PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE

May 30, 2019

Advice Letter 5537-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: Revised Grid Modernization Classification Table in Compliance with Resolution E-4982

Dear Mr. Jacobson:

Advice Letter 5537-E is effective as of April 29, 2019.

Sincerely,

Edward Randolph

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

Pacific Gas and Electric Company

Erik Jacobson
Director
Regulatory Relations

Pacific Gas and Electric Company
77 Beale St., Mail Code B13U
P.O. Box 770000
San Francisco, CA 94177

Fax: 415-973-3582

April 29, 2019

Advice 5537-E
(Pacific Gas and Electric Company ID U 39 E)

Public Utilities Commission of the State of California

Subject: **Revised Grid Modernization Classification Table in Compliance with Resolution E-4982**

Purpose

In compliance with Ordering Paragraph (OP) 5 of California Public Utilities Commission (CPUC or Commission) Resolution E-4982, Pacific Gas and Electric Company (PG&E) is submitting this Tier 1 advice letter to update its Grid Modernization Classification (Grid Mod) Table.

Background

On March 22, 2018, the Commission issued Decision (D.)18-03-023, Decision on Track 3 Policy Issues, Sub-track 2 (Grid Modernization), requiring the IOUs to submit updates to the Grid Mod Tables.

In compliance with OP 3 of D.18-03-023, PG&E submitted AL 5300-E on May 21, 2018, for approval of its updates to the Grid Mod Tables in compliance with OP 3 of D.18-03-023. The advice letter was subsequently protested by the Public Advocates Office (formerly Office of Ratepayer Advocates).

On December 3, 2018, PG&E submitted supplemental AL 5300-E-A to further update its Grid Mod Table. The supplemental advice letter was subsequently protested by the Public Advocates Office. To resolve the disputed issues, Energy Division issued a draft resolution on February 7, 2019.

On March 28, 2019, the CPUC approved Resolution E-4982, requiring the investor-owned utilities (IOUs) to submit compliance Advice Letters no later than 30 days to add cross-

references to their most recent General Rate Case (GRC) application to the updated Grid Modernization Classification Table.[1]

In compliance with OP 5, PG&E hereby provides in Attachment A the common Grid Modernization Classification Table adopted in Res. E-4982 with cross-references to its 2020 GRC application.

PG&E notes that the text in Column I ("Utility GRC Application Volume and Category") of this Attachment A reflect updates to the corresponding column provided in Exhibit 4, WP 19-48 of PG&E's 2020 GRC filing. These updates are intended to bring PG&E's GRC volume references into optimal alignment with the Technology Category definitions adopted in Resolution E-4982. PG&E will file an update to the GRC workpaper provided in Exhibit 4, WP 19-48 reflecting the updates contained within this Attachment A at its earliest opportunity.

Attachments

Attachment A: Revised PG&E Grid Modernization Table

Protests

Anyone wishing to protest this submittal may do so by letter sent via U.S. mail, facsimile or E-mail, no later than May 20, 2019, which is 21 days[2] after the date of this submittal. Protests must be submitted to:

CPUC Energy Division
ED Tariff Unit
505 Van Ness Avenue, 4th Floor
San Francisco, California 94102

Facsimile: (415) 703-2200
E-mail: EDTariffUnit@cpuc.ca.gov

Copies of protests also should be mailed to the attention of the Director, Energy Division, Room 4004, at the address shown above.

The protest shall also be sent to PG&E either via E-mail or U.S. mail (and by facsimile, if possible) at the address shown below on the same date it is mailed or delivered to the Commission:

[1] PG&E timely submits this compliance advice letter since 30 days from the effective date of the Resolution is a non-business day, and April 29, 2019, is the next business day.

[2] The 20-day protest period concludes on a weekend, therefore, PG&E is moving this date to the following business day.

Erik Jacobson
Director, Regulatory Relations
c/o Megan Lawson
Pacific Gas and Electric Company
77 Beale Street, Mail Code B13U
P.O. Box 770000
San Francisco, California 94177

Facsimile: (415) 973-3582
E-mail: PGETariffs@pge.com

Any person (including individuals, groups, or organizations) may protest or respond to an advice letter (General Order 96-B, Section 7.4). The protest shall contain the following information: specification of the advice letter protested; grounds for the protest; supporting factual information or legal argument; name, telephone number, postal address, and (where appropriate) e-mail address of the protestant; and statement that the protest was sent to the utility no later than the day on which the protest was submitted to the reviewing Industry Division (General Order 96-B, Section 3.11).

Effective Date

Pursuant to Resolution E-4982, OP 5, this advice letter is submitted with a Tier 1 designation. This Tier 1 advice letter become effective upon submittal, which is April 29, 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 list for R.14-08-013 and A.15-07-006. 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 submittals can also be accessed electronically at: http://www.pge.com/tariffs/.

/S/
Erik Jacobson
Director, Regulatory Relations

Attachments

cc: Dina Mackin – Energy Division
Service Lists for R.14-08-013 and A.15-07-006

California Public Utilities Commission

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) #: 5537-E

Tier Designation: 1

Subject of AL: Revised Grid Modernization Classification Table in Compliance with Resolution E-4982

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 #: E-4982

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: 4/29/19

No. of tariff sheets: N/A

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: N/A

Service affected and changes proposed[1]: N/A

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

[1]Discuss in AL if more space is needed.

Clear Form

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

Advice 5537-E
April 29, 2019

Attachment A

Revised PG&E Grid Modernization Table

Attachment A - PG&E's 2020 GRC Grid Modernization Classification Table

A. Technology Category	B. Use Cases	C. Function	D. System wide or Local Deployment	E. Distribution System Management Activities and Responsibilities	F. System/ Integration Challenges Addressed	G. Relevant DERs	H. Applicable Grid Mod Technologies Related to DER Integration	I. Utility GRC Application Volume and Category
1. Grid Connectivity Model	HDA, S&R, GDS	Circuit modeling, Data Used for Forecasting and DER Value and Solution Analysis	System wide	Distribution Planning, Grid Operations, Market Operations	Items 1 - 8 of list of challenges	EV, DG, ES, EE, DR	Base data layer for ICA, Load and DER forecasting, state estimation, ArcGIS, EDGIS	*Distribution GIS Asset Data Improvement* (Exhibit 4, Chapter 19, MWC 63/HG, 2F/JV) *Field Asset Inventory* (Exhibit 4, Chapter 18, MWC GE) *Electric Distribution Mapping* (Exhibit 4, Chapter 18, MWC GE) *Leverage Technology to Improve Asset Data Quality* (Exhibit 4, Chapter 15, MWC 2F/JV)
2. Grid Management Systems (GMS)	HDA, GDS, S&R	All functions in the definitions, except for DER Value and Solutions Analysis	System wide	Distribution Grid Operations	All items	PEV, DG, ES, DR	Distributed Energy Resource Management System (DERMS), Advanced Distribution Management System (ADMS), Demand Response Management System (DRMS), DER Head-End, and VVO.	*Advanced Distribution Management System* (Exhibit 4, Chapter 19, MWC 63/HG) *IGP Cybersecurity Project* (Exhibit 7, Chapter 9, MWC 2F/JV)
3. Long and Short-term Planning Tools	HDA, S&R, GDS	DER Forecasting, DER Valuation Solution Analysis, Circuit Modeling	System wide	Distribution Planning	Thermal, Operational Limitations	EE, DR, EV, DG, ES	Integrated Load and DER forecasting, solution analysis for capacity/reliability, LoadSEER, Power flow modeling and analysis of distribution feeders (CYME) System Modeling Toolset (SMT); Long- Term Planning Tools (LTPT;) Integration Capacity Analysis (ICA), Locational Net Benefit Analysis Tool (LNBA)	*Distribution Engineering Planning Tools* (Exhibit 4, Chapter 19, MWC 2F/JV) *Advanced Distribution Management System* (Exhibit 4, Chapter 19, MWC 63/HG) *Funding for LNBA and ICA is tracked through the Distribution Resources Plan Tools Memorandum Account (DRPTMA). No funding is requested in this GRC filing.
4. Data Sharing Portals	HDA, S&R, GDS	DER Valuation, Solution Analysis, Circuit Modeling	System wide	Distribution Planning	Sustained voltage violations, thermal, protection	EE, DR, EV, DG, ES	Data Sharing Portal (web interface) to publish Distribution Resources Plan data; Distribution Resource Plan External Portal (DRPEP)	*Funding for the Data Access Portal is tracked through the Distribution Resources Plan Tools Memorandum Account (DRPTMA). No funding is requested in this GRC filing.
5. Grid Analytics Application	HDA, S&R, GDS	Circuit/System Modeling	System wide	Distribution Planning Grid Operations	Sustained voltage violations, thermal, protection, asset management	EV, DG, ES, DR	Asset management, sensing and measurement (data), improves quality of asset data to improve distribution planning inputs and operational decisions	*Distribution GIS Asset Data Improvement* (Exhibit 4, Chapter 19, MWC 63/HG, 2F/JV) *Advanced Distribution Management System* (Exhibit 4, Chapter 19, MWC 63/HG) *Distribution Engineering Planning Tools* (Exhibit 4, Chapter 19, MWC 2F/JV) *Asset Performance Center* (Exhibit 4, Chapter 14, MWC FZ)
6. Interconnection Processing Tool	HDA, S&R, GDS	Application Assessment and Processing	System wide	Service Planning and Customer Engagement	Indirect impact on sustain voltage violations, thermal, protection interconnection process)	EV, DG, ES	Customer facing application to support streamlining the interconnection process, improve distribution planning, Integration Capacity Analysis (ICA)	*Electric Generation Interconnection* (Exhibit 4, Chapter 19, MWC 2F/JV) *Funding for ICA is tracked through the Distribution Resources Plan Tools Memorandum Account (DRPTMA). No funding is requested in this GRC filing.

Attachment A - PG&E's 2020 GRC Grid Modernization Classification Table

A. Technology Category	B. Use Cases	C. Function	D. System wide or Local Deployment	E. Distribution System Management Activities and Responsibilities	F. System/ Integration Challenges Addressed	G. Relevant DERs	H. Applicable Grid Mod Technologies Related to DER Integration	I. Utility GRC Application Volume and Category
7. Adaptive Protection System	S&R, HDA, GDS	Sensing & Measurement, Data & Device Communications, Control & Feedback Systems, Reliability Management,	Local & System wide	Grid Operations	Protection	All	This is typically incorporated as part of the Common Substation Platform (CSP) at the substation level. In the future, it may be incorporated into ADMS. (Capability in GMS for SCE)	*Advanced Distribution Management System* (Exhibit 4, Chapter 19, MWC 63/HG) *Although funding for implementation of an Adaptive Protective System is not requested in this GRC filing, funding for enabling foundational technologies is requested in the chapters noted above.
8. Substation Automation and Common Substation Platform (CSP)	HDA, S&R, GDS	Sensing & Measurement, Data & Device Communications, Control & Feedback Systems, Reliability Management, Cybersecurity	Local & System Wide	Distribution Planning, Grid Operations, Market Operations	Items 1 - 10 of list of challenges	EV, DG, ES	SCADA, coordinated distribution device control with DERs, protection, cybersecurity	*Install Substation SCADA* (Exhibit 4, Chapter 10, MWC 09) *Replace Substation SCADA* (Exhibit 4, Chapter 10, MWC 09)
9. Volt/Var Optimization	HDA, S&R, GDS	Sensing & Measurement, Data & Device, Communications Control & Feedback Systems	Local	Distribution Planning, Grid Operations, Market Operations	Voltage fluctuation, sustained voltage violations, Low (Secondary) Voltage Controllers, Conservation Voltage Reduction	EV, DG, ES, DR	Substation Load Tap Changers, Voltage Regulators, Automated programmable capacitor controls, integration with DMS and EMS, future integration with smart inverters	*Advanced Distribution Management System* (Exhibit 4, Chapter 19, MWC 63/HG) *Enable Distributed Generation Dist Line* (Exhibit 4, Chapter 13, MWC 06) *Power Factor Management* (Exhibit 4, Chapter 13, MWC 06) *Although funding for implementation of VVO is not requested in this GRC filing, funding for enabling foundational technologies is requested in the chapters noted above.
10. Fault Location, Isolation and Service Restoration (FLISR)	HDA, S&R, GDS	Sensing & Measurement, Data & Device Communications, Control & Feedback Systems, Reliability Management	Local	Distribution Planning, Grid Operations, Market Operations	Thermal, Operational Limitations, Fault Location & Service Restoration, Cybersecurity	EV, DG, ES, DR	Remote Intelligent Switches, Augmented Remote Control Switches, Automatic Reclosers, RCS retrofits	*FLISR* (Exhibit 4, Chapter 9, MWC 49) *Advanced Distribution Management System* (Exhibit 4, Chapter 19, MWC 63/HG)
11. Remote Fault Indicators	S&R, HDA, GDS	Sensing & Measurement, Data & Device Comms.	Local	Distribution Planning, Grid Operations, Market Operations	Thermal, Operational Limitations, Cybersecurity	EV, DG, ES	Wireless bidirectional fault indicators, providing real time power flow characteristics	*OH Fault Indicators/Line Sensors* (Exhibit 4, Chapter 9, MWC 49)
12. Field Area Network	S&R, HDA, GDS	Sensing and Measurement, Data & Device Communications, Cybersecurity	Large Local Areas, eventually system wide	Distribution Planning, Grid Operations, Market Operations	Items 1 - 10 of list of challenges	EV, DG, ES	Wireless radios, Routers	*Integrated Grid Platform Enablement IT Infrastructure* (Exhibit 7, Chapter 8, MWC 2F/JV)
13. Wide Area Network	S&R, HDA, GDS	Sensing and Measurement, Data & Device Communications, Cybersecurity	Large Local Areas, eventually system wide	Distribution Planning, Grid Operations, Market Operations	Items 1 - 10 of list of challenges	EV, DG, ES	Fiber optic and IP connectivity	*Integrated Grid Platform Enablement IT Infrastructure* (Exhibit 7, Chapter 8, MWC 2F/JV) *Network Technologies - Asset Lifecycle* (Exhibit 7, Chapter 8, MWC 2F/JV) *Network Technologies - Capacity and Reliability Improvements* (Exhibit 7, Chapter 8, MWC 2F/JV)

Attachment A - PG&E's 2020 GRC Grid Modernization Classification Table

A. Technology Category	B. Use Cases	C. Function	D. System wide or Local Deployment	E. Distribution System Management Activities and Responsibilities	F. System/ Integration Challenges Addressed	G. Relevant DERs	H. Applicable Grid Mod Technologies Related to DER Integration	I. Utility GRC Application Volume and Category
14. Grid Sensors	HDA, S&R, GDS	Sensing & Measurement, Data & Device Comms.	Local	Distribution Planning, Grid Operations, Market Operations	Thermal, Operational Limitations, Fault Location & Service Restoration, Cybersecurity	EV, DG, ES	Typically, incorporated with other devices/systems such as SCADA reclosers, and FLISR schemes. Telemetry included with the RFIs, RCS retrofits and RISs. This could also include Phasor Measurement Units (PMUs)	*OH Fault Indicators/Line Sensors* (Exhibit 4, Chapter 9, MWC 49)
15. Remote Controlled Switches	HDA, S&R	Control & Feedback Systems	Local	Distribution Planning, Grid Operations,	Operational Limitations	All	Typically, incorporated with other devices/systems such as SCADA reclosers, and FLISR schemes.	*FLISR* (Exhibit 4, Chapter 9, MWC 49) *FuseSavers* (Exhibit 4, Chapter 9, MWC 49) *Automation and Proection - Granular Sectionalizing* (Exhibit 4, Chapter 9, MWC 49) *Install/Replace Distribution Line SCADA* (Exhibit 4, Chapter 10, MWC 09) *Install Substation SCADA* (Exhibit 4, Chapter 10, MWC 09) *Replace Substation SCADA* (Exhibit 4, Chapter 10, MWC 09) *Recloser Protocols - CWSP Wildfire Reclosers* (Exhibit 4, Chapter 10, MWC 09)
16. DER Hosting Capacity Reinforcement	HDA, GDS, S&R	Control & Feedback Systems	Local	Grid Operations	Thermal	All	Installing new manual switches, upgrading sections of cable/ conductor, extending feeder lines to create new ties	*Although many capacity projects described in Exhibit-4, Chapter 13 come with ancillary benefits related to DER hosting capacity, none are being pursued primarily for reasons related to DER hosting capacity.
17. Relay Replacement	HDA, S&R	Control & Feedback Systems	Local	System Planning, Grid Operations	Protection	All	Upgrading legacy protection relays on as-needed basis	*Replace Substation Protective Relays* (Exhibit 4, Chapter 10, MWC 09)
18. Utility-Owned Storage	HDA, S&R	Sensing & Measurement, Control & Feedback, Reliability Management	Local	System Planning and Grid Operations	Voltage Violations, Thermal, Operational Limitations, DER Aggregation Impacts	DR, EV, DG, ES	Energy storage systems installed on the distribution systems to buffer DER output and load (PEV)	*Normal Capacity Deficiencies* (Exhibit 4, Chapter 13, MWC 46) *The Llagas Utility-Owned Storage project is referenced in this chapter.
19. Microgrid Interfaces	HDA, S&R	Sensing & Measurement, Control & Feedback, Reliability Management	Local	System Planning and Grid Operations	Voltage Violations, Thermal, Operational Limitations, DER Aggregation Impacts	DR, EV, DG, ES	"Trayer" switches and other hardware and software which allow DER powered microgrids to operate in islanded mode	*Resilience Zones* (Exhibit 4, Chapter 9, MWC 49)

PG&E Gas and Electric
Advice Filing List
General Order 96-B, Section IV

AT&T
Albion Power Company
Alcantar & Kahl LLP

Alta Power Group, LLC
Anderson & Poole

Atlas ReFuel
BART

Barkovich & Yap, Inc.
P.C. CalCom Solar
California Cotton Ginners & Growers Assn
California Energy Commission
California Public Utilities Commission
California State Association of Counties
Calpine

Cameron-Daniel, P.C.
Casner, Steve
Cenergy Power
Center for Biological Diversity
City of Palo Alto

City of San Jose
Clean Power Research
Coast Economic Consulting
Commercial Energy
County of Tehama - Department of Public Works
Crossborder Energy
Crown Road Energy, LLC
Davis Wright Tremaine LLP
Day Carter Murphy

Dept of General Services
Don Pickett & Associates, Inc.
Douglass & Liddell

Downey & Brand
East Bay Community Energy
Ellison Schneider & Harris LLP
Energy Management Service
Evaluation + Strategy for Social Innovation
GenOn Energy, Inc.
Goodin, MacBride, Squeri, Schlotz & Ritchie
Green Charge Networks
Green Power Institute
Hanna & Morton
ICF
International Power Technology
Intestate Gas Services, Inc.
Kelly Group
Ken Bohn Consulting
Keyes & Fox LLP
Leviton Manufacturing Co., Inc.
Linde
Los Angeles County Integrated Waste Management Task Force
Los Angeles Dept of Water & Power
MRW & Associates
Manatt Phelps Phillips
Marin Energy Authority
McKenzie & Associates

Modesto Irrigation District
Morgan Stanley
NLine Energy, Inc.
NRG Solar

Office of Ratepayer Advocates
OnGrid Solar
Pacific Gas and Electric Company

Pioneer Community Energy
Praxair
Regulatory & Cogeneration Service, Inc.
SCD Energy Solutions

SCE
SDG&E and SoCalGas

SPURR
San Francisco Water Power and Sewer
Seattle City Light
Sempra Utilities
Southern California Edison Company
Southern California Gas Company
Spark Energy
Sun Light & Power
Sunshine Design
Tecogen, Inc.
TerraVerde Renewable Partners
Tiger Natural Gas, Inc.

TransCanada
Troutman Sanders LLP
Utility Cost Management
Utility Power Solutions
Utility Specialists

Verizon
Water and Energy Consulting
Wellhead Electric Company
Western Manufactured Housing Communities Association (WMA)
Yep Energy