

TRIP REPORT
EVALUATION OF THE SITE CONDITIONS OF THE CANCELLED UNITS
VIRGIL C. SUMMER NUCLEAR PLANT

Authors:

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South Carolina Governor's

Nuclear Advisory Council

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I. Introduction

During the August 15, 2024 University of South Carolina sponsored conference on nuclear reactors and the future of the industry, Rick Lee, Chairman of the Governor's Nuclear Advisory Council (GNAC), had occasion to hear Senator Tom Davis, who was serving on a panel discussion, ask questions regarding the possibility of restarting the V.C. Summer Nuclear Power Station project. After the program, Mr. Lee talked to Senator Davis who asked Mr. Lee if he had time to visit the site and report his findings. Mr. Lee agreed to do so.

The purpose of the visit was to observe the status of the site's assets and provide a high-level opinion on the condition of the project facilities and equipment.

This report summarizes the high level observations of the condition of the nuclear units cancelled at the Virgil Summer Nuclear Plant. It is important to note that no assessment of critical NQA-1 quality assurance documentation, maintenance records and the like was performed. The inspection consisted of a 3 hour walk through of many existing facilities, warehouses and storage areas containing critical equipment.

In preparation for the visit, Mr. Lee invited Mr. Jim Little, a member of the GNAC, to participate. Mr. Little has industry recognized knowledge and experience surrounding nuclear projects including construction and re-starting. Mr. Lee contacted Santee Cooper personnel who were very happy to arrange a tour of the facilities.

The visit occurred on September 12, 2024. We were accompanied by site personnel who showed us a wide array of structures, storage areas and specialized nuclear power plant equipment. There have been many anecdotal discussions across South Carolina and in the press which indicated that the facility and its materials were in a state of decay and neglect.

We began our inspection assuming the broadly held public opinions and views that the site was in a dramatic state of decay with much material and equipment having been sold or removed from the site were correct.

To the contrary, the observations of the September 12, 2024 visit contained in this report indicate that, conditions and considerations being satisfied, that there were no technical obstacles to a more detailed examination of the potential completion of the facilities.



Aerial view of the inactive V.C. Summer Nuclear Plant Site

II. **Background**

The planned design at the Virgil Summer site were two Westinghouse designed AP1000 units identical to two units recently constructed and now in operation for the Southern Company at the Plant Vogtle site near Augusta, Georgia. The V.C. Summer Unit 2 and 3 site is adjacent to the existing operating Westinghouse-design 3 loop reactor in operation since 1984. The majority ownership of the new units at V.C. Summer would be held by SCE&G with approximately 45% ownership by Santee Cooper, the state-owned, largest utility in South Carolina.

The current state of the project is shown in the aerial photo above with Unit 2 at approximately 48% completion and Unit 3 with significantly less completion. The final resolution currently rests on the proposed sale of project assets and equipment.

Given the pending power shortage in SC, the push towards sustainable energy sources, the extensive lead time for starting new nuclear projects and the significant amount of value invested in the completed work and inventory at V.C. Summer, it is prudent to take a last look at whether the plant offers an opportunity to jump start the solution to our power needs.

III. Scope of Visit

The scope of the visit included a tour of the Unit 2 facilities, key component storage buildings and associated warehouses. An extensive tour of several hours was conducted by site personnel who also provided needed background on the state of conditions and activities already undertaken and planned.

The tour and discussion included the following:

1. Containment Building
2. Turbine Hall
3. Cooling Towers
4. Large Components (Partially Installed on Unit 2, On Site for Unit 3)
 - a. Generator Dome
 - b. Unit 3 Building Assemblies, Sub Structures
 - c. Reactor Vessels (with internals installed)
 - d. Upper Head Assemblies
 - e. Reactor Coolant Pumps
 - f. Steam Generators (Installed on Unit 2)
 - g. Condenser (installed on Unit 2)
 - h. Moisture Separators
 - i. Feed water Heaters
 - j. Containment Rings
 - k. Diesel Generators
 - l. Generator Stator
 - m. Site Crane (disassembled)
5. Buildings
 - a. Administration Building (Complete – ready for occupancy)
 - b. Modular assembly Building (MAB)
 - c. Warehouses (with Class A air-conditioned spaces)

Photographs taken during the visit are attached to the end of this report.

IV. Observations

The Site

Overall, the site is in excellent condition with other than some overgrowth there is no apparent degradation of grade or access to facilities. The laydown areas for materials and large components are well established and, where necessary, cordoned off with signage. The general impression of the site condition is one of a shutdown of several months rather than the actual term of seven years since cancellation in 2017.

Facilities

The condition of the various buildings and facilities shows no degradation, corrosion or spalling of concrete. All of the installed components show no corrosion other than surface rust which would be expected under a construction project in progress. The exposed rebar material, which is coated, also shows no serious defects and with normal rust management techniques could be ready for additional concrete lifts. The warehouses are well maintained and intact with sufficient systems of lighting and ventilation operational.

Components and Materials

Both the installed components and those in storage are in excellent condition. There is an extensive inventory of materials, assemblies and electrical and instrumentation systems that is well maintained and inventoried in a series of warehouses.

V. Conclusions

From a technical perspective, no obvious conditions preclude undertaking completion. This conclusion is a qualified one in that does not include the necessary considerations of re-establishment of the license, addressing the aspects of quality assurance and code compliance with the resumption of a project from a cancelled state. Unit 2 would be the most likely target for consideration given its approximate 48% completion.

Restarting a nuclear power project after suspension or cancellation has been done previously in the United States successfully. In 2015, the Watts Bar Unit 2 project was recommenced after its discontinuation in 1988. In addition, there is the recent completion experience of the identical units at Plant Vogtle with Unit 3 entering commercial operation in 2023 and Unit 4 entering commercial operation this year may provide an opportunity (if approved by Southern Company) for V.C. Summer to have access for the first time to a completed set of as-built engineering drawings.

The following section is a summary list of aspects to be considered in any decision for resumption of the project.

VI. Considerations Regarding Resumption

Reestablishing a nuclear project is a complicated and complex undertaking. In addition to a technical assessment, there are a number of other factors which must be carefully considered. These include:

1. A thorough assessment by qualified and experienced engineering/construction company should be performed to include an assessment of quality documentation, the facilities, the complete inventory of materials and development of a recovery schedule and budget.
2. Identifying sources of funding associated with the completion, evaluating the ownership and equity positions of various stakeholders and an approach required to address state utility commission interests.
3. From a regulatory perspective, much work would be needed to establish a protocol for reestablishing the license and/or developing an alternative Part 50 license approach - a

first-of-a-kind experience. This effort would include an assessment of QA programs and Code conditions, etc.

4. From a project perspective, a significant effort would be necessary to re-constitute project planning and cost and schedule estimates to complete.
5. Development of sources of supply, labor surveys and availability
6. Availability of unit completion design drawings from Southern Company

VII. Potential Next Steps

Our suggested next step would be to conduct a feasibility study with an in-depth assessment of the considerations mentioned Section VI as well as the facilities and equipment inventory. This assessment should provide sufficient clarity of the obstacles which must be overcome to consider a plan for resumption of the project and an assessment of its likelihood of success.

If there is an opportunity to restart the Unit 2 construction, this evaluation should be done in a timely fashion. It is our understanding that agreements among the owners as part of the bankruptcy contain provisions which will declare all the equipment still on the site as of August 2025 as surplus and will be sold off or scrapped. Time is of the essence if this project is to be revived.

With only a brief inspection, there is no guarantee that this plant can be completed economically. However, we concluded that there is enough value at the Unit 2 site in the inventory, parts, completed work and stored critical components to warrant a serious discussion and further investigation as to the feasibility of completion. Towards that end we offer this report.



Date 9-19-24

Rick Lee
Chairman
Governor's Nuclear Advisory Council



Date 9-19-24

Jim Little
Industry Representative
Governor's Nuclear Advisory Council

Inspection photographic documentation on the following pages

Photographs



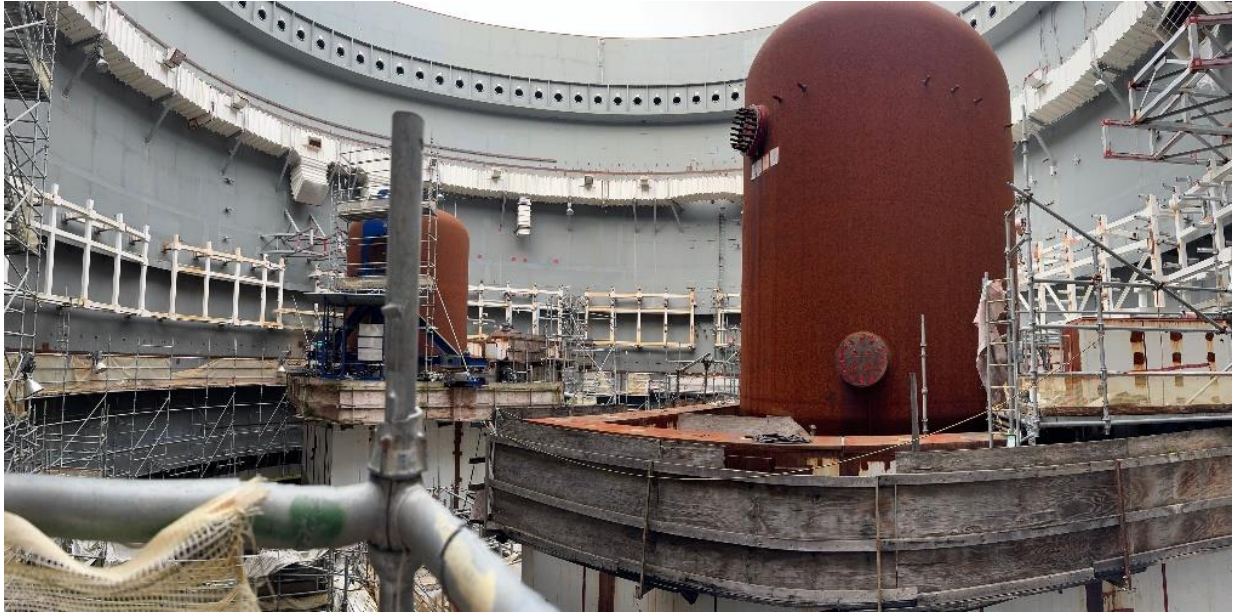
Site Overview (Unit 2 Left, Unit 3 Right)



Unit 2 Reactor Containment Structure



Additional view of Reactor 2 containment structure



Interior of Unit 2 Structure and Containment rings with Steam Generator Installed



Additional view of Unit 2



Upper Reactor Assemblies in storage



Wrapped and stored Unit 3 Steam Generator



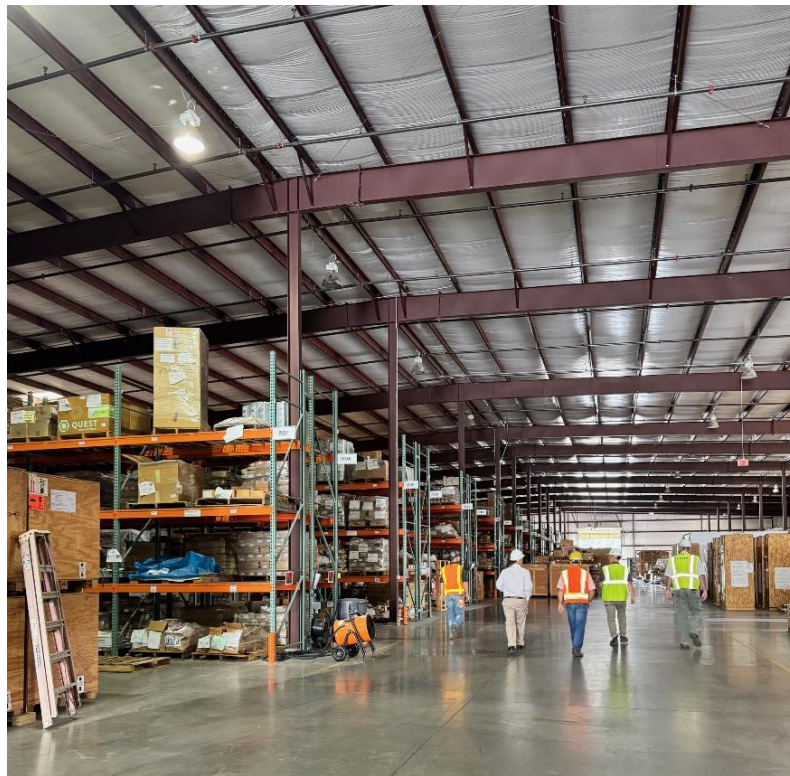
There are 14 Warehouses, 80,000 sq ft each. Ones observed were full of materials



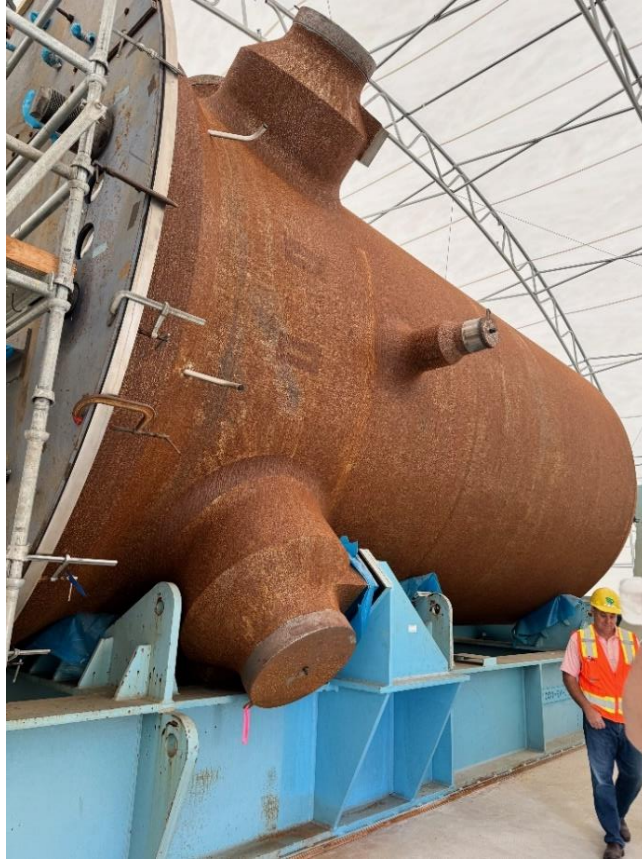
Warehouse Interior



Warehoused Materials



Another warehouse storage area



Unit 3 Reactor Vessel in storage with all Internals



Unit 3 Stator in storage and awaiting installation



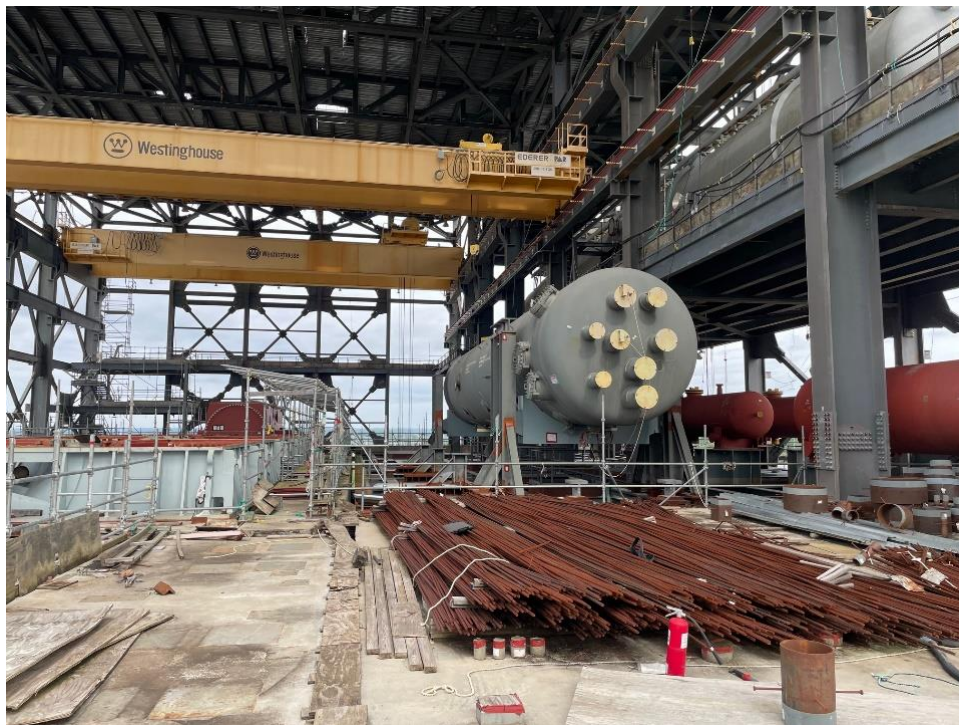
Valve Assemblies in storage



A row of Emergency Power 3500 KW Diesel Generator Packs (4 total) – Regulator Preventive Maintenance is still being performed on the units



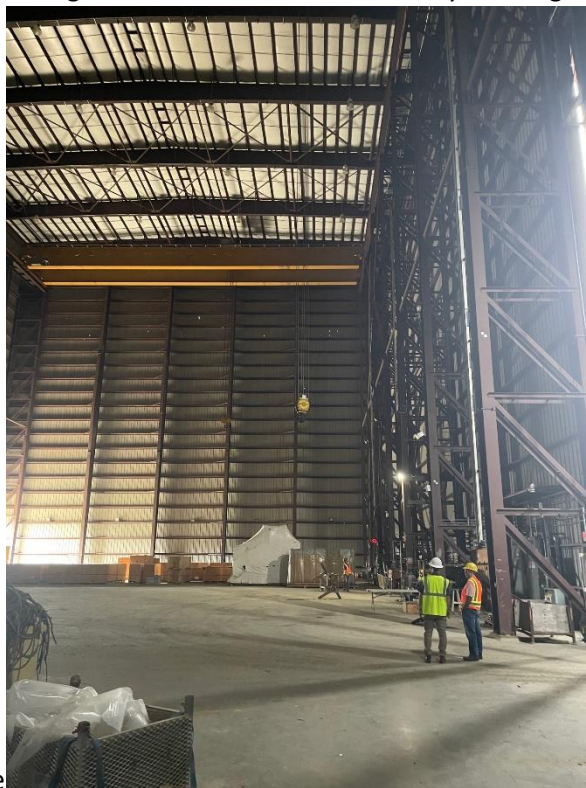
Reactor Coolant Pump storage



Turbine Hall



View from the Unit 2 Turbine Building towards the Modular Assembly Building and Unit 3 Containment



Structure

Modular Assembly Building



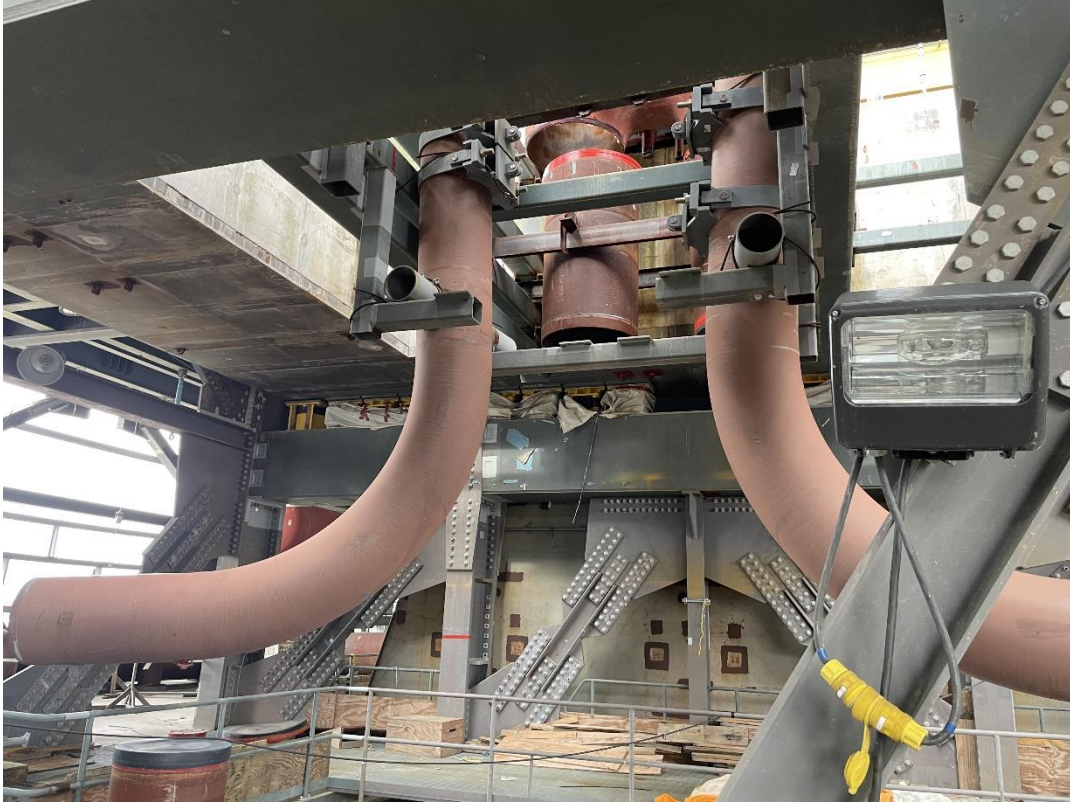
Administration Building (Completed) awaiting sewer system hook up



This photo and the following 3 provide examples of installed equipment, piping and structures in the turbine building



Turbine Building installation



Turbine Building installation



Turbine Building installation