

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298



October 16, 2019

Advice Letter 5641-E

Erik Jacobson
Director, Regulatory Relations
Pacific Gas and Electric Company
77 Beale Street, Mail Code B10C
P.O. Box 770000
San Francisco, CA 94177

**SUBJECT: Information-Only Submittal - Frequency Deviations Report for the Period
May 23, 2019 through August 22, 2019 Pursuant to Resolution E-4898
Ordering Paragraph 4 and PG&E Advice Letter 5336-E-A.**

Dear Mr. Jacobson:

Advice Letter 5641-E is effective as of September 20, 2019.

Sincerely,

A handwritten signature in dark ink that reads "Edward Randolph".

Edward Randolph
Deputy Executive Director for Energy and Climate Policy/
Director, Energy Division

September 20, 2019

Advice 5641-E

(Pacific Gas and Electric Company ID U 39 E)

Public Utilities Commission of the State of California

Subject: Information-Only Submittal - Frequency Deviations Report for the Period May 23, 2019 through August 22, 2019 Pursuant to Resolution E-4898 Ordering Paragraph 4 and PG&E Advice Letter 5336-E-A

Purpose

Pacific Gas and Electric Company (PG&E) submits this Tier 1 advice letter (AL) to report the system frequency events for the period from May 23, 2019 through August 22, 2019, pursuant to Ordering Paragraph 4 of Resolution E-4898¹ (Resolution) and PG&E commitments made in Advice Letter 5336-E-A.²

Background

On September 22, 2011, the California Public Utilities Commission (Commission or CPUC) initiated Rulemaking (R.) 11-09-011 to review and, if necessary, revise the rules and regulations governing the interconnection of generation and storage facilities to the electric distribution systems of the investor-owned utilities (IOUs). The IOUs' rules and regulations pertaining to the interconnection of generating facilities are set forth in the Electric Rule 21 Tariff. A large subset of the generating resources interconnecting to the utility grid via Rule 21 produce direct current (DC) power that requires an inverter to convert the DC to the alternating current (AC) of the utilities' distribution systems.

¹ "Resolution E-4898. Approval, with Modifications, of Request for Modifications to Electric Rule 21 Tariff to Incorporate Smart Inverter Phase 3 Advanced Functions in Compliance with Decision 16-06-052" can be found at:

<http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M213/K658/213658887.PDF>

² **AL 5336-E-A** "Supplemental: Reporting Methodology Proposal to Monitor The Frequency And Duration of Frequency Events Pursuant to Resolution E-4898 as a Part of Electric Rule 21 Phase 3 Smart Inverter Functionality" submitted July 25, 2018, approved November 14, 2018 and made effective October 19, 2018. This supplemental advice letter replaced the original advice letter, 5336-E, in its entirety.

In early 2013, to take advantage of the advancing inverter technical capabilities, a Smart Inverter Working Group (SIWG) was established to discuss and develop various implementation proposals among interested stakeholders. In March 2016, the SIWG completed its first set of recommendations for the Phase 3 advanced functions.

On August 18, 2017, PG&E submitted AL 5129-E³.

On April 26, 2018, the CPUC issued Resolution E-4898 approving AL 5129-E addressed certain Phase 3 smart inverter issues.

In addition, a specific smart inverter featured addressed by the Resolution is Frequency watt functionality. As described in the Resolution:

“Frequency Watt Mode: As a system-wide parameter, frequency is affected by all devices connected to the electric power system. High frequency events are often a sign of too much power in the grid and vice versa. Frequency Watt Mode is one method for countering these events, which is accomplished by reducing power in response to rising frequency or vice versa.”

In the Resolution’s discussion of the Frequency Watt mode (also referred to as Function 5), the CPUC calls out a sub-issue on “*Whether to Require IOU Reporting on Impact of Function 5.*”

The CPUC notes that it sees “no need to track the impacts to all individual DERs as initially intended by the Draft Resolution. The impact is expected to be de minimis and reporting on all individual DERs would create unnecessary burden on all parties.”

However, the CPUC continues with:

“...will continue to monitor grid frequency going forward. Because frequency events are generally infrequent events, it is feasible for the IOUs to monitor the number of events per year and report to the Commission on their duration and estimated impact on DER customers. In addition, given that the IOUs have storage assets themselves and there are a collection of Commission-approved programs which support DERs, we find it feasible to monitor the impact of activating Function 5 on a set of DER customers and/or use IOU-operated resources as a proxy for determining impact.”⁴

Accordingly, the CPUC in the Resolution goes on to order:

³ AL 5129-E “Modifications to PG&E’s Electric Rule 21 Tariff and Interconnection Agreements and Forms to Incorporate Smart Inverter Phase 3”

https://www.pge.com/tariffs/assets/pdf/adviceletter/ELEC_5129-E.pdf

⁴ Resolution, Page 23

3. Pacific Gas and Electric, Southern California Edison, and San Diego Gas & Electric shall develop reporting methodology to monitor the frequency and duration of frequency events and, in consultation with the Commission's Energy Division, shall each file a Tier 1 Advice Letter on the proposed methodology no later than 90 days after the effective date of this Resolution.

4. Pacific Gas and Electric, Southern California Edison, and San Diego Gas & Electric shall each file quarterly reports via Tier 1 information-only Advice Letter for one year starting three months after the mandatory activation of Function 5 on frequency events with the methodology approved by the Tier 1 Advice Letters from Ordering Paragraph 3, and following the completion of the quarterly reports, shall file annual reports on frequency events via Tier 1 information-only Advice Letter. No sooner than five years after the activation of Function 5, the IOUs may file proposals via Tier 2 Advice Letter on whether to continue or modify the reporting requirement.⁵

Advice Letter 5336-E-A Proposed the following:

To satisfy the requirements of Ordering Paragraph 3, PG&E proposes to monitor system frequency data at one of its substations. PG&E will monitor the data and report the count of instances where continuous system frequency events had the potential to reduce output of smart inverters with activated frequency/watt as follows:

PG&E will count the instances where the smart inverter output would:

Increase or reduce output by as a percentage of nameplate	for what duration:
up to 5%	5 minutes
up to 15%	1 minute
up to 30%	1 minute
greater than 30%	1 minute

Further, when PG&E or a set of DER customers install smart inverters with the capabilities of providing frequency/watt reporting information, PG&E will use that information in conjunction with its system frequency information to serve as a proxy for the impacts of DER output production. Currently, smart inverters do not have the capability, nor is it planned in the near future to log when certain modes are activated and to estimate the curtailment amount. The IOUs encourage manufacturers to consider adding this functionality.

Based on the Edward Randolph, Director of the California Public Utility Commission's Energy Division, July 11, 2018, email confirming that, pursuant to Resolutions E-4832 and E-4898, Phase 2 requirements and Functions 1, 5, 6, and 8 of Phase 3 will become mandatory for generating facilities utilizing inverter-based technologies for which an

⁵ Resolution, Page 50

interconnection request is submitted on or after February 22, 2019, PG&E proposes the following schedule for reporting pursuant to Ordering Paragraph 4:

Quarter Ends	Report	Tier 1 AL with Report due
May 22, 2019	1st Report	June 22, 2019
► August 22, 2019	2nd Report	September 22, 2019
November 22, 2019	3rd Report	December 22, 2019
February 22, 2019	4th Report	March 22, 2020 (see below)

Following the completion of the quarterly reports, PG&E proposes to submit annual reports on frequency events via Tier 1 information-only Advice Letter, which will be combined with the February 22 4th quarter report on March 22, 2020, and each year on March 22, thereafter, until after five years, PG&E or the other utilities may submit a proposal (via Tier 2 Advice Letter) to continue or modify the reporting requirement.

This Advice Letter is for the 2st report indicated above.

Frequency Report

PG&E includes the report on the template as Attachment A: Frequency Reporting Template in Compliance with Resolution E-4898. This quarterly report covers the three-month period from May 23, 2019, to August 22, 2019.

Protests

This is an information-only advice letter submittal. Pursuant to General Order 96-B Section 6.2, PG&E is not seeking relief through this advice letter and is not subject to protest.

Effective Date

Pursuant to Ordering Paragraph 4 of Resolution E-4898, PG&E requests that this Tier 1 information-only advice letter become effective upon date of submittal, which is September 20, 2019.

Notice

In accordance with General Order 96-B, Section IV, a copy of this advice letter is being sent electronically and via U.S. mail to parties shown on the attached list and the parties on the service lists for R.11-09-011 and R.17-07-007. Address changes to the General Order 96-B service list should be directed to PG&E at email address PGETariffs@pge.com. For changes to any other service list, please contact the Commission's Process Office at (415) 703-2021 or at Process_Office@cpuc.ca.gov.

Send all electronic approvals to PGETariffs@pge.com. Advice letter filings can also be accessed electronically at: <http://www.pge.com/tariffs/>

/S/

Erik Jacobson
Director, Regulatory Relations

Attachments

cc: Service Lists R.11-09-011 and R.17-07-007



ADVICE LETTER SUMMARY

ENERGY UTILITY



MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No.: Pacific Gas and Electric Company (ID U39E)

Utility type:

☒ ELC ☐ GAS ☐ WATER
☐ PLC ☐ HEAT

Contact Person: Yvonne Yang

Phone #: (415)973-2094

E-mail: PGETariffs@pge.com

E-mail Disposition Notice to: Yvonne.Yang@pge.com

EXPLANATION OF UTILITY TYPE

ELC = Electric GAS = Gas WATER = Water
PLC = Pipeline HEAT = Heat

(Date Submitted / Received Stamp by CPUC)

Advice Letter (AL) #: 5641-E

Tier Designation: Information-Only

Subject of AL: Information-Only Submittal - Frequency Deviations Report for the Period May 23, 2019 through August 22, 2019 Pursuant to Resolution E-4898 Ordering Paragraph 4 and PG&E Advice Letter 5336-E-A

Keywords (choose from CPUC listing): Compliance

AL Type: ☐ Monthly ☒ Quarterly ☐ Annual ☐ One-Time ☐ Other:

If AL submitted in compliance with a Commission order, indicate relevant Decision/Resolution #: Ordering 4 of Resolution E-4898

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: No

Summarize differences between the AL and the prior withdrawn or rejected AL:

Confidential treatment requested? ☐ Yes ☒ No

If yes, specification of confidential information:

Confidential information will be made available to appropriate parties who execute a nondisclosure agreement. Name and contact information to request nondisclosure agreement/ access to confidential information:

Resolution required? ☐ Yes ☒ No

Requested effective date: 9/20/19

No. of tariff sheets: 0

Estimated system annual revenue effect (%): N/A

Estimated system average rate effect (%): N/A

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected:

Service affected and changes proposed¹: N/A

Pending advice letters that revise the same tariff sheets: N/A

¹Discuss in AL if more space is needed.

Protests and all other correspondence regarding this AL are due no later than 20 days after the date of this submittal, unless otherwise authorized by the Commission, and shall be sent to:

CPUC, Energy Division
Attention: Tariff Unit
505 Van Ness Avenue
San Francisco, CA 94102
Email: EDTariffUnit@cpuc.ca.gov

Name: Erik Jacobson, c/o Megan Lawson
Title: Director, Regulatory Relations
Utility Name: Pacific Gas and Electric Company
Address: 77 Beale Street, Mail Code B13U
City: San Francisco, CA 94177
State: California Zip: 94177
Telephone (xxx) xxx-xxxx: (415)973-2093
Facsimile (xxx) xxx-xxxx: (415)973-3582
Email: PGETariffs@pge.com

Name:
Title:
Utility Name:
Address:
City:
State: District of Columbia Zip:
Telephone (xxx) xxx-xxxx:
Facsimile (xxx) xxx-xxxx:
Email:

Clear Form

Attachment A

Frequency Reporting Template in Compliance with Resolution E-4898

Frequency Reporting Template in Compliance of Resolution E-4898 (Attachment A)							
Utility Name	Pacific Gas & Electric						
	Start Date	End Date					
Reporting Period	5/23/2019	8/22/2019					
Report Issued Date	9/17/2019						
Frequency Reporting Ranges							
Range Level	High Frequency (Hz) Low End	High Frequency (Hz) High End	Low Frequency (Hz) Low End	Low Frequency (Hz) High End	Duration Time (Minutes)		
Frequency Range 1	60.036	<60.136	59.864<	59.964	5		
Frequency Range 2	60.136	<60.336	59.664<	59.864	1		
Frequency Range 3	60.336	<60.636	59.364<	59.664	1		
Frequency Range 4	60.636	No Limit	0	59.364	1		
Event #	Event Date	Event Start Time	Event End Time	Time (Minutes) Frequency Range 1	Time (Minutes) Frequency Range 2	Time (Minutes) Frequency Range 3	Time (Minutes) Frequency Range 4
#1	6/5/2019	17:46:26	17:51:53	5.45-Low			
#2	6/10/2019	17:55:23	18:08:30	13.12-High			
#3	6/10/2019	20:21:38	20:27:06	5.47-High			
#4	6/13/2019	10:25:27	10:30:27	5-Low			
#5	6/13/2019	20:35:45	20:41:00	5.25-High			
#6	6/30/2019	0:01:38	0:08:06	6.47-Low			
#7	7/7/2019	7:27:57	7:34:22	6.42-High			
#8	7/10/2019	12:16:07	12:21:32	5.42-Low			
#9	7/13/2019	13:01:26	13:07:48	6.37-Low			
#10	7/22/2019	11:42:02	11:51:59	9.95-Low			
#11	7/28/2019	17:52:24	18:01:57	9.55-High			
#12	7/29/2019	3:00:00	3:08:30	8.5-Low			
#13	8/3/2019	8:32:51	8:39:11	6.33-Low			
#14	8/4/2019	23:59:13	0:04:16	5.05-Low			
#15	8/5/2019	17:59:11	18:04:46	5.58-High			
#16	8/13/2019	5:01:17	5:08:23	7.1-Low			
#17	8/15/2019	7:01:32	7:07:26	5.9-Low			
#18	8/15/2019	15:58:06	16:03:15	5.15-High			
#19	8/22/2019	22:02:01	22:07:58	5.95-Low			
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**PG&E Gas and Electric
Advice Submittal List
General Order 96-B, Section IV**

AT&T	Downey & Brand	Pioneer Community Energy
Albion Power Company	East Bay Community Energy	Praxair
Alcantar & Kahl LLP	Ellison Schneider & Harris LLP	
	Energy Management Service	Redwood Coast Energy Authority
Alta Power Group, LLC	Engineers and Scientists of California	Regulatory & Cogeneration Service, Inc.
Anderson & Poole	Evaluation + Strategy for Social	SCD Energy Solutions
	Innovation	
Atlas ReFuel	GenOn Energy, Inc.	SCE
BART	Goodin, MacBride, Squeri, Schlotz &	SDG&E and SoCalGas
	Ritchie	
Barkovich & Yap, Inc.	Green Charge Networks	SPURR
P.C. CalCom Solar	Green Power Institute	San Francisco Water Power and Sewer
California Cotton Ginners & Growers Assn	Hanna & Morton	Seattle City Light
California Energy Commission	ICF	Sempra Utilities
California Public Utilities Commission	International Power Technology	Southern California Edison Company
California State Association of Counties	Intestate Gas Services, Inc.	Southern California Gas Company
Calpine	Kelly Group	Spark Energy
	Ken Bohn Consulting	Sun Light & Power
Cameron-Daniel, P.C.	Keyes & Fox LLP	Sunshine Design
Casner, Steve	Leviton Manufacturing Co., Inc. Linde	Tecogen, Inc.
Cenergy Power	Los Angeles County Integrated Waste	TerraVerde Renewable Partners
Center for Biological Diversity	Management Task Force	Tiger Natural Gas, Inc.
City of Palo Alto	Los Angeles Dept of Water & Power	
	MRW & Associates	TransCanada
City of San Jose	Manatt Phelps Phillips	Troutman Sanders LLP
Clean Power Research	Marin Energy Authority	Utility Cost Management
Coast Economic Consulting	McKenzie & Associates	Utility Power Solutions
Commercial Energy		Utility Specialists
County of Tehama - Department of Public	Modesto Irrigation District	
Works	Morgan Stanley	Verizon
Crossborder Energy	NLine Energy, Inc.	Water and Energy Consulting Wellhead
Crown Road Energy, LLC	NRG Solar	Electric Company
Davis Wright Tremaine LLP		Western Manufactured Housing
Day Carter Murphy	Office of Ratepayer Advocates	Communities Association (WMA)
	OnGrid Solar	Yep Energy
Dept of General Services	Pacific Gas and Electric Company	
Don Pickett & Associates, Inc.	Peninsula Clean Energy	
Douglass & Liddell		