**BEFORE THE**

**GEORGIA PUBLIC SERVICE COMMISSION**

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| **IN THE MATTER OF GEORGIA POWER COMPANY’S TWENTY-FIFTH 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**

**DECEMBER 1, 2021**

**Table of Contents**

[I. INTRODUCTION 1](#_Toc89016204)

[II. UNIT THREE SCHEDULE 7](#_Toc89016205)

[III. SNC MANAGEMENT DECISIONS 13](#_Toc89016206)

[IV. UPDATE ON UNIT 3 HOT FUNCTIONAL TESTING 24](#_Toc89016207)

[V. UNIT 3 CHALLENGES 26](#_Toc89016208)

[VI. UNIT 4 UPDATE 34](#_Toc89016209)

[VII. PROJECT COST UPDATE 35](#_Toc89016210)

[VIII. RECOMMENDATIONS 37](#_Toc89016211)

## I. INTRODUCTION

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

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

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

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

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

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

**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 the Twenty-Fourth 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 Project forecast Cost and Schedule as they occur. In addition, I keep the Commission informed of significant challenges to the Project that could impact the Project forecast Cost and/or Schedule. I have presented testimony in the Plant Vogtle Unit 3 and 4 Certification (Docket 27800) and the First through the Twenty-Fourth Semi-Annual VCM proceedings describing the construction monitoring activities, the status of the Project and any concerns or significant issues.

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

**A.** Our assignment is to present the results of the Staff’s oversight from certification of the Project to the present with emphasis on the time period covered by the Twenty-Fifth Semi-annual VCM Report (“25 VCM”), January 1, 2021 to June 30, 2021. In this testimony, we present our analysis of the current status of the Project and discuss at a high level the status of the most recent Schedule and Cost forecast provided by the Company and identify risks and areas of concern for the Project. Details of the schedule and cost analyses are provided in the testimony of Mr. Donald N. Grace. Finally, we make a recommendation regarding Georgia Power Company’s (“Company”) request for verification and approval of costs incurred during the Twenty-Fifth Semi-annual VCM Report period in the amount of $67 million.

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

**A.** As described in prior VCM testimonies, the Staff Team continues to actively monitor the Project. Monitoring activities include monthly meetings between Staff and Company personnel to discuss Project status. As a result of COVID-19, other than the permanent on-site representative, the Staff Team has not made regular site visits as in the past; however, on October 8-9, 2021, Mr. Roetger and Mr. Grace did perform a walk down of both Units. Staff continues to be active in all major site related meetings such as the Monthly Project Review (“MPR”) meeting. We review the Company’s Weekly Metrics reports, Monthly Status Reports including addenda, and submit data requests to the Company for additional information. The Team has continued its review of the Company’s process for handling Project invoices from WEC[[1]](#footnote-1) and Bechtel[[2]](#footnote-2), and other Company contractors. This includes review of the Project cost control procedures and sampling of processed invoices. Please refer to the Shemetha Q. Jones testimony for further details on the cost review Staff performs. Other examples of activities conducted by the Staff Vogtle Construction Monitoring Team include:

* Review of Monthly status reports issued by Bechtel and Westinghouse;
* Review of the Company’s Semi-Annual VCM Reports and testimony;
* Preparation of discovery requests for additional information as needed following review of the monthly status reports, semi-annual construction monitoring reports or meetings with the Company;
* Monitoring via teleconference the site Plan of the Day and Work-To-Go meetings;
* Attendance via teleconference at management briefings by the Vogtle Construction Review Board;
* Attendance via teleconference in bi-weekly SNC Management Update Calls;
* Attendance via teleconference in monthly meetings with the Company to review the Project Management Board presentation;
* Participation in Nuclear Regulatory Commission (“NRC”) public meetings in person and via conference call as appropriate;
* Review of public correspondence between the Company and the NRC;
* Review of correspondence between the Contractor and the Company;
* Review of trade articles and journals related to new nuclear power plant development;

In addition, as described in our testimony in the Twenty-First VCM, the Vogtle Project monitoring activities by Staff and the Construction Monitor have been augmented by the addition of the Vogtle Monitoring Group (“VMG”) personnel. VMG activities include a full-time experienced construction manager stationed at the Vogtle site and detailed schedule and cost analyses as presented in Mr. Don N. Grace’s testimony.

**Q. WHAT TIME PERIOD BEYOND JUNE 30, 2021 DOES YOUR TESTIMONY COVER AND WHY?**

**A.** The results of our monitoring includes the July through November 2021 time period. Staff covers the most recent months for which it has accurate data in order to keep the Commission apprised of the status of the Project in as close to real time as possible.

**Q. HAS STAFF’S STANDARD FOR EVALUATING THE PERFORMANCE OF SNC AND GEORGIA POWER COMPANY CHANGED AS A RESULT OF COVID-19?**

**A.** No. Under all circumstances Staff uses the reasonableness and prudency standards as dictated by statute.

**Q. HAS STAFF LOOKED AT THE COSTS AND SCHEDULE IMPACTS OF COVID-19?**

**A.** Now that COVID-19 has been present on the Project for nearly 20 months, Staff is able to factor into its analyses and conclusions assumptions regarding the impacts of the virus.

## II. UNIT THREE SCHEDULE

**Q. GENERALLY, DESCRIBE UNIT 3 SCHEDULE PERFORMANCE DURING THE VCM 25 PERIOD AND THROUGH OCTOBER OF 2021.**

A. The Unit 3 schedule continues to be extended at a rate of nearly one month of schedule slippage per calendar month of work on the Unit. As described in our VCM 24 testimony, Unit 3 COD slipped three months in the three-month period between July 2020 and October 2020 (VCM 24 Roetger-Jacobs, page 8, lines 6-8). In its Twenty-Fifth Semi-annual Vogtle Construction Monitoring Report dated August 31, 2021, Table I-A, the Company provided a benchmark schedule with Unit 3 COD in June 2022. In the Company’s VCM 25 direct testimony of Stephen Kuczynski filed October 21, 2021, the forecast of Unit 3 COD had slipped to September 2022, a slip of 3 months during the 2 months between the Company’s reporting dates. This level of schedule performance does little to inspire confidence in the Company’s ability to accurately forecast progress on the Project. We have testified in many prior VCMs that the schedules provided by the Company are not achievable. As discussed in more detail further in this testimony, the Company’s lack of a reasonable and achievable schedules has had and continues to have negative impacts to the Project.

**Q. PLEASE COMPARE THE VCM 24 DATES TO THE VCM 25 DATES FOR THE MAJOR MILESTONES OF 103(g) LETTER, FUEL LOAD AND COD FOR UNIT 3 AS SHOWN IN THE COMPANY’S DIRECT TESTIMONY.**

A. These dates are shown in the table below:

|  |  |  |  |
| --- | --- | --- | --- |
| Unit 3 Milestone | VCM 24Site Work PlanApril 2021 Current View | VCM 25Target In-service Date | Additional Month Delay |
| 103(g) Letter Issued | August 2021 | April 2022 | 7 |
| Fuel Load | August 2021 | May 2022 | 8 |
| COD | December 2021 | September 2022 | 9 |

**Q. PLEASE EXPLAIN THE 103(g) LETTER AND ITS SIGNIFICANCE.**

A. The name of this letter comes from the paragraph in 10 CFR 52.103(g) in which the NRC makes a finding that the acceptance criteria, or Inspections, Tests, Analyses, & Acceptance Criteria (“ITAAC”), in the Combined License are met. Upon satisfactory completion of all ITAAC, the Company will submit a letter to the NRC formally stating that all ITAAC are complete. The NRC will review the Company’s submittal and, if they agree, the NRC will issue the 103(g) finding authorizing the loading of fuel into the reactor.

**Q. DIDN’T YOU FORECAST ADDITIONAL SCHEDULE DELAYS IN YOUR TESTIMONY IN VCM 24?**

A. Yes, in our testimony in VCM 24 we stated that it was our opinion that “Unit 3 COD would be significantly later than the 1/18/2022 Unit 3 forecast by the Company.” (VCM 24 Testimony, Roetger-Jacobs, page 9, lines 18-19). We explained that the primary drivers of this delay were the delay in starting HFT, the extended duration of HFT and the duration between completion of HFT and Fuel Load.

**Q. IN YOUR VCM 24 TESTIMONY, WHAT FACTORS DID YOU IDENTIFY THAT WOULD INCREASE THE DURATION BETWEEN COMPLETION OF HFT AND FUEL LOAD?**

A. As discussed in more detail in our VCM 24 testimony, we identified the following factors that we believed would increase the duration between completion of HFT and Fuel Load:

* Completion of direct construction that was planned to be completed prior to HFT but had been deferred until after HFT;
* Completion of subcontractor work;
* Late turnover of systems from construction to ITP;
* Completion of pre-operational tests;
* Late turnover of systems from ITP to Operations;
* Turnover of areas from Construction to Operations;
* Completion of ITAAC and submittal of ITAAC to the NRC;
* Receipt of the 103(g) letter from the NRC;

**Q. WAS YOUR VCM 24 FORECAST OF ADDITIONAL DELAYS BETWEEN HFT AND UNIT 3 FUEL LOAD ACCURATE?**

A. Yes, it was. In its testimony in VCM 24, the Company forecast the duration between HFT and Fuel Load to be four months from April 2021 to August 2021. The current forecast is for the duration between HFT and Fuel Load is 10 months from July 28, 2021 to May 2022. So, the duration between completion of HFT and the current target date for Fuel Load is 2.5 times the duration forecast by the Company in VCM 24. We note that Fuel Load in May 2022 is only a forecast and given the lack the Company’s history of providing unreliable and inaccurate forecasts, the duration between completion of HFT and Fuel Load could be even longer.

**Q. WHAT IS THE CURRENT CRITICAL PATH FOR UNIT 3 AT THIS TIME?**

A. Currently the actual Unit 3 critical path is difficult to determine. Unit 3 has many near critical paths at this time that are within hours of each other so the primary critical path changes from day to day. The near critical paths are shown below. Note that these are subject to change:

* Completion of construction and testing of the Passive Containment Cooling System (“PCS”) system;
* Completion of testing and retesting of the Protection and Safety Monitoring System (“PMS”);
* Completion of electrical rework in the Main Control Room;
* Completion of electrical rework in the Containment Building;
* Completion of construction and remediation of electrical work in the Auxiliary Building;
* Completion of testing of the Stand-by Diesel Generators;
* Completion and testing of the Class 1E DC and UPS System (“IDS”);
* Completion and testing of the Radiation Monitoring System (“RMS”);

**Q. WHAT ARE THE DRIVERS OF THE UNIT 3 SCHEDULE DELAYS AND CHALLENGES TO FUEL LOAD?**

A. Simply stated, the main driver is finish building the plant, test it and turn it over to Operations. The current challenges are essentially the same as we identified in VCM 24. A brief description of the Unit 3 challenges and schedule drivers are shown below:

* Completion of electrical punchlist closeout items. These include items required by IEEE remediation and other items required to complete electrical construction. As of the November 9, 2021 Weekly Project Metrics report, XXXX items required completion of work and verification and an additional XXX items were field work complete but require verification. Total work to go punchlist items for Fuel Load were approximately XXXXX[[3]](#footnote-3) (Project Management Board meeting slide 28, dated October 27, 2021);
* As of the November 9, 2021 Weekly Project Metrics report, XXXX work packages required for the 103(g) submittal remained to be closed and an additional XXXX work packages require closure for Fuel Load.
* As of the November 9, 2021 Weekly Project Metrics report, 153 ITAAC remained to be completed and submitted to the NRC;
* As of the November 9, 2021 Weekly Project Metrics report, XX component tests are required to meet the 103(g) requirements and an additional XXXX component tests are required to be completed for Fuel Load.
* As of the November 16, 2021 Weekly Project Metrics report, 50 systems remain to be turned over to Operations prior to Fuel Load;

 As seen from the data above, a large amount of work must be completed to finish construction and testing of the plant, completing and submitting the ITAAC to the NRC and turning the plant over to Operations.

**Q. WHAT IS YOUR OPINION OF THE CURRENT UNIT 3 SCHEDULE?**

A. Staff believes that the current Risk Adjusted Unit 3 COD of September 2022 is more reasonable than prior schedules issued by the Company. However, the Risk Adjusted COD, or Target Schedule COD, of September 2022 faces significant challenges as described above and in the testimony of Mr. Grace. We agree with Mr. Grace that a more probable forecast for Unit 3 COD is between December 2022 and February 2023.

## III. SNC MANAGEMENT DECISIONS

**Q. WHAT WAS THE MAJOR SIGNIFICANCE OF THE 17TH VCM?**

A. The major issue to be resolved at the conclusion of the 17th VCM was to decide whether to continue the Project, either as a two Unit site or a one Unit site or cancel the Project. The issue can also be called a ‘go’, or ‘no go’ decision.

**Q. WHAT WAS THE COMPANY’S RECOMMENDATION WITH REGARD TO THIS GO OR NO GO DECISION?**

A. The Company recommended the Commission, after a lengthy presentation of analyses and reviews, to continue the Project as a two Unit site.

**Q. WHAT DID THE COMMISSION DECIDE WITH RESPECT TO THE CONTINUATION OF THE PROJECT?**

A. The Commission elected to continue the Project and deemed reasonable $7.3 billion estimate at completion (“EAC”) for the Company’s ownership share and deemed the in-service dates of November 2021 for Unit 3 and November 2022 for Unit 4 to be reasonable.

**Q. WOULD ANY PERSON OR PERSONS MAKING THIS GO OR NO GO DECISION HAVE HAD TO RELY HEAVILY ON THE INFORMATION, ANALYSES, AND ASSUMPTIONS PROVIDED BY THE COMPANY?**

A. Yes. No other person or entity as a party to this case had the resources, both human and financial, nor the data set[[4]](#footnote-4), to perform the required detail forecasting.

**Q. WHAT WERE THE COMPANY’S SUMMARY CONCLUSIONS FROM ALL OF THEIR ANALYSES?**

A. They can best be presented in table format. The Table below provides four cases of the cost estimate to complete (“ETC”) the Project. The cases were presented as +20 months, +23 months, +29 months, and then an outer bound of +33 months. The ‘plus’ months used the commercial operation dates of December 2019 for Unit 3 and September 2020 for Unit 4. The first three cases (20, 23, 29) were assigned probabilities while the last case was simple build up from the Integrated Project Schedule and other sources. No formal probability was assigned this case but it was termed as a ‘outer bound’ scenario which could be described as a worse case plus and should never occur.



The bold column, or plus 23 months, was selected as the amount recommended by the Company for approval by the Commission. It is important to note that the plus 23 month scenario also included $1.129 billion of contingency which has been completely used by the Project.

**Q. IS THE EAC AS OF THE 25TH VCM INCLUSIVE OF THE TOSHIBA PARENT GUARANTEE?**

A. Yes. Exclusive of the Guarantee, the EAC would be $23.18 billion ($19.5 B + $3.68 B).

**Q. WHAT CAN BE GATHERED FROM THIS TABLE WITH REGARD TO THE COMPANY’S ANALYSES?**

A. First, no scenario was reasonably accurate. The most accurate scenario was the outer bound case of plus 33 months. Even it underestimated the current forecast of $19.5 billion to complete the Project by $1.7 billion. The percent under the current forecast for the all scenarios, starting with the plus 20 month case, are 16%, 14%, 11%, and 10%, respectively. Second, using the current forecast completion dates of September 2022 for Unit 3 and June 2023 for Unit 4 the units would be plus 33 months and plus 30 months[[5]](#footnote-5). Based on these schedule delays the Units would be completed within the ranges set by the Company in the 17th VCM. Lastly, based on the preceding, the actual change in capital and construction cost has far exceeded any forecast change in capital and construction costs presented by the Company. The actual delay costs are reasonably close to what was assumed in the SNC ETC. Therefore, the vast majority of the cost increase can be attributable to management of site performance.

**Q. DID THE COMPANY ALSO PRESENT INDEPENDENT REVIEWS OF THEIR ETC MEANS AND METHODS?**

A. Yes. The Kenrich Group reviewed the means and methods use by SNC to develop their ETC and agreed with their methodology and results. Bechtel performed a detailed review of its scope of work which was then used by SNC. PricewaterhouseCoopers (“PwC”) performed a Probabilistic Risk Assessment (“PRA”) but used the data inputs and assumptions provided by SNC. PwC did not independently review the data inputs and assumptions. PwC concluded that given the data and assumptions used the predicted outcome should fall within the range of ETCs developed by SNC.

**Q. DOES STAFF BELIEVE THAT SNC’S CURRENT COST FORECAST OF $19.5 BILLION WILL HOLD THROUGH COMPLETION OF UNIT 4?**

A. No. Mr. Grace’s testimony presents analyses that show that an additional $1 billion increase of the total project cost, 100%, is more probable.

**Q. DOES STAFF HAVE ANY THOUGHTS REGARDING WHY THE COST OF THE PROJECT HAVE ESCALATED SO MUCH AND MAY AGAIN BE INCREASED?**

A. Yes. As Staff has stated in every VCM beginning with the sixth VCM, unachievable, and therefore overly aggressive, schedules have had and continue to have serious negative unintended consequences. In an attempt to meet these unachievable schedules, SNC senior management changed the focus on the Project from one of construction completion, then testing, with some reasonable overlap, to a Project that was primarily focused on achieving Major Milestones such as Open Vessel Testing, Cold Hydro Testing, and Hot Functional Testing. This decision required the balance of work off the critical path milestones to be de-emphasized, unaccomplished and therefore pushed forward in the schedule, and it also placed to a significant degree production over quality.

**Q. WHAT ARE SOME OF THE CONSEQUENCES OF AN UNACHIEVABLE SCHEDULE THAT STAFF HAS OBSERVED ON THE PROJECT?**

1. Difficult to status the Project cost and schedule;
2. Inability for senior management to hold personnel accountable to the schedule;
3. Promotes a culture of production over quality;
4. Promotes a culture of poor inspecting or non-inspecting of work;
5. Inability to efficiently staff activities;
6. High personnel turnover and absenteeism;
7. Inability to accurately status the Project;
8. Large backlogs of work scopes;
9. Large backlogs of work package closures;
10. High first-time component testing failure rates;
11. Extensive rework and retesting.

**Q. IN STAFF’S OPINION HAS THE QUALITY ASSURANCE PROGRAM BEEN INEFFECTIVE AT TIMES?**

A. Yes. This can be best explained with an example. In VCM 24 Staff presented an issue with significant pipe hammering while testing the Condensate System (“CDS”) in the Turbine Building [Pp.28-31]. There were four separate pipe hammer events with the first event occurring on December 22, 2019 and the last event occurring on November 5, 2020. After each event a Condition Report[[6]](#footnote-6) (“CR”) should have been generated. It was not until after the last event that a CR was written and acted upon. Staff wrote in the 24th VCM the following:

After each event a Condition Report given a proper severity level should have been written. Had a Condition Report been written after any of the first three events, each subsequent event could have been eliminated. A written Condition Report would have brought the pipe hammer issue to senior management’s attention, who in turn would have instituted measures to prevent recurrence. Writing of Condition Reports is fundamental to a Corrective Action Program and Quality Assurance Program [emphasis added].

The IEEE[[7]](#footnote-7)-384 cable separation issue was very similar in nature to the CDS issue. As far as Staff can ascertain, the first cable violating IEEE-384 was installed in Unit 3 November 2019. This issue was first entered into SNC’s Corrective Action Program (“CAP”) on December 22, 2020 via the writing of CR 50072803 by the ITAAC[[8]](#footnote-8) Group. The Company asserts that there were approximately 600 IEEE-384 violations. No CRs were written between the first improper cable installation until over a year later. In addition to the missed opportunity to mitigate the consequences of the IEEE violations from not writing CRs, in the Company’s own ETC performed for the 17th VCM, two risk items identifying that IEEE-384 could be an issue were included in its Risk Register:





It is the responsibility of SNC, the Licensee, to ensure that an effective Quality Assurance Program (“QAP”) is being performed at all times. It is a regulatory requirement. In addition to writing CRs an Extent of Condition should have been performed to determine if there were other disciplines, or groups, not using the CRs to inform the CAP contained the Company’s QAP. Root Causes for both the CDS issues and the IEEE issues noted that production was placed over quality.

The Apparent Violations (“AV”) by the Nuclear Regulatory Commission (“NRC”) were finalized on November 17, 2021 as two white[[9]](#footnote-9) findings as follows.

1. Final Determination of AV 05200025/2020010-01, **Failure to Promptly Identify and Correct IEEE 384 Cable Separation and Seismic/Structural Nonconformances** (White NOV)

After considering the information developed during the inspection and provided in the October 5, 2021 letter, the NRC concluded that the 10 CFR 50, Appendix B, Criterion XVI violation for Unit 3 is appropriately characterized as White in accordance with IMC 2519, a finding of low to moderate safety significance. The inspectors screened the programmatic finding for the approximately 600 cable separation and multiple seismic/structural nonconformances using Appendix A of IMC 2519. As a result, the inspectors concluded that because examples of the nonconformances affected all four Class 1E divisions, Row 3 of Step 12 was applicable because the finding was associated with structures such that reasonable assurance was not provided to conclude that the structure can meet its design function.

1. Final Determination of AV 05200025/2020010-02, **Failure to Install Electrical Raceways and Connections in Accordance with Applicable Instructions, Procedures, and Drawings**

(White NOV)

After considering the information developed during the inspection and the additional information provided in the October 5, 2021 written response letter, the NRC has concluded that the preliminary greater-than-Green finding which documented the failure to accomplish separation for Class 1E system field installations is a violation of 10 CFR 50, Appendix B, Criterion V and is appropriately characterized as White, a finding of low to moderate safety significance.

**Q. PLEASE DESCRIBE THE ISSUES RELATED TO THESE VIOLATIONS IN MORE DETAIL.**

A. These violations are described in more detail in the NRC’s Special Inspection Report 05200025/2021010 and 05200026/2021010 as shown below:

On July 28, 2020, the licensee identified in condition report (CR) 50057411 that spring nuts on the Unit 3 24-hour, 72-hour, and spare Class 1E direct current (dc) and uninterruptible power supply system (IDS) battery racks (six in total) were improperly installed and did not seat properly on Unistrut channel sections, as prescribed by the vendor manual. On September 29, 2020, the licensee initiated CR 50064326 to capture and assess the impact of other structural issues affecting the Unit 3 IDS battery rack installations, which included torque seals being broken, loose threaded connections, and cross braces not being installed per manufacturer specifications. The licensee performed a root cause determination (RCD) to determine the cause of these issues with the battery racks.

NRC inspectors identified additional nonconformances related to the installation of safety related raceways including:

* Bolts not being fully set on splice plates;
* Double nuts on expansion plates not being installed per design;
* Cable clams not being installed per design;
* Improper thread engagement on splice plates and conduits;
* Improperly installed Unistrut spring nuts.

NRC inspectors observed that some cable raceway issues had been previously identified in the Corrective Action Program and not resolved in a timely manner.

In November and December 2020, the licensee generated 57 CRs related to cable separation. On December 22, 2020, the licensee-initiated CR 50072803, “Electrical Installation Quality Adverse Trend,” to initiate an investigation for not meeting IEEE 384 cable separation provisions. On January 25, 2021, as a result of increased walkdowns, the licensee identified other examples of SR and non-safety-related (NSR) cables not meeting cable separation provisions and initiated an RCD, documented in condition action record (CAR) 80004436, to further examine the causes of the nonconformances

**Q. ARE THESE VIOLATIONS ISOLATED INSTANCES FOR SNC?**

A. No. For example, please refer to the VCM 17 Roetger-Jacobs testimony. For convenience below is the list of Notices of Violation (“NOV”) from that testimony:

1. NOV 2009-201 April 16, 2009 ML091030646: During a Nuclear Regulatory Commission (NRC) inspection conducted at the Southern Nuclear Company (SNC) in Birmingham, AL, on March 3–6, 2009, two violations of NRC requirements were identified.
	1. Criterion VI, “Document Control,” to Appendix B
	2. Criterion XVI, “**Corrective Action**” to Appendix B[[10]](#footnote-10)
2. NOV 2010-008\_002\_001 February 14, 2011 ML110460304: During an NRC inspection conducted between October 1 and December 31, 2010, a violation of NRC requirements was identified. Criterion VII, “Control of Purchased Material, Equipment, and Services,” of Appendix B.
3. NOV 2011-009 September 16, 2011 ML11259A159: During NRC inspections conducted between June 22 to 26, 2011 and August 17 to 18, 2011, a violation of NRC requirements was identified. Criterion III, “Design Control,” of Appendix B
4. NOV 2012-004 November 14, 2012 ML12319A458: During an NRC inspection conducted between July 1 and September 30, 2012, two violations of NRC requirements were identified.
	1. Criterion III, “Design Control,” of Appendix B
	2. Criterion VII, “Control of Purchased Material, Equipment, and Services,” of Appendix B
5. NOV 2012-006 June 19, 2012ML12171A330: During an NRC inspection conducted on April 16-20, 2012, two violations of NRC requirements were identified.
	1. Criterion XVI, **Corrective Action**, of 10 CFR Part 50, Appendix B
	2. Criterion XVI of 10 CFR Part 50, **Corrective Action** of Appendix B
6. NOV 2012-009 June 19, 2012ML12171A058: During an NRC inspection, completed May 25, 2012, one violation of NRC requirements was identified.

10 CFR 50 Appendix B Criterion III, Design Control

1. NOV 2013-007 March 12, 2013 ML13072A805: During an NRC inspection conducted on January 28 through February 1, 2013, one violation of NRC requirements was identified. 10 CFR 50.55(e)(3) require, in part, the licensee to adopt appropriate procedures to evaluate deviations and failures to comply and to identify: (iii)(C) … any significant breakdown in any portion of the quality assurance program conducted under the requirements of Appendix B to 10 CFR Part 50 which could have produced a defect in a basic component.

**Q. HAS THE PROJECT EXPERIENCED OTHER NON-CITED QUALITY CONTROL ISSUES?**

A Yes. For example, please refer to the Roetger-Jacobs Testimony for the 23rd VCM, Section IV, the Roetger Jacobs Testimony for the 24th VCM, Section V, and Section V below.

**Q. HAVE LEGACY WORK PACKAGES BEEN A CONSISTENT PROBLEM FOR THE PROJECT?**

A. Yes. When SNC took control of the Project in April of 2017 they inherited approximately 11,000 legacy work packages that had not been properly closed. Currently, the Unit 3 is in the same situation of having a high backlog of work packages and other paperwork open which will require final closure (please see Section II, page 12 above)

**Q. HAS SNC INSTITUTED A PROCEDURE OR PROCESS FOR UNIT 4 TO ELIMINATE A BUILD UP OF PAPERWORK?**

A. Yes. On Unit 4 SNC has instituted a ‘sign as you go’ policy which requires field engineer signatures and quality control signatures to attest that the as built condition of the equipment installed meets all requirements.

## IV. UPDATE ON UNIT 3 HOT FUNCTIONAL TESTING

**Q. PLEASE BRIEFLY DESCRIBE THE PURPOSE OF HOT FUNCTIONAL TESTING (“HFT”) AND HOW IT IS ACCOMPLISHED.**

A. During HFT, operation of the Reactor Coolant Pumps is used to increase the temperature and pressure of the primary (nuclear) side of the plant to the temperature and pressure that will be experienced during normal operations. This provides an operating environment as close as possible to that experienced during plant operation. While HFT provides a test of the primary side of the plant, not all of the secondary side components and systems are required to be tested. For example, the Auxiliary Boiler in the Turbine Building was not used or tested for HFT. Instead, a temporary external boiler was rented to perform the task.

**Q. TO REFRESH THE COMMISSIONS MEMORY ON THIS TOPIC, WHAT WAS THE ORIGINAL PLANNED DURATION FOR UNIT 3 HFT?**

A. Unit 3 HFT was planned for a duration of 45 days.

**Q. WHAT WAS THE ACTUAL DURATION FOR UNIT 3 HFT?**

A. The actual duration of HFT was 93 days, more than twice the planned duration. The extended duration included the need to cool down after 20 days and failure to reach normal operating temperature until 36 days after starting plant heat up compared to a plan of approximately 14 days after starting plant heat up.

**Q. HOW WOULD STAFF CHARACTERIZE THE PERFORMANCE DURING HFT?**

A. Staff would characterize the performance during HFT as disappointing. In addition to the lengthy extension of the planned duration, many more significant issues were encountered than expected including:

* Problems with the Variable Frequency Drives;
* Problems with Reactor Coolant Pump cable temperatures and amperage;
* Problems with secondary side systems including the Main Feedwater System, Circulating Water System and Condensate System;
* Numerous thermal expansion interferences;
* Problems with support systems that were not fully tested prior to HFT;

**Q. DOES THE COMPLETION OF HFT PROVIDE AN INDICATION OF HOW THE PLANT WILL PERFORM AT POWER AFTER FUEL LOAD?**

A. Yes, it does. An unexpectedly large number of equipment issues were encountered during HFT. Some of these issues such as thermal expansion interferences were resolved as needed to allow the testing to proceed and the resolution of others was deferred until completion of HFT. For example, resolution of issues with the Primary Sampling System (PSS) are still in progress at this time. However, while HFT tests the primary side of the plant, the secondary side is largely untested with the exception of rolling the Main Turbine. Testing of the major secondary side systems such as the Feedwater System and the Condensate System at the flows, pressures and temperatures that will be encountered during power operation cannot be accomplished during HFT. Given the relatively poor performance of primary side equipment during HFT despite the fact that the primary equipment is identical to the China units, and the fact that the Vogtle secondary side equipment is different than the China units and has not been operated before, relatively poor equipment performance during the initial phases power operation would not be surprising.

## V. UNIT 3 CHALLENGES

**Q.** **BRIEFLY DESCRIBE THE ISSUES RELATED TO FAILURE TO INSTALL ELECTRICAL COMMODITIES IN ACCORDANCE WITH IEEE-384 AND SEISMIC AND STRUCTURAL REQUIREMENTS.**

A. In December 2020, several Unit 3 cable separation issues and other electrical installation quality issues were brought to the attention of SNC leadership by the ITAAC group. These issues included cables that did not meet the required separation per IEEE-384 and installation of cable raceway that was not in accordance with seismic and structural requirements. A subsequent extent of condition investigation identified approximately 600 cable separation issues within 64 rooms. In total XXXX electrical punch list items were eventually identified as of the November MPR (October period End).

**Q. WHAT DID THE COMPANY DETERMINE TO BE THE ROOT CAUSE OF THESE FAILURES TO INSTALL ELECTRICAL COMMODITIES IN ACCORDANCE WITH THE REQUIREMENTS?**

A. In March 2021 the Company issued a 101 page Root Cause Determination Report identifying a root cause and several contributing causes for these failures to install electrical commodities in compliance with design and installation requirements. The root cause was determined to be

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While the Company has often stated that safety and quality are the top priorities on the Project, in this case production and meeting the schedule was a priority over ensuring quality. In addition, the Root Cause team determined that construction personnel believed that a nonconformance only occurs if the condition was missed by Field Engineering or Quality Control inspectors. Of the approximately 40,000 inspections performed during 2018 to 2020, only approximately 50 CRs were written. Interviews with QC inspectors stated they would simply communicate what needed to be done in order to pass the inspection rather than enter the issue into the Corrective Action Program as required so that negative trends could be identified and corrected as early as possible.

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The Root Cause Team determined that personnel responsible for electrical installation did not have sufficient knowledge to identify all requirements, which can be contained in several layers of primary and supporting design documents.

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SNC may delegate execution but retains responsibility for the quality assurance program. In this case, Corrective Action Program trending did not provide early identification of quality issues and SNC performance monitoring and field observations did not identify the significance or magnitude of the electrical related deficiencies.

**Q. WHAT HAS BEEN THE IMPACT ON THE PROJECT OF THE COMPANY’S FAILURE TO INSTALL ELECTRICAL COMMODITIES IN ACCORDANCE WITH REQUIREMENTS?**

A. The Company’s failure to install electrical commodities in accordance with requirements and the failure to properly utilize the Corrective Action Program to identify these issues as soon as possible has resulted in massive rework and schedule delays for the Project. Correction of cable separation issues often requires that the cable or cables to be de-terminated and pulled back from the end device. The cable must then be re-routed to obtain the required separation and then reinstalled and re-terminated. Finally, any affected equipment must be retested to ensure it still functions properly. This mitigation work has required thousands of hours to accomplish and has been a massive disruption to the testing program as systems are not ready for testing when planned and critical testing resources have been used to retest equipment that has already been accepted. In addition, the requirement to use hundreds of electricians to perform this rework has diverted electricians from Unit 4 and has delayed critical electrical construction activities on Unit 4.

**Q. PLEASE PROVIDE AN UPDATE OF THE REMEDIATION WORK REQUIRED FOR THE SPENT FUEL POOL AND FUEL TRANSFER CANAL.**

A. The remediation for the Spent Fuel Pool (“SFP”) and Fuel Transfer Canal (“FTC”) are now complete and tested. Each are ready for receipt of fuel.

**Q. WHAT WAS THE EXTENT OF THE REMEDIATION WORK?**

A. For the FTC extensive Non-destructive Examination (“NDE”) was required which revealed welds that showed indications that the welds were not properly performed. These welds were primarily located where the floor meets the walls. These welds had to ground out, re-welded, and then re-examined using sophisticated NDE techniques. The repairs to the SFP were significantly more extensive and issue with the welds located between the floor panels and at the wall panels were exacerbated by ITP testing of the SFP.

**Q. PLEASE EXPLAIN THE TECHNIQUE THAT WAS USED IN THE SFP BY ITP TO ASSIST IN THE IDENTIFICATION OF THE LOCATIONS OF THE LEAKS.**

A. To assist in the identification of the leaks ITP pressurized with air the leak chases that are located underneath all the panel seam welds. To do this the SFP was filled with water. By pressurizing the leak chases the hope was that air bubbles would form at the leaks and therefore identify the leak locations. The initial pressure used was 30 pounds per square inch. When no bubbles were observed, the ITP lead without adequate review or approval decided to double the pressure to 60 pounds per square inch.

**Q. IS IT NORMAL PRACTICE WHEN PERFORMING TESTING TO SIMPLY CHANGE THE PARAMETERS OF THE TEST WITHOUT STOPPING TO CONDUCT ADDITIONAL REVIEW AND RECEIVE APPROVAL, AND IF NECESSARY PERFORM ANALYSES TO SUPPORT THAT THE CHANGE?**

A. No. Doubling of the air pressure is a significant change to the approved test method. The result of this doubling of air pressure was that the floor panels became distorted to the extent that they could no longer be used. New panels had to be manufactured and installed onto the floor of the SFP. Had an analysis been performed its results would have shown that the doubling of the air pressure step change would likely cause further damage to the welded plates.

**Q. WHAT WAS THE DURATION TO FIX ALL THE LEAKS AND POOR WELDING IN THE FTC AND SFP?**

A. The full cycle from the first test to full remediation and submittal of related ITAACs of the FTC and SFP began in March 2021 and is forecast to be complete in January 2022.

**Q. HAVE THERE BEEN STARTUP ISSUES WITH OTHER COMPONENTS THAT STAFF HAS YET TO DISCUSS?**

A. Yes. SNC has had and continues to have significant difficulty in commissioning the Unit Reserve Auxiliary Transformers (“RAT”), Unit Auxiliary Transformers (“UAT”) and the Main Step-up Transformers (“MSU”); the Unit 3 Alpha and Bravo Diesel Generators; the Unit 3 IDS (Class 1E DC and UPS[[11]](#footnote-11) System); and the Unit 3 Protection and Safety Monitoring System (“PMS”).

**Q. WHAT IS THE PURPOSE OF THE RATs, UATs AND MSUs?**

A. They are part of the ECS, or Main AC[[12]](#footnote-12) Power System, which provides normal power to the plant auxiliary and service loads during normal operation. The ECS receives power from either the Main Generator during Unit operation or the off-site electrical power grid when the Turbine Generator is off-line.

**Q. WHAT WAS THE INITIATING EVENT THAT REQUIRED INVESTIGATION OF THE ECS?**

A. On April 22, 2021 the System was attempted to be powered when RAT 4 Alpha tripped. Subsequent to this trip Subject Matter Experts (“SME”) from SNC, Southern Company Services (“SCS”) and Enercon, a consultant, were convened to assess the protection of and vulnerabilities of the ECS System.

**Q. WHAT WERE SME’S FINDINGS?[[13]](#footnote-13)**

A. Their findings were as follows:

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**Q. PLEASE PROVIDE A SUMMATION OF THE CONDITIONS REPORTS WRITTEN AGAINST THESE ISSUES?**

A. The first CR was written on April 27, 2021. So far, Staff has been able to identify approximately forty CRs written against testing of the RATs, MSUs, and UATs. Please refer to Exhibit A at the end of this testimony for a complete list with description.

**Q. WOULD THIS LEVEL OF EFFORT BE EXPECTED TO ENERGIZE THE MSUs, UATs, RATs?**

A. No. This series of components, configurations, and application is common place for a utility scale generation plant of any type. There is nothing unusual about this site that should have caused these many issues

**Q.** **ARE THERE OTHER AREAS THAT STAFF IS MONITORING DUE TO EXCESSIVE REMEDIATION AND/ OR LONG DURATIONS?**

A. Yes. Staff is closely monitoring testing of the Diesel Generators (“DG”), the finalization of the Main Control Room (“MCR”), the Plant Lighting System (“ELS”), the Communication System (“EFS”), the Class 1E DC and UPS System (“IDS”), and the Protection and Safety Monitoring System (“PMS”).

## VI. UNIT 4 UPDATE

**Q. PLEASE PROVIDE AN UPDATE ON THE STATUS OF UNIT 4 SCHEDULE.**

A. As with Unit 3, the Unit 4 major milestones continue to slip with the target in-service date now forecast to be June 2023. This represents an additional 3-month schedule extension from the prior target in-service date of March 2023 Risk Adjusted completion date presented in the October 20, 2021 Monthly Project Review meeting.

**Q. WHAT IS YOUR ASSESSMENT OF THE COMPANY’S CURRENT UNIT 4 TARGET IN-SERVICE DATE OF JUNE 2023?**

A. We believe that the June 2023 target in-service date for Unit 4 is more reasonable than prior schedule forecasts but that achieving COD by June 2023 faces significant challenges. As described in the detailed Unit 4 schedule analysis presented in the testimony of Donald Grace, we find that the probable range of Unit 4 COD from November 2023 to February 2024 is a more reasonable forecast of Unit 4 COD.

**Q. PLEASE BRIEFLY DESCRIBE THE CHALLENGES THAT COULD FURTHER DELAY UNIT 4 COD BEYOND JUNE 2023.**

A. Challenges that could further delay Unit 4 COD beyond June 2023 include:

* Continued delays in Unit 3 COD;
* Inability to decrease the current lag from Unit 3COD to 12 months;
* Inability to attract sufficient electrical craft to support the plan of staffing Unit 4 independently from Unit 3.

## VII. PROJECT COST UPDATE

**Q. PLEASE PROVIDE A BRIEF UPDATE ON THE FORECAST COST OF THE VOGTLE 3 AND 4 PROJECT DURING THE VCM 25 PERIOD.**

A. The Project cost forecast is discussed in detail in the testimony of Mr. Don Grace. Through the VCM 25 period ending June 30, 2021, GPC’s Total Construction & Capital Cost increased by $561 million from $10.005 billion in VCM 24 to $10.565 billion as shown in Table 1.1 of the Company’s Twenty-fifth Semi-annual Vogtle Construction Monitoring Report. The Project to Date Total Construction & Capital Cost, net of Parent Guarantee, increased by $541 million from $7.233 billion in VCM 24 to $7.841 billion in VCM 25.

**Q. WHAT IS THE COMPANY’S FORECAST FOR THE COST OF THE PROJECT AT COMPLETION AS PRESENTED IN THEIR VCM 25 SEMI-ANNUAL REPORT?**

A. The Company’s projected share of the total Project cost increased by $508 million since VCM 24 to $9.2 billion.

**Q. HAS THE COMPANY’S TOTAL PROJECT COST FORECAST INCREASED SINCE IT FILED THE VCM 25 SEMI-ANNUAL REPORT?**

A. Yes, the Company’s Total Project Cost forecast has increased an additional $300 million since it filed the VCM 25 Semi-annual Report.

**Q. WHAT DROVE THIS INCREASE IN FORECAST COST DURING VCM 25?**

A. Several factors drove the forecast cost increase and continue to drive cost increases at this time. These factors include”

* Continued schedule slippage of both Unit 3 and Unit 4;
* Additional costs to complete remediation work that resulted from poor initial quality and failure to perform electrical construction of cables and supports in accordance with specifications;
* Continued low construction productivity and failure to achieve earned hours and the assumed CPI;
* Additional support required to test and turnover systems to ITP and Operations.

**Q. DO YOU ANTICIPATE CONTINUED INCREASES IN THE FORECAST PROJECT COST IN THE FUTURE?**

A. Yes, we do. We believe future increases in forecast Project cost will continue to be driven by additional remediation on Unit 3, continued schedule slippages of both units, continued low productivity as reflected in a CPI that is higher than the Company is using in its forecast, additional support personnel and field non-manual personnel needed to improve first time quality and prolonged staffing at higher levels than anticipated. These and other factors are discussed in detail in Mr. Grace’s testimony in which he predicts Total Project Costs (100% $) to be in the range of $20.1 billion to $20.5 billion compared to the Company’s forecast of $19.5 billion.

## VIII. RECOMMENDATIONS

**Q. WHAT IS STAFF’S RECOMMENDATION WITH REGARD TO THE AMOUNT REQUESTED BY THE COMPANY TO BE VERIFIED AND APPROVED IN THE CURRENT VCM?**

A**.** Staff recommends that the expenditures of $67 million incurred during the Twenty-fifth VCM period be verified and approved. As Staff has previously explained, “verification and approval” of costs means a determination that such costs have actually been spent on the Project and does not preclude a subsequent disallowance by the Commission.

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

A**.** Yes.

EXHIBIT A

ECS Condition Reports

The list below highlights the subsequent events that occurred and that some required remediation[[14]](#footnote-14):

* REDACTED IN ITS ENTIRETY

 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, Florida2003-2005**

**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

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, Georgia1996-1997

**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

**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 rolling12 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.

1. Westinghouse provides the engineering, design, and applicable analyses for the Design Certification Document (“DCD”). [↑](#footnote-ref-1)
2. Bechtel is the construction contractor. [↑](#footnote-ref-2)
3. This large number of punch list items is atypical. Punch list work usually refers to minor touch-ups and adjustments; however, for the Vogtle site, punch list refers to all remaining work that had been pushed forward from previous schedules, re-work and remaining punch list items. [↑](#footnote-ref-3)
4. Fluor and WEC design details, commodity take-offs, unit rates, etc… [↑](#footnote-ref-4)
5. It should be noted that at certification the in-service dates for Unit 3 and Unit 4 were forecast to be April 1, 2016 and April 1, 2017; or currently plus 77 months for Unit 3 and plus 73 months for Unit 4. [↑](#footnote-ref-5)
6. A Condition Report is used to document variances from design, poor quality, lessons learned, unintended events [↑](#footnote-ref-6)
7. IEEE = Institute of Electrical and Electronics Engineers [↑](#footnote-ref-7)
8. Inspections, Tests, Analyses, &Acceptance Criteria [↑](#footnote-ref-8)
9. A White finding is characterized as a finding of low to moderate safety significance. [↑](#footnote-ref-9)
10. [↑](#footnote-ref-10)
11. DC = Direct Current; UPS = Uninterruptable Power Supply [↑](#footnote-ref-11)
12. AC = Alternating Current [↑](#footnote-ref-12)
13. Source SNC CAP CRs [↑](#footnote-ref-13)
14. Source SNC CAP CRs [↑](#footnote-ref-14)