

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco CA 94102-3298



Pacific Gas & Electric Company
ELC (Corp ID 39)
Status of Advice Letter 6782E
As of December 21, 2023

Subject: Modifications to PG&E's Electric Rule 21 to Address Anti-Islanding Pursuant to the Rule 21 Working Group 4 Decision 21-06-002

Division Assigned: Energy

Date Filed: 12-07-2022

Date to Calendar: 12-14-2022

Authorizing Documents: D2106002

Disposition:	Accepted
Effective Date:	12-12-2022

Resolution Required: No

Resolution Number: None

Commission Meeting Date: None

CPUC Contact Information:

edtariffunit@cpuc.ca.gov

AL Certificate Contact Information:

Kimberly Loo

(415)973-4587

PGETariffs@pge.com

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco CA 94102-3298



To: Energy Company Filing Advice Letter

From: Energy Division PAL Coordinator

Subject: Your Advice Letter Filing

The Energy Division of the California Public Utilities Commission has processed your recent Advice Letter (AL) filing and is returning an AL status certificate for your records.

The AL status certificate indicates:

- Advice Letter Number
- Name of Filer
- CPUC Corporate ID number of Filer
- Subject of Filing
- Date Filed
- Disposition of Filing (Accepted, Rejected, Withdrawn, etc.)
- Effective Date of Filing
- Other Miscellaneous Information (e.g., Resolution, if applicable, etc.)

The Energy Division has made no changes to your copy of the Advice Letter Filing; please review your Advice Letter Filing with the information contained in the AL status certificate, and update your Advice Letter and tariff records accordingly.

All inquiries to the California Public Utilities Commission on the status of your Advice Letter Filing will be answered by Energy Division staff based on the information contained in the Energy Division's PAL database from which the AL status certificate is generated. If you have any questions on this matter please contact the:

Energy Division's Tariff Unit by e-mail to
edtariffunit@cpuc.ca.gov

December 7, 2022

Advice 6782-E

(Pacific Gas and Electric Company ID U 39 E)

Public Utilities Commission of the State of California

Subject: Modifications to PG&E's Electric Rule 21 to Address Anti-Islanding Pursuant to the Rule 21 Working Group 4 Decision 21-06-002

Purpose

Pacific Gas and Electric Company (PG&E) hereby submits this Tier 2 advice letter to propose modifications to PG&E's Electric Rule 21 to address anti-islanding procedures in support of the California Public Utilities Commission (CPUC, Commission) Decision (D.) 21-06-002, Ordering Paragraph (OP) 13 on Proposal 18e.

Background**Rulemaking 17-07-007**

Rulemaking 17-07-007 the *Order Instituting Rulemaking to Consider Streamlining Interconnection of Distributed Energy Resources and Improvements to Rule 21*, was initiated in late 2017 where "the primary objective in this proceeding is to streamline the interconnection application process, which the adopted proposals aim to accomplish."¹

In the original scoping memo and subsequent refinements, the proceeding was broken into three phases. The issues to be addressed in the first phase was further divided up between four working groups. Each Working Group convened with the Commission, the IOUs² and various other parties over a period, culminating in a final working group report. That report was then used to inform the Commission in the preparation of a final decision addressing implementation of the various working group's issues.

Pertinent to this advice letter, the November 16, 2018, Assigned Commissioner's Amended Scoping Memo and Joint Administrative Law Judge Ruling (Amended

¹ D. 21-06-002 Background, p2

² The IOUs, or investor-owned utilities, consist of Pacific Gas and Electric Company, Southern California Edison Company, and San Diego Gas & Electric Company.

Scoping Memo) revised the scope and schedule for this proceeding in response to the Motion of the California Solar & Storage Association (CALSSA).

Working Group Four

Working Group Four first convened February 12, 2020, with twelve subsequent in-person and virtual meetings. On August 13, 2020, representatives of Working Group Four filed the final Working Group Four Report (Report). The final Working Group Four Report was submitted August 12, 2020.³ As noted in the Report, parties and other stakeholders participated in discussion of and developed proposals on the issues, including Proposal 18e.⁴

Issue 18 was included as related to this advice letter and was among four issues identified in the Amended Scoping Memo. It is:

Issue 18: Should the Commission adopt changes to anti-islanding screen parameters to reflect research on islanding risks when using UL 1741-certified inverters in order to prevent unnecessary mitigations? If yes, what should those changes entail?⁵

Rule 21 defines islanding as:

Island; Islanding: A condition on Distribution Provider's Distribution System in which one or more Generating Facilities deliver power to Customers using a portion of Distribution Provider's Distribution System that is electrically isolated from the remainder of Distribution Provider's Distribution System.⁶

The isolation is often the result of a system fault, and can create unsafe situations on the distribution grid for utility personnel and other customers.

And anti-islanding in Rule 21 is defined as:

Anti-Islanding: A control scheme installed as part of the Generating or Interconnection Facility that senses and prevents the formation of an Unintended Island.⁷

Currently Rule 21 Screen L includes an islanding test.

³ [WG 4 Report](#) dated August 12, 2020.

⁴ IBID p14

⁵ IBID p6, 11

⁶ Current Rule 21 sheet 26

⁷ IBID sheet 17

By way of background, the Report notes:

If a fault occurs on the distribution system, any Distributed Energy Resource (DER) connected to the system must quickly de-energize (or go off-line) so that there is not an unintentional “island” formed (i.e., a portion of the distribution grid remains energized). Unintentional islanding, which is defined as an unplanned island that lasts greater than two seconds, is a concern....” [and goes on to describe five risks that result from islanding.]⁸

While individual inverters must be certified as being anti-islanding, the Report goes on to explain a specific area of concern that needs to be addressed in Issue 18:

Anti-islanding capability has always been tested on the individual inverter level per the test procedures of IEEE 1547.1. Recent research [footnote 22] has shown that there may be distribution system concerns that affect the ability of an individual inverters to successfully detect an island. For instance, it has been shown that interactions between inverters and rotating machines can decrease anti-islanding effectiveness. It has been shown that some anti-islanding algorithms may be more effective than others, and different algorithms have less to do with any individual inverter (since all are certified to have adequate individual anti-islanding capabilities) and more to do with a variety of different types of interactions between equipment on the distribution system. As a result, it is becoming clear that unintentional islanding is a distributions system issue, and yet individual inverters are being called on to address the issue.

Footnote 22: Gonzalez, A. Ellis, M. Ropp, C. Mouw, D. Shutz and S. Perlenfein, “Unintentional Islanding Detection Performance with Mixed DER Types,” Sandia National Laboratories report SAND2018-8431, July 2018, <https://www.osti.gov/servlets/purl/1463446M9>.

Additionally, where some DER use non-inverter based “rotating machine” types of generators, PG&E conducts additional screening of [such] DERs for the risks of islanding. When those DERs fail those screens they may be required to install reclosers on machine generators and/or Direct Transfer Trip (DTT) at the substation so that they can be shut down or separated from the transmission system during a grid outage or fault, for which the customer is required to pay. This can add significant costs in the interconnection (~\$500,000 for DTT and ~\$80,000 for recloser) and significant delays (18-24 months). It is claimed this requirement can impact project economics.¹⁰

⁸ Report p14

⁹ Report p21

¹⁰ Report see p17

As a result of the above concerns, nine proposals (Proposals 18-a through 18-i) were presented in the Report to address the anti-islanding concerns raised in Issue 18. Proposal 18e is the subject of this advice letter.

Proposal 18e required, among other things, that PG&E adopt new anti-islanding screens (see D. 21-06-002 Appendix D) in its interconnection process that consider aggregate generation relative to minimum load, aggregate machine generation or aggregate uncertified distributed generation to total generation ratio, fixed power factor modes, and inverter anti-islanding “types”. The new screens would be used to verify or ensure islands are terminated in two seconds in accordance with Rule 21, when there is a question of whether a system configuration may result in an island lasting more than two seconds.

Decision 21-06-002 Ordering Paragraph 13¹¹

Decision 21-06-002 was issued to address the remaining Phase 1 issues including those from Working Group 4. Pertinent to this advice letter, it address Proposal 18e.

In D. 21-06-002, OP 13, the Commission directs that:

*13. Proposal 18e is adopted and only applies to utilities that perform enhanced anti-islanding screening based on Sandia studies. **Required utilities shall implement new anti-islanding screens, as indicated in Appendix D, in their Interconnection application process** that consider aggregator generation relative to minimum load, aggregate machine generation or aggregate uncertified distributed generation to total generation ratio, fixed power factor modes, and inverter anti-islanding types. The proposed screens are used to verify or ensure islands are terminated in two seconds or less in accordance with Rule 21 Section H.1a.iii and Section 4.b. No later than August 12, 2022, required utilities shall host a workshop with inverter manufacturers and stakeholders to discuss changes to: i) the definition of preferred anti-islanding methods and ii) the threshold in Screen 5 of Appendix D of this Decision. [emphasis added]*

This Advice Letter

Rule 21 Screen L currently notes, “PG&E will temporarily apply anti-islanding tests until the resolution of Issue 18* in R. 17-07-007, Working Group Four Report made effective in PG&E’s tariffs.”¹² This advice letter makes modifications to PG&E’s Electric Rule 21 in

¹¹ [D. 21-06-002](#) - Decision Addressing Remaining Phase I Issues - Issued June 4, 2021

¹² Electric Rule 21 sheet 159

support of implementing the anti-islanding screens required in CPUC D.21-06-002 OP 13. Specifically, PG&E modifies Electric Rule 21 as shown below:

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

- I. Screen L: Transmission Dependency, and Stability, Overvoltage, and Islanding Tests

...

PG&E will temporarily apply anti-islanding screens as described in Distribution Provider's Distribution Generation Interconnection Handbook. * ~~tests until the resolution of Issue 18* in R. 17-07-007, Working Group Four Report made effective in PG&E's tariffs.~~

* ~~Decision 21-06-002, R. 17-07-007, Ordering Paragraph 13 adopted Issue 18 regarding is "Should the Commission adopt changes to anti-islanding screens. parameters to reflect research on islanding risks when using UL 1741-certified inverters in order to avoid unnecessary mitigations? If yes, what should those changes entail?"~~

PG&E includes these Electric Rule 21 tariff revisions in Attachment 1. For convenience of the reader, PG&E has also included redline revisions in Attachment 2.

Protests

Anyone wishing to protest this submittal may do so by letter sent electronically via E-mail, no later than December 27, 2022, which is 20 days after the date of this submittal. Protests must be submitted to:

CPUC Energy Division
ED Tariff Unit
E-mail: EDTariffUnit@cpuc.ca.gov

The protest shall also be electronically sent to PG&E via E-mail at the address shown below on the same date it is electronically delivered to the Commission:

Sidney Bob Dietz II
Director, Regulatory Relations
c/o Megan Lawson
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



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 U39 E)

Utility type:

- ELC GAS WATER
 PLC HEAT

Contact Person: Kimberly Loo

Phone #: (415)973-4587

E-mail: PGETariffs@pge.com

E-mail Disposition Notice to: KELM@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) #: 6782-E

Tier Designation: 2

Subject of AL: Modifications to PG&E's Electric Rule 21 to Address Anti-Islanding Pursuant to the Rule 21 Working Group 4 Decision 21-06-002

Keywords (choose from CPUC listing): Compliance, Rule 21

AL Type: Monthly Quarterly Annual One-Time Other:

If AL submitted in compliance with a Commission order, indicate relevant Decision/Resolution #: D.21-06-002

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: 12/12/22

No. of tariff sheets: 3

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: See Attachment 1

Service affected and changes proposed¹: N/A

Pending advice letters that revise the same tariff sheets: 6682-E-A, 6757-E

¹Discuss in AL if more space is needed.

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

California Public Utilities Commission
Energy Division Tariff Unit Email:
EDTariffUnit@cpuc.ca.gov

Contact Name: Sidnev Bob Dietz II. c/o Megan Lawson
Title: Director, Regulatory Relations
Utility/Entity Name: Pacific Gas and Electric Company

Telephone (xxx) xxx-xxxx:
Facsimile (xxx) xxx-xxxx:
Email: PGETariffs@pge.com

Contact Name:
Title:
Utility/Entity Name:

Telephone (xxx) xxx-xxxx:
Facsimile (xxx) xxx-xxxx:
Email:

CPUC
Energy Division Tariff Unit
505 Van Ness Avenue
San Francisco, CA 94102

Clear Form

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
54779-E*	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 149	51805-E
54780-E*	ELECTRIC TABLE OF CONTENTS Sheet 1	52830-E*
54781-E*	ELECTRIC TABLE OF CONTENTS Sheet 20	54496-E



ELECTRIC RULE NO. 21
GENERATING FACILITY INTERCONNECTIONS

Sheet 149

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

I. Screen L: Transmission Dependency, and Stability, Overvoltage, and Islanding Tests

Is the Interconnection Request for an area where: (i) there are known, or posted, transient/dynamic stability limitations, or (ii) the proposed Generating Facility has interdependencies, known to Distribution Provider, with earlier-queued Transmission System interconnection requests, or (iii) islanding conditions are possible based on PG&E's currently adopted and published screening policies with respect to antiislanding, or (iv) transmission ground fault overvoltage is possible based on PG&E's currently adopted and published screening policies with respect to overvoltage screening. Where (i) or (ii) or (iii) or (iv) above are met, the impacts of this Interconnection Request to the Transmission System may require further Study.

(T)

- If Yes (fail), Supplemental Review is required.
- If No (pass), continue to Screen M.

Significance: Special consideration must be given to those areas identified as having current or future (due to currently-queued interconnection requests) grid stability concerns.

PG&E will apply anti-islanding screens as described in Distribution Provider's Distribution Generation Interconnection Handbook.*

(T)

(T)

* Decision 21-06-002, R. 17-07-007, Ordering Paragraph 13 adopted Issue 18 regarding anti-islanding screens.

(T)

(T)

(Continued)



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Advice 6782-E
Decision D.21-06-002

Issued by
Meredith Allen
Vice President, Regulatory Affairs

Submitted
Effective
Resolution

December 7, 2022



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Advice 6782-E
December 7, 2022

Attachment 2

Redline Tariff Revisions



ELECTRIC RULE NO. 21
GENERATING FACILITY INTERCONNECTIONS

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

I. Screen L: Transmission Dependency, and Stability, Overvoltage, and Islanding Tests

Is the Interconnection Request for an area where: (i) there are known, or posted, transient/dynamic stability limitations, or (ii) the proposed Generating Facility has interdependencies, known to Distribution Provider, with earlier-queued Transmission System interconnection requests, or (iii) islanding conditions are possible based on PG&E's currently adopted and published screening policies with respect to antiislanding, or (iv) transmission ground fault overvoltage is possible based on PG&E's currently adopted and published screening policies with respect to overvoltage screening. Where (i) or (ii) or (iii) or (iv) above are met, the impacts of this Interconnection Request to the Transmission System may require further Study.

(T)

- If Yes (fail), Supplemental Review is required.
- If No (pass), continue to Screen M.

Significance: Special consideration must be given to those areas identified as having current or future (due to currently-queued interconnection requests) grid stability concerns.

PG&E will temporarily apply anti-islanding screens as described in Distribution Provider's Distribution Generation Interconnection Handbook. * tests until the resolution of Issue 18* in R. 17-07-007, Working Group Four Report made effective in PG&E's tariffs PG&E will temporarily apply anti-islanding tests until the resolution of Issue 18* in R. 17-07-007, Working Group Four Report made effective in PG&E's tariffs.

(T)

(T)

* * Decision 21-06-002, R. 17-07-007, Ordering Paragraph 13 adopted Issue 18 regarding is "Should the Commission adopt changes to anti-islanding screens. parameters to reflect research on islanding risks when using UL 1741-certified inverters in order to avoid unnecessary mitigations? If yes, what should these changes entail?" Issue 18 is "Should the Commission adopt changes to anti-islanding screen parameters to reflect research on islanding risks when using UL 1741-certified inverters in order to avoid unnecessary mitigations? If yes, what should these changes entail?"

(T)

(T)

(Continued)

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

AT&T
Albion Power Company

Alta Power Group, LLC
Anderson & Poole

Atlas ReFuel
BART

Barkovich & Yap, Inc.
Braun Blaising Smith Wynne, P.C.
California Cotton Ginners & Growers Assn
California Energy Commission

California Hub for Energy Efficiency
Financing

California Alternative Energy and
Advanced Transportation Financing
Authority
California Public Utilities Commission
Calpine

Cameron-Daniel, P.C.
Casner, Steve
Center for Biological Diversity

Chevron Pipeline and Power
City of Palo Alto

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

Dept of General Services
Don Pickett & Associates, Inc.
Douglass & Liddell
Dish Wireless L.L.C.

East Bay Community Energy Ellison
Schneider & Harris LLP
Engineers and Scientists of California

GenOn Energy, Inc.
Goodin, MacBride, Squeri, Schlotz &
Ritchie
Green Power Institute
Hanna & Morton
ICF

iCommLaw
International Power Technology
Intertie

Intestate Gas Services, Inc.

Johnston, Kevin
Kelly Group
Ken Bohn Consulting
Keyes & Fox LLP
Leviton Manufacturing Co., Inc.

Los Angeles County Integrated
Waste Management Task Force
MRW & Associates
Manatt Phelps Phillips
Marin Energy Authority
McClintock IP
McKenzie & Associates

Modesto Irrigation District
NLine Energy, Inc.
NRG Solar

OnGrid Solar
Pacific Gas and Electric Company
Peninsula Clean Energy

Pioneer Community Energy

Public Advocates Office

Redwood Coast Energy Authority
Regulatory & Cogeneration Service, Inc.

Resource Innovations

SCD Energy Solutions
San Diego Gas & Electric Company

SPURR
San Francisco Water Power and Sewer
Sempra Utilities

Sierra Telephone Company, Inc.
Southern California Edison Company
Southern California Gas Company
Spark Energy
Sun Light & Power
Sunshine Design
Stoel Rives LLP

Tecogen, Inc.
TerraVerde Renewable Partners
Tiger Natural Gas, Inc.

TransCanada
Utility Cost Management
Utility Power Solutions
Water and Energy Consulting Wellhead
Electric Company
Western Manufactured Housing
Communities Association (WMA)
Yep Energy