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REBUTTAL TESTIMONY OF

ERIC H. BELL

ON BEHALF OF

SOUTH CAROLINA ELECTRIC & GAS COMPANY

DOCKET NO. 2019-2-E

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Eric H. Bell. My business address is 220 Operation Way, Cayce, South Carolina.

Q. ARE YOU THE SAME ERIC BELL WHO HAS PREVIOUSLY FILED TESTIMONY IN THIS DOCKET?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. The purpose of my rebuttal testimony is to discuss the response of South Carolina Electric & Gas Company ("SCE&G" or the "Company") to the direct testimony of Mr. Brendan Kirby filed on behalf of the South Carolina Coastal Conservation League and Southern Alliance for Clean Energy ("CCL/SACE") regarding the availability of combined cycle ("CC") generation capacity and the Fairfield pumped storage plant for reserves. I also discuss the Company's response to the direct testimony of Mr. Brian Horii filed on behalf of the South Carolina

Office of Regulatory Staff ("ORS") regarding the Navigant study's consideration of risk and cost.

REBUTTAL TO TESTIMONY OF MR. KIRBY

Q. ON PAGE 3, LINES 16 THROUGH 19, AND ON PAGE 1 OF EXHIBIT BK-1, MR. KIRBY SUGGESTS THAT THE ANALYSIS CONDUCTED BY NAVIGANT FAILED TO INCLUDE OFFLINE CC GENERATION CAPACITY AS AVAILABLE RESERVES TO MITIGATE SOLAR FORECAST ERRORS. HOW DO YOU RESPOND TO THIS SUGGESTION?

A. It appears that Mr. Kirby has a fundamental misunderstanding about how SCE&G dispatches its generating facilities. Hydro and internal combustion turbine ("ICT") facilities can be kept offline to quickly provide reserve generation capacity when needed and, when possible, SCE&G currently operates these units in this manner. In contrast, the CC units are not normally offline and sitting idle due to system economics. Fairfield Pumped Storage operation can be altered for regulation and reserves, as was done by Navigant in the production cost models. Currently, however, most of the energy from Fairfield Pumped Storage is dispatched under the economic dispatch plan. This operation is characterized as peak shaving which emphasizes cost minimization by not running and pumping around the clock, but only operating when economical. This also allows Fairfield to fully contribute cost effectively to reserves in peak hours. The Company's steam units have higher

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operation costs than CC units based on current fuel prices. Therefore, SCE&G typically dispatches its CC units to serve load before dispatching its steam units. This means that, when more operating reserves are needed, such as in the event of solar uncertainty, CC units are unavailable to provide additional capacity as these units are already on line. The units that are available to provide such operating reserves normally have higher operating costs than the facilities that are already online and serving load.

Q. COULD SCE&G KEEP CC UNITS OFFLINE FOR RESERVE GENERATION AS MR. KIRBY SUGGESTS?

A. Yes, however, this would require SCE&G to rely more heavily on its steam facilities, which have a higher operating cost due to current fuel prices, thus increasing SCE&G's costs to operate its system. In addition, it takes between 6 to 8 hours to ramp up a CC plant that is offline and requires a warm or cold start. Even a CC unit that already is online but not operating all available turbines takes approximately 2 hours to ramp up to full generation output and capacity. Navigant's VIC analysis conservatively allowed units remaining online to contribute their full remaining output toward reserves.

In addition, hydro, pumped storage, and ICT units are quick-start generators and, therefore, can easily meet reserve requirements if they are needed to quickly replace lost generation, for example, when unexpected weather reduces output from a solar facility. As a matter of economics, slower steam units are kept offline

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to reduce operating costs when possible. These units cannot start in four hours and, therefore, cannot provide offline reserves within the 4-hour ahead forecast time period. If the quick-start hydro, pumped storage, and ICT units are already providing contingency reserves, and SCE&G could be required to keep CC units offline in order to provide the additional offline reserve capacity for solar as Mr. Kirby suggests. Under such an operational scenario, the Company would be required to maintain the slow-start, relatively higher-cost steam units online to create additional overhead online reserve capacity. Thus, operating a CC Unit in the manner Mr. Kirby suggests would significantly increase SCE&G's variable system costs. In summary, using efficient combined cycle to bolster offline operating reserves and altering the pumped storage dispatch from the most economical to fulfill additional reserve requirements adds operating costs.

Q. ARE THERE OTHER OPERATING CONSTRAINTS THAT AFFECT THE DEPLOYMENT OF CC UNITS?

A. Yes. As the "Duck Curve" illustrates, solar provides large amounts of generation even in times of the year when demand is low during the day. This will create an oversupply for several daytime hours, and generation will exceed demand to a point that it difficult to operate. During these events, SCE&G could be forced, against normal, economical, and reliable operating practice, to take one or more of its generating units offline to balance load, reserves, and generating capacity. Because steam units are not responsive enough to come offline and then back online

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for the next or subsequent peak load hour, steam units, the higher cost units, would not be chosen for this response if the unit is needed back online soon. Instead, the more economical CC units would be brought offline due their ability to return to operation more quickly. Like the need for additional operating reserves, these events add operating costs due to the introduction of large amounts of solar generation.

Q. HOW DO YOU RESPOND TO MR. KIRBY'S SUGGESTION ON PAGE 4, LINES 7 THROUGH 9 AND PAGE 8 OF EXHIBIT BK-1 THAT THE NAVIGANT ANALYSIS FAILED TO INCLUDE SIGNIFICANT ADDITIONAL RESERVES FROM THE FAIRFIELD PUMPED STORAGE PLANT AND INTERRUPTIBLE LOAD?

A. Regarding Fairfield, it is my understanding that the Navigant study modeled Fairfield's operations so as to allow it to change its operation to minimize overall system cost while meeting the requirements for solar integration. The model therefore allowed Fairfield to serve as a reserve unit or to meet load depending upon system need and operational cost impact. Accordingly, the Navigant study reflects the operation of Fairfield as Mr. Kirby suggests.

Regarding interruptible load, SCE&G's Interruptible Service Rider to Rates 23 and 24 is designed to address insufficient capacity during peak periods resulting from the loss of firm, dispatchable generating capacity or abnormally high demand on the Company's system due to weather. SCE&G does not believe it would be appropriate, prudent, or reasonable to rely upon interruptible load to meet its need

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for daily operating reserves used to follow load and smooth generation. Relying upon interruptible load in this manner would significantly increase the number of curtailments and result in substantial additional economic impacts to commercial and industrial interruptible customers.

REBUTTAL TO TESTIMONY OF MR. HORII

Q. DID NAVIGANT CONSIDER RISK VERSUS COST WHEN EXAMINING RESERVES NEEDED FOR SOLAR AS SUGGESTED ON PAGE 19, LINE 9?

A. Yes. Navigant and the Company agree that the appropriate solar uncertainty threshold to use in modeling system reserves is a 1% risk of dropping firm load. Before recent growth of solar generation, FERC required that a reserve sharing group ("RSG") must have contingency reserves to back up the largest single contingency in the group, i.e., a sudden loss of the largest generating unit operated in the RSG. In addition, the RSG was required to cover the loss of that generator within 15 minutes and restore contingency reserves within 90 minutes after that. However, FERC, which sets the acceptable level of risk for a failure or outage of a component and the required contingency reserves, does not consider the unexpected loss of solar generation to be a "failure." For this reason, when output from a solar facility is reduced below forecasted levels, for example due to unexpected weather, SCE&G must use operating reserves to replace this lost capacity, but also must

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continue to maintain its available contingency reserves by bringing additional generation units online.

Generation currently provided by solar facilities currently is very volatile. As solar generation grows on the system, this volatility may be reduced and SCE&G may be able to quantify a different risk threshold for use in future years. At present, however, the Company believes it is appropriate to conservatively operate its system in order to remain in compliance with reserve requirements and to avoid dropping load when solar facilities do not meet their generation forecasts.

Q. IS SCE&G SUBJECT TO PENALTIES IF IT DOES NOT MAINTAIN SUFFICIENT CONTINGENCY RESERVES AS REQUIRED BY FERC?

A. Yes. Violations of the NERC reliability standards for Resource and Demand Balancing or VACAR requirements, or instances of controlled load shedding would result in additional reporting to the SERC Regional Reliability Entity, increased reserve and regulation requirements, probable probation and additional regulatory scrutiny, and possible FERC fines up to $1 million per day per incident. Violation of the reliability standards is not something any responsible entity would plan to do, and controlled load shedding is the ultimate last resort a Balancing Area like SCE&G would take before complete loss of system control and possible cascading blackout.

For these reasons, operating the system in the manner suggested by Mr. Horii, which would expose SCE&G to being non-compliant with FERC

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requirements 2% to 4% of the time simply is not a reasonable or prudent option. System reliability is always a significant concern of SCE&G and providing this level of reliable service can result in additional costs. However, the Company believes that such costs are reasonable and appropriate to ensure sufficient generation is available to meet customer needs as well as SCE&G's obligations to comply with FERC requirements.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes.

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