

**BEFORE THE  
GEORGIA PUBLIC SERVICE COMMISSION**

**IN THE MATTER OF GEORGIA POWER  
COMPANY'S NINETEENTH SEMI-ANNUAL  
VOGTLE CONSTRUCTION MONITORING REPORT**

**DOCKET NO. 29849**

**PUBLIC DISCLOSURE**

**DIRECT TESTIMONY**

**AND EXHIBITS**

**OF**

**STEVEN D. ROETGER**

**WILLIAM R. JACOBS, JR., PhD.**

**ON BEHALF OF THE  
GEORGIA PUBLIC SERVICE COMMISSION  
PUBLIC INTEREST ADVOCACY STAFF**

**NOVEMBER 30, 2018**

1

2 **Table of Contents**

3 I. INTRODUCTION ..... 2  
4 II. STATUS OF PROJECT ..... 8  
5 III. RISKS AND AREAS OF CONCERN ..... 17  
6 IV. RECOMMENDATIONS ..... 24

7

8

9 **Exhibits:**

10 STF-SDR-1 Resume of Steven D. Roetger

11 STF-WRJ-1 Resume of William R. Jacobs, Jr., Ph.D.

12

1 **I. INTRODUCTION**

2 **Q. PLEASE STATE YOUR NAMES, TITLES AND BUSINESS ADDRESSES.**

3 **A.** My name is Steven D. Roetger. I am the lead analyst for the Georgia Public Service  
4 Commission (“Commission”) Staff Public Interest Advocacy Team for the Semi-  
5 annual Vogtle Construction Monitoring Docket 29849. My business address is 244  
6 Washington Street, S.W., Atlanta, Georgia, 30334. My name is William R. Jacobs,  
7 Jr., Ph.D. I am an executive consultant with GDS Associates, Inc. My business  
8 address is 1850 Parkway Place, Suite 800, Marietta, Georgia, 30067.

9  
10 **Q. MR. ROETGER, PLEASE SUMMARIZE YOUR EDUCATIONAL**  
11 **BACKGROUND AND EXPERIENCE.**

12 **A.** I hold a Bachelor of Business Administration degree from Georgia State University.  
13 I have been employed by the Georgia Public Service Commission since September  
14 of 2008, primarily in the capacity as the team leader for the Plant Vogtle Unit 3 and  
15 4 Project under Docket 29849. Also, I was a member of the Public Interest  
16 Advocacy Staff team for the Plant Vogtle Unit 3 and 4 Certification (Docket 27800),  
17 and a Commissioner Advisory Staff team member for various other proceedings.  
18 Prior to joining the Commission, I held various positions in either an accounting or  
19 finance capacity for firms in different industries. My resume is included in Exhibit  
20 STF-SDR-1.

21

1 **Q. DR. JACOBS, PLEASE SUMMARIZE YOUR EDUCATIONAL**  
2 **BACKGROUND AND EXPERIENCE.**

3 **A.** I received a Bachelor of Mechanical Engineering in 1968, a Master of Science in  
4 Nuclear Engineering in 1969 and a Ph.D. in Nuclear Engineering in 1971, all from  
5 the Georgia Institute of Technology. I am a registered Professional Engineer and a  
6 member of the American Nuclear Society. I have more than forty years of  
7 experience in the electric power industry including more than twelve years of  
8 nuclear power plant construction and start-up experience. I have participated in the  
9 construction and start-up of seven nuclear power plants in this country and overseas  
10 in management positions including start-up manager and site manager. As a loaned  
11 employee to the Institute of Nuclear Power Operations (“INPO”), I participated in  
12 the Construction Project Evaluation Program, performed operating plant evaluations  
13 and assisted in development of the Outage Management Evaluation Program. Since  
14 joining GDS Associates, Inc. in 1986, I have participated in rate case and litigation  
15 support activities related to power plant construction, operation and  
16 decommissioning. I have evaluated nuclear power plant outages at numerous  
17 nuclear plants throughout the United States. I served on the management committee  
18 during construction of Plum Point Unit 1, a 650 Megawatts Electric (“MWe”) coal  
19 fired power plant. As a member of the management committee, I assisted in  
20 providing oversight of the Engineering, Procurement and Construction (“EPC”)   
21 contractor for this Project. I have assisted the Georgia Public Service Commission  
22 as the Independent Construction Monitor in providing oversight of the Vogtle 3 and  
23 4 Project since August 2009. My resume is included in Exhibit STF-WRJ-1.

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**Q. WHOM ARE YOU REPRESENTING IN THIS PROCEEDING?**

A. We are representing the Commission’s Public Interest Advocacy Staff (“Staff”) team in this matter.

**Q. MR. ROETGER, WHAT IS YOUR INVOLVEMENT WITH THE VOGTLE 3 AND 4 PROJECT?**

A. Since Docket No. 27800, I have been directly involved in the oversight of the Plant Vogtle Unit 3 and 4 Project (“Project”) as lead analyst of the Staff Team. I have closely monitored the Project with Dr. Jacobs since certification. Among other oversight, along with Dr. Jacobs, I monitor the Project areas that either have realized schedule delays or show a risk of potentially experiencing delay or increased Project cost. I have testified in the Eighth through Eighteenth Semi-Annual Vogtle Construction Monitoring (“VCM”) proceedings.

**Q. DR. JACOBS, WHAT IS YOUR INVOLVEMENT WITH THE VOGTLE 3 AND 4 PROJECT?**

A. I am the Commission’s Independent Construction Monitor (“CM”) for the Project. My duties are to assist the Staff Team in its regulatory oversight of all aspects of the Project and to keep the Commission informed of significant Project issues or changes in the projected cost and schedule as they occur. In addition, I keep the Commission informed of significant challenges to the Project that could impact the Project cost and/or schedule. I have presented testimony in the Plant Vogtle Unit 3

1 and 4 Certification (Docket 27800) and the First through the Eighteenth Semi-  
2 Annual VCM proceedings describing the construction monitoring activities, the  
3 status of the Project and any concerns or significant issues.

4  
5 **Q. WHAT IS YOUR ASSIGNMENT IN THIS PROCEEDING?**

6 A. Our assignment is to present the results of the Staff’s oversight from certification of  
7 the Project to the present with emphasis on the time period covered by the  
8 Nineteenth Semi-annual VCM Report, January 1, 2018 through June 30, 2018. In  
9 this testimony, we present our analysis of the current status of the Project which  
10 includes a discussion of the Project performance since the transition to Project  
11 management by Southern Nuclear Company (“SNC”). We discuss the status of the  
12 most recent schedule provided by the Company and identify risks and areas of  
13 concern for the Project. Finally, we make a recommendation regarding Georgia  
14 Power Company’s (“Company”) request for verification and approval of costs  
15 incurred during the period in the amount of \$578 million.

16  
17 **Q. PLEASE DESCRIBE THE CONSTRUCTION MONITORING PROGRAM**  
18 **THAT THE STAFF TEAM HAS IMPLEMENTED TO MONITOR THE**  
19 **CONSTRUCTION OF THE VOGTLE 3 AND 4 PROJECT.**

20 A. The Staff Team continues to actively monitor the Project. Monitoring activities  
21 include monthly meetings between Staff and Company personnel to discuss Project  
22 status and regular trips to the Vogtle Project site to observe the Monthly Project  
23 Review (“MPR”) meeting and to witness firsthand construction activities’ progress.

1 We review the Company's Weekly Metrics reports, Monthly Update Reports  
2 including addenda, and submit data requests to the Company for additional  
3 information. The Team has continued its review of the Company's process for  
4 handling Project invoices from WEC and other Company contractors<sup>1</sup>. This includes  
5 review of the Project cost control procedures and sampling of processed invoices.  
6 Other activities conducted by the Staff Vogtle Construction Monitoring Team  
7 include:

- 8 • Review of the Weekly Project Metrics Reports and monitoring of the  
9 weekly management update conference calls;
- 10 • Review of Monthly Project status reports issued by the Company;
- 11 • Review of Monthly status reports issued by Bechtel and Westinghouse;
- 12 • Review of the Company's Semi-Annual VCM Reports;
- 13 • Preparation of discovery requests for additional information as needed  
14 following review of the monthly status reports, semi-annual construction  
15 monitoring reports or meetings with the Company;
- 16 • Attendance at management briefings by the Vogtle Construction Review  
17 Board;
- 18 • Participation in Nuclear Regulatory Commission ("NRC") public  
19 meetings in person and via conference call as appropriate;
- 20 • Review of public correspondence between the Company and the NRC;
- 21 • Review of correspondence between the Contractor and the Company;
- 22 • Review of trade articles and journals related to new nuclear power plant  
23 development;

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<sup>1</sup> Please see the Staff Team testimony of Cary Cook and Shemetha Jones for a detailed discussion of this review and any findings.

- 1                   • Witnessing significant construction activities.

2

3 **Q. PLEASE DESCRIBE THE ACTIVITIES UNDERTAKEN BY CPT**  
4 **CONSTRUCTION OVERSIGHT, LLC TO ASSIST IN MONITORING OF**  
5 **THIS EXPANDED SCOPE.**

6 A. As described in our testimony in the 18<sup>th</sup> VCM, Staff has retained the services of  
7 Cost Plus Technology - Nuclear Construction Oversight, LLC (“CPT”) to provide  
8 additional expertise in several areas including construction management, overall  
9 project controls, Earned Value Management Systems (“EVMS”), variance analysis,  
10 risk and risk mitigation. CPT personnel have been actively involved in Project  
11 monitoring including review of metrics reports and construction scorecards provided  
12 by the Company, issuance of data requests, interviews with Project management  
13 personnel and conducting site inspections. CPT’s activities and observations are  
14 described in more detail in the testimony of Don Grace.

15

16 **Q. WHY HAS STAFF ENGAGED CPT ONLY FOR THE 19<sup>TH</sup> VCM**  
17 **PROCEEDING?**

18 A. Staff’s current budget for monitoring the Project is \$1.1 million per year. Given the  
19 unanticipated rejection of the Engineering, Procurement, and Construction  
20 Agreement (“EPC”) by Westinghouse Electric Company (“WEC”), the subsequent  
21 Project Management being led by SNC, and the continuing increases in the cost  
22 forecasts and challenges to the schedule, the current budget is inadequate to allow  
23 for the complete review and comprehensive monitoring of the Project. As addressed



1 further in our testimony, the Project is entering a new critical phase and Staff will  
2 need additional funds for outside assistance in order to continue to provide the  
3 Commission with a thorough analysis of the Project in a timely manner.  
4

## 5 II. STATUS OF PROJECT

### 6 Q. PLEASE DESCRIBE THE CURRENT STATUS OF THE PROJECT.

7 A. Construction continues on the Vogtle Project with the emphasis on increasing  
8 production by adding additional craft personnel while maintaining a high level of  
9 productivity and moving into system completion and turnover to the Initial Test  
10 Program (“ITP”) testing group. Production as measured by percent complete  
11 continues to be below the plan based on the +21-month schedule<sup>2</sup>. As of September  
12 2018, the total Project is reported to be 71.4% complete based on a weighted average  
13 of the following components as shown below:  
14

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<sup>2</sup> The Company and its primary contractor (Bechtel) are managing the work at the site based on a 21-month extension from prior commercial operation dates of June 2019 / 2020.

1

<u>Project Phase</u>	<u>March to September</u> <u>2018 Change<sup>3</sup></u>	<u>September 2018 Percent</u> <u>Complete<sup>4</sup></u>
Engineering	2.10%	97.8%
Procurement	3.30%	90.4%
Construction	5.40%	57.7%
<i>Bechtel</i>	7.8%	48.5%
<i>Direct Subs</i>	5.1%	74.7%
I&C/Cyber Security	2.50%	91.5%
Initial Test Program	3.20%	6.8%
Total Project	3.90%	71.4%

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Through October 2018, direct construction is reported to be 49.9% complete, slightly behind the +21-month schedule goal. For this metric, direct construction is defined as the Bechtel scope of work which primarily represents the Unit 3 and Unit 4 power blocks and Bechtel-directed Balance of Plant areas. The graph below shows the actual and forecast direct construction completion as of the end of October 2018.

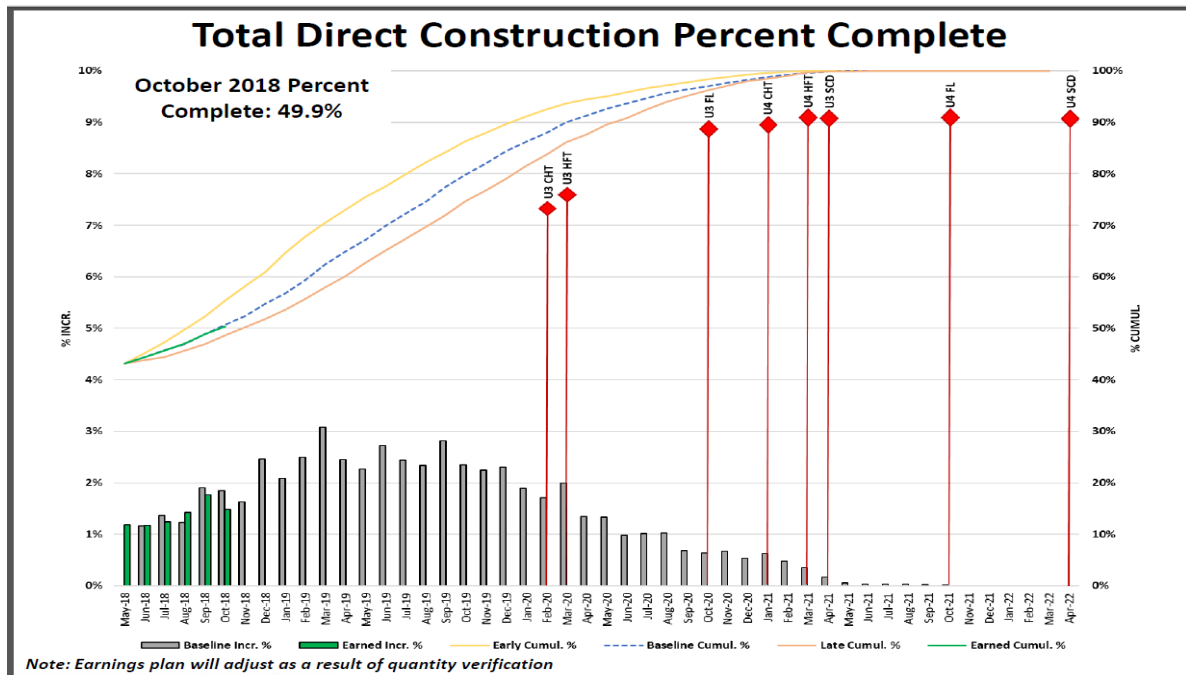
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<sup>3</sup> Represents six months.

<sup>4</sup> Monthly Project Review (“MPR”) slides 11/13/2018, page 33.

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GRAPH 1



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Note: This figure is based on the +21-month schedule described below.

4

5 **Q. WHAT ARE THE COMPANY'S 2018 GOALS FOR DIRECT**  
 6 **CONSTRUCTION PERCENT COMPLETE?**

7 A. The Company established 2018 direct construction percent complete goals of 62%  
 8 for Unit 3 and 44% for Unit 4<sup>5</sup>.

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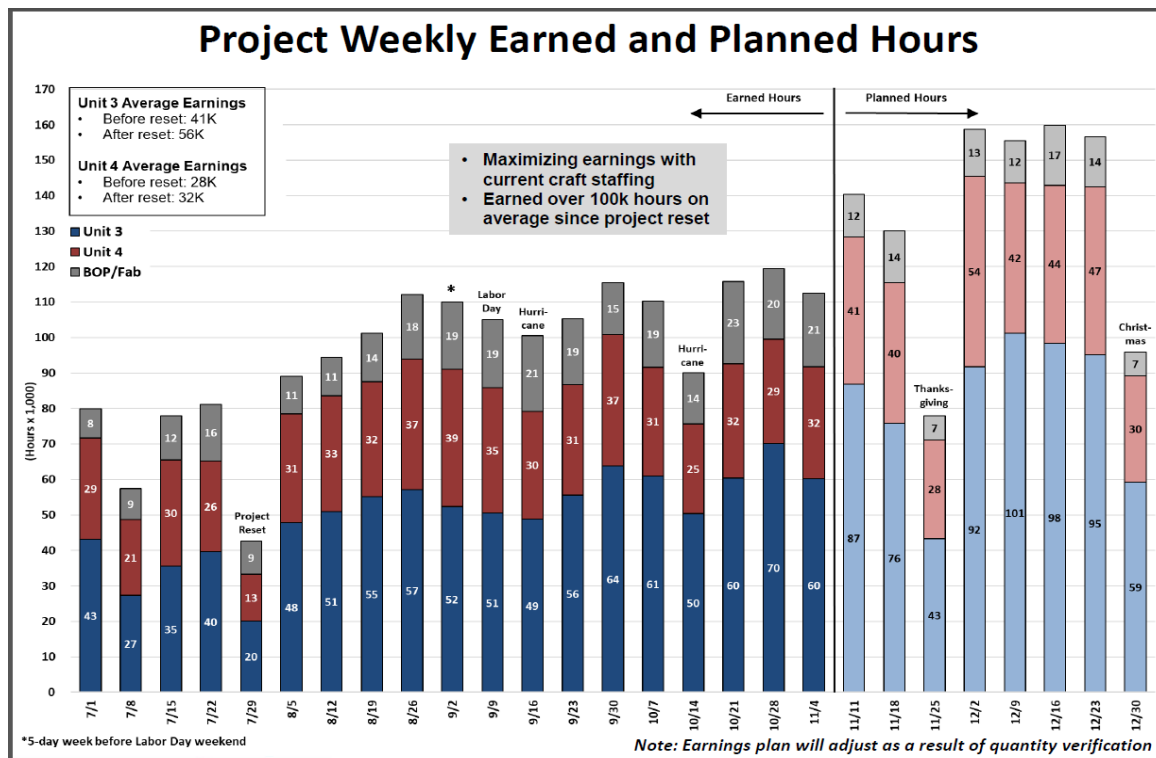
10 **Q. WHAT IS STAFF'S OPINION CONCERNING THE ACHIEVABILITY OF**  
 11 **THESE CONSTRUCTION COMPLETION GOALS?**

<sup>5</sup> MPR meeting slides 6/12/18, page 3.

1 A. Staff agrees with projections provided by SNC at the October 2018 Monthly Project  
 2 Review meeting indicating that these goals are significantly challenged. At the  
 3 current pace of direct construction, that reflects the most recent weekly earned hours,  
 4 at year end 2018 Unit 3 will be approximately 59% complete and Unit 4 will be  
 5 approximately 42% complete, which is 2-3% less than the goal for each Unit. Graph  
 6 2 below shows actual earned hours from July 1, 2018 to November 4, 2018 and the  
 7 planned earned hours for the remainder of the year necessary to meet the 62% and  
 8 44% goals. The consecutive peaks for the weeks ending December 2, December 9,  
 9 December 16, and December 23 of nearly 160,000 planned earned hours clearly  
 10 exceed the actual 119,000 earned hours in the best week to date.

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GRAPH 2

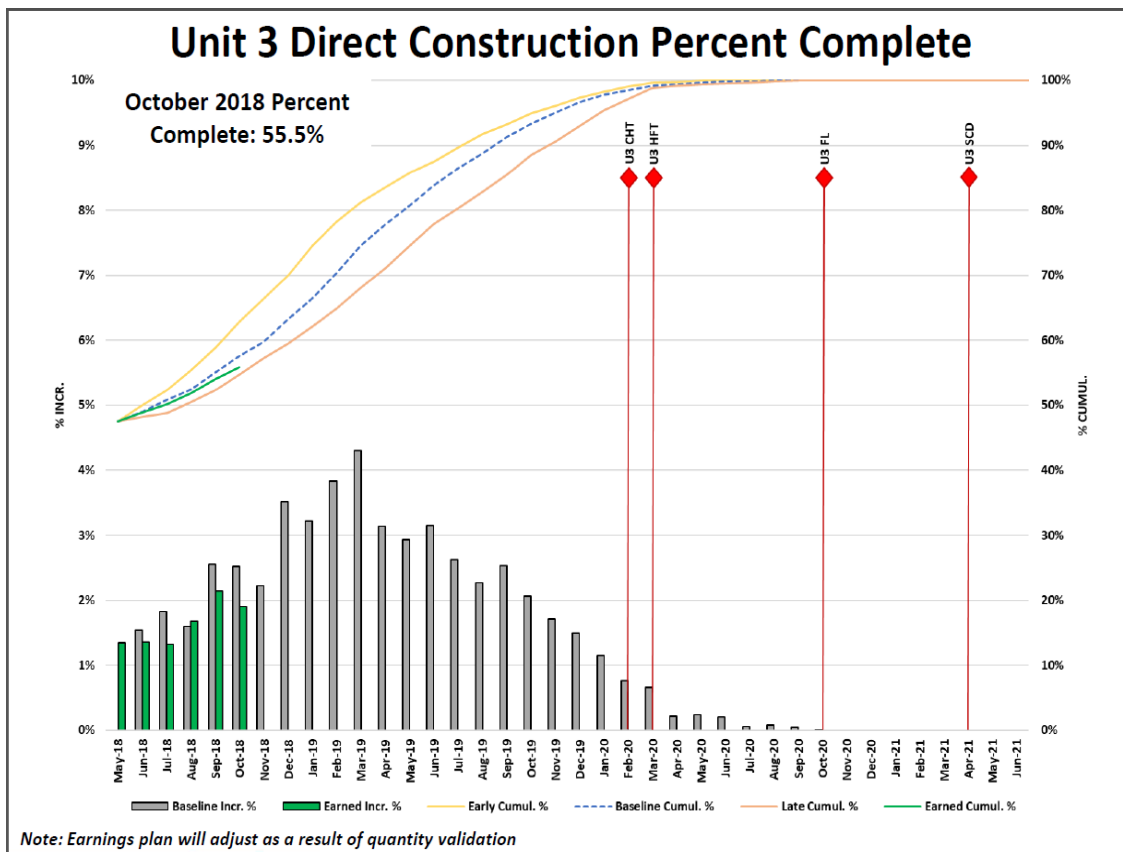


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1 **Q. DOES STAFF BELIEVE THAT THE CURRENT +21-MONTH SCHEDULE**  
 2 **IS ACHIEVABLE?**

3 A. Staff believes that it is highly unlikely that the +21-month schedule will be achieved.  
 4 As shown in Graph 1, monthly percent complete for the Project must increase to a  
 5 peak above 3% in March 2019 to achieve the +21-month schedule for Unit 4. The  
 6 largest percent complete per month achieved to date is 1.76%. The planned monthly  
 7 percent complete for Unit 3 is even more challenging peaking at 4.3% complete as  
 8 shown below in Graph 3. In addition to bulk construction completion, meeting the  
 9 system turnover schedule (waterfall) is also very challenging. This is discussed in  
 10 more detail in Section III of this testimony.

11 **GRAPH 3**



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2 **Q. GIVEN THAT STAFF BELIEVES THAT ACHIEVABILITY OF THE +21-**  
3 **MONTH SCHEDULE IS HIGHLY UNLIKELY, WHAT IS STAFF'S**  
4 **OPINION REGARDING ACHIEVABILITY OF THE +29-MONTH**  
5 **SCHEDULE?**

6 A. Due to the risks and challenges described below in Section III, Staff believes that  
7 meeting the +29-month schedule<sup>6</sup> will also be challenging for the Company.  
8 However, because the Project metrics and schedule forecasts are all based on the  
9 +21-month schedule, it is not possible for Staff to accurately determine the status of  
10 the Project with respect to the +29-month schedule. For example, the required peak  
11 monthly completion percentages to meet the +29-month schedule are not available  
12 for Staff to assess the reasonableness of meeting these targets.

13

14 **Q. HAVE THE PROJECT SCHEDULE MILESTONES BEEN ACHIEVED**  
15 **DURING THE 19<sup>TH</sup> VCM PERIOD?**

16 A. In general, yes. In some cases, in which certain activities have fallen behind  
17 schedule, actions such as re-sequencing of construction activities have been taken to  
18 mitigate the impact of the delay. To date, the forecast dates of the major Project  
19 milestones have not changed. Achieving recent milestones, however, does not  
20 necessarily indicate that SNC will be able to meet these upcoming milestones. As

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<sup>6</sup> The +29-month schedule represents a 29-month extension from prior CODs of June 2019 / 2020 and is current schedule approved by the Commission.

1 discussed in more detail in Section III of this testimony, the Project is entering a  
2 critical period of construction completion and system turnover to testing. Results  
3 from the first system turnovers have not demonstrated the Company's ability to meet  
4 the very challenging turnover schedule.

5 **Q. WHAT ARE THE UPCOMING MAJOR PROJECT MILESTONES FOR**  
6 **UNIT 3?**

7 A. The Major Project Milestones and current +21-month schedule forecast dates are:

- 8 • Initial Energization Complete 05/07/2019
- 9 • RCS<sup>7</sup> Integrated Flush Start 07/23/2019
- 10 • Open Vessel Testing Start 10/27/2019
- 11 • RCS Cold Hydro Start 02/09/2020
- 12 • Hot Functional Test Start 03/31/2020
- 13 • Integrated Leak Rate Test Start 07/19/2020
- 14 • Fuel Load Start 10/14/2020
- 15 • Substantial Completion 04/14/2021

16 With a few exceptions, the bulk of the plant must be completed and turned over to  
17 ITP prior to Hot Functional Testing. Achieving these Major Project Milestones is  
18 critical to meeting the Project schedule. Staff believes that the above Major Project  
19 Milestones dates are on an aggressive schedule and any significant slippage in these  
20 dates will impact the Project completion dates.

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<sup>7</sup> RCS: Reactor coolant system

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**Q. PLEASE DESCRIBE THE COMPANY’S NEW COST ESTIMATE TO COMPLETE THE VOGTLE 3&4 PROJECT.**

A. In Southern Company’s 10-Q issued August 8, 2018, the Company announced an increase in the base capital cost forecast of \$694 million for the Project and a \$366 million increase in contingency for a Total Project Cost forecast of \$8.4 billion. This increase is net of the \$1.7 billion already received under the Toshiba Parental Guaranty Settlement Agreement and \$188 million in Customer refunds. The Company has stated that they will not seek recovery of the \$700 million increase in forecast capital costs but the Company may request the Commission to evaluate costs included in the revised contingency of \$366 million for rate recovery at a later date.

**Q. WHAT WERE THE PRIMARY DRIVERS FOR THE INCREASE IN CAPITAL CONSTRUCTION COSTS?**

A There were three primary drivers for SNC’s need to re-forecast the Estimate at Completion (“EAC”) for the Project. First, Bechtel construction costs were increased. As part of this increase, to address the labor shortage, per diems and hourly rates were increased to attract and retain qualified craft personnel. SNC conducted a study to determine where the Vogtle Project was relative to other large Projects in the Southeast with regards to craft compensation. It was determined that the Vogtle Project’s craft compensation was in the bottom quartile of those projects sampled. With these increases in craft compensation, the Project is now in the upper



1           quartile. Second, as major sub-contracts were being re-negotiated it became evident  
2           that some of the larger contract values were going to exceed the amount accounted  
3           for by SNC in the Estimate to Complete (“ETC”) it brought forward in the 17<sup>th</sup>  
4           VCM. Third, there was an increase in the forecast for SNC labor and Field Non-  
5           manual labor. The amounts for each (100%) are approximately \$776 million, \$534  
6           million and \$260 million, respectively.

7  
8   **Q.   DOES STAFF HAVE CONCERNS ABOUT THIS NEW ESTIMATE TO**  
9   **COMPLETE?**

10  A.   Yes. Our primary concerns are as follows:

- 11       •     Staff is concerned with the accuracy, and therefore sufficiency, of the new  
12       ETC. SNC has included approximately \$800 million in contingency funding  
13       (100% basis) in its latest ETC. However, based on historical increases  
14       required to complete the Project, the \$800 million may prove to be  
15       insufficient;
- 16       •     Staff believes that the +21-month schedule is highly unlikely to be achieved;
- 17       •     Staff believes that the +29-month schedule is also stressed. Staff believes  
18       that the transfer of jurisdiction from construction to ITP testing to the  
19       Operations organization requires a higher level of sustained productivity and  
20       production that could easily deteriorate in 2019;
- 21       •     Given the monthly spending rate, currently \$200 million per month (100 %)   
22       on the Project, the cost consequences of Project delay could be severe  
23       depending on the duration of the delay.

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### **III. RISKS AND AREAS OF CONCERN**

3 **Q. WHAT DOES STAFF BELIEVE TO BE THE GREATEST MATERIAL**  
4 **RISKS TO THE PROJECT AT THIS TIME?**

5 A. The greatest risks to the Project identified by Staff at this time are: (1) the  
6 Company's ability to meet the required construction completion per month and; (2)  
7 the ability to achieve the completion and turnover of plant systems to meet the  
8 current plan for system turnover to ITP. We note that the Company is well aware of  
9 these challenges and is taking action to attempt to manage them. However, given the  
10 current schedule for system turnovers, Staff questions whether the actions taken by  
11 the Company will be sufficient to mitigate the impacts of these challenges.

12

13 **Q. PLEASE EXPLAIN YOUR CONCERN WITH THE ABILITY OF THE**  
14 **COMPANY TO MEET THE REQUIRED CONSTRUCTION COMPLETION**  
15 **PER MONTH.**

16 A. This concern was discussed in our testimony in the 18<sup>th</sup> VCM and the level of our  
17 concern has increased since the 18<sup>th</sup> VCM. Construction completion is measured  
18 each week by the number of hours earned on the Project. As described in our  
19 testimony in the 18<sup>th</sup> VCM, the Project earns hours when a commodity such as feet  
20 of pipe or cubic yard of concrete is installed in accordance with the unit rates  
21 established for the Project ETC and Integrated Project Schedule ("IPS"). The  
22 number of hours earned each week is primarily a function of the number of craft

1 personnel working on the Project and the level of productivity of the craft. Recently,  
2 the level of productivity on the Project has increased with the number of earned  
3 hours approaching the maximum possible given the number of craft on site. In order  
4 to meet the rapidly increasing planned earned hours per week, craft staffing must be  
5 increased while maintaining a high level of productivity.

6  
7 **Q. HAS PROGRESS BEEN MADE IN INCREASING CRAFT STAFFING**  
8 **SINCE YOU RAISED THIS CONCERN IN THE 18<sup>TH</sup> VCM?**

9 A. Only a very little. In fact, the level of craft staffing has actually decreased since our  
10 testimony in the 18<sup>th</sup> VCM. The Company and Bechtel have initiated several actions  
11 to attract additional craft including providing per diem for traveling craft, increasing  
12 available overtime and increasing the wage rate. In addition, the Company applied  
13 for the H2B visa program to allow craft from Canada to work on the Project.  
14 However, to date these actions have not been effective in attracting significant  
15 numbers of additional craft to the Project.

16  
17 **Q. HOW MANY ADDITIONAL CRAFT PERSONNEL ARE NEEDED TO**  
18 **MEET THE PROJECT PLAN?**

19 A. To put this need in perspective, the latest information provided by the Company  
20 indicates that approximately 350 additional pipefitters and 350 additional  
21 electricians will be needed over the next three months to meet the required staffing.

22

1 **Q. DO YOU HAVE ADDITIONAL CONCERNS WITH THE ABILITY OF SNC**  
2 **TO ACHIEVE THE PLANNED EARNED HOURS?**

3 A. Yes. In addition for the need to add a large number of electricians and pipefitters,  
4 and incorporate them productively into the work force, the Project is moving from  
5 the heavy civil construction phase into the bulk commodity installation phase.  
6 During the bulk commodity phase, commodities including large bore pipe, small  
7 bore pipe, cable tray, cable, fire protection piping, and Heating Ventilation Air  
8 Conditioning (“HVAC”) ducting must be installed efficiently and in the proper  
9 sequence. This requires a different skill set than civil construction and a decrease in  
10 productivity should be anticipated as these activities initially get under way. In  
11 addition, the relatively small footprint of the AP1000 compared to prior nuclear  
12 plants will result in cramped, congested work areas where work scope must be  
13 sequenced and managed effectively to maintain a high level of productivity. Staff  
14 notes that this level of detailed work scope and execution, to date, has not been  
15 required nor achieved for the Project.

16

17 **Q. WHAT IS SNC’S POSITION REGARDING THE +21-MONTH SCHEDULE**  
18 **AT THIS TIME?**

19 A. SNC continues to work to the +21-month schedule. However, as discussed during  
20 the Monthly Project Review Meeting held on November 13, 2018, the Company will  
21 be evaluating several key factors over the next few months including the outcome of

1 the quantity validation process<sup>8</sup> that is currently underway, the ability to attract and  
2 on-board sufficient craft resources and the ability to utilize additional craft personnel  
3 at a high level of productivity. The Company stated that this evaluation will be  
4 completed in the February to March 2019 time frame and that SNC would be in the  
5 position to re-baseline the Project schedule at that time based on their evaluations.

6  
7 **Q. BASED ON THIS ONGOING EVALUATION, HOW WOULD YOU**  
8 **SUMMARIZE THE STATUS OF THE PROJECT?**

9 A. At this time the status of the Project is uncertain. The Company's ability to meet the  
10 construction completion rates required by the +21-month schedule and the +29-  
11 month schedule will become clearer once the evaluation of quantities and craft  
12 availability and productivity are completed. However, as discussed below, Staff has  
13 concerns with the Company's ability to meet the system turnover schedule required  
14 to support the current Major Milestone schedule.

15  
16 **Q. PLEASE DISCUSS YOUR CONCERN REGARDING SYSTEM**  
17 **COMPLETION AND TURNOVER TO THE TESTING GROUP.**

18 A. The transition from bulk construction to system completion and turnover is typically  
19 a difficult time for a nuclear project. In addition to completing the bulk commodity  
20 installation at the required rate, Project management must focus on the meticulous

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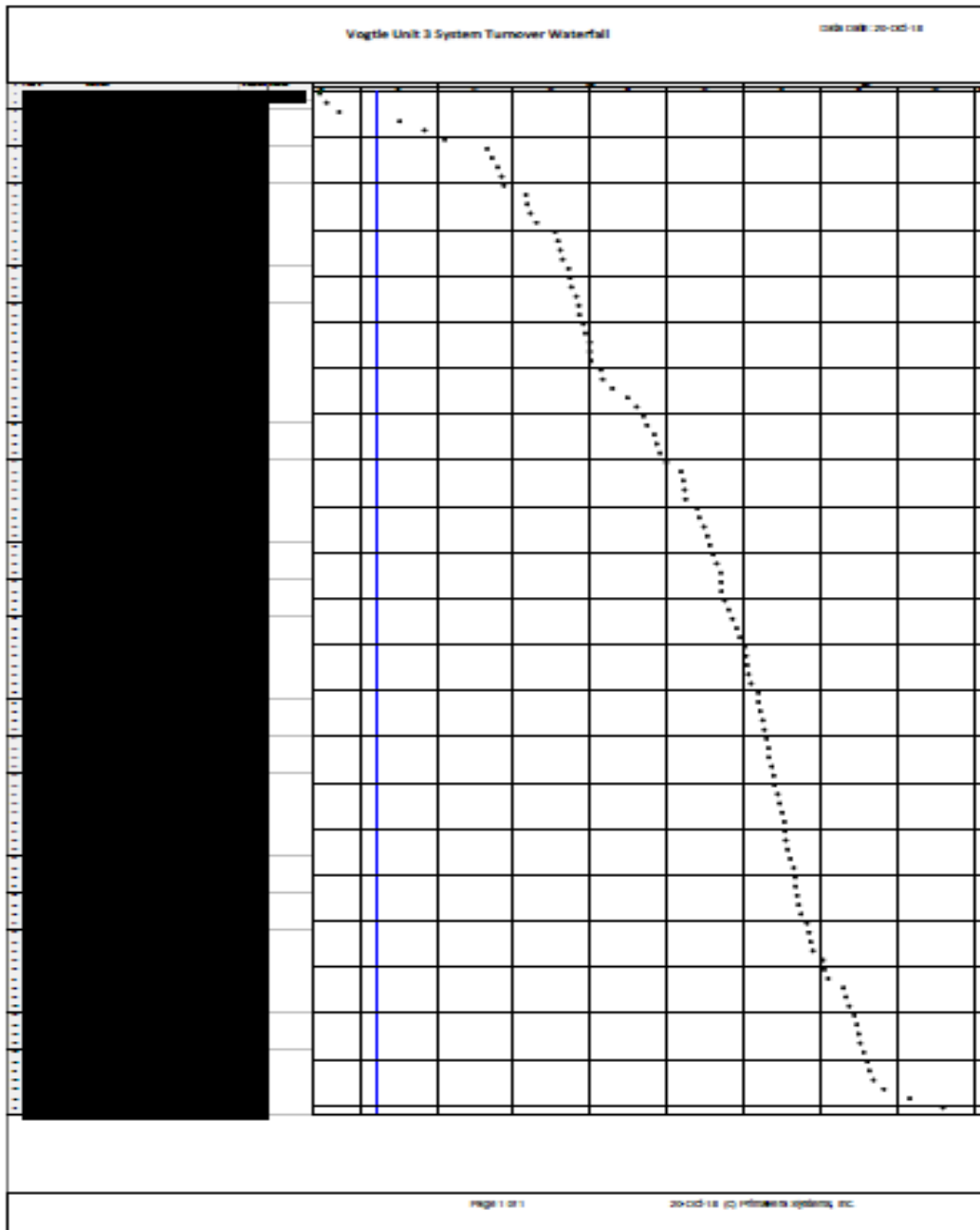
<sup>8</sup> Monthly Project Review Meeting November 13, 2018, Slide 5.

1 process of completing each system in a prescribed sequence. This process is very  
2 detailed and time consuming including completion of all construction activities,  
3 closing all related open work packages and compiling the necessary documentation  
4 for each system or partial system to be turned over. In addition, many systems  
5 contain Inspections, Tests, Analysis, and Acceptance Criteria (“ITAAC”) that must  
6 be verified concurrently by the NRC’s Staff. The Company has developed what they  
7 refer to as a “system waterfall” that prescribes the order of system turnovers needed  
8 to support the major project milestones discussed above. As can be seen from the  
9 system turnover (waterfall) shown below in Graph 4 the plan for system turnovers is  
10 very aggressive. Please note that the time represented between the vertical bars in  
11 Graph 4 is three months. Staff believes that it is unlikely that this schedule of  
12 system turnovers (waterfall) can be achieved even if the high level of commodity  
13 installation is met.

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GRAPH 4<sup>9</sup>



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<sup>9</sup> Email from J. H. Haswell to William Jacobs dated 11/12/2018.

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**Q. WHAT HAS BEEN SNC’S PERFORMANCE TO DATE RELATED TO SYSTEM TURNOVERS?**

A. SNC’s performance with system turnovers does little to add to Staff’s confidence regarding the Company’s ability to meet the system turnover waterfall. Four partial system turnovers have been identified as needed to support the major milestone of initial energization. Of these four partial systems, EDS-2, Non-class 1E DC and UPS System was turned over to testing 70 days later than the June 2018 baseline schedule and ECS-1, Main AC Power is forecast to be turned over to testing on November 21, 2018, 76 days later than the June 2018 baseline schedule. These delays and aggressive ITP schedule are discussed by Staff in CPT’s testimony.

**Q. DOES STAFF HAVE OTHER AREAS OF CONCERN AT THIS TIME?**

A. Yes, as Staff as stated in previous testimonies, Staff continues to have concerns with other areas previously identified in our testimony in the 18<sup>th</sup> VCM which include:

- Installation and testing of the digital Instrumentation and Control (“I&C”) system;
- Completion of all ITAAC and timely receipt of the 103.g letter from the NRC authorizing fuel load;
- Timely resolution of issues identified during commissioning, preoperational and startup testing;
- Impact of first of a kind equipment and systems testing.

**Q. BASED ON THE CONCERNS THAT YOU HAVE NOTED AND THE SUBSTANTIAL RISKS THEY PLACE ON RATEPAYERS, DOES STAFF**





1 that the Company has requested be verified and approved, less \$51.6 million  
2 associated with the Administrative Claim discussed in the testimony of Mrs. Jones  
3 and Mr. Cook. As Staff has previously explained, “verification and approval” of  
4 costs means a determination that such costs have actually been spent on the Project  
5 and does not preclude a subsequent disallowance by the Commission. In our  
6 opinion, if the Company cannot demonstrate the funds were used on the Project, it  
7 does not meet this basic standard of verification.

8  
9 **Q. DOES STAFF RECOMMEND ENHANCED MONITORING DUE TO SNC**  
10 **NOW MANAGING AND CONTROLLING THE PROJECT?**

11 A. Yes. As SNC has taken control and has total responsibility for all aspects of the  
12 Project without the protections of the prior EPC Agreement, Staff must also expand  
13 its work scope to monitor all aspects of the Project. Staff recommends an increase of  
14 \$3.6 million for 2019 to perform the recommended comprehensive Project  
15 monitoring activities. Staff also recommends to the Commission that it be provided  
16 all necessary access to SNC and Bechtel personnel, at mutually agreeable dates and  
17 times, to facilitate this increase in monitoring scope.

18  
19 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

20 A. Yes, it does.

# **EXHIBIT STF-SDR-1**

## **Resume Of Steven D. Roetger**

**Steven D. Roetger**

244 Washington Street, S.W.  
Atlanta, GA 30334

**Professional Experience**

**Georgia Public Service Commission Atlanta, Georgia 2008-Present**

**Analyst** Primary responsibilities include monitoring the Vogtle expansion of Units 3 and 4, attending site visits on a regular basis, participate with the Commission and Company interface, and assist in the preparation of testimony.

**Key achievements**

Manage the Vogtle Construction monitoring process including engineering, procurement, and construction; economic analysis of the value of the Project; and financial accounting review for the Project's costs.

Write and review direct pre-filed testimony of the status of the Project for a semi-annual hearings.

**BCD Travel Atlanta, Georgia 2007-2008**

**Finance Manager** Primary responsibilities were to manage financial analysts, generate and review variance analyses, analyze departmental financials, and facilitate the coordination between our group and various internal departments.

**Key achievements**

Elevated team's performance to improve consistency, accuracy, and timeliness of service  
Identified client missed revenue opportunities and communicated to Operations for recapture and/or inclusion with future invoicing

**Key Requirements**

Train, motivate, and develop 3 financial analysts to achieve an outstanding level of service and performance

Direct work flow to maintain efficiency and productivity without compromising standards

Analyze departmental financials to maximize profitability by reviewing contracts, perform variance analyzes, and ensure complete transaction billing

Review complex contracts and interpret for finance reconciliation and billing procedures

Prepare client budgets and forecasts

**Marine Bank of Florida Marathon, Florida 2003-2005**

**Accounting Operations Manager/Bank Officer** Primary responsibilities were to manage the Bank's Accounting Department and, as directed by the COO, Deposit Operations' functions.

**Key achievements**

Identified high-risk, time sensitive accounts for dedicated review to significantly reduce financial risk to the Bank

In partnership with the CFO reduced audit management exceptions from 13 to zero year over year

Launched new wire department procedures to decrease response time, increase capacity, and improve customer service without increasing staff

## Resume of Steven D. Roetger

In partnership with the COO implemented the Bank's new ACH operations to enhance existing customer relations, attract new business, and respond in a timely manner to ACH adjustments/returns

### Key Requirements

Comprehensive G/L management including reconciliations, adjusting entries, and monthly/annual close

Manage and review the activities of 3 accounting and 2 deposit operations personnel responsible for accounts payable, wires, ACH operations, VISA check card operations, branch settlements, electronic funds transfers, and check clearing.

Establish and refine departmental policies and procedures to improve accuracy and timeliness of reporting, facilitate employee transition, and meet audit requirements

Oversaw Federal Reserve, FHLB, and IBB correspondent accounts

Supported the CFO to meet external audit requirements

Oversaw the Bank's daily cash position to minimize overnight net interest expense

Support branch operations by assisting branch managers maintain acceptable internal controls, provide training on Bank reporting procedures, and process exceptions

## **B. Terfloth & Co. USA) Inc. Atlanta, Georgia 1998-2000**

**Accounting Manager** Primary responsibilities were to manage the Branch's Accounting Department with an emphasis on controlling expenses and manage the yearly audit process.

### Key achievements

Re-established accurate and timely monthly reporting to the Corporate Office

Developed a cash flow forecasting model to assess the Branch's financing needs and negotiated under the President's supervision a working capital credit line to meet those needs

### Key requirements

Comprehensive G/L management including reconciliations, adjusting entries, and monthly/annual close

Manage the annual audit process

Accounts payable and accounts receivable

Payroll and annual bonus calculations

## **Bridgetown Grill Restaurants Inc. Atlanta, Georgia 1996-1997**

**Interim Controller** Primary responsibilities were to re-establish a reliable Accounting process and once established facilitate the transition to a new Controller.

### Key achievements

Established internal controls to better manage purchases, inventories, and reduce cash variances

Developed Accounting procedures for Unit Managers and trained the management staff on those procedures

Assisted the Owner in evaluating an outside purchase offer

### Key requirements

Comprehensive G/L management including reconciliations, adjusting entries, and monthly close procedures

Coordinate the annual audit process

Manage accounts payable and payroll processing

Manage credit card transaction procedures to reduce charge backs

Resume of Steven D. Roetger

**Turner Broadcasting System Inc.** Atlanta, Georgia 1991-1996

**Staff Accountant** Primary responsibility was to support the Managers with accurate and timely completion of assigned tasks.

**Key achievements**

Partnered with Management to streamline the procedure for The Statement of Cash Flows

Corrected the EPS calculation

Streamlined governmental reporting and incorporated detailed procedures for each report

Provided a Companywide vacation and sick time accrual analysis

**Key requirements**

Worked, as part of a team, on the Consolidated Financial Statements of TBS, Inc.

Develop various footnotes to the Financial Statements

Provide analysis of accounts for actual to budget and actual to rolling 12 month forecast variances

Provide analysis of, and recommendations for, lease capitalizations

Coordinate with 72 Operating Unit Controllers for the content and timely receipt of Unit financial data

Prepare debt covenant calculations for 4 issues and provide forecasts with sensitivity analysis

Prepare all U.S. Department of Commerce and U.S. Treasury Department statistical reports

**Software**

*PeopleSoft/nVision* reporting, *Kirchman/Bankway* and *IPS Sendero* banking software, *MSA* accounting software, *Excel*, *Outtask*, and *Word*

**Education**

BBA Georgia State University in Finance with an equivalent in Accounting

Completed 70 percent of course work toward an MBA in Finance from Georgia State University

**EXHIBIT STF- WRJ-1**

**Resume Of**

**William R. Jacobs, Ph.D.**

**EDUCATION:** Ph.D., Nuclear Engineering, Georgia Tech 1971  
MS, Nuclear Engineering, Georgia Tech 1969  
BS, Mechanical Engineering, Georgia Tech 1968

**ENGINEERING REGISTRATION:** Registered Professional Engineer

**PROFESSIONAL MEMBERSHIP:** American Nuclear Society

**EXPERIENCE:**

Dr. Jacobs has over thirty-five years of experience in a wide range of activities in the electric power generation industry. He has extensive experience in the construction, startup and operation of nuclear power plants. While at the Institute of Nuclear Power Operation (INPO), Dr. Jacobs assisted in development of INPO's outage management evaluation group. He has provided expert testimony related to nuclear plant operation and outages in Texas, Louisiana, South Carolina, Florida, Wisconsin, Indiana, Georgia and Arizona. He currently provides nuclear plant operational monitoring services for GDS clients. Dr. Jacobs was a witness in nuclear plant certification hearings in Georgia for the Plant Vogtle 3 and 4 project on behalf of the Georgia Public Service Commission and in South Carolina for the V.C. Summer 2 and 3 projects on behalf of the South Carolina Office of Regulatory Staff. His areas of expertise include evaluation of reactor technology, EPC contracting, risk management and mitigation, project cost and schedule. He is assisting the Florida Office of Public Counsel in monitoring the development of four new nuclear units in the State of Florida, Levy County Units 1 and 2 and Turkey Point Units 6 and 7. He also evaluated extended power uprates on five nuclear units for the Florida Office of Public Counsel. He has been selected by the Georgia Public Service Commission as the Independent Construction Monitor for Georgia Power Company's new AP1000 nuclear power plants, Plant Vogtle Units 3 and 4. He has assisted the Georgia Public Service Commission staff in development of energy policy issues related to supply-side resources and in evaluation of applications for certification of power generation projects and assists the staff in monitoring the construction of these projects. He has also assisted in providing regulatory oversight related to an electric utility's evaluation of responses to an RFP for a supply-side resource and subsequent negotiations with short-listed bidders. He has provided technical litigation support and expert testimony support in several complex law suits involving power generation facilities. He monitors power plant operations for GDS clients and has provided testimony on power plant operations and decommissioning in several jurisdictions. Dr. Jacobs represents a GDS client on the management committee of a large coal-fired power plant currently under construction. Dr. Jacobs has provided testimony before the Georgia Public Service Commission, the Public Utility Commission of Texas, the North Carolina Utilities Commission, the South Carolina Public Service Commission, the Iowa State Utilities Board, the Louisiana Public Service Commission, the Florida Public Service Commission, the Indiana Regulatory Commission, the Wisconsin Public Service Commission, the Arizona Corporation Commission and the FERC.



A list of Dr. Jacobs' testimony is available upon request.

1986-Present GDS Associates, Inc.

As Executive Consultant, Dr. Jacobs assists clients in evaluation of management and technical issues related to power plant construction, operation and design. He has evaluated and testified on combustion turbine projects in certification hearings and has assisted the Georgia PSC in monitoring the construction of the combustion turbine projects. Dr. Jacobs has evaluated nuclear plant operations and provided testimony in the areas of nuclear plant operation, construction prudence and decommissioning in nine states. He has provided litigation support in complex law suits concerning the construction of nuclear power facilities. Dr. Jacobs is the Georgia PSC's Independent Construction Monitor for the Plant Vogtle 3 and 4 nuclear project.

1985-1986 Institute of Nuclear Power Operations (INPO)

Dr. Jacobs performed evaluations of operating nuclear power plants and nuclear power plant construction projects. He developed INPO Performance Objectives and Criteria for the INPO Outage Management Department. Dr. Jacobs performed Outage Management Evaluations at the following nuclear power plants:

- Connecticut Yankee - Connecticut Yankee Atomic Power Co.
- Callaway Unit I - Union Electric Co.
- Surry Unit I - Virginia Power Co.
- Ft. Calhoun - Omaha Public Power District
- Beaver Valley Unit 1 - Duquesne Light Co.

During these outage evaluations, he provided recommendations to senior utility management on techniques to improve outage performance and outage management effectiveness.

1979-1985 Westinghouse Electric Corporation

As site manager at Philippine Nuclear Power Plant Unit No. 1, a 655 MWe PWR located in Bataan, Philippines, Dr. Jacobs was responsible for all site activities during completion phase of the project. He had overall management responsibility for startup, site engineering, and plant completion departments. He managed workforce of approximately 50 expatriates and 1700 subcontractor personnel. Dr. Jacobs provided day-to-day direction of all site activities to ensure establishment of correct work priorities, prompt resolution of technical problems and on schedule plant completion.

Prior to being site manager, Dr. Jacobs was startup manager responsible for all startup activities including test procedure preparation, test performance and review and acceptance of test results. He established the system turnover program, resulting in a timely turnover of systems for startup testing.

As startup manager at the KRSKO Nuclear Power Plant, a 632 MWE PWR near Krsko, Yugoslavia, Dr. Jacobs' duties included development and review of startup test procedures, planning and coordination of all startup test activities, evaluation of test results and customer assistance with regulatory questions. He had overall responsibility for all startup testing from Hot Functional Testing through full power operation.

1973 - 1979 NUS Corporation

As Startup and Operations and Maintenance Advisor to Korea Electric Company during startup and commercial operation of Ko-Ri Unit 1, a 595 MWE PWR near Pusan, South Korea, Dr. Jacobs advised KECO on all phases of startup testing and plant operations and maintenance through the first year of commercial operation. He assisted in establishment of administrative procedures for plant operation.

As Shift Test Director at Crystal River Unit 3, an 825 MWE PWR, Dr. Jacobs directed and performed many systems and integrated plant tests during startup of Crystal River Unit 3. He acted as data analysis engineer and shift test director during core loading, low power physics testing and power escalation program.

As Startup engineer at Kewaunee Nuclear Power Plant and Beaver Valley, Unit 1, Dr. Jacobs developed and performed preoperational tests and surveillance test procedures.

1971 - 1973 Southern Nuclear Engineering, Inc.

Dr. Jacobs performed engineering studies including analysis of the emergency core cooling system for an early PWR, analysis of pressure drop through a redesigned reactor core support structure and developed a computer model to determine tritium build up throughout the operating life of a large PWR.

#### **SIGNIFICANT CONSULTING ASSIGNMENTS:**

Georgia Public Service Commission – Selected as the Independent Construction Monitor to assist the GPSC staff in monitoring all aspects of the design, licensing and construction of Plant Vogtle Units 3 and 4, two AP1000 nuclear power plants.

Georgia Public Service Commission – Assisted the Georgia Public Service Commission Staff and provided testimony related to the evaluation of Georgia Power Company's request for certification to construct two AP1000 nuclear power plants at the Plant Vogtle site.

South Carolina Office of Regulatory Staff – Assisted the South Carolina Office of Regulatory Staff in evaluation of South Carolina Electric and Gas’ request for certification of two AP1000 nuclear power plants at the V.C. Summer site.

Florida Office of Public Counsel – Assists the Florida Office of Public Counsel in monitoring the development of four new nuclear power plants and extended power uprates on five nuclear units in Florida including providing testimony on the prudence of expenditures.

East Texas Electric Cooperative – Represented ETEC on the management committee of the Plum Point Unit 1 a 650 Mw coal-fired plant under construction in Osceola, Arkansas and represents ETEC on the management committee of the Harrison County Power Project, a 525 Mw combined cycle power plant located near Marshall, Texas.

Arizona Corporation Commission – Evaluated operation of the Palo Verde Nuclear Generating Station during the year 2005. Included evaluation of 11 outages and providing written and oral testimony before the Arizona Corporation Commission.

Citizens Utility Board of Wisconsin – Evaluated Spring 2005 outage at the Kewaunee Nuclear Power Plant and provided direct and surrebuttal testimony before the Wisconsin Public Service Commission.

Georgia Public Service Commission - Assisted the Georgia PSC staff in evaluation of Integrated Resource Plans presented by two investor owned utilities. Review included analysis of purchase power agreements, analysis of supply-side resource mix and review of a proposed green power program.

State of Hawaii, Department of Business, Economic Development and Tourism – Assisted the State of Hawaii in development and analysis of a Renewable Portfolio Standard to increase the amount of renewable energy resources developed to meet growing electricity demand. Presented the results of this work in testimony before the State of Hawaii, House of Representatives.

Georgia Public Service Commission - Assisted the Georgia PSC staff in providing oversight to the bid evaluation process concerning an electric utility’s evaluation of responses to a Request for Proposals for supply-side resources. Projects evaluated include simple cycle combustion turbine projects, combined cycle combustion turbine projects and co-generation projects.

Millstone 3 Nuclear Plant Non-operating Owners – Evaluated the lengthy outage at Millstone 3 and provided analysis of outage schedule and cost on behalf of the non-operating owners of Millstone 3. Direct testimony provided an analysis of additional post-outage O&M costs that would result due to the outage. Rebuttal testimony dealt with analysis of the outage schedule.

H.C. Price Company – Evaluated project management of the Healy Clean Coal Project on behalf of the General Contractor, H.C. Price Company. The Healy Clean Coal Project is a 50 megawatt coal burning power plant funded in part by the DOE to demonstrate advanced clean coal technologies. This project involved analysis of the project schedule and evaluation of the impact of the owner’s project management performance on costs incurred by our client.

Steel Dynamics, Inc. – Evaluated a lengthy outage at the D.C. Cook nuclear plant and presented testimony to the Indiana Utility Regulatory Commission in a fuel factor adjustment case Docket No. 38702-FAC40-S1.

Florida Office of Public Counsel - Evaluated lengthy outage at Crystal River Unit 3 Nuclear Plant. Submitted expert testimony to the Florida Public Service Commission in Docket No. 970261-EI.

United States Trade and Development Agency - Assisted the government of the Republic of Mauritius in development of a Request for Proposal for a 30 MW power plant to be built on a Build, Own, Operate (BOO) basis and assisted in evaluation of Bids.

Louisiana Public Service Commission Staff - Evaluated management and operation of the River Bend Nuclear Plant. Submitted expert testimony before the LPSC in Docket No. U-19904.

U.S. Department of Justice - Provided expert testimony concerning the in-service date of the Harris Nuclear Plant on behalf of the Department of Justice U.S. District Court.

City of Houston - Conducted evaluation of a lengthy NRC required shutdown of the South Texas Project Nuclear Generating Station.

Georgia Public Service Commission Staff - Evaluated and provided testimony on Georgia Power Company's application for certification of the Intercession City Combustion Turbine Project - Docket No. 4895-U.

Seminole Electric Cooperative, Inc. - Evaluated and provided testimony on nuclear decommissioning and fossil plant dismantlement costs - FERC Docket Nos. ER93-465-000, et al.

Georgia Public Service Commission Staff - Evaluated and prepared testimony on application for certification of the Robins Combustion Turbine Project by Georgia Power Company - Docket No. 4311-U.

North Carolina Electric Membership Corporation - Conducted a detailed evaluation of Duke Power Company's plans and cost estimate for replacement of the Catawba Unit 1 Steam Generators.

Georgia Public Service Commission Staff - Evaluated and prepared testimony on application for certification of the McIntosh Combustion Turbine Project by Georgia Power Company and Savannah Electric Power Company - Docket No. 4133-U and 4136-U.

New Jersey Rate Counsel - Review of Public Service Electric & Gas Company nuclear and fossil capital additions in PSE&G general rate case.

Corn Belt Electric Cooperative/Central Iowa Power Electric Cooperative - Directs an operational monitoring program of the Duane Arnold Energy Center (565 Mwe BWR) on behalf of the non-operating owners.

Cities of Calvert and Kosse - Evaluated and submitted testimony of outages of the River Bend Nuclear Station - PUCT Docket No. 10894.

Iowa Office of Consumer Advocate - Evaluated and submitted testimony on the estimated decommissioning costs for the Cooper Nuclear Station - IUB Docket No. RPU-92-2.

Georgia Public Service Commission/Hicks, Maloof & Campbell - Prepared testimony related to Vogtle and Hatch plant decommissioning costs in 1991 Georgia Power rate case - Docket No. 4007-U.

City of El Paso - Testified before the Public Utility Commission of Texas regarding Palo Verde Unit 3 construction prudence - Docket No. 9945.

City of Houston - Testified before Texas Public Utility Commission regarding South Texas Project nuclear plant outages - Docket No. 9850.

NUCOR Steel Company - Evaluated and submitted testimony on outages of Carolina Power and Light nuclear power facilities - SCPSC Docket No. 90-4-E.

Georgia Public Service Commission/Hicks, Maloof & Campbell - Assisted Georgia Public Service Commission staff and attorneys in many aspects of Georgia Power Company's 1989 rate case including nuclear operation and maintenance costs, nuclear performance incentive plan for Georgia and provided expert testimony on construction prudence of Vogtle Unit 2 and decommissioning costs of Vogtle and Hatch nuclear units - Docket No. 3840-U.

Swidler & Berlin/Niagara Mohawk - Provided technical litigation support to Swidler & Berlin in law suit concerning construction mismanagement of the Nine Mile 2 Nuclear Plant.

Long Island Lighting Company/Shea & Gould - Assisted in preparation of expert testimony on nuclear plant construction.

North Carolina Electric Membership Corporation - Prepared testimony concerning prudence of construction of Carolina Power & Light Company's Shearon Harris Station - NCUC Docket No. E-2, Sub537.

City of Austin, Texas - Prepared estimates of the final cost and schedule of the South Texas Project in support of litigation.

Tex-La Electric Cooperative/Brazos Electric Cooperative - Participated in performance of a construction and operational monitoring program for minority owners of Comanche Peak Nuclear Station.

Tex-La Electric Cooperative/Brazos Electric Cooperative/Texas Municipal Power Authority (Attorneys - Burchette & Associates, Spiegel & McDiarmid, and Fulbright & Jaworski) - Assisted GDS personnel as consulting experts and litigation managers in all aspects of the lawsuit brought by Texas Utilities against the minority owners of Comanche Peak Nuclear Station.