

PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298



July 19, 2022

PG&E AL 6514-E, SCE AL 4730-E,
SDG&E AL 3961-E

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**Subject: Staff Disposition of PG&E AL 6514-E, SCE AL 4730-E, and SDG&E AL 3961-E --
Joint Report on Cybersecurity Discussions with the Smart Inverter Working Group and
Recommended Path Forward Directed in Ordering Paragraph 4 of Resolution E-5000.**

Dear Dietz, Menon, Kaushik and Faber:

Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric Company (SDG&E) submitted Joint Advice Letters (ALs) 6514-E, 4730-E, and 3961-E (Joint ALs), respectively, pursuant to Ordering Paragraph (OP) 4 of Resolution E-5000. The ALs were not protested. The Joint ALs are approved with an effective date of July 19, 2022 without an endorsement from Staff that cybersecurity discussions should be continued within Rulemaking (R.) 21-06-017.¹

Attachment 1 contains a discussion of the Joint ALs and Energy Division staff's determination that they are compliant with Resolution E-5000 OP 4.

¹ The scoping memo for R.21-06-017 (Order Instituting Rulemaking to Modernize the Electric Grid for a High Distributed Energy Resources Future) was issued on November 17, 2021, and included the following: "What existing cybersecurity standards should be applied for smart inverter operationalization and DERMS to ensure communications between the equipment and management systems are secure (e.g., IEEE 1547.3)?" *Assigned Commissioners Scoping Memo and Ruling, R. 21-06-017*. IEEE 1547.3 is a "Guide for Monitoring, Information Exchange, and Control of Distributed Resources Interconnected with Electric Power Systems."

Please contact Jose Aliaga-Caro of the Energy Division staff at jc5@cpuc.ca.gov if you have any questions.

Sincerely,

 FOR

Leuwam Tesfai
Deputy Executive Director for Energy and Climate Policy /
Director of Energy Division
California Public Utilities Commission

cc: Justin.Regnier@cpuc.ca.gov; Jose.Aliaga-Caro@cpuc.ca.gov; EDTariffUnit@cpuc.ca.gov; Service Lists R.17-07-007, and R.21-06-017. PGETariffs@pge.com; AdviceTariffManager@sce.com; Karyn.Gansecki@sce.com; ACarrillo@sdge.com; GAnderson@sdge.com, SDGETariffs@sdge.com

Attachment 1

I. BACKGROUND

On July 12, 2019, the California Public Utilities Commission (Commission) issued Resolution E-5000 (the Resolution) to clarify smart inverter communications requirements in response to the California Solar & Storage Association Petition for Modification of Resolutions E-4832 and E-4898. Resolution E-5000 clarified that the Smart Inverter Phase 2² requirements do not require IEEE 2030.5³ capabilities at the inverter level. The Commission also recognized that communications pathways that do not require end-to-end implementation of the IEEE 2030.5 protocol might allow for cybersecurity gaps. Additionally, because the timeline for the implementation of the Phase 2 communications requirements did not allow sufficient time for cybersecurity issues to be comprehensively addressed, the Resolution, in Ordering Paragraph (OP) 4, ordered that:

PG&E, SCE, and SDG&E shall, within 90 days of the publication of IEEE [Institute of Electrical and Electronic Engineers] 1547.1,^[4] begin meeting with the SIWG [Smart Inverter Working Group]^[5] and other interested parties, in order to address cybersecurity concerns raised by the Phase 2 communications requirements and develop a pathway forward. This direction is given without changes to previous orders.⁶

The Joint ALs (PG&E AL 6514-E, SCE AL 4730-E, and SDG&E AL 3961-E)—Joint Report on Cybersecurity Discussions with the Smart Inverter Working Group and Recommended Path Forward Directed in Ordering Paragraph 4 of Resolution E-5000—were submitted on February 25, 2022 to comply with this requirement. The Joint ALs were not protested.

II. DISPOSITION

Energy Division staff (Staff) has reviewed Resolution E-5000, and the IOUs' Joint ALs, and finds that the Joint ALs are in compliance with OP 4 of the Resolution.

In the Joint ALs, the IOUs state:

² The Phase 2 SIWG recommendations outline communications requirements for inverter-based generating facilities.

³ The Institute of Electrical and Electronic Engineers (IEEE) 2030.5 standard, sometimes referred to as the Smart Energy Profile (SEP) 2.0, defines an application profile that provides an interface between the smart grid and users. It specifies the mechanisms for exchanging application messages, the exact messages exchanged, and the required security features while allowing for a variety of possible architectures and usage models. Unlike other common communications protocols, IEEE 2030.5 fully supports the set of smart inverter functionalities recommended by the Smart Inverter Working Group.

⁴ “This standard specifies the type, production, commissioning, and periodic tests and evaluations that shall be performed to confirm that the interconnection and interoperation functions of equipment and systems interconnecting distributed energy resources (DERs) with the electric power system (EPS) conform to IEEE Std 1547.” *Source: “IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Energy Resources with Electric Power Systems and Associated Interfaces,” in IEEE Std 1547.1-2020, vol., no., pp.1-282, 21 May 2020, doi: 10.1109/IEEESTD.2020.9097534.*

⁵ The Smart Inverter Working Group (SIWG) grew out of a collaboration between the CPUC and California Energy Commission (CEC) in early 2013 that identified the development of advanced inverter functionality as an important strategy to mitigate the impact of high penetrations of distributed energy resources (DERs).

⁶ Resolution E-5000 at 43.

No Commission action is required to adopt this path forward given that this issue is already scoped within R.21-06-017. However, the IOUs request confirmation that they have fulfilled OP 4 of Resolution E-5000 by conducting extensive meetings with the SIWG to address cybersecurity concerns raised by the Phase 2 communications requirements; making a good faith and reasonable effort to develop a path forward; and identifying an appropriate venue through which to continue these efforts.⁷

In this disposition we confirm that the IOUs have fulfilled the requirements of Resolution E-5000 OP 4. The Resolution did not, however, require the IOUs to identify a venue through which to continue cybersecurity discussions; the type of “path forward” stated in the Resolution was not specified. In setting up the SIWG meetings, the Resolution stated:

We are cognizant that the timeline for the implementation of the Phase 2 communications requirements is unlikely to allow sufficient time for cybersecurity issues to be comprehensively addressed. In order to provide a proper venue in which to address the cybersecurity concerns raised in the responses to the Petition and Comments on the draft Resolution, we order the IOUs to begin meeting with the SIWG and other interested parties within 90 days of the publication of IEEE 1547.1, if not earlier, in order to address cybersecurity concerns raised by the Phase 2 communications requirements and develop a pathway forward.⁸

As indicated in the Resolution, the intent of the SIWG meetings was to provide a venue for discussions and to develop a pathway forward. Staff finds that Resolution E-5000 included no specific requirement that this pathway forward would necessarily entail discussions in a formal proceeding. Staff finds that asserting that the path forward lies within another proceeding is not in scope of the requirements of the Resolution. Staff finds it inappropriate for the IOUs to attempt to utilize an AL to establish that R.21-06-017 is the appropriate venue for the path forward. Such choices are generally made by relevant Administrative Law Judges and Commissioners rather than via Advice Letter.

Therefore, while it is Staff’s determination that the IOUs have fulfilled the requirements of the Resolution, Staff finds the IOUs have exceeded the requirements of the Resolution by identifying another venue to continue discussions regarding cybersecurity. As the Joint ALs are not part of a formal proceeding, Staff are not able to direct that these discussions should continue in R.21-06-017. Therefore, while these ALs are approved, they should not constitute an endorsement that these discussions should be part of R.21-06-017.

III. CONCLUSION

Staff finds that the IOUs have met the requirements of Resolution E-5000 OP 4 in the Joint ALs by having discussions with the SIWG and developing a pathway forward. Staff, however, cannot dictate the proceeding within which the discussions should be continued via the AL process.

Therefore, PG&E 6514-E, SCE AL 4730-E, and SDG&E AL 3961-E are approved without an endorsement to continue these discussions in R.21-06-017.

⁷ Joint ALs at 6-7.

⁸ Resolution E-5000 at 26.



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February 25, 2022

ADVICE LETTER 3961-E

San Diego Gas & Electric Company (U 902-E)

ADVICE LETTER 6514-E

Pacific Gas & Electric Company (U 39-E)

ADVICE LETTER 4730-E

Southern California Edison Company (U 338-E)

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

SUBJECT: Joint Report on Cybersecurity Discussions with the Smart Inverter Working Group and Recommended Path Forward Directed in Ordering Paragraph 4 of Resolution E-5000

I. PURPOSE

San Diego Gas & Electric Company (SDG&E), Southern California Edison Company (SCE), and Pacific Gas and Electric Company (PG&E) – together, the Joint Investor-Owned Utilities (IOUs) – submit this supplemental Tier 2 advice letter (AL) to the California Public Utilities Commission (Commission) to document how they complied with the requirement in Ordering Paragraph (OP) 4 of Resolution E-5000 to work with the Smart Inverter Working Group (SIWG) and other interested parties to address cybersecurity concerns raised by the Phase 2 communications requirements and develop a pathway forward.

II. BACKGROUND

On July 12, 2019, the Commission issued Resolution E-5000 to clarify smart inverter communications requirements in response to the California Solar & Storage Association Petition for Modification of Resolutions E-4832 and E-4898. Most notably, Resolution E-5000 reaffirmed that the Phase 2 communications requirements, as specified by the approved Rule 21 tariffs, may be met by any of the four options prescribed in Rule 21 Section Hh.5:

- 1) direct communication between the utility and smart inverter,
- 2) communication between the utility and an energy management system (EMS) that manages the inverter-based generating asset,

- 3) communication between the utility and an aggregator that manages the inverter-based generating asset, or
- 4) another communications pathway by mutual agreement.

Resolution E-5000 further clarified that the Phase 2 requirements do not require IEEE 2030.5 capabilities at the inverter level. Furthermore, the Commission recognized that the communications pathways that do not require end-to-end implementation of the IEEE 2030.5 protocol might allow for cybersecurity gaps. However, because the timeline for the implementation of the Phase 2 communications requirements did not allow sufficient time for cybersecurity issues to be comprehensively addressed, the Commission ordered that:

PG&E, SCE, and SDG&E shall, within 90 days of the publication of IEEE 1547.1, begin meeting with the SIWG and other interested parties, in order to address cybersecurity concerns raised by the Phase 2 communications requirements and develop a pathway forward. This direction is given without changes to previous orders.^{1,2}

The Joint IOUs commenced discussions with the SIWG to address cybersecurity concerns raised by the Phase 2 communications requirements on August 6, 2020. These cybersecurity discussions continued over the course of nine (9) SIWG meetings, the last of which occurred on February 6, 2022. A summary of each SIWG meeting is provided below.

III. DISCUSSION

A. Smart Inverter Working Group Discussions

Meetings 1-7 focused primarily on defining and understanding cybersecurity concerns associated with the Phase 2 communications requirements. Meetings 8-9 focused on discussing potential paths forward.

1. Kickoff Meeting

On August 6, 2020, the SIWG kicked off discussion of cybersecurity concerns raised by Phase 2 inverter communications. The IOUs outlined the ecosystem and architecture associated with IEEE 2030.5 communications, defining what is now referred to as “the grey box.” The grey box is the secure perimeter under the IOUs’ direct control, since the Commission declined to require IEEE 2030.5 at the inverter level for generating facilities that communicate with the utility via EMS or aggregator. The IOUs also proposed that the SIWG discuss and address cybersecurity concerns raised by Phase 2 inverter communications from a risk-based ecosystem approach, whereby all parties within the ecosystem – inverters, gateways, aggregators, and EMS – acknowledge and do their part to maintain cybersecurity. The IOUs also discussed potential development of cybersecurity requirements within each IOU’s Interconnection Handbook. The IOUs initiated regular meetings to discuss a proposed draft guideline to mitigate risk beyond the IOU grey box.

¹ Resolution E-5000, Ordering Paragraph (OP) 4.

² IEEE 1547.1 was published May 21, 2020.

2. Defining the Grey Box

On September 3, 2020, the IOUs continued discussion of the grey box and communications ecosystem. Stakeholders discussed additional industry efforts to develop standards and guides for reference that could be leveraged in the Rule 21 cybersecurity context, one such example is: IEEE 1547.3-2007 *Guide for Monitoring, Information Exchange, and Control of Distributed Resources Interconnected with Electric Power Systems*. The IOUs proposed development of a potential guide that could be structured according to key topic areas and plans to present an initial outline at the next SIWG meeting.

3. Reference Guide Outline

At the October 15, 2020, meeting, the IOUs presented and discussed with stakeholders an initial outline for a reference guide covering these topic areas:

- Overview, Risks and Accountability
- Reference Architectures and Demarcations
- Cybersecurity Overview, General Considerations and Certificates
- Utility Cybersecurity Recommendations Supporting Phase 2 DER Inverter Communications
- Main section defining the requirements Supporting Phase 2 DER Inverter Communications
- Reference Guides and Standards

4. Topic Area 1: Overview

The November 19, 2020, SIWG meeting focused on Topic Area 1 Overview. This covered scope, limitations, stakeholder considerations, risks and assessments, risk mitigation, and accountability. The IOUs also proposed four phases to creating a cybersecurity guide that would be published within the Interconnection Handbook, beginning with the outline (Phase 1), creation of the guide content (Phase 2), final draft guide for peer review (Phase 3), and final publication of the guide in the Interconnection Handbook in August 2021 (Phase 4).

5. Topic Area 2: Cybersecurity Overview

On February 4, 2021, the IOUs presented Topic Area 2: Cybersecurity Overview – Communications and Concepts. This topic focused on communications protocols, public key infrastructure (PKI), certificates, trust chains, security components and concepts, monitoring and response, and next generation security modeling.

6. Topic Area 3: Utility Cybersecurity Requirements

On March 18, 2021, the IOUs presented Topic Area 3: Utility Cybersecurity Requirements for DER Interconnection in supporting Phase 2 of DER inverter communications. Components of the discussion included:

- Boundary Protection
- Communication Protocols
- Cipher Suites
- Certificates
- Authentication, Authorization and Access Control
- Registration and Provisioning
- System Logs and Reporting Mechanisms
- Malicious Code Protection

7. Topic Areas 4-5: Reference Architecture, References and Standards

The May 13, 2021, meeting covered the final two topic areas: Topic Area 4 Reference Architecture and Topic Area 5 References and Standards. The IOUs again emphasized the entire ecosystem and cybersecurity concerns from an end-to-end perspective – including devices and users downstream of the utility – where cybersecurity threats may permeate. Stakeholders were able to ask questions and provide feedback during the meeting.

8. Reevaluating the Pathway Forward

The SIWG then reconvened on cybersecurity supporting Phase 2 inverter communications topic on May 26, 2021. SunSpec Alliance presented its perspective on cybersecurity, highlighting concerns with IOUs' limited perimeter protection framework, and proposed a "zero trust" security model. It is the IOUs' understanding that the "zero trust" model assumes no implicit trust granted to assets or users based solely on location or on asset ownership as highlighted in an excerpt from the presentation that reflects SunSpec Alliance's proposal for DER cybersecurity in California:

- Each party manages its own domain according to Zero Trust principles (*i.e.*, no reaching into others' domains)
- Non-utility actors will voluntarily do their part because their reputations and business prospects demand it
- All parties agree to cooperate by implementing best zero trust security practices and sharing information when security events occur

9. Pathway Forward

Following Meeting 8, the Joint IOUs reevaluated the recommended path forward. On July 2, 2021, the Commission issued an *Order Instituting Rulemaking to Modernize the Electric Grid for a High Distributed Energy Resources Future* (R.21-06-017, or High DER OIR) to consider issues directly related to Phase 2 communications, including distribution system operation (DSO) roles and responsibilities, optimizing the citing of DER within the distribution planning process, smart inverter operationalization, and grid modernization. In comments responding

to the OIR, the Joint IOUs each raised cybersecurity as an additional consideration within the scope of the proceeding.³ Further discussion of these cybersecurity concerns within the context of the new OIR was allocated within the Energy Division workshop held on September 29, 2021.

After several months of discussions among the Joint IOUs and with Energy Division staff, the SIWG reconvened on February 6, 2022. The Joint IOUs recommended to the SIWG that cybersecurity discussions within the context of Resolution E-5000 come to an end. Some stakeholders expressed disappointment that California may not develop cybersecurity requirements, where different national standards bodies may be either slow or unwilling. Other stakeholders agreed with the Joint IOUs and raised concerns that California-specific cybersecurity requirements could cause challenges for manufacturers ultimately having to follow multiple requirements across the United States. The Joint IOUs closed the SIWG discussion by sharing plans to file this advice letter. No stakeholders expressed opposition to this approach.

B. Recommended Path Forward

The SIWG meetings conducted since August 2020 did not result in ongoing consensus regarding how to address cybersecurity concerns raised by the Phase 2 communications requirements or consensus on a clear path forward. The Joint IOUs believe that the discussions were robust and highly technical, where all stakeholders learned a great deal. However, cybersecurity has broader, cross-cutting implications.

The Joint IOUs believe that Resolution E-5000 did not outline a clear scope or regulatory vehicle surrounding cybersecurity within the Rule 21 context. However, on November 17, 2021, the scoping memo for R. 21-06-017 (Order Instituting Rulemaking to Modernize the Electric Grid for a High Distributed Energy Resources Future) was issued, including the following: “What existing cybersecurity standards should be applied for smart inverter operationalization and DERMS to ensure communications between the equipment and management systems are secure (e.g., IEEE 1547.3)?”⁴

At the last SIWG meeting, Stakeholders considered this question and how it can be addressed in the Smart Inverter Operationalization Working Group (SIOWG). Industry advancements are critical but still in progress. The Institute of Electrical and Electronics Engineers (IEEE) is currently working to revise the IEEE Standard 1547.3-2007, Guide for Monitoring, Information Exchange, and Control of Distributed Resources Interconnected with Electric Power Systems. However, a national standard is not currently available. Traditionally, and ideally, standards development organizations (SDO), or standards-setting organizations (SSO), publish national standards and test procedures for industry to follow and according to which Nationally Recognized Testing Laboratories (NRTLs) certify and list vender products and devices. An SDO, or SSO, is an organization whose primary function is developing, coordinating, promulgating, revising, amending, reissuing, interpreting, or otherwise producing technical

³ PG&E Opening Comments at 12, SCE Opening Comments at 19, and SDG&E Opening Comments at 5, filed August 16, 2021.

⁴ Assigned Commissioners Scoping Memo and Ruling, R. 21-06-017, November 15, 2021

standards to address the needs of a group of affected adopters. Put another way, such an organization works to create uniformity across producers, consumers, government agencies, and other relevant parties regarding terminology, product specifications (e.g., size, including units of measure), protocols, and more.

Absent a national standard, requirements, or guide, the California IOUs could draft requirements from scratch, which presents risks. As discussed above, the Joint IOUs recommended this pathway to the SIWG and discussed steps to develop requirements (*i.e.*, what “shall” be done) and guidelines (*i.e.*, what we recommend “should” be done) in Meetings 1-7. Furthermore, it is unclear whether Resolution E-5000 authorizes the Joint IOUs to develop end-to-end cybersecurity requirements and guidelines as a condition of Rule 21 interconnection. Therefore, the Joint IOUs recommend the following path forward in compliance with Ordering Paragraph 4 of Resolution E-5000:

- The IOUs recommend the path forward for addressing cybersecurity concerns raised by the Phase 2 communications requirements be through Track 3, Phase 1, item 3 in R. 21-06-017, through the SIOGW. Addressing these concerns in R.21-06-017, where they are already scoped, will allow stakeholders to develop a more complete record, provide a formal structure for stakeholder engagement, and streamline efforts to address remaining cybersecurity concerns.
- The SIOGW is discussing use cases for smart inverter operationalization to prioritize in the distribution planning process within the scope of the High DER OIR. These use cases will consider the requirements and parties obligations necessary to implement them as real grid services
- Once implemented, these use cases will help to define requirements for grid service participation. These requirements will include the necessary level of cybersecurity and communication pathways as a contractual condition of providing the service. This experience of implementing these contracts will provide a practical foundation for establishing industry shareable model agreements including terms for cybersecurity, communications and other non-functional requirements for providing a grid service through DERs.
- If and when SDOs develop cybersecurity standards, guidelines, and/or testing procedures for the DER community, the Commission can reconvene the SIWG and/or SIOGW to evaluate the potential applicability and impact to Rule 21 and recommend a path forward.⁵ This should necessarily include a discussion/review of selected contract agreements already in force.

No Commission action is required to adopt this path forward given that this issue is already scoped within R.21-06-017. However, the IOUs request confirmation that they have fulfilled OP 4 of Resolution E-5000 by conducting extensive meetings with the SIWG to address

⁵ Any such Commission action would be unrelated to OP4 of Resolution E-5000 which is met by the path forward described in this Advice Letter.

cybersecurity concerns raised by the Phase 2 communications requirements; making a good faith and reasonable effort to develop a path forward; and identifying an appropriate venue through which to continue these efforts.

EFFECTIVE DATE

This filing is subject to Energy Division disposition and should be classified as Tier 2 pursuant to OP 9 of the Decision which Joint IOUs respectfully request become effective on March 27, 2022, which 30 days subsequent to the date of this submittal.

PROTEST

Anyone may protest this Advice Letter to the California Public Utilities Commission. The protest must state the grounds upon which it is based, including such items as financial and service impact, and should be submitted expeditiously. The protest must be submitted electronically and must be received by March 17, 2022, which is 20 days from the date filed. There is no restriction on who may file a protest.

The protest should also be sent via e-mail to the attention of the Energy Division Tariff Unit (EDTariffUnit@cpuc.ca.gov). A copy of the protest should also be sent via e-mail to the address shown below on the same date it is mailed or delivered to the Commission.

SDG&E

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NOTICE

A copy of this filing has been served on the IOUs and interested parties shown on the attached list and Service Lists for R.17-07-007 and R.21-06-017, by either providing them a copy electronically or by mailing them a copy hereof, properly stamped and addressed. Address changes should be directed to SDG&E Tariffs by e-mail at SDGETariffs@sdge.com.

/s/ Clay Faber

CLAY FABER
Director – Regulatory Affairs



ADVICE LETTER SUMMARY

ENERGY UTILITY



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

Company name/CPUC Utility No.: San Diego Gas & Electric Company (U902-E)

Utility type:

- ELC GAS WATER
 PLC HEAT

Contact Person: Aurora Carrillo

Phone #: (858) 654-1542

E-mail: ACarrillo@sdge.com

E-mail Disposition Notice to: ACarrillo@sdge.com

EXPLANATION OF UTILITY TYPE

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

(Date Submitted / Received Stamp by CPUC)

Advice Letter (AL) #: 3961-E et al

Tier Designation: 2

Subject of AL: Joint Report on Cybersecurity Discussions with the Smart Inverter Working Group and Recommended Path Forward Directed in Ordering Paragraph 4 of Resolution E-5000

Keywords (choose from CPUC listing):

AL Type: Monthly Quarterly Annual One-Time Other:

If AL submitted in compliance with a Commission order, indicate relevant Decision/Resolution #:

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: N/A

Summarize differences between the AL and the prior withdrawn or rejected AL: N/A

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: 3/27/22

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 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
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General Order No. 96-B
ADVICE LETTER SUBMITTAL MAILING LIST

cc: (w/enclosures)

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B. Barkovich

Biofuels Energy, LLC

K. Frisbie

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Solar Turbines

C. Frank

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K. Gansecki

TerraVerde Renewable Partners LLC

F. Lee

TURN

M. Hawiger

UCAN

D. Kelly

US Dept. of the Navy

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Service List

R.17-07-007
R.21-06-017

**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 Blasing 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
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Don Pickett & Associates, Inc.
Douglass & Liddell

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
International Power Technology

Intertie

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

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