including the first South Texas Unit 1 SGR involving the Bechtel/Westinghouse agreement.

1992–1994: For the Virgil C. Summer SGR project, Mr. Beck had the same duties as for the Harris project. He also planned and mobilized direct-hire and field subcontracts; interfaced with the client for design, procurement, and field activities; developed and negotiated subcontracts; directly participated in onsite work activities during outage and nonoutage periods; and was directly involved in quality assurance activities.

1991–1992: For the ASCO Units 1 and 2 SGR project, Mr. Beck managed photogrammetry and interference walkdowns, the redesign of the biological shield wall, preparation of the technical specification, and technical evaluation of replacement steam generator fabrication proposals. He also managed SGR studies for St. Lucie Unit 1 and for Mitsubishi Heavy Industries, Ltd. in Japan.

Assistant Project Manager

1989–1991: For the Palisades SGR project, Mr. Beck provided management overview of the engineering team and management support to the cost and schedule supervisor for schedule and budget control. He assisted in coordinating Bechtel's client interface on licensing and other high priority issues and coordinated the development of the SGR outage schedule with the SGR project team (management, engineering, construction, procurement, subcontractors, and client). As night shift outage coordinator during the replacement outage, he coordinated Bechtel's night shift construction activities with the client and the client's contractors. During job closeout, he assisted the project manager and field services manager with closeout activities, including engineering as-built package completion, contract compliance closeout, outage work activity completion, and licensing and quality assurance review closeout.

Project Engineer/Project Engineering Manager

1985–1989: For the South Texas Units 1 and 2 project, Mr. Beck supported the civil/ structural, pipe stress and pipe support, architectural, and plant design layout disciplines. He directly interfaced with the client in completing engineering design, licensing, and engineering assurance activities associated with these disciplines. He also assisted in managing the contractual and legal aspects of

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the project's main cooling reservoir; coordinated interfaces with the project's constructor and client and Bechtel management; and directed the coordination of engineering activities associated with Unit 1 hot functional testing, including development of engineering hot functional test procedures for thermal and vibration monitoring.

Design Engineer/Group Leader/Engineering Supervisor

1972–1985: Mr. Beck was assigned to the Grand Gulf Nuclear Station Units 1 and 2 project. Initially, he developed various preliminary design studies subsequently used for input to the Preliminary Safety Analysis Report and to project cost and final design studies. He reviewed cooling tower structural design calculations, wrote and administered a subcontract for cooling tower foundation piling installation, and wrote piping technical specifications. Later he supported various site engineering tasks and completion of final ultimate heat sink basin structural designs and assisted in managing group design activities. Subsequently, he led the design activities associated with the reactor containment building (RCB) and site and managed a specialized task force performing dynamic loading analysis of the BWR Mark III RCB. He supervised development of the Final Safety Analysis Report sections associated with the RCB and other Seismic Category I site facilities. He participated in regulatory hearings with the NRC and the Advisory Committee on Reactor Safeguards in conjunction with the RCB dynamic analyses and assisting in supervising civil/structural design activities. Ultimately, he was responsible for all civil/structural engineering design activities associated with Unit 2.

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Randolph S. McCarraher, PMP

Project Management and Project Controls

Technical Qualifications

- Member, Project Management Institute (PMI)
- Certified Project Management Professional (PMP)
- Certified Bechtel Project Manager Level I

Education

- Certificate, Electronics, Western Montgomery County Technical School
- AAS, Construction Management, Frederick Community College
- Certificate, International Business Management, Georgetown University

Randolph (Randy) McCarraher has over 35 years of experience in the EPC/EPCM industry in positions in field engineering, contracts, project controls, project management, and business development. Randy has a global view of what it takes to complete a successful project, as his experience includes working in North and South America, Australia, Europe, and the Asia Pacific region as well as India, and it includes projects in the Power (fossil and nuclear); Oil, Gas and Chemical; Government Services; Telecommunications; Mining & Metals; and Industrial business lines. He is a manager who can get the tough jobs done due to his strong technical skills, his ability to teach and mentor young employees, and his performance-based leadership skills.

Project Development Manager, Nuclear Power

2012–Present: In his current role, Randy is responsible for identifying, evaluating, and recommending prospective new work in the nuclear business line including strategic market development and penetration. He develops strategy and directs preparation of proposals and presentations for new business opportunities and establishes and maintains effective customer relationships. In addition to these duties, he has been deployed to provide project management leadership at two EPU outages and has led teams to perform project management/construction readiness reviews at Hinkley Point C (UK), Bruce Power (Canada), and Olkiluoto 3 (Finland).

Project Manager, UniStar Nuclear Project

2011–2012: As Project Manager, Randy was responsible for screening all cost and schedule optimization opportunities and overseeing preparation of the final report and presentations to UniStar/EDF senior management on project status of this U.S. EPR project.

Deputy Project Director, Turkey Point, St. Lucie, and Point Beach EPU Projects

2010–2011: Randy assisted the project director in managing the EPU projects across the three jobsite locations. His specific responsibilities included leading the effort to re-baseline both the St. Lucie and Point Beach projects, participate in contract negotiations for implementing a "target price" commercial structure, and leading implementation of the AST/CREFS modification during the Point Beach outage in early 2011.

Project Manager for Services, Calvert Cliffs Unit 3 Project

2009–2010: As Project Manager, Randy was responsible for the management of all work other than the engineering detailed design activities in support of developing the Calvert Cliffs U.S. EPR project. His responsibilities included developing and implementing work processes, procedures, and control tools; monthly reporting to monitor and control the work; daily coordination with the consortium partner and client; and providing project status to both internal and external customers.

Business Manager, Elm Road Generating Station

2006–2008: As Business Manager, Randy managed all commercial systems including cost, schedule, accounting, and prime contract administration. He provided technical direction to project controls personnel in the home office and field. He interfaced daily with team members to ensure

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compliance with the project execution strategy and objectives and provided status information to project team members and senior management. He also interfaced with the owner and subcontractors and assisted the project manager with other duties as assigned.

Assistant Project Manager, Worsley Alumina Project

2005–2006: Randy was responsible for managing the project from the proposal stage through execution and closeout activities. His specific responsibilities included providing oversight and direction to the Contracts, Procurement, IS&T, Administration, Office Services, Accounting, Project Controls, Prime Contracts Administration, and Human Resources departments.

Business Support Manager, Mining & Metals

2004–2005: Randy was responsible for reviewing the Mining & Metals Global Business Unit (GBU) business management systems and upgrading them as necessary to facilitate standard reporting across the GBU. He conceptualized and developed a commercial database allowing comparison of historical and active projects, and he provided support to the proposal development process.

Project Controls Functional Manager, Bechtel Telecommunications and Industrial

2002–2004: Randy provided functional oversight for projects in North America to ensure correct application of cost/schedule control tools and accurate analysis. He also administered personnel functions for project controls employees and interfaced with senior management to ensure that project needs were being met and future needs anticipated.

Project Controls Functional Manager, Bechtel Power

2000–2002: Randy provided functional oversight for fossil projects in North America to ensure correct application of cost/schedule control tools and accurate analysis. He administered personnel functions for project controls employees and interfaced with global and regional business unit managers as well as project managers to ensure continuous fulfillment of project needs.

Business Manager, Hsin Tao Combined Cycle Project

1999–2000: Randy was responsible for all cost- and schedule-related functions, prime/subcontract administration, and commercial operations. He interfaced with team members to ensure compliance with the project execution strategy and objectives, provided status information to team members and senior management, interfaced with the owner/contractors, and assisted the project manager with other duties as assigned.

Project Controls Supervisor, Nuclear OMV Core Team, TermoEmcali, Dabhol, and Perryman Projects

1993–1999: On the Nuclear OMV Core Team, Randy's responsibilities included analyzing utility and industry data to identify potential business opportunities, performing detailed financial analysis of target facility operating budgets, and developing future budget models. He supported business development by developing oral and visual presentation material.

On the TermoEmcali project, Randy supported project development efforts, performing bid package analysis for Power Island and construction services contracts.

On the Dabhol project, Randy supervised day-to-day operations and provided technical direction as required. He ensured accuracy and timeliness of project reports and provided special reports/studies to management.

On the Perryman Unit 51 project, Randy monitored the budgets, prepared monthly management reports, developed trend and scope change estimates, and supervised startup/closeout activities.

Project Planner/Cost & Scheduling Engineer/System Planner, Hershey Foods, Chevron/ Bechtel Alliance Philadelphia Refinery, Lipari Landfill Superfund, Limerick, and Peach Bottom Projects

1988–1993: Randy's responsibilities included providing cost and schedule support, developing and issuing weekly and monthly management reports, developing budgets and cash flows, estimating lump sum contracts, preparing quarterly financial updates, and supporting business development.

Electrical Field Engineer, Limerick, Pilgrim, Palo Verde, and Byron Projects

1979–1988: Randy was responsible for reviewing drawings, compiling and maintaining open items punch lists, implementing design change packages during outages, reviewing startup work authorizations for work scope and material requirements, distributing work, and resolving field engineering problems.

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Edward (Ed) A. Sherow

Design and Licensing

Technical Qualifications

- Six Sigma Champion

Education

- BS, Electrical Engineering, Rensselaer Polytechnic Institute

Ed Sherow has over 42 years of engineering experience in the nuclear and fossil power industry, focusing on all phases of power plant activities, with specific background in electrical. He has worked on numerous projects throughout his career including Calvert Cliffs, Grand Gulf, Turkey Point, Brown's Ferry Units 1 and 3, and U.S. EPR.

Engineering Manager, Nuclear Projects

2012–Present: Ed Sherow is currently responsible for functional engineering management oversight and development and execution of multiple nuclear projects. His responsibilities include assistance and review of project estimates/schedules, project setup and staffing review, quality, schedule, and budget performance monitoring, project-specific process and procedural approvals, and coordination of lessons learned and experience among multiple nuclear projects.

Nuclear Project Engineering Manager/Project Engineer, U.S. EPR, UniStar Projects

2005–2011: Ed managed the detailed design for the U.S. EPR 1,600 MW nuclear plant with the first plant targeted for Calvert Cliffs. He also managed the work associated with supporting the design certification support to AREVA for the U.S. EPR nuclear plant, and he managed the development and support to UniStar (Constellation) for the combined operating license application for Calvert Cliffs nuclear plant Unit 3.

Fossil Project Engineer, Fossil Technology Group

2005–2005: Ed managed the development and design of fossil generation plants. His role involved supervision or coordination of multidisciplinary engineers, technical specialists, estimators, and Business Development to develop practicable proposals for fossil power projects. In this role he coordinated closely with clients.

Task Integration Manager/Metrics Manager, Browns Ferry Unit 1 Restart Project

2003–2005: Ed was responsible for the overall execution and quality of work related to metrics reporting, integrated task equipment list programming and data integrity, and the training program.

Assistant Project Manager/Project Engineer, Mountainview Project

2001–2003: As Assistant Project Manager, Ed's responsibilities included supervising execution planning, contract administration of the EPC agreement, contract administration of major equipment (including the GE Power Island subcontract), contract compliance, and championing other specific areas of critical concern for project success. He was also responsible for interface with the owner's project manager and for monitoring cost and schedule progress. As project engineer, he was responsible for the overall engineering of the project, including technical correctness, compliance with codes, optimization of design/installation costs, and interface with suppliers and the owner.

Fossil Project Engineer, Fossil Technology Group

1999–2001: Ed managed the development and design of fossil generation plants. His role involved supervision or coordination of multidisciplinary engineers, technical specialists, estimators, and Business Development to provide proposals that realistically account for the development aspects of fossil power projects. Ed also completed a 7-month assignment at the Red Hills Generation Facility, a 440 MW CFB in Mississippi, as the Project Field Engineer responsible for all field engineering.

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Multi Project Acquisition Group (MPAG) Manager, MPAG

1996–1999: Ed managed the electrical MPAG, an integrated cross-functional team of engineering and procurement personnel implementing the Bechtel supply chain strategy. His efforts focused on optimizing and managing cost and schedule in the delivery of equipment. Key items included interfacing power projects and suppliers, implementing standard products, making process improvements, and negotiating supplier agreements. During this period, he managed the combined Electrical/Control Systems MPAG until it was separated into two groups.

Project Manager, Substation/Transmission Engineering

1993–1996: In this assignment, Ed was responsible for commercial and technical operations of the Gaithersburg Substation/Transmission Engineering (STE) Group. The STE Group varied from 20 to 30 multidisciplinary engineers conducting switchyard and transmission line work directly for utilities while also supporting Bechtel New Generation projects.

Project Engineer, Browns Ferry Nuclear Unit 3

1991–1993: Ed's responsibilities included overseeing the electrical discipline consisting of 135 to 200 engineers preparing design modifications for upgrading Unit 3 to allow restart. His efforts included monitoring schedules for all activities; monitoring costs; interfacing with the client; supervising personnel; and preparing, evaluating, and approving proposals. He was also responsible for special projects and later the Design Change Notice (DCN) Production Group. Special projects duties included overall responsibility for the Procurement Engineering Group and engineering scheduling for restart of Browns Ferry Unit 3. For the DCN Production Group, he was responsible for a multidisciplinary group of 250 engineers preparing design modifications for upgrade of Unit 3 to allow restart. That role included monitoring schedules for all activities; monitoring costs; interfacing with the client; and preparing, evaluating, and approving DCN modification packages.

Project Engineer/Group Supervisor, Florida Power and Light (FPL) Projects

1986–1991: Ed was responsible for managing FPL's drawing update efforts for Turkey Point Units 3 and 4. His work included approving drawings as client representative, monitoring and controlling work output, reviewing indicators, assigning work priorities for up to 60 people, and maintaining budgets/schedules. He was also responsible for managing the design fossil operating plant services and the electrical and I&C work.

Group Supervisor, Electrical/Control Systems Group, Operating Services

1984–1986: Ed's responsibilities included supervising electrical and instrumentation and controls (I&C) work at various operating plants. He approved drawings, calculations, and installation packages; prepared and evaluated proposals, coordinated with vendors and the client, monitored schedules and budgets, and oversaw the electrical/control systems work of up to 20 engineers. Typical projects included addition of a precipitator for BG&E H.A. Wagner Unit 3, addition of a dry cask spent fuel storage, a radiation monitoring upgrade, and a facilities renovation for Virginia Power's North Anna and Surry Nuclear Stations. In addition, he managed installation of a natural gas warm-up for BG&E H.A. Wagner Unit 2, an upgrade of coal handling and sampling facilities for Virginia Power's Mt. Storm Plant, a conversion to natural gas for FPL's Martin plants, and use of coal water slurry as an alternate fuel for the Pfizer plant at Groton.

Group Supervisor, Electrical/Control Systems Group, Grand Gulf Units 1 and 2

1976–1984: In this assignment, Ed's responsibilities included approving drawings, calculations, and installation packages, preparing/evaluating proposals, coordinating with vendors/client, monitoring schedules/budgets, and supervising electrical and I&C work.

Electrical Field Engineer, Calvert Cliffs Units 1 & 2 and Grand Gulf Unit 1

1972–1980: Ed was responsible for installation and turnover to Startup of various plant systems. His duties included verifying system scope, walking down the system to ensure construction conformance to the design, interfacing with Design Engineering, preparing punch lists for outstanding items, and releasing systems to Startup. He was also responsible for cable installation. His other duties included verifying routing (both by drawing review and walkdowns), correcting routings, cable inspections, initiating termination installation, cable termination inspection, documentation reviews, and problem resolution.

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Stephen D. Routh

Design and Licensing

Technical Qualifications

- Registered Professional Engineer, Virginia
- Six Sigma Champion

Education

- MBA, Finance, Mount St. Mary's College
- MEng, Nuclear Engineering, Pennsylvania State University
- BS, Nuclear Engineering, Pennsylvania State University

Memberships

- Member, American Nuclear Society
- Member, ANS SMR Task Force
- Member, EPRI Advanced Nuclear Technology Group
- Member, NEI COL Task Force
- Member, NEI Seismic Issues Task Force

Steve Routh, Senior Project Manager, has over 30 years of nuclear experience, has supported new nuclear generation efforts at various sites since 2001, and is the manager of Bechtel's New Nuclear Generation and Fukushima Response projects. He is recognized as an industry expert in nuclear engineering, safety, and licensing, and is an active member of NEI and EPRI new generation task forces and working groups.

Manager, Nuclear Engineering Services

2013–Present: Steve is responsible for Bechtel's engineering and licensing services projects including support of operating plants, new nuclear generation, Fukushima response projects, and proposal preparation.

Manager of New Nuclear Generation and Fukushima Response Projects

2009–Present: Steve is responsible for Bechtel's new nuclear generation and Fukushima response projects including:

- North Anna COL and Owner's Engineer (APWR/ESBWR)
- Turkey Point COL (AP1000)
- Calvert Cliffs COL (USEPR)
- AREVA DCD (USEPR)
- Clinch River Construction Permit Application (mPower)
- Dominion, South Texas, Watts Bar, and Constellation Fukushima response projects

He also managed Bechtel's overall Fukushima response efforts including industry representation, development of approaches and capabilities, and proposal preparation.

Project Manager

2001–2008: As Manager of the ESP/COL Technology Group, Steve provided engineering and licensing oversight of Bechtel's new generation projects (Calvert Cliffs, North Anna, South Texas, Vogtle, V.C. Summer, Turkey Point, and Victoria County). He was also the project manager for the North Anna ESP project, North Anna COL and Site Engineering project, and the Turkey Point COL project.

Manager of Regulatory Affairs

1999–2001: Steve was responsible for the licensing and regulatory oversight of Bechtel nuclear power projects (including Connecticut Yankee decommissioning, new nuclear generation, steam generator replacements, and operating plant services) and SERCH, Bechtel's generic licensing service.

Licensing and Safety Analysis Supervisor, U. S. Enrichment Corporation

1995–1999: Steve managed the preparation of the upgraded Safety Analysis Reports for the Paducah and Portsmouth gaseous diffusion plants and managed activities for the project team including subcontractor support. He also provided detailed cost and schedule control and technical

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review of revised analyses, responded to NRC questions, and interfaced with NRC and DOE personnel. He also established regulatory processes for NRC oversight.

Project Engineer for the North Anna 1, North Anna 2, and Ginna SGR Projects

1991–1995: Steve's duties included managing mechanical, materials, civil, nuclear, and licensing engineering activities in support of the projects, including evaluation of alternative approaches, conceptual and detailed engineering, constructability reviews, subcontractor control, and client interface.

Assistant Chief Nuclear Engineer

1987–1991: Steve provided nuclear licensing support to operating plant services projects in the areas of design change packages, operability and safety evaluations, justification for continued operations, Part 21s, and NRC interaction, and he assisted in the administration of the nuclear department and salary planning.

Nuclear/Licensing Supervisor

1983–1987: Steve prepared the safety analysis report, environmental report, and license documents for the Surry plant dry cask independent spent fuel storage installation (the first one licensed in the United States), and he supported several other operating plant services and SGR projects.

Licensing Engineer/Deputy Supervisor, Grand Gulf Project

1980–1982: Steve supported the licensing effort for the operating license, preparation of the FSAR, and development of the environmental report and the technical specifications. He supported NRC question responses and public hearings as well as NRC safety evaluation report review and SER open item responses.

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Robert A. Exton

Supply Chain Management

Technical Qualifications

- Member, Original Lifetime Certified Purchasing Manager, Institute for Supply Management
- Bechtel Certification—Procurement Manager

Education

- BS, Business Administration with Emphasis in General Management, Humboldt State University
- AS, Forestry Science, North Dakota State University

Robert (Bob) Exton, Procurement Operations Manager for nuclear projects, has 37 years of procurement experience working on nuclear, fossil, and telecommunications projects, over half of them in the nuclear power generation industry. Bob has held positions of increasing responsibility in various field procurement managerial positions, including material management and purchasing, contracts and purchases management, and commercial leadership.

Procurement Operations Manager, Nuclear Power

2008–Present: In his current role, Bob is responsible for managing and monitoring procurement operations for all nuclear projects. His main focus the past year has been on setting up and staffing our ongoing nuclear projects in addition to overseeing activities on the other nuclear projects, drawing on past experience, lessons learned, and the Six Sigma philosophy. As an active participant at the Nuclear Energy Institute Manufacturing Outreach Workshops, Bob maintains extensive relationships with the nuclear supplier community.

Program Procurement Manager and Deputy Program Procurement Manager, Cingular Wireless Project and the AWS Project

2002–2008: Bob was responsible for the procurement operations of these telecommunication projects, focusing on Materials Management. He was also responsible for the integration of the AWS project to the Cingular system and for ongoing procurement operations in support of the nationwide build program. This build program included 8 markets with a staff of 20, including material coordinators and a purchasing group.

Proposal Manager, Power Multi-Project Acquisition Group (MPAG)

2000–2002: Bob was involved with all proposal efforts for power projects and was the primary representative on project development teams, providing market knowledge and strategy and ensuring that Procurement supported the development schedule.

MPAG Commercial Lead, Balance of Plant and Electrical

2000–2000: Bob was responsible for managing and coordinating the buying activities in support of the power projects executed from the Bechtel Power Center of Excellence.

Project Procurement Manager, Aleppo, Quezon and Dabhol Projects / Nuclear Operations

1991–2000: Bob was responsible for developing, negotiating, and administering purchase orders and subcontracts for three fossil power projects in the Middle East and Asia. On the Aleppo Project, Bob was responsible for final equipment buyouts, expediting, inspection, traffic and logistics and shipment of remaining equipment and services.

Additionally, Bob was involved in the development of new power plant construction projects. In this Nuclear Operations role, he was responsible for coordinating procurement activities associated with the North Anna Unit 1 SGR, V.C. Summer SGR, and FURNAS project and for the issuance and administration of major lump sum subcontracts.

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Senior Contracts/Purchases Supervisor Specialist, Palisades Steam Generator Replacement
1989–1991: Bob was responsible for negotiating and issuing major lump sum subcontracts and purchase orders.

Contracts/Purchases Supervisor Specialist, Limerick Nuclear Project
1987–1989: Bob was responsible for coordinating purchasing activities, administering assigned blanket orders, and supervising closeout of home office contracts and field purchase orders.

Contracts/Purchases Supervisor/Specialist Buyer/Spare Parts Supervisor/Warehouse Receiving Supervisor, Palo Verde Nuclear Project
1978–1987: Bob was responsible for assisting in forecast planning, conducting training on procedures, and reporting progress to the client and engineering.

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Exhibit A.3

ORS_00005773

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Crosby, Michael

From: Crosby, Michael
Sent: Friday, February 06, 2015 9:35 AM
To: 'Albert, Craig'
Cc: Carter, Lonnie; Watson, Marty
Subject: RE: DRAFT Proposal from Bechtel

Craig,

Thank you a for the draft proposal and transmittal letter. We really appreciate the urgency you have placed on this project.

The Bechtel approach (outlined) in the assessment certainly appears comprehensive, and the seniority of the proposed assessment team is not only appropriate, but I believe vital to receiving buy-in by all parties.

A couple of focus areas, not specifically mentioned in the proposal, but I'm sure could be wrapped by this 360 assessment:

1. **Status of the CB&I / Stone & Webster balance of plant (BOP) engineering, procurement and construction effort. There is so much Consortium emphasis being placed on nuclear island progress these days, I fear BOP design, procurement and ultimate commodity installation may not be receiving the proper attention required to plan and execute a successful and timely schedule.**
2. **CB&I Site Leadership – I'm convinced we do not have the "A Team" on board to execute - even if all other areas were problem free. I believe a candid assessment (and recommendation) regarding the construction leadership (managers, superintendents, etc) would be both eye-opening and valuable to our success moving forward.**

Lastly, I would ask that you scrub back through the transmittal and proposal documents and replace the word "prudent" where you can. SCANA is very sensitive to this type language, particularly as it relates to its interface with the South Carolina Office of Regulatory Staff and the Public Service Commission (a Base Load Review Act – rate recovery issue).

Lonnie is traveling, but he and I will be getting together on this soon.

I suspect the next step will be a reach-out … Lonnie to Kevin Marsh.

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Please do not hesitate to call me if you need anything – I'm sure we will be back in touch soon.

Have a Great Weekend,

Michael Crosby

From: Albert, Craig [mailto:cmalbert@Bechtel.com]
Sent: Thursday, February 05, 2015 6:00 PM
To: Carter, Lonnie; Crosby, Michael; Crosby, Michael; Carter, Lonnie
Cc: Adams, Mike A. (BGI); Troutman, Tyrone; Watson, Marty
Subject: DRAFT Proposal from Bechtel

Lonnie, Michael,

Attached is a draft of the proposal we committed to providing, and below is a draft of the text I would include in a letter transmitting the final/formal proposal. Please advise of any changes you would like us to make.

Look forward to hearing from you.

Craig

Dear Lonnie and Michael,

Thanks again for meeting with Mike Adams and me on January 24 to discuss the status of the V.C. Summer project. Successful delivery of this project is obviously essential for Santee Cooper, SCANA, and your contractors, but it is also vitally important to our industry and to Bechtel. We understand how important it is to you that the project be executed in the most prudent manner possible and that the new units be delivered at the earliest possible completion date.

Bechtel has supported a number of owners in performing independent assessments of complex EPC projects and we are committed to making a team of senior Bechtel personnel available to support such a review on V.C. Summer. We are very knowledgeable of the AP1000 design basis and our broad experience with world-wide supply chain management, grass-roots nuclear construction, and executing mega projects that leverage large

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scale modularization provides us with the insight needed to understand the complexities and challenges to deliver this project.

Given the importance and magnitude of this project, I handpicked Bechtel Senior Vice President Mike Lewis to lead our proposed assessment team. Mike is one of our very best project managers for complex, mega projects and is currently serving as our corporate Manager of Construction, the most senior construction manager in Bechtel. In addition, we have included other senior managers on the team who have very successful history working at V.C. Summer.

In terms of the assessment, we propose that our team focus on understanding the current status and forecasted path to completion through various aspects of the project including: design; supply chain management, with emphasis on module fabrication; construction; and startup. With WEC's support, we can focus on getting a clear picture of the status of the WEC design and licensing efforts and evaluate how those activities may impact the future path to completion. Our team will review project metrics and reports; interview select owner and contractor personnel; and visit the site and key fabrication facilities to evaluate the health of the project execution plan and the thoroughness of the current forecast – from both a schedule and cost performance perspective.

Note that our review will focus on the methods and tools being used to manage project execution, changes, and isks, but will not review the attribution of past impacts or validity of any pending or future claims. Beyond the numbers, we plan to assess the degree to which all parties are aligned in a positive project culture focused on the quality and efficiency of project delivery. We will also look for potential opportunities to tailor contractor oversight given the current project status and circumstances.

As part of our assessment, we will provide you with our initial conclusions and recommendations focusing on the most prudent path forward, and what that means in terms of cost and schedule to improve the trajectory of the project. We are confident, based on our experience in the industry and with assisting owners in completing complex projects that we can provide recommendations that will help you and your current contractors with delivery of your project.

The effort for an assessment of this magnitude will require approximately 10 senior managers, will last 8 weeks in total, and will cost $1 million. Attached is a **DRAFT** proposal that outlines and further defines the details for how the assessment will be executed, key members of the team, commercial considerations, documents and data that are needed from the project to support the assessment, and the proposed topics for the assessment report. Additional information on Bechtel's experience with the AP1000 technology and other relevant projects is also included.

We look forward to supporting you in this endeavor and are prepared to start at your request. I suggest we quickly set up a follow-on meeting with some of our key team leaders to further discuss this effort in detail and

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answer any of your questions. We are prepared to formally issue this proposal if it meets your expectations and can obviously incorporate any changes you would like. I would be happy to help finalize our proposal. Ty Troutman, our General Manager for Nuclear Power, who is copied on this email and can be reached at 703-429-6284, can also help coordinate this follow on discussion. Please let me know of any questions.

Best regards,

Craig

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If you have questions, please call the IT Support Center at Ext. 7777.
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