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San José City Data Center (19-SPPE-04)

Data Response Set 5 (Data Requests 58, 59, 60, 61, 62, and 63)

Submitted to
California Energy Commission

Prepared by
Microsoft Corporation

with technical assistance from

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Introduction

Attached are Microsoft Corporation's (Microsoft or the Applicant) responses to the California Energy Commission (CEC) Data Request, Set 5 regarding the San José City Data Center (SJC02) (19-SPPE-04) Small Power Plant Exemption (SPPE).

The responses are grouped by individual discipline or topic area. Within each discipline area, the responses are presented in the same order as the CEC presented them and are keyed to the Data Request numbers.

New or revised graphics or tables are numbered in reference to the Data Request number. For example, the first table used in response to Data Request 28 would be numbered Table DR28-1. The first figure used in response to Data Request 28 would be Figure DR28-1, and so on.

Additional tables, figures, or documents submitted in response to a data request (for example, supporting data, stand-alone documents such as plans, folding graphics, etc.) are found at the end of each discipline-specific section and have their own page-numbering, separate from the remainder of the document, though they may have their own internal page numbering system.

As noted below, the Applicant is awaiting information previously requested from the utility for several of the data requests and will provide supplemental responses once that information is received.

Response to Staff Data Request Set 5 (58 – 63)

- 58) Please provide the proposed 115 kV underground cables' name, type, current carrying capacity, and size. Would each individual cable be rated high enough to serve the total data center load, or are both underground cables required to serve the rated load?

Response: The tie-lines connecting the San Jose Data Center project (SJC02) to Pacific Gas & Electric Company's (PG&E) Los Esteros substation are connecting to two separate bays, bays 7 and 8, configured in a breaker-and-a-half (BAAH) scheme. Therefore, an outage in either of the SJC interconnections will not cause an outage at SJC02. If a breaker in either bay 7 or 8 failed to open, it may result in the loss of one of the 115 kV lines serving SJC02, but the other SJC02 interconnection would still supply the entire SJC02's electrical demand. As a result, SJC02, with redundant electrical interconnections, typically would only experience power quality impacts when there is a transmission outage. A line outage could occur with force majeure events (such as an earthquake), however, bays 7 & 8 at the Los Esteros substation are served from the Los Esteros Critical Energy Facility (LECEF) (LECEF #1 and #2) via 115 kV underground cables, which may be less prone to outages associated with overhead power lines.

The tie-lines connecting the SJC02 to Los Esteros substation are 1,250 kcmil copper XLPE extruded dielectric cables capable of transmitting 150 MVA. These lines are currently planned to be underground lines. PG&E has indicated that overhead lines may also be used, but they have not provided any additional information about the number or types of poles required for an overhead interconnection.

- 59) Would the design of the system prevent both 115 kV lines from going out of service at the same time? If so, how?

Response: As noted in the response to Data Request #58, the SJC02 is supplied by two redundant interconnections, with each interconnection tied to a different bay in the Los Esteros substation. A loss of both breakers in both bays in the substation is a possible but unlikely event.

- 60) The Los Esteros Substation one-line diagram indicated that there are six existing 115 kV transmission lines connected to the Los Esteros Substation 115 kV bus. Are the 115 kV lines able to provide power to the Los Esteros Substation when one or both of the 230 kV lines (Metcalf-Los Esteros and Newark-Los Esteros) are out of service?

Response: The Applicant is waiting for a response from the utility on this request. Once received, a response will be filed.

- 61) Please describe any outages or service interruptions, including Public Safety Power Shutoffs (PSPS), on the 115 kV systems that would serve the proposed San Jose City Data Center:

- a. How long were any outages, when did they occur, and what were their causes?

Response: Table DR61 presents the outages for the 115 kV lines for the Los Esteros Substation from 2007 to 2020, including the reported causes. PG&E has indicated there have been no planned outages this year. Table DR61 shows that since 2007, there have been five outages of the 115 kV lines feeding the Los Esteros substation. Two events (each) in 2008 and 2010 and one event in 2014, with a collective outage duration of 18 hours and 20 minutes. Since 2010, the duration of outages for these 115 kV lines is less than 3 minutes. None of the outages were due to PSPS events.

Table DR61

Outage History Los Esteros 115kV

FACILITY	Date Out	Time Out	MED	Durn (hr:min)	Durn (mins)	Date In	Time In	Out Cls	Cause Category	Cause Detail	Secondary Cause	Comments	Cust Affected
LOS ESTEROS-NORTECH	08/03/08	23:14	No	12:46	766	08/04/08	12:00	F	Equipment failure	Relay	RELY	Relayed, failed to reclose (LE CBs 632 & 732); no customer interruption; weather clear; forced out next day to investigate; eventID=5898	0
LOS ESTEROS-NORTECH	08/04/08	12:11	No	5:31	331	08/04/08	17:42	F	Equipment failure	Relay	RELY	Forced out Nortech CB-122 to investigate NG Set B and breaker failure relays, open ending this line (LosEsteros CBs 632 & 732 had relayed yesterday at 1211); found metal shavings in cabinet that may have contacted relay; eventID=5898	0
LOS ESTEROS-TRIMBLE	01/11/10	15:42	No	0:01	1	01/11/10	15:43	F	Equipment failure	Other-station	COMM	Relayed, tested OK; Trimble CB 332 opened, no fault on system; all relay event reports showed breaker opening, no fault & CB automatically closed by parallel feature; no customer interruptions; weather cloudy; extensive testing performed on LFCB relay, found to be in proper working order; initial relay problems caused by a malfunctioning communication channel bank card that has since been repaired; eventID=7015	0
LOS ESTEROS-TRIMBLE	04/09/10	8:40	No	0:01	1	04/09/10	8:41	F	Unknown	Patrol found nothing	NONE	Relayed, tested OK; no customer interruption; weather clear; patrol found no cause	0
LOS ESTEROS-MONTAGUE	11/19/14	16:34	No	0:01	1	11/19/14	16:35	F	Unknown	Patrol found nothing	NONE	Relayed - 11/19/14, 1634 LosEsteros-Montague 115kV open ended after Montague CB-132 tripped open, reclosed by automatics; MOM Montague #1 & #2-115/21kV xfmr (7,872); rain; no indication of any system disturbance that might have caused trip, so clearance has been set on 12/29/14 to do a functional test on CB-132	7,872

- b. Did PG&E implement equipment upgrades or operational changes to reduce the likelihood of a repeat of the events that led to an outage?

Response: PG&E's actions regarding each outage are described under the comment column of Table DR61.

- c. What were the responses to the outage(s) by any existing data centers (i.e., initiated operation of some or all backup generation equipment, data off-shoring, data center shutdown, etc.)?

Response: The Applicant is waiting for a response from the utility on this request. Once received, a response will be filed.

- 62) Please provide historic information on the frequency and duration of outages of the 115 kV facilities, including the 115 kV portion of the Los Esteros Substation that would be likely to trigger a total loss of service to the proposed data center's onsite substation and lead to emergency operations of the diesel-powered generators. Please include the reliability of service historically provided by PG&E to other similar data centers in its service territory and located in Santa Clara County.

Response: Table DR61 provides the historic information on the frequency and duration of the 115 kV portion of the Los Esteros substation. The Applicant is waiting for a response from the utility on this request. Once received, a response will be filed.

- 63) How would local and regional PSPS events be implemented on the 115 kV system compared to PSPS events on the 230 kV system (in other words, would a customer who is extremely concerned about reliability prefer one system over another)?

Response: The Applicant is waiting for a response from the utility on this request. Once received, a response will be filed.