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VANTAGE DATA CENTERS RESPONSE TO COMMITTEE QUESTIONS

August 29, 2018

INTRODUCTION

Vantage Data Centers (Vantage) submits the following responses to the Committee's questions contained in its Memorandum dated August 28, 2017 (TN 224620). Vantage will provide witnesses that can adopt the following as sworn testimony at the Evidentiary Hearing. Vantage requests this document be identified as Exhibit 30.

1. Is the CAT 3526E diesel-fired generator set a turbine generator?

VANTAGE RESPONSE: It should be noted that according to the Revised SPPE Application - Appendix A, the MBGF will utilize CAT 3516 E backup generators. The generators are internal combustion engines and are not turbine generators.

2. Is there a warranty or other specific limitation that should be used to calculate generating capacity for the proposed facility?

VANTAGE RESPONSE: Vantage has secured warranties for the CAT 3516 E backup generators. The generators have a continuous rating of 70 percent of the name plate rating. Operating the generators continuously above the continuous rating will void the warranty on equipment that costs millions of dollars and there is no ability to use the electricity at the facility or deliver it to the transmission grid.

However, the more important criteria on limitation on the operation of the generators is the load capacity of the McLaren Data Center (MDC). As described in the Revised SPPE Application, there are three independent generator yards to serve three data center buildings. Each yard is electrically interconnected to its respective building and NOT interconnected to the substation. There is simply no interconnection between the MBGF and Silicon Valley Power.

The substation serves the MDC and is a distribution substation stepping down the power from the 60 kV transmission system for use by the MDC buildings. If the MBGF backup generators were operated in a way that generated more electricity than the buildings required, it would be physically impossible for the excess electricity to be delivered to the substation. There is no step-up transformer and therefore there is no ability for excess electricity to be transmitted to the grid.

The electricity generated by the MBGF is regulated by each building.

Software is used to operate the generator sets in a manner that meets the building demand. If the demand decreases (e.g., less mechanical load for cooling, etc.) the generator sets will automatically adjust the loading and corresponding electrical output. If a generator or the software were to malfunction and attempt to generate more electricity than the building demand, individual electrical generator controllers would shut their respective generators down.

3. In the Initial Study and Proposed Mitigated Negative Declaration (IS/MND)² published by the Energy Commission staff (Staff) and in Staff's responses to comments on the IS/MND, Staff indicates that determining a number of hours for operation (as opposed to hours for testing the equipment) is too speculative. Why is this determination speculative in light of data from Silicon Valley Power, the local power provider, showing historic outage data?³ Are there other factors, including, but not limited to, the characteristics of the transmission system, that render analyzing emissions from the operations of the backup generators speculative?

VANTAGE RESPONSE: Vantage agrees that attempting to predict the way the facility will operate during an emergency is very speculative. The link provided in footnote 3 does not provide meaningful information relative to outages. The specific location of the outages are not provided. The geographical extent and types of users affected by the outages is not provided. Whether the outage was on the distribution system or the 10 kV or 60 kV transmission system is not provided. Whether the outage would have affected the MDC cannot be determined. It is important to note that Vantage's Santa Clara Campus was not affected by any of the outages identified in the SVP data. It is likely that Vantage's Santa Clara Campus was not affected by any of the reported outages because the outage was local to other areas, occurred on the lower voltage distribution system, or was the type that Vantage's electrical system design minimized the affect and preventing the operation of the generators.

Vantage has incorporated several measures into the design of the MDC that would provide increased protection from SVP outages.

¹ TN 224237.

² TN 223911.

³ <http://www.siliconvalleypower.com/svp-and-community/outages-and-alerts/outages/outage-history>

These design measures include:

- Paying for a distribution substation dedicated to the MDC;
- A third redundant transformer at the dedicated substation;
- Interconnecting the dedicated substation on the 60kV transmission system through a dual loop configuration which would require failure on both loops to cause an outage;
- Use of a Uninterruptible Power System (UPS) which incorporates batteries to respond to short term power fluctuations and power quality issues so that these more frequent circumstances do not trigger the MBGF generators to start.

Vantage provided information about the outages it has experienced at its Santa Clara Campus over the eight years that Vantage has owned it. There has only been one outage during the last eight years that required the generators at the Santa Clara Campus to operate and produce electricity for use at the facility. That outage lasted approximately 19 hours and was due to a problem outside the Silicon Valley Power (SVP) system.

In addition to the difficulty in predicting the operating hours during an emergency, to assess potential public health impacts (raised by the Intervenor Helping Hand Tools) the emergency that would give rise to MBGF operations would have to coincide with the following:

- The circumstances that cause an outage must affect both 60 kV transmission loops of the SVP transmission system;
- The MDC would be at maximum critical IT load and at worst-case mechanical loads (hottest day) and Vantage has not exceed 60 percent on average.
- The design loading conditions are for the hottest day in 50 years;
- Presence of a sensitive receptor at the maximum point of impact during an emergency;
- Meteorological conditions that would result in the highest emissions impacts for any hour at the maximum point of impact;
- The emergency would have to be one that is a long term event that is not handled by the UPS battery systems;

Vantage commissioned Ramboll to conduct a health risk assessment, which found that at the maximum point of impact (the project fence line) all health risks were below significance thresholds. Public health impacts at any other location, including the indoor soccer facility, would be even lower than those at the project

fenceline. Since there are no residences near the project fenceline the probability that a sensitive receptor would be present at that location is extremely low. The acute risks were calculated assuming that all generators were running at the hour when the worst impacts were expected, and it was also below a level of concern.

However, the Committee should note that the health risk assessments that were performed for the MBGF were very conservative and evaluated more hours and operating conditions than would be used for maintenance and testing. For example, the cancer risk, the chronic hazard index and the acute hazard index all evaluated the impacts of all generators running at a standard testing cycle for 50 hours even though Vantage's experience at its Santa Clara Campus is that approximately 10 hours is customarily needed on average to perform the maintenance testing of each generator. For the MBGF, Vantage has committed to only operating one generator at a time for maintenance testing.

Therefore, the health risk assessments, which show less than significant public health impacts, have overestimated the likely maintenance operations by a factor of 4. That would leave approximately 40 hours available each year for emergencies. Historically, Vantage has only experienced one event at its Santa Clara Campus. If that event were averaged over the last 8 years, it would amount to a little over 2 hours per year. As described above, unlike some data centers the Vantage's use of the UPS system allows the MDC to avoid requiring the MBGF to operate for short term power quality (frequency control, etc.) events.

Simply put the Commission has everything it needs to conclude that the MBGF would not cause significant public health impacts and any additional study need to rely on highly speculative assumptions. Additional study would not provide any meaningful information to assist the Commission Decision because it would be based these highly speculative assumptions. Lastly, the results provided in the health risk assessment are conservative by including more hours of operation than Vantage normally uses.

The Commission has sufficient evidence and grounds to conclude that the MBGF will not cause significant health impacts during emergency operations because:

- The conservative nature of the health risk assessment over predicts potential impacts;
- The assessment evaluated more hours than Vantage would likely use for maintenance testing;

- The probability of emergency operation is extremely low given Vantage's design measures and the history of SVP outages at the Santa Clara Campus;
- The combined probability of an unlikely outage requiring the MBGF to run at a time when a sensitive receptor is located at the project fenceline is infinitesimally low.