

## PUBLIC UTILITIES COMMISSION

505 VAN NESS AVENUE  
SAN FRANCISCO, CA 94102-3298



March 03, 2022

PG&E AL 6286-E, 6286-E-A, and 6286-E-B  
SCE AL 4559-E and 4559-E-A  
SDG&E AL 3822-E, 3822-E-A, and 3822-E-B

Sidney Bob Dietz II  
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

Tara S. Kaushik  
Managing Director, Regulatory Relations  
c/o Karyn Gansecki  
Southern California Edison Company  
601 Van Ness Avenue, Suite 2030  
San Francisco, California 94102  
Facsimile: (415) 929-5544  
E-mail: Karyn.Gansecki@sce.com

Shinjini C. Menon  
Managing Director, State Regulatory Operations  
Southern California Edison Company  
8631 Rush Street  
Rosemead, California 91770  
Facsimile: (626) 302-6396  
E-mail: [AdviceTariffManager@sce.com](mailto:AdviceTariffManager@sce.com)

Greg Anderson  
Regulatory Tariff Manager  
E-mail: GAnderson@sdge.com  
SDGETariffs@sdge.com

**Subject: Staff Disposition of: PG&E AL 6286-E, 6286-E-A, and 6286-E-B; SCE AL 4559-E and 4559-E-A; and SDG&E AL 3822-E, 3822-E-A and 3822-E-B -- Modifications to Rule 21, Generating Facility Interconnections, Pursuant to Decision 20-09-035 Ordering Paragraphs 7, 49, 50 and 52 (SCE only)**

Dear Dietz, Menon, Kaushik and Anderson:

Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric Company (SDG&E) submitted Advice Letters (ALs) 6286-E, AL 4559-E, and AL 3822-E, respectively, pursuant to Ordering Paragraph (OP) 55<sup>1</sup> of Decision (D.) 20-09-035. The ALs were protested by Tesla, Inc. (Tesla) and the Interstate Renewable Energy Council, Inc. (IREC). In response, PG&E, SCE and SDG&E submitted supplemental PG&E AL 6286-E-A, PG&E 6286-E-B, SCE AL 4559-E-A, SDG&E AL 3822-E-A and SDG&E AL 3822-E-B addressing selected contested topics. PG&E, SCE, and SDG&E have met the requirements set forth in D.20-09-035 Ordering

<sup>1</sup> OP 55 provides a list of the OPs in D.20-09-035 requiring changes to Electric Tariff Rule 21 and the corresponding Advice Letter deadline for each change.

Paragraphs 7, 49, 50 and 52 (applicable to SCE only) by making the necessary tariff changes. PG&E AL 6286-E, 6286-E-A and 6286-E-B, SCE AL 4559-E and 4559-E-A, and SDG&E AL 3822-E, 3822-E-A and 3822-E-B and corresponding substitute sheets are approved with an effective date of August 6, 2021.

Attachment 1 contains a discussion of the ALs, the protests of Tesla and IREC, the IOUs replies to the protests and Energy Division staff's determination that PG&E AL 6286-E, 6286-E-A and 6286-E-B, SCE AL 4559-E and 4559-B, and SDG&E AL 3822-E, 3822-E-A, 3822-E-B and corresponding substitute sheets are compliant as modified with D. 20-09-035.

Please contact Jose Aliaga-Caro of the Energy Division staff at [jc5@cpuc.ca.gov](mailto:jc5@cpuc.ca.gov) if you have any questions.

Sincerely,



Simon Baker  
Interim Deputy Executive Director for Energy and Climate Policy /  
Interim Director of Energy Division  
California Public Utilities Commission

cc: [Justin.Regnier@cpuc.ca.gov](mailto:Justin.Regnier@cpuc.ca.gov); [Jose.Aliaga-Caro@cpuc.ca.gov](mailto:Jose.Aliaga-Caro@cpuc.ca.gov); [EDTariffUnit@cpuc.ca.gov](mailto:EDTariffUnit@cpuc.ca.gov); Service Lists R.11-09-011, and R.17-07-007. [PGETariffs@pge.com](mailto:PGETariffs@pge.com); [KELM@pge.com](mailto:KELM@pge.com); [AdviceTariffManager@sce.com](mailto:AdviceTariffManager@sce.com); [Karyn.Gansecki@sce.com](mailto:Karyn.Gansecki@sce.com); [ACarrillo@sdge.com](mailto:ACarrillo@sdge.com); [SDGETariffs@sdge.com](mailto:SDGETariffs@sdge.com); [anschwartz@tesla.com](mailto:anschwartz@tesla.com); [stanfield@smwlaw.com](mailto:stanfield@smwlaw.com)

## Attachment 1

### **I. BACKGROUND**

Decision 20-09-035 *Adopting Recommendations from Working Groups Two, Three, and Subgroup*, (D.20-09-035 or the Decision) issued on September 30, 2020, in the Rulemaking (R.) 17-07-007,<sup>2</sup> directs the modification of Electric Tariff Rule 21<sup>3</sup> (Rule 21) of Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), and San Diego Gas & Electric Company (SDG&E) (collectively the IOUs).

Ordering Paragraph (OP) 55<sup>4</sup> of the Decision orders PG&E, SCE and SDG&E to update Rule 21 in compliance with other OPs in the Decision; OP 55 provides a list of the OPs in the Decision requiring changes to Rule 21, the grouping of such changes, and the deadline for submitting the ALs. Per OP 55, the first set of ALs included changes ordered in seven (7) OPs: 7, 13, 14, 46, 49, 50 and 52.<sup>5</sup>

#### **A. Initial ALs: PG&E AL 5988-E, SCE AL 4328-E, and SDG&E AL 3642-E**

PG&E AL 5988-E, SCE AL 4328-E, and SDG&E AL 3642-E (the Initial ALs) were submitted on October 30, 2020 to respond to the OP 55 requirements. These ALs were timely protested on November 19, 2020. The IOUs submitted timely replies to the protests on November 30, 2020. In response to the protests, PG&E AL 5988-E-A, SCE AL 4328-E-A, and SDG&E AL 3642-E-A (collectively “the Supplementals to the Initial ALs”) were submitted on May 19, 2021 addressing *selected* contested issues from the protests. These supplemental ALs resolved those contested issues that allowed for consensus between parties. These supplemental ALs, at Energy Division’s guidance, did not contain all the content included in the Initial ALs and *only included* modifications to Rule 21 as ordered by OPs 13, 14, and 46. The Supplementals to the Initial ALs were disposed of separately and are not discussed herein.<sup>6</sup>

#### **B. Current ALs Subject to this Disposition Letter: PG&E AL 6286-E, SCE AL 4559-E and SDG&E AL 3822-E**

Modifications to Rule 21 in compliance with OPs 7, 49, 50 and 52 were *excluded* from the Supplementals to the Initial ALs. The reason for excluding content related to these OPs was because these modifications to Rule 21 required more in-depth discussions and were more complicated to resolve. Modifications in compliance with these OPs are the subject of this Disposition Letter.

Energy Division held meetings between February 2021 and July 2021 with the IOUs and the stakeholders who submitted protests to the Initial ALs. The purpose of the meetings was to clarify the

---

<sup>2</sup> Order Instituting Rulemaking to Consider Streamlining Interconnection of Distributed Energy Resources and Improvements to Rule 21.

<sup>3</sup> Rule 21 governs the interconnection of distributed energy resources to the utilities’ electric grid.

<sup>4</sup> The OPs in D.20-09-035 contained errors in references to other OPs. These were the result of an OP that was deleted, from the draft, in the final decision, which changed the numbering sequence of subsequent OPs. D.21-01-027, issued on January 21, 2021, corrected the numbering sequence. Table 1 of this Disposition Letter reflects this correction.

<sup>5</sup> OP 52 is applicable to SCE only.

<sup>6</sup> PG&E’s AL 5988-E-A and SDG&E AL 3642-E-A were approved by Energy Division disposition letter dated September 21, 2021; SCE AL 4328-E-A was approved by Energy Division disposition letter dated December 13, 2021.

issues, gain consensus and resolve issues related to the use of Power Control Systems (PCS). The cumulation of these discussions led to the filing of PG&E AL 6286-E, SCE AL 4559-E, SDG&E AL 3822-E (collectively “the Current ALs”) on August 6, 2021 modifying Rule 21 in compliance with OPs 7, 49, 50 and 52 of the Decision. This Disposition Letter addresses the Current ALs and the associated protests.

### *C. Ordering Paragraph Requirements*

OP 7: OP 7 adopted Option B of Proposal 8i which maintains the current process whereby non-exporting projects of all sizes skip Interconnection Rule 21 Screens K, L, and M.<sup>7</sup>

Although the current process is maintained, modifications to Rule 21 were still needed to include language mandated by OP 49 and 50. Modifications to Rule 21 for OP 7 are included in the IOUs’ Rule 21 Section G.1.i--Screen I<sup>8</sup> (Engineering Review Details-Initial Review Screens-Screen I).<sup>9</sup>

OP 49 and OP 50: OP 49 and OP 50 adopted Proposal A-B-1 and Proposal A-B-2, respectively. These proposals allow the use of a PCS for non-export and limited-export applications. Specifically, OP 49 lists the requirements that a generating facility must meet to be treated as non-export or limited export, while OP 50 lists the requirements that a generating facility must meet to be treated as inadvertent export.

Modifications to Rule 21 for OP 49 and 50 are included in the IOUs’ Rule 21 Sections:

- G.1.i: Engineering Review Details-Initial Review Screens-Screen I,
- Mm1.Option 8: Non-Export Utilizing Certified Power Control Systems,
- Mm2.Option 9: Limited Export Utilizing Certified Power Control Systems,
- Mm3. Option 10: Non-Export with Inadvertent Export Utilizing Certified Power Control Systems, and
- Mm4. Option 11: Limited Export with Inadvertent Export Utilizing Certified Power Control Systems.<sup>10</sup>

OP 52 (applicable to SCE only): OP 52 adopted Proposal A-B-4 only for customers of SCE. SCE was ordered to revise its Rule 21 tariff to require SCE customers applying for interconnection with a PCS to use only the systems on a pre-approved list. Modifications to Rule 21 for OP 52 are included in SCE’s Rule 21 Section Hh.1.g (Smart Inverter Generating Facility Design and Operating Requirements-General Interconnection and Protective Functions Requirements).<sup>11</sup>

---

<sup>7</sup> Screen K asks whether a generating facility is a net energy metering project with a nameplate capacity equal to 500 kW or less. Screen L asks whether there are known transient stability limitation or if the proposed project has interdependencies with earlier-queued Transmission System interconnection requests. Screen M asks whether the total generation capacity on the line section is less than 15 percent of line section peak load for all time sections bounded by automatic sectionalizing devices.

<sup>8</sup> Screen I asks whether power will be exported across the Point of Common Coupling.

<sup>9</sup> PG&E AL 6286-E, at 7-8, SCE AL 4559-E at 4-5, and SDG&E AL 3822-E at 2-3.

<sup>10</sup> PG&E AL 6286-E at 12-16, SCE AL 4559-E at 5-12, and SDG&E AL 3822-E at 5.

<sup>11</sup> SCE AL 4559-E at 5.

#### ***D. Traditional Protective Relays and Power Control Systems (PCS) – Background for OP 49 Requirements***

A traditional protective relay will physically disconnect the generating or storage facility from the grid if power flow is sensed in whichever direction power flow is not permitted. Its main function is to protect the electric grid by removing an element of the power system from service when it starts to operate in an abnormal manner that might damage or interfere with the effective operation of the electric grid. In the standard practice of the IOUs, the relay disconnects the generating facility if the relay senses reverse power flow for a time greater than 2 seconds. According to the Rule 21 Working Group 3 Report “if a customer installs a physical non-export relay it is relatively simple for the utility to validate that the system will not export. However, non-export relays can be prohibitively expensive.”<sup>12</sup>

PCS are systems or devices that electronically limit or control the Alternating Current (AC) or Direct Current (DC) of a generating facility to a programmable limit or level. PCS have an Open Loop Response Time (OLRT) that is described by the Working Group 3 Report below:

The example of a load-following generating facility with both solar and storage can illustrate the concepts of open-loop response time and inadvertent export. When load increases, the storage system discharges to meet that load. When the load decreases, the system reduces output or stops discharging but will inadvertently export to the grid for a period of time to the extent that instantaneous generation exceeds instantaneous load. **This time period is referred to as the open loop response time of the control system.** When load reduces quickly, power may be inadvertently exported to the grid during the time it takes for the system to sense the load reduction and tell the battery to stop discharging. If a system has been tested and certified under the UL CRD<sup>13</sup> for limited export, the generating facility can export power up to nameplate capacity until the control system makes a correction within its certified open-loop response time.

Utilities must account for this inadvertent export while also recognizing that it is short-lived and non-coincidental among customers on a circuit segment because the load of neighboring customers does not go up and down in unison. Further, it should be noted that these control systems do not limit the number of export occurrences, and the instances of export are based on the customer’s operating characteristics. Customers who have very cyclic loads will undergo inadvertent export many times, while customers who have relative steady load pattern will have very few instances of inadvertent export.<sup>14</sup>

A key difference between a traditional protective relay and a PCS has to do with the mechanism used to control power output to the electric grid. Once a relay registers a level of current that triggers the protective function, the relay will create a physical air gap between the generating system and the

---

<sup>12</sup> Rule 21 Working Group Three Final Report, June 14, 2019, at 127.

<sup>13</sup> UL CRD refers to *Underwriters Laboratory Power Control Systems Certification Requirements Decision* which lists testing conformance for PCS. It “provides a way for inverters and power control systems to be tested and qualified for non-export and limited export.... A power control system certified to the UL CRD allows a device to demonstrate that it is capable of preventing or limiting export, within a time-delay of up to 30 seconds.” (Rule 21 Working Group Three Final Report, June 14, 2019, at 127.)

<sup>14</sup> Rule 21 Working Group Three Final Report, June 14, 2019, at 129, emphasis added.

electric grid, thereby bringing the power output to the electric grid to zero. Once a PCS registers a level of current that triggers the protective function, a PCS will rely on electronics to control the power output to the electric grid and may not entirely bring power output to the grid to a zero value and may not necessarily retain it at or near zero within the OLRT. Additionally, the Working Group 3 Final Report reads:

[A relay] acts in unexpected circumstances, when generating facility controls deviate from normal. A [PCS] device, in contrast, may operate much more frequently, or even continuously, to regulate system output under normal conditions. A further difference is the level of historical utility experience. Relays have been used for many decades, while very little experience yet exists with [PCS]. While power control systems have been used historically, they have not been relied upon historically in the same way that [PCS] devices without a physical non-export relay are now being relied upon.<sup>15</sup>

Discussions during the meetings Energy Division held with the IOUs and stakeholders centered on the OLRT and the limitations of a PCS to stop export of power within the OLRT of 2 seconds<sup>16</sup> per the requirements of OP 49. To reflect the inability of the PCS to act identically to a relay and make these proposals workable to ensure safety and reliability of the grid, the discussions revolved around adding a period of time after the OLRT for the PCS to reach a steady state value. Although no formal definition has been adopted in Rule 21 nor the standards for “steady state,” in general terms, steady state is a system condition where the controlled parameter (e.g., output power) does not change over time or the change is bounded within certain values.

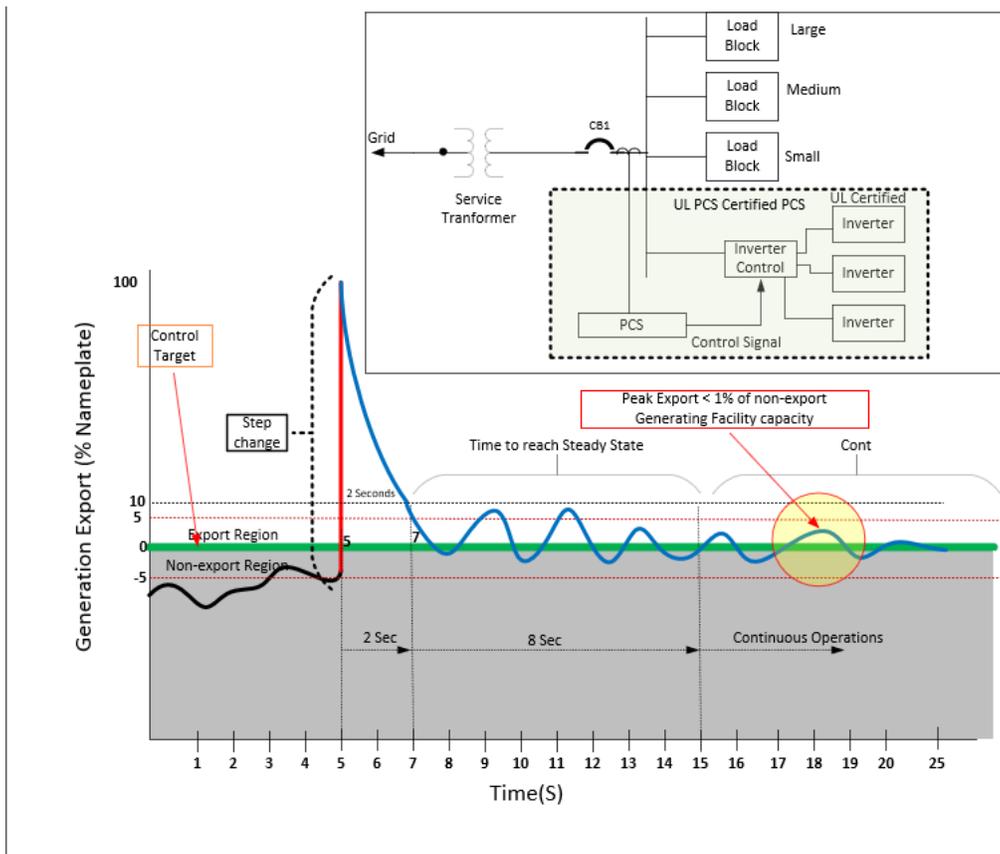
Figure 1 shows the concept of steady state for a 2 second ([s]) OLRT. Between time (t) equals (=) zero to t=5 [s] the generating facility is not exporting power to the electric grid and all power produced by the generating facility is being absorbed by the existing load (black squiggly line). At t=5 [s] there is a sudden drop in load and the facility starts exporting power to the electric grid (vertical red line the “step change”) more than the allowed limit (horizontal green line). The period between t=5 and t=7 [s] is the 2-second OLRT during which time the PCS attempts to bring the export power value back down (blue descending line) to the allowed limit. But the PCS may not reach the allowed limit within the OLRT and there could be a time after the 2 [s] OLRT where the PCS exports and absorbs small amounts of power (blue squiggly line). To account for this operation, the IOUs have added, after the OLRT, an 8 [s] period of time for the PCS to reach steady state--the PCS must reach steady state within 10 [s] (at t=15) after the step change. After t=15 [s], during continuous operation, the PCS will keep the export value bounded and below a pre-determined value.

**Figure 1: PCS Operation Responding to a Rapid Loss in Load**

---

<sup>15</sup> Rule 21 *Working Group Three Final Report, June 14, 2019*, at 128.

<sup>16</sup> “A power control system certified to the UL CRD allows a device to demonstrate that it is capable of preventing or limiting export, within a time-delay of up to 30 seconds.” (Rule 21 *Working Group Three Final Report, June 14, 2019*, at 127.)



Source: Diagram from informal discussions papers. E-mail from SCE on Tuesday 6/1/2021 at 5:10 P.M.

### E. Protest by Tesla, and Replies by the IOUs

Tesla submitted a protest to the Current ALs on August 26, 2021. The IOUs filed timely replies on September 2, 2021 to Tesla’s protest.

Tesla protested four topics. The protest and the IOUs’ replies are summarized below:

- Section Mm1 should be expanded to explicitly indicate that non-exporting systems that meet the stated requirements and criteria enumerated as part of Option 8 shall be treated as non-exporting.** Tesla acknowledges that section Mm1 captures the requirements agreed upon, but requests language be added “that makes explicit that systems that meet the identified criteria will be treated as non-exporting.”<sup>17</sup>

- The IOUs reply that the change proposed is unnecessary and Tesla’s proposed language is “the complement and tantamount to the same requirements that PG&E has included in its tariff,”<sup>18</sup> that the IOUs proposed language “adequately addresses Tesla’s

<sup>17</sup> Tesla Protest at 2.

<sup>18</sup> PG&E Reply to Tesla’s Protest at 3.

concern,”<sup>19</sup> and that “Tesla’s proposed language is a different way to arrive at the same conclusion when compared to the existing language.”<sup>20</sup>

**2. The thresholds included in the criteria applicable to systems greater 600 kVA should be revisited and revised in the future based on empirical data and/or study to ensure they are grounded in a more objective and fact-based assessment of practical impacts.** Tesla argues that revisions in sections Mm1 and Mm2 include thresholds for the steady state value of the PCS as 1 percent. This percentage was a result of informal discussions between the IOUs and selected stakeholders that had protested this language. Tesla states that the 1% value is not based on empirical data or evidence and that the ALs should be modified to indicate that the thresholds are interim and will be updated when more information is available “ideally via an expressly defined research and evaluation plan over the next year that will further assess the practical impacts of inadvertent export and what levels/durations would result in material impacts on the grid.”<sup>21</sup>

- PG&E replies that “there is no evidence indicating that these threshold values are not the “right” thresholds.”<sup>22</sup> SCE replies “The proposed thresholds, which stakeholders supported, are appropriate and necessary to ensure grid safety and reliability given that it is not possible to determine the exact level, timing, and frequency at which a system would experience an issue”<sup>23</sup> and is not opposed to revisiting these values in the future as long as safety and reliability are not compromised. SDG&E also supports revising the existing criteria in the future based on new data.<sup>24</sup>

**3. The data requirements imposed on applicants that are included as part of Sections Mm3 and Mm4 regarding anticipated inadvertent exports are highly impractical and require additional work to operationalize.** Tesla acknowledges these requirements were included pursuant to OP 50 of the Decision, but is concerned that “they are highly impractical. In order to obtain this data the applicant would need to extensively meter their site at significant cost and then model how a storage or other DER system would operate to arrive at a reasonable estimate or characterization of anticipated inadvertent export”<sup>25</sup> and recommends “additional stakeholder dialogue to discuss how this information can be obtained without unduly burdening customers.”<sup>26</sup>

- The IOUs reply that this language was included in the Proposal A-B-2 which was a consensus proposal by stakeholders and was approved by the Decision. Additionally, the IOUs argue that it is impossible for them to determine how the system will operate and therefore must rely on the customer to provide this information.<sup>27</sup> SCE further

---

<sup>19</sup> SCE Reply to Tesla’s Protest at 1.

<sup>20</sup> SDG&E Reply to Tesla’s Protest at 1.

<sup>21</sup> Tesla Protest at 2.

<sup>22</sup> PG&E Reply to Tesla’s Protest at 4.

<sup>23</sup> SCE Reply to Tesla’s Protest at 2.

<sup>24</sup> SDG&E Reply to Tesla’s Protest at 1.

<sup>25</sup> Tesla Protest at 3.

<sup>26</sup> Tesla Protest at 3.

<sup>27</sup> PG&E Reply to Tesla’s Protest at 5; SCE Reply to Tesla’s Protest at 2-3; and SDG&E Reply to Tesla’s Protest at 2.

argues that because it was a consensus proposal and was “approved by the Commission, there is no need for additional stakeholder dialogue.”<sup>28</sup>

4. **Additional clarification and information is needed regarding the distribution provider’s approved list of PCS systems.** Tesla requests that the IOUs “provide additional information regarding the process by which an entity can request to have their PCS listed, how the utilities will evaluate the PCS, as well as a timeline for the review to be completed from start to finish.”<sup>29</sup> Tesla also requests the IOUs to be directed to establish a uniform and coordinated review process.

- PG&E replies that it “will prepare a website detailing the process for its review and approval of PCSs, as well as its list of approved PCS, as part of the implementation of OP 52.”<sup>30</sup> SCE replies that this requirement is only applicable to SCE and states “While coordinating with the other IOUs is a good industry practice, it was not required as part of OP 52. SCE will maintain a website detailing the process for SCE to review and approve control systems, along with its list of approved control systems, as part of the implementation of OP 52.”<sup>31</sup> SDG&E replies that this requirement is only applicable to SCE.<sup>32</sup>

#### *F. Protest by IREC, and Replies by the IOUs*

IREC submitted a protest to the Current ALs on September 2, 2021. Protests were due on August 26, 2021; therefore, this protest was submitted late. Energy Division informed the IOUs that IREC’s late protest was accepted, and per GO 96-B, Section 7.4.4, the IOUs had five business days to reply. The IOUs filed timely replies on September 10, 2021 to IREC’s protest.

IREC protested six topics. The protest and the IOUs’ replies are summarized below:

1. **The requirements in the newly added Mm1 through Mm4 are unduly restrictive and are only acceptable as a temporary solution.** IREC argues the proposals “to establish requirements for the use of certified PCS are unduly restrictive, not supported by evidence of documented risks, and thus should only be used as a temporary solution.”<sup>33</sup> IREC states that there is no evidence to demonstrate that there is a need to impose further restrictions on facilities using PCS, beyond requiring a two or ten second OLRT and believes it is more appropriate to require that PCS have an open loop response time of two or ten seconds and nothing more. IREC notes it agreed upon certain restrictions beyond requiring a two or ten second OLRT with the intent that these restrictions were temporary, and that IREC prepared a document, with input from the IOUs, describing the “next steps” IREC states that the IOUs had agreed to include the “next steps” document in their Advice Letters but failed to do so.

---

<sup>28</sup> SCE Reply to Tesla’s Protest at 3.

<sup>29</sup> Tesla Protest at 3.

<sup>30</sup> PG&E Reply to Tesla Protest at 5.

<sup>31</sup> SCE Reply to Tesla Protest at 3.

<sup>32</sup> SDG&E Reply to Tesla Protest at 2.

<sup>33</sup> IREC Protest at 2.

- PG&E and SCE reply that there was a discussion on the “next steps”<sup>34</sup> document, but it is incomplete and consequently was not included in the Current ALs.<sup>35</sup> PG&E states it is committed to completing the analysis and “taking additional actions, including updating the appropriate Mm sections if the analysis supports that updates to these sections will not compromise equipment operations and/or grid safety.”<sup>36</sup> SCE also shares this commitment<sup>37</sup> and SDG&E “supports revisiting existing criteria in the future, based upon new empirical data to avoid or add requirements.”<sup>38</sup>

2. **No evidence indicates that an open loop response time of 2 or 10 seconds is insufficient to ensure the safe and reliable operation of the grid, and it is not rational to conclude that the Decision imposes additional restrictions.** IREC argues that to “interpret the language in the Decision<sup>39</sup> as imposing additional restrictions beyond the open loop response time is not rational...[and] Interpreting that language as an additional requirement involves developing substantial further technical specifications that go well beyond what the Commission adopted in its Decision.”<sup>40</sup> While IREC asserts the additional requirements are unnecessary from a safety and reliability standpoint, it remains committed to addressing the IOUs’ concerns. The “Next Steps” process IREC proposes identifies the list of concerns and research that can address them. IREC states that the Commission should either (1) adopt the Next Step process as a requirement for approving the Current ALs or (2) reject the Current ALs and “remove the additional requirement that projects cease operation within two seconds.”<sup>41</sup> IREC argues that the IOUs have not identified any evidence that projects with PCS that meet the OLRT would cause safety or reliability impacts to the grid.<sup>42</sup> IREC argues that “In the absence of a Next Steps document, the Commission should require that PCS certified under the UL CRD have an open loop response time of 2 or 10 seconds, and nothing more.”<sup>43</sup> IREC states “Essentially all the requirements in Ordering Paragraph 49 would remain except the duplicative language in item (ii) indicating systems should reduce export within two seconds.”<sup>44</sup>

- PG&E replies “acceptance of proposal A-B #1 and A-B #2 was based on the working group consensus that the control system would be able to reduce export to approve limit within a required time (2 seconds or 10 seconds)...[and that OP 49] is very clear about the two second requirement.”<sup>45</sup> PG&E states that the additional proposed language regarding the steady state period of time in the tariff revisions was necessary to bring the PCS operational performance close to OP 49 requirements because the PCS failed

<sup>34</sup> As PG&E describes it, “The “next steps” process IREC mentions identifies the list of potential concerns the utilities have identified, research that can address those concerns, and provided that parties will evaluate and discuss the research.”

PG&E Reply to IREC Protest at 2-3.

<sup>35</sup> PG&E Reply to IREC Protest at 2-3; SCE Reply to IREC Protest at 1-2.

<sup>36</sup> PG&E Reply to IREC Protest at 3.

<sup>37</sup> SCE Reply to IREC Protest at 2.

<sup>38</sup> SDG&E Reply to IREC Protest at 1.

<sup>39</sup> Footnote 5 in IREC’s Protest at 3-4 states “the language in question reads that a PCS shall: “be able to reduce export power to the approved export limit within two seconds of exceeding the approved export limit.””

<sup>40</sup> IREC Protest at 3-4.

<sup>41</sup> IREC Protest at 4.

<sup>42</sup> IREC Protest at 4.

<sup>43</sup> IREC Protest at 4.

<sup>44</sup> IREC Protest at 4.

<sup>45</sup> PG&E Reply to IREC Protest at 3-4.

to meet the Decision’s requirements to “reduced export power to the approved export limit” as agreed upon in the Working Group 3 Report. PG&E states it is committed to continue to work through these issues with stakeholders once sufficient information is available to show there are no safety issues from the PCS and only then should the requirements be modified. Similarly, SCE states:

SCE is not misinterpreting the Decision to impose additional restrictions. The language in the Decision is clear that the PCS “must be able to reduce export power to the approved export limit within two seconds of exceeding the approved export limit... To date, the PCS has been unable to meet OP 49’s requirement to “reduce export power to the approved export limit” within two seconds.<sup>46</sup>

and:

SCE is unable to ignore the export associated with these systems without evaluating the risks. However, SCE is committed to continuing to work on these issues with stakeholders. Indeed, SCE and stakeholders already agreed to add language to Sections Mm1 and Mm2 to bring the requirement closer to the PCS operational performance. (SCE added the following language to address the fact that the PCS cannot meet the Decision’s requirements: “A PCS that is certified with an open-loop response time of two seconds or less, and a time to reach steady state of 10 seconds or less, meets this requirement.”) Moreover, when sufficient information is available that shows that there are no safety issues due to the performance of the PCS, SCE would be supportive of reviewing and modifying the requirements.<sup>47</sup>

SDG&E “argues the opposite: no evidence existing to indicate the open-loop response time of 2 or 10 seconds is sufficient to ensure safety and reliability.”<sup>48</sup> SDG&E also states that it is not misinterpreting the OP 49 language and that the language in the Decision is clear in stating that the PCS “must be able to reduced export power to the approved export limit within two seconds of exceeding the approved export limit.”<sup>49</sup> SDG&E also expresses that “the PCS has fallen short of its expectations and cannot meet the performance requirements of OP 49 to ‘reduce export power to the approved export limit.’”<sup>50</sup> SDG&E also states it is committed to continuing the discussions on these issues with stakeholders and that it supports modifications to the requirements once information is available that there are no safety issues due to the performance of the PCS.

**3. Section Mm1 needs revision to clearly state that projects will be treated as non- export during the screening process.** IREC argues that section Mm1 does not provide sufficient

---

<sup>46</sup> SCE Reply to IREC Protest at 2.

<sup>47</sup> SCE Reply to IREC Protest at 3.

<sup>48</sup> SDG&E Reply to IREC Protest at 1.

<sup>49</sup> D.20-09-035 at 222.

<sup>50</sup> SDG&E Reply to IREC Protest at 2.

clarity that qualifying projects will be treated as non-exporting projects in Screen N or other appropriate screens when they meet all the IOUs' requirements, and suggests language should be added to section Mm1(iii) to make that clear.

- The IOUs reply that the proposed language included in the Current ALs was drafted by IREC. Furthermore, the IOUs state that there was no conversation to include language related to Screen N within section Mm1 because projects under this section would not make it to Supplemental Review (Screen N) as these projects are considered non-export.<sup>51</sup>
4. **Section Mm4 is Missing Part of the Consensus Language.** IREC states that at the end of Rule 21 section Mm4 (Option 11, Limited Export OLRT between 2 and 10 seconds), the submitted advice letters failed to include language that was part of the consensus language agreed upon during discussions and should be added back to the tariff. Specifically, IREC argues that the following language be added “Use only the largest facility in the line section for aggregate evaluation for subsequent interconnection requests.”
- The IOUs reply that the language was intentionally left out because Section Mm4 is for exporting generators and are thus part of the interconnection queue and are used to study subsequent interconnection requests. Furthermore, “The language remains for Mm3, inadvertent export, because it is not expected that all projects would be in inadvertent export mode at the same time. However, Section Mm4 addresses exporting generators that are expected be exporting at the same time, so they must be studied as such.”<sup>52</sup>
5. **PG&E’s proposed language contains minor inconsistencies with the language proposed by the other IOUs.** IREC notes that it is important that the language used in Rule 21 be consistent across each of the IOUs’ tariffs to avoid confusion and facilitate further revisions down the road and requests that this inconsistency be remedied.
- PG&E states it “regrets it missed these differences and will submit a supplement to address them.”<sup>53</sup>
6. **SCE proposes to revise its Interconnection Application forms, but PG&E and SDG&E have not.** IREC argues all the IOUs should revise their interconnection application forms. Additionally, IREC argues that SCE’s interconnection application forms do not use Rule 21’s defined terms, suggests revisions to SCE’s forms; and recommends that if the other IOUs are required to revise their forms, they should pay attention to the use of defined terms.
- IOUs’ Replies: PG&E states that it has revised its Interconnection Application for Non-Export. PG&E states it:

---

<sup>51</sup> PG&E Reply to IREC Protest at 4-5; SCE Reply to IREC Protest at 3; SDG&E Reply to IREC Protest at 2-3.

<sup>52</sup> PG&E Reply to IREC Protest at 5; SCE Reply to IREC Protest at 3; SDG&E Reply to IREC Protest at 3.

<sup>53</sup> PG&E Reply to IREC Protest at 6.

included changes to address the various non-export scenarios in its updates to forms for the consolidated application portal – the Smart Connect/ You[r]Projects advice submittal, AL 6270-E.<sup>54</sup> While this AL is approved and effective, PG&E is open to additional changes on its forms for the non-export scenarios. PG&E is contemplating additional changes to its forms for its new portal in succeeding roll-out.<sup>55</sup>

SCE opposes most of IREC’s proposed modifications to its Interconnection Application forms.<sup>56</sup> SDG&E “agrees to revise its Interconnection Application Form consistent with SCE’s proposed revisions.”<sup>57</sup>

***G. Supplemental ALs Filed in Response to IREC’s Protest: PG&E AL 6286-E-A and 6286-E-B, SCE AL 4559-E-A, and SDG&E 3822-E-A and 3822-E-B***

On November 19, 2021 PG&E filed Supplemental AL 6288-E-A addressing IREC’s protest regarding the inconsistent language in its Rule 21 modifications. On January 7, 2022 PG&E filed Supplemental AL 6288-E-B seeking to update its existing interconnection application forms to align with those of SCE and SDG&E.

On November 19, 2021 SDG&E filed Supplemental AL 3822-E-A addressing IREC’s protest regarding aligning its interconnection forms with those of SCE. On January 7, 2022, SDG&E filed Supplemental AL 3822-E-B standardizing verbiage for the Interconnection Application Forms.

On January 7, 2022 SCE filed Supplemental AL 4559-E-A addressing IREC’s protest and modifying Form 14-732, Generating Facility Interconnection Application and Form 14-918, Rule 21 Exporting Generating Facility Interconnection Request, to provide greater consistency among the IOUs.

On January 28, 2022, the IOUs submitted substitute sheets correcting a typo in modifications to Section G.1.i (Screen I).

Details to these supplemental filings are described in Section II: Disposition.

***II. DISPOSITION***

Energy Division staff (Staff) has reviewed D.20-09-035, the IOUs’ ALs (PG&E AL 6286-E, SCE AL 4559-E and SDG&E AL 3822-E), Tesla’s and IREC’s protests, the IOUs’ replies to the protests, the Supplementals ALs (PG&E AL 6286-E-A and 6286-E-B, SCE 4559-E-A, and SDG&E AL 3822-E-A and 3822-E-B) and finds that PG&E AL 6286-E, 6286-E-A and 6286-E-B, SCE AL 4559-E and 4559-E-A, and SDG&E AL 3822-E, AL 3822-E-A, and AL 3822-E-B and corresponding substitute sheets are in compliance with OPs 7, 49, 50 and 52 of D.20-09-035.

***A. Disposition of Tesla’s Protested Topics***

---

<sup>54</sup> PG&E AL 6270-E: Modifications to Various Pacific Gas and Electric Company's Electric Rule 21 Filed Forms to Support the Consolidation of its "YourProjects" Generator Application and Service Plan Application Online Portals

<sup>55</sup> PG&E Reply to IREC Protest at 6.

<sup>56</sup> SCE Reply to IREC Protest at 4.

<sup>57</sup> SDG&E Reply to IREC Protest at 3.

**1. Tesla: Section Mm1 should be expanded to explicitly indicate that non-exporting systems that meet the stated requirements and criteria enumerated as part of Option 8 shall be treated as non-exporting.**

Background: Section Mm1, Option 8 (Non-Export Utilizing Certified Power Control Systems) is added to Rule 21 to comply with OP 49. Section Mm1, Option 8 describes the requirements for non-export systems that use a PCS with an OLRT of no more than two seconds.

Protested Issue and Replies: Tesla requests language be added to Section Mm1, Option 8 to make explicit that systems that meet the identified criteria will be treated as non-exporting. The IOUs argue that the language Tesla proposes is redundant and unnecessary as it is already included in the proposed language. SCE states:

SCE's proposed language adequately addresses Tesla's concern by making clear that a non-export system will be evaluated under screens I, J, K, M, N, and O utilizing the provided calculation only if it has an aggregate PCS controlled nameplate greater than 600 kVA and the maximum reported steady state value of the PCS is greater than 1 percent of the PCS controlled nameplate.<sup>58</sup>

The IOUs have proposed the following language:

If the non-export system has an aggregate PCS controlled nameplate greater than 600 kVA and the maximum reported steady state value of the PCS is greater than 1% of the PCS controlled nameplate (as provided in the NRTL<sup>59</sup> testing reports), the evaluation may utilize the following calculation when determining the impacts to the grid under screens I, J, K, M, N, and O: The sum of the nameplate values of the exporting DER resource (if any) plus the maximum percentage steady state value of the PCS (as provided in the NRTL testing reports) times PCS controlled nameplate capacity.<sup>60</sup>

Tesla's proposes the following language should be added at the end of the IOUs proposed language:

If the non-export system has an aggregate PCS controlled nameplate of 600 kVA or less, or the maximum reported steady state value of the PCS is 1% or less of the PCS controlled nameplate (as provided in the NRTL testing reports), then the system is considered non-exporting (export = zero) in screens I, J, K, M, N and O.<sup>61</sup>

Disposition: Tesla is concerned about a system being considered as non-export, under Option 8, in screens I, J, K, M, N and O if the system has an aggregate PCS controlled nameplate of 600 kVA or less, or the maximum reported steady state value of the PCS is 1% or less of the PCS controlled nameplate. We dispose of Tesla's concerns based on the Rule 21 screens:

---

<sup>58</sup> SCE Reply to Tesla Protest at 1-2.

<sup>59</sup> National Recognized Testing Laboratory, a private sector organizations that performs certification for certain products to ensure that they meet the requirements of both the construction and general industry electrical standards.

<sup>60</sup> PG&E AL 6286-E at 13, SCE AL 4559-E at 6, SDG&E AL 3822-E at 83 (Tariff Sheet: Cal. PUC. Sheet No. 35153-E)

<sup>61</sup> Tesla Protest at 2.

- i. Screen I: Screen I asks “Will power be exported across the PCC?” This screen determines whether a project is considered export or non-export. All projects must go through this screen. Choosing any option within this screen determines that the project is non-export as long as the project meets the requirements in the option chosen. Therefore, Staff finds that inclusion of Tesla’s proposed language is redundant since choosing Option 8, and passing the requirements, would already classify the project as non-export.
- ii. Screens J, K, M: OP 7 of the Decision requires “Option B of Proposal 8i is adopted whereby non-exporting projects of all sizes skip Interconnection Rule 21 Screens K, L, and M.”<sup>62</sup> Modifications in compliance with OP 7 are included in modifications to Screen I, whereby the IOUs propose the following language (strikethroughs signify deletions, underline signify additions):
  - o Screen I: Will power be exported across the PCC?
    - If Yes, Continue to Screen J. This includes Options 5, ~~and 6, 9, 10 and 11~~ below.
    - If No, then to ensure that the Generating Facility does not export across the PCC, the Generating Facility must incorporate ~~Protective Function~~ Options 1, 2, 3, 4, 7 or 8 below. Following that selection, Screen J, K, L, and M are skipped and Initial Review is complete. If ~~Protective Function~~ Option 8 is used, see section ~~Mm2-[Mm1~~<sup>63</sup>] to determine screen application.<sup>64</sup>

This language is inclusive of non-export systems of all sizes and states that Screens J, K, L, and M are skipped once an option is chosen. Staff determines that this language adequately addresses Tesla’s concern of non-export systems skipping screens J, K and M upon choosing Option 8.

- iii. Screens N and O: Under Rule 21, the Fast Track Review process consists of the Initial Review (Screens A through M) and, only if required, a Supplemental Review (Screens N through P). The need for Supplemental Review is determined based on the results of the Initial Review screens (Screens A-M). The modifications for OP 7, as stated above, guarantee that Initial Review is passed once a non-export option is chosen. Projects that pass the Initial Review and meet all the requirements of the option chosen may not be required to go to Supplemental Review.

Option 8 (Section Mm1) lists the minimum requirements for non-export systems that use a certified PCS with an OLRT of no more than 2 seconds or less. In addition, the tariff modification states “The PCS must reduce export to zero or less within two seconds of commencing export. A PCS that is certified with an open-loop response time of two seconds or less, and a time to reach steady state of 10 seconds or less, meets this requirement.”<sup>65</sup> This language applies the time to reach steady state window which was discussed during the meetings Energy Division held between stakeholders—it allows the use of the PCS given its

---

<sup>62</sup> D.20-09-035 at 207.

<sup>63</sup> Substitute sheets submitted on January 28, 2022 by the IOUs corrected a typo—the original proposed text referenced section Mm2, which is Option 9, not Option 8. The substitute sheets now reference Section Mm1 (Option 8).

<sup>64</sup> PG&E AL 6286-E-A at 7, SCE AL 4559-E at 4, SDG&E AL 3822-E at 2.

<sup>65</sup> PG&E AL 6286-E at 12, SCE AL 4559-E at 6, SDG&E AL 3822-E at 83 (Tariff Sheet: Cal. PUC. Sheet No. 35153-E).

limitations to reduce export to zero within 2 seconds. Option 8 also specifies, as the IOUs propose:

If the non-export system has an aggregate PCS controlled nameplate greater than 600 kVA and the maximum reported steady state value of the PCS is greater than 1% of the PCS controlled nameplate (as provided in the NRTL testing reports), the evaluation may utilize the following calculation when determining the impacts to the grid under screens I, J, K, M, N, and O: The sum of the nameplate values of the exporting DER resource (if any) plus the maximum percentage steady state value of the PCS (as provided in the NRTL testing reports) times PCS controlled nameplate capacity.

The language above applies to systems **greater than** 600 kVA with the maximum reported steady state value of the PCS greater than 1% of the PCS controlled nameplate. It does not apply to systems below 600 kVA or below the steady state value of the PCS less than 1%, which concerns Tesla. Tesla's proposed additional language is the inverse of the language already proposed by the IOUs. If systems below the specified criteria pass the Mm1 screen, they will bypass Screens N and O. Therefore, Staff determines that this process addresses Tesla's concern of non-export systems skipping screen N and O.

For the foregoing reasons, Staff determines that the IOUs' language is sufficient under Section Mm 1, Option 8, and there is no need to add the additional language Tesla has requested and that Tesla's concern is addressed by the Rule 21 screening process. Should any issues arise regarding this topic through any formal or informal complaint, Staff may address it through an appropriate venue. Therefore, this request by Tesla is denied.

**2. Tesla: The thresholds included in the criteria applicable to systems greater 600 kVA should be revisited and revised in the future based on empirical data and/or study to ensure they are grounded in a more objective and fact-based assessment of practical impacts.**

Background: Revisions in sections Mm1, Option 8 (Non-Export Utilizing Certified Power Control Systems) and Mm2, Option 9 (Limited Export Utilizing Certified Power Control Systems) are added to Rule 21 in response to OP 49 and include thresholds for the steady state value of the PCS as one percent (1%). This percentage was a result of informal discussions Energy Division held between the IOUs and selected stakeholders that had protested this language in the Initial ALs. The percentage was chosen as a means to evaluate this screen given the limitations of the PCS in achieving the requirements set forth in the Decision.

Protested Issue and Replies: Tesla states that the 1% value is not based on empirical data or evidence and that the ALs should be modified to indicate that the thresholds are interim and will be updated when more information is available.

PG&E, in its reply, states that there is no evidence indicating that the thresholds are not the right ones and states "we are in a condition where the thresholds are not well understood and therefore, keeping grid safety and reliability in mind, it is more appropriate to side with keeping these assumptions on the

side of needing to perform additional analysis than to assume no safety issues will occur.”<sup>66</sup> SCE and SDG&E state they are not opposed to revisiting this criteria in the future based on available information as long as safety and reliability are not compromised.

Disposition: While Staff finds merit in revisiting this topic, Staff does not agree that language to revisit this topic needs to be included in the Current ALs. The 1% requirement was a compromise to allow PCS, which perform differently than a traditional relay, to achieve the goals of the new screens (Mm1 and Mm2). Therefore, this request by Tesla is denied at this time.

This determination, however should not be interpreted as indicating that this issue is not worthy of discussion at a future date. Staff reminds stakeholders that there are venues to further discuss these topics, such as the Interconnection Discussion Forum (IDF) and the Smart Inverter Working Group (SIWG). Additionally, per D.21-06-002<sup>67</sup> OP 17 Energy Division will be compiling a list of topics to revisit in the future rulemaking. OP 17 of D.21-06-002 specifically states:

One year from the closure of this proceeding, Commission Energy Division is authorized to seek informal comments on new interconnection issues and potential revisions to interconnection policies, from entities listed on this and future interconnection proceeding service lists. The comments shall be used to draft the preliminary scope in an Order Instituting Rulemaking for the successor interconnection rulemaking.<sup>68</sup>

Staff expects that by this time, if not sooner, the utilities will have better experience implementing these new screens and have more knowledge for the issue to be better addressed.

**3. Tesla: The data requirements imposed on applicants that are included as part of Sections Mm3 and Mm4 regarding anticipated inadvertent exports are highly impractical and require additional work to operationalize.**

Background: Sections Mm3, Option 10 (Non-Export with Inadvertent Export Utilizing Certified Power Control Systems) and Mm4, Option 11 (Limited Export with Inadvertent Export Utilizing Certified Power Control Systems) are added to Rule 21 in response to OP 50. OP 50 of the Decision states “during Supplemental Review the applicant shall identify, within 15 days, the frequency of inadvertent export, the real power level in watts of inadvertent export and the time duration of inadvertent export.”

Protested Issue and Replies: Tesla argues that the OP 50 requirements are impractical for the customer and recommends additional stakeholder dialogue so as not to burden customers.

The IOUs reply that this language was approved by the Decision. Additionally, the IOUs argue that it is impossible for them to determine how the system will operate and therefore must rely on the customer to provide this information.

---

<sup>66</sup> PG&E Reply to Tesla Protest at 4.

<sup>67</sup> Decision 21-06-002 in R.17-07-007 resolved remaining issues from the Rule 21 Working Group 4 Report.

<sup>68</sup> D.21-06-002 at 92.

Disposition: The Decision adopted this requirement. Therefore, this request by Tesla is denied. Should this become an issue in the future, there are venues where it can be addressed such as the IDF or the SIWG. Alternatively, Tesla has the option to formally request modification of the Decision per the CPUC's Rules of Practice and Procedure.

**4. Tesla: Additional clarification and information is needed regarding the distribution provider's approved list of PCS systems.**

Background: Information regarding a pre-approved list is included for SCE only pursuant to OP 52.

Protested Issue and Replies: Tesla requests the utilities "provide additional information regarding the process by which an entity can request to have their PCS listed, how the utilities will evaluate the PCS, as well as a timeline for the review to be completed from start to finish."<sup>69</sup> Tesla also requests the IOUs to be directed to establish a uniform and coordinated review process.

PG&E replies that it "will prepare a website detailing the process for review and approval of PCSs and a list of approved PCS as part of the implementation of OP 52."<sup>70</sup> SCE replies that this requirement is only applicable to SCE and states that coordination with other IOUs was not required as part of OP 52. Furthermore, SCE replies it will maintain a website detailing the process for review and approval of control systems, and a list of approved control systems. SDG&E replies that this requirement is only applicable to SCE.

Disposition: Pursuant to OP 52 of the Decision and the Rule 21 Working Group 3 Report<sup>71</sup> the pre-approved list requirement is only applicable to SCE. While not explicitly obligated to do so, PG&E, in its reply, stated that it will maintain a website and list of approved PCS. Staff finds that PG&E's efforts are not mandated by the Decision but are welcomed as they will increase transparency and inform developers of approved PCSs. Staff also finds, that while these topics merit further discussion, they are beyond the scope of the requirements of OP 52 as the Decision did not order SCE to provide information on the process by which an entity can request approval and listing of a PCS. This topic is better suited for a discussion in the IDF, and Staff expects to place it on a future IDF agenda. Staff encourages SCE, SDG&E and PG&E, to informally provide additional transparency about their process to review and approve PCSs. Therefore, this request by Tesla is denied.

***B. Disposition of IREC's Protested Topics***

**1. IREC: The requirements in the newly added Mm1 through Mm4 are unduly restrictive and are only acceptable as a temporary solution.**

Background: Sections Mm1, Option 8 (Non-Export Utilizing Certified Power Control Systems) and Mm2, Option 9 (Limited Export Utilizing Certified Power Control Systems) are added to Rule 21 in response to OP 49; and Sections Mm3, Option 10 (Non-Export with Inadvertent Export Utilizing Certified Power Control Systems) and Mm4, Option 11 (Limited Export with Inadvertent Export Utilizing Certified Power Control Systems) are added to Rule 21 in response to OP 50. Energy

---

<sup>69</sup> Tesla Protest at 3.

<sup>70</sup> PG&E Reply to Tesla Protest at 5.

<sup>71</sup> Rule 21 Working Group Three Final Report, June 14, 2019, at 137-138.

Division held meetings between February 2021 and July 2021 with the IOUs and the stakeholders that protested the Rule 21 modifications arising from OP 49 in the Initial ALs. The purpose of the meetings was to analyze how to align the requirement of OP 49 with the operational capabilities of PCSs.

Protested Issue and Replies: IREC argues the proposals to establish requirements for the use of certified PCSs are “unduly restrictive, not supported by evidence of documented risks, and thus should only be used as a temporary solution...[and there is no evidence] to demonstrate that there is a verifiable need to impose further restrictions on facilities using PCS, beyond requiring a two or ten second open loop response time.”<sup>72</sup> IREC states that the appropriate approach is to simply require that PCS have an open loop response time of two (Ordering Paragraph 49) or ten (Ordering Paragraph 50) seconds and nothing more. IREC notes it agreed upon certain restrictions during the Energy Division discussions beyond requiring a two or ten second OLRT with the intent that these restrictions were temporary, and that IREC prepared a document (“Next Steps on Power Control System Performance”)<sup>73</sup> with input from the IOUs describing the next steps to be taken concerning the use of PCSs. The document lists steps to be taken to “identify whether, and to what extent, inadvertent export from certified power control systems may impact the distribution system.”<sup>74</sup> The document outlined steps to be taken by the IOUs to evaluate transformer loading scenarios to determine impacts of inadvertent export on transformers, scenarios to be analyzed with regards to OP 49 and OP 50 to understand the impacts of PCS, timelines to conduct these analysis, and the IOUs’ concerns. The document mentions Department of Energy research projects:

that are expected to evaluate impacts from inadvertent export: The National Renewable Energy Laboratories (NREL) “Improving Solar and Solar+Storage Screening Techniques to Reduce Utility Interconnection Time and Costs” project and the Interstate Renewable Energy Council and the Electric Power Research Institute “Building a Technically Reliable Interconnection Evolution for Storage” (BATRIES)<sup>75</sup>

and includes a timeline for the CPUC Energy Division to re-convene discussions with stakeholders and the IOUs regarding these research projects. IREC states that the IOUs agreed to include the Next Steps on Power Control System Performance in their Advice Letters but failed to do so.

PG&E and SCE reply that there was a discussion regarding this document, but it is incomplete and consequently was not included in the Current ALs. PG&E, SCE and SDG&E state they support revisiting the criteria and updating the appropriate Mm sections if the analysis supports updates that will not compromise equipment operations and/or grid safety.

Disposition: While it was Energy Division’s understanding that the “Next Steps on Power Control System Performance” document *would be* included in the Current ALs, after more consideration Staff determines that the “Next Steps on Power Control System Performance” document provided by IREC contains some information that is not appropriate for an advice letter, and is not necessary in order to

---

<sup>72</sup> IREC Protest at 2-3.

<sup>73</sup> See IREC Protest, Attachment A.

<sup>74</sup> IREC Protest, Attachment A at 1.

<sup>75</sup> IREC Protest, Attachment A at 2.

continue further discussions. Therefore, this request by IREC to include the document in the Current ALs is denied.

Denial of including the “Next Steps on Power Control System Performance” document in the Current ALs should not be interpreted, however, as Staff’s determination that this issue is not worthy of discussion at a future date, or that the Utilities acted in good faith in drafting the ALs. While the document outlines a clear course of action, it contains wording that is inappropriate to include in an AL, such as mandating Energy Division to take certain actions<sup>76</sup> or mandating the CPUC to convene meetings to discuss the results of studies.<sup>77</sup> Staff finds that such mandates for Energy Division or the CPUC are not appropriate for a third-party to impose upon as a requirement for next steps to be taken concerning further discussions around the OLRT and PCS. Furthermore, there are venues to further discuss these topics, such as the IDF and the SIWG. Pursuant to D.21-06-002 OP 17 Energy Division will be compiling a list of topics to revisit in the future rulemaking. These venues allow Energy Division and the Commission to further explore this topic without the necessity for including a “next steps” document in the Current ALs. The IOUs support revisiting the criteria and updating the appropriate sections in Rule 21. Staff will work with IREC and the IOUs to schedule further discussions on this topic in the venues identified above.

**2. IREC: No evidence indicates that an open loop response time of 2 or 10 seconds is insufficient to ensure the safe and reliable operation of the grid, and it is not rational to conclude that the Decision imposes additional restrictions.**

Background: This issue is related to Section II.B.1 (Disposition of IREC Protested Topic 1) above.

Sections Mm1, Option 8 (Non-Export Utilizing Certified Power Control Systems) and Mm2, Option 9 (Limited Export Utilizing Certified Power Control Systems) are added to Rule 21 in response to OP 49; and Sections Mm3, Option 10 (Non-Export with Inadvertent Export Utilizing Certified Power Control Systems) and Mm4, Option 11 (Limited Export with Inadvertent Export Utilizing Certified Power Control Systems) are added to Rule 21 in response to OP 50. Energy Division held meetings between February 2021 and July 2021 with the IOUs and the stakeholders that had protested the Rule 21 modifications due OP 49 and 50 in the Initial ALs. The purpose of the meetings was to attempt to align the requirements of OP 49 and OP 50 with the operational capabilities of a PCS.

Protested Issue and Replies: IREC states that it was its understanding that

based on the extensive discussions of the Working Group [3], that a two second open loop response time was sufficient. To interpret the language in the Decision<sup>5</sup> as imposing additional restrictions beyond the open loop response time is not rational.<sup>78</sup>

IREC states “Interpreting that language as an additional requirement involves developing substantial further technical specifications that go well beyond what the Commission adopted in its Decision.”<sup>79</sup>

---

<sup>76</sup> Such as “In April 2022, the CPUC energy division will re-convene the stakeholders to discuss the BATTRIES and NREL research results.” IREC Protest, Attachment A at 2.

<sup>77</sup> IREC Protest, Attachment A at 1.

<sup>78</sup> IREC Protest at 3. IREC footnote 5 states: “the language in question reads that a PCS shall: “be able to reduce export power to the approved export limit within two seconds of exceeding the approved export limit”.”

<sup>79</sup> IREC Protest at 4.

While IREC does not believe additional requirements are necessary from a safety and reliability standpoint, it remains committed to addressing the IOUs' concerns. IREC states that the Commission should adopt the process outlined in the "Next Steps on Power Control System Performance" document as a requirement for approving the Current ALs or "alternately, the Commission should reject the Advice Letters and instead simply remove the additional requirement that projects cease operation within two seconds."<sup>80</sup> IREC argues that the IOUs have not identified evidence that projects with PCS that meet the OLRT would cause safety or reliability impacts to the grid. IREC argues that "In the absence of a Next Steps ["Next Steps on Power Control System Performance"] document, the Commission should require that PCS certified under the UL CRD have an open loop response time of 2 or 10 seconds, and nothing more."<sup>7,81</sup>

SDG&E replies that there is no evidence existing to indicate the open-loop response time of 2 or 10 seconds is sufficient to ensure safety and reliability. PG&E replies that "acceptance of proposal A-B #1 and A-B #2 was based on the working group consensus that the control system would be able to reduce export to approve limit within a required time (2 seconds or 10 seconds)...[and that OP 49] is very clear about the two second requirement."<sup>82</sup> SCE and SDG&E also express that they are not misinterpreting the Decision to impose additional restrictions and that OP 49 is clear that the PCS must be able to reduce export power to the approved export limit within two seconds of exceeding the approved export limit.

PG&E states that the additional proposed language (i.e., the steady state language) in the tariff revisions was to bring the PCS operational performance close to OP 49 requirements because the PCS failed to meet the Decision's requirements to reduce export power to the approved export limit as agreed upon in the Working Group 3 Report. SCE and SDG&E also state that the PCS has been unable to meet OP 49's requirement to reduce export power to the approved export limit within the two seconds ordered by OP 49. Additionally, SCE states it is:

unable to ignore the export associated with these systems without evaluating the risks.... Indeed, SCE and stakeholders already agreed to add language to Sections Mm1 and Mm2 to bring the requirement closer to the PCS operational performance. (SCE added the following language to address the fact that the PCS cannot meet the Decision's requirements: "A PCS that is certified with an open-loop response time of two seconds or less, and a time to reach steady state of 10 seconds or less, meets this requirement.")<sup>83</sup>

PG&E, SCE and SDG&E express commitment to continue to work through these issues with stakeholders once sufficient information is available to show there are no safety issues due to the performance of the PCSs and support reviewing and modifying the requirements in the future as additional information becomes available.

Disposition: IREC's protested issue is two-fold:

---

<sup>80</sup> IREC Protest at 4.

<sup>81</sup> IREC Protest at 4. IREC footnote 7 states "Essentially all the requirements in Ordering Paragraph 49 would remain except the duplicative language in item (ii) indicating systems should reduce export within two seconds...."

<sup>82</sup> PG&E Reply to IREC Protest at 3-4.

<sup>83</sup> SCE Reply to IREC Protest at 3.

(1) *Adoption of “Next Steps on Power Control System Performance” document as a Requirement to Approve the Current ALs:* While Staff recognizes the importance of future discussions that may lead to modifications of Sections Mm1 through Mm 4 in Rule 21, as discussed in Section II.B.1 of this Disposition Letter (Disposition of IREC Protested Topic 1) the document does not need to be formally adopted in order to continue discussions as there are other venues available to stakeholders, Energy Division, and the Commission to address this subject. Furthermore, although this document serves to outline future steps to take, it was not part of the requirement of the OPs in the Decision and thus it is not necessary to include the document in the Current ALs. Therefore, this request by IREC is denied.

However, the document does serve as a starting point for future discussions. Topics for future discussion include, but are not limited to:

- Transformer Impacts – The IOUs, working with transformer manufacturers, shall evaluate loading scenarios to determine potential impacts of inadvertent export on transformer life.
- DOE Funded Research Projects – Reconvene stakeholders to discuss the BATTRIES and NREL research results, and relevant findings of these projects and applicability to inadvertent export and PCSs.
- Identify Further Concerns – The IOUs identified further concerns (e.g., Impact to Voltage Regulation Equipment, Impact on protection (fuses, reclosers), Impact on reactive power equipment (Capacitor banks) that need to be discussed further in light of new research findings and IOU experience with PCSs.

Staff will evaluate the topics and place them in the correct venues for discussion; these topics shall be on the agenda for the 2022 meetings for either IDF or SIWG. Depending on outcomes of those discussions, Staff will pursue any necessary steps needed for tariff modifications if such modifications are warranted.

(2) *Open Loop Response Time of Two (OP 49) Seconds—“Additional Requirement” and Steady-State Language:* OP 49 states:

Proposal A-B 1 is adopted. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company (Utilities) shall modify their Rule 21 tariffs to allow the use of a power control system for non-export and limited export interconnection applications. Rule 21 shall be modified to establish the following five specifications that generating facilities must meet to be treated as non-export or limited export: i) use a power control system that passes the requirements of the Underwriters Laboratory (UL) Power Control Systems Certification Requirements Decision (CRD) test protocol; ii) use a power control system that has an open-loop response time of no more than two seconds, as provided in the control systems specification data sheets, **and must be able to reduce export power to the approved export limit within two seconds of exceeding the approved export limit** [emphasis added]...

With regards to IREC’s claim that “the Commission should reject the Advice Letters and instead simply remove the additional requirement that projects cease operation within two seconds” Staff clarifies that this is **not an additional requirement**. The Decision adopted Proposal A-B-1<sup>84</sup> without

---

<sup>84</sup> D.20-09-035 at 153.

modifications.<sup>85</sup> In the Working Group 3 Report, Proposal A-B-1, which was a consensus proposal that stakeholders agreed upon, specifically states “the PCS is required to reduce export power to the approved export limit within 2 seconds of exceeding the approved export limit.”<sup>86</sup> The Working Group 3 Report also notes the proponent’s position of CALSSA:

A zero-export system uses power controls in lieu of a physical non-export relay but operates in an **equivalent** [emphasis added] fashion to a system with a physical non-export relay. **Rule 21 currently includes a maximum response time of two seconds for relays.** If a power control system **responds within the same timeframe** the resource should be treated the same as a resource using a relay. Also, limited export is no different. If it **will not export beyond the set amount for more than two seconds**, the controlled maximum export should be treated as the system capacity.<sup>87</sup>

The language in the Working Group 3 Report and the Decision is clear: the PCS is required to reduce export power to the approved export limit within 2 seconds. Therefore, Staff finds IREC’s argument regarding this as being an “additional requirement” is inaccurate and the IOUs are not misinterpreting the language for this requirement.

Staff finds that because these are new technologies there is neither evidence for nor against the assertion that PCS OLRT of 2 or 10 seconds is sufficient to ensure grid safety and reliability. In adopting proposals A-B-1 (OP 49) and A-B-2 (OP 50) to allow the use of a power control system for non-export, limited export and inadvertent export for interconnection applications the Decision found that “that adoption of these recommendations allows the Commission to maintain technology neutrality, while fully utilizing new technologies that can **safely and reliably substitute non-export relays** [emphasis added] and limit the grid impacts of interconnecting generation.”<sup>88</sup>

In keeping with the intent to keep the grid safe and reliable, and because the PCSs do not meet the requirements in the exact manner as a relay, a steady state period of time has been added to Rule 21 to align the current capabilities of PCS with the requirements of the Decision for OP 49. The steady state period of time for the PCS allows the power output of the generating facility to arrive at a well bounded level of export. For OP 49, the IOUs have included the following language “The PCS must reduce export to zero or less within two seconds of commencing export. A PCS that is certified with an open-loop response time of two seconds or less, and a time to reach steady state of 10 seconds or less, meets this requirement.”<sup>89</sup> In so doing, the IOUs have met the requirements of OP 49 and have added language to better align the capabilities of the PCS to the intent of the Decision. Staff acknowledges that the time to reach steady state is an additional requirement. However, Staff finds inclusion of the steady state period of time strikes a balance between the 2-second zero current requirement as required by OP 49 and the capabilities of the PCS because it allows the use of a PCS in a manner “almost equivalent” to a relay. Out of abundance of caution to maintain a safe and reliable grid and minimizing grid impacts due to interconnecting generation, Staff finds the proposed language

---

<sup>85</sup> As opposed to Proposal A-B-3 (not discussed herein) in which the Decision specifically states “We also adopt Proposal A-B-3 but modified...” (D.20-09-035 at 154)

<sup>86</sup> Rule 21 *Working Group Three Final Report, June 14, 2019*, at 131.

<sup>87</sup> Rule 21 *Working Group Three Final Report, June 14, 2019*, at 132, emphasis added.

<sup>88</sup> D.20-09-035 at 154.

<sup>89</sup> PG&E AL 6286-E at 12 and 14, SCE AL 4559-E at 6 and 7, and SDG&E AL 3822-E at 82 (Sheet 166) and 83 (Sheet 167).

by the IOUs complies with OP 49 and the intent of the Decision. The language complies with the requirement of the Decision as it does not prohibit a PCS from reaching that steady state within the 2-second OLRT.

For the reasons stated above, this request by IREC is denied.

**3. IREC: Section Mm1 needs revision to clearly state that projects will be treated as non-export during the screening process.**

Background: Section Mm1, Option 8 (Non-Export Utilizing Certified Power Control Systems) is added to Rule 21 to comply with OP 49. Section Mm1, Option 8 describes the requirements for non-export systems that use a PCS with an OLRT of no more than two sections.

Protested Issue and Replies: IREC argues that section Mm1 does not provide clarity that qualifying projects will be treated as non-exporting projects in Screen N, or other screens, when they meet all the IOUs' requirements, and suggests language should be added to section Mm1 to make that clear.

The IOUs reply that there was no discussion to include language related to Screen N within section Mm1 because projects under this section would not make it to Supplemental Review (Screen N) as these projects are considered non-export.

IREC proposes the following language be added, which is the same language proposed by Tesla (See Section II.A.1 of this Disposition Letter).

If the non-export system has an aggregate PCS controlled nameplate of 600 kVA or less, or the maximum reported steady state value of the PCS is 1% or less of the PCS controlled nameplate (as provided in the NRTL testing reports), then the system is considered non-exporting (export = zero) in screens I, J, K, M, N and O.

Disposition: This language is the same language proposed by Tesla and the issue has already been disposed of in Section II.A.1 of this Disposition Letter. Therefore, the request by IREC is denied for the same reasons.

**4. IREC: Section Mm4 is Missing Part of the Consensus Language.**

Background: Sections Mm3, Option 10 (Non-Export with Inadvertent Export Utilizing Certified Power Control Systems) and Mm4, Option 11 (Limited Export with Inadvertent Export Utilizing Certified Power Control Systems) are added to Rule 21 in response to OP 50 adopting Proposal A-B-2 from the Rule 21 Working Group 3 Report.

Protested Issue and Replies: IREC argues that Section Mm 4, Option 11 (Limited Export with Inadvertent Export Utilizing Certified Power Control Systems) failed to include language agreed upon during the discussions with the IOUs and requests the following language be added:

vi. Use only the largest facility in the line section for aggregate evaluation for subsequent interconnection requests.

The IOUs reply that this language (“the disputed language”) was intentionally omitted from the Current ALs because Section Mm4 (Limited Export with Inadvertent Export Utilizing Certified Power Control Systems) is for exporting generators that are part of the interconnection queue and are used to study subsequent interconnection requests. The IOUs also assert that the language remains for Section Mm3, Option 10 (Non-Export with Inadvertent Export Utilizing Certified Power Control Systems).

In Section Mm3, Option 10 (Non-Export with Inadvertent Export Utilizing Certified Power Control Systems) the IOUs propose to include the same language proposed by IREC:

The distribution provider evaluating generating facilities requesting interconnection under this section shall:

...

6. Use only the largest facility in the line section for aggregate evaluation for subsequent interconnection requests.<sup>90</sup>

For Section Mm4, Option 11 (Limited Export with Inadvertent Export Utilizing Certified Power Control Systems) the above language is excluded.

Disposition: The Rule 21 Working Group 3 Report describes Issues A and B as follows:<sup>91</sup>

- Issue A: What changes are needed to clarify the parameters for approval of system design to achieve non-export and limited export?
- Issue B: How should utilities treat generating capacity for behind the meter paired solar and storage systems that are not certified non-export?

The Working Group 3 Report recognized that the two issues are interrelated and thus the proposals address them jointly.<sup>92</sup> In discussing Proposal A-B-1 the Working Group 3 Report states that Rule 21 language must be updated “to include the use of a PCS **for non-export and limited-export applications** [emphasis added]...”<sup>93</sup> In discussing Proposal A-B-2, the Working Group 3 Report states that the proposal needs to “Updated Rule 21 language to include the use of a PCS **for limited-export interconnection applications** [emphasis added].”<sup>94</sup> The Working Group 3 Report continues to discuss the process for the technical evaluations for Proposal A-B-2, which includes the language disputed herein: “For Existing Generating Facilities that meet the requirements under this proposal, only the largest generating facility in the line section would be used for aggregate evaluation for subsequent interconnection requests.”<sup>95</sup> The Working Group 3 Report does not mention this language is applicable for non-export systems; it only mentions it in the context of limited-export interconnection applications. The Decision adopted Proposal A-B-1 and A-B-2<sup>96</sup> without modifications. The Decision states “We find Proposals A-B 1 and A-B 2, which are consensus proposals, both appropriately address Issues A and B.”<sup>97</sup>

---

<sup>90</sup> PG&E AL 6286-E at 15, SCE AL 4559-E at 9, SDG&E AL 3822-E at 85 (Tariff Sheet: Cal. PUC. Sheet No. 35155-E)

<sup>91</sup> Rule 21 Working Group Three Final Report, June 14, 2019, at 125.

<sup>92</sup> Rule 21 Working Group Three Final Report, June 14, 2019, at 125.

<sup>93</sup> Rule 21 Working Group Three Final Report, June 14, 2019, at 131.

<sup>94</sup> Rule 21 Working Group Three Final Report, June 14, 2019, at 133.

<sup>95</sup> Rule 21 Working Group Three Final Report, June 14, 2019, at 133.

<sup>96</sup> D.20-09-035 at 153.

<sup>97</sup> D.20-09-035 at 164.

OP 49 and OP 50 both list the requirements to be met for non-export and limited export interconnection applications. The difference is that OP 49 specifically lists the requirements to be met for generating facilities **to be treated as non-export or limited export**, while OP 50 lists the requirements to be met for generating facilities **to be treated as inadvertent export**. Non-export systems “are designed to prevent the transfer of electrical energy from the generating facility to the distribution or transmission system”<sup>98</sup> while limited export systems “are designed and set to **limit the level of export** [emphasis added] to some specified amount less than the nameplate capacity of the system.”<sup>99</sup> Under Rule 21 Inadvertent Export is defined as “The unscheduled and uncompensated export of real power from a Generating Facility (GF) for a limited duration as specified in Sections M and Mm.”<sup>100</sup>

OP 50 states:

Proposal A-B 2 is adopted. [The IOUs] shall modify their Rule 21 tariffs to allow the use of a power control system for non-export and limited-export applications. Rule 21 tariffs shall be modified to require that, to be treated as inadvertent export, a generating facility must meet the following six specifications: ... Upon meeting the six specifications, the Utilities shall review the facility as such: ... and only the largest facility in the line section shall be used for aggregate evaluation for subsequent interconnection requests....

OP 50 makes the distinction of two different types of applications: non-export and limited-export, both having inadvertent export. For Section Mm3 (**non-export** with inadvertent export applications) the IOUs have modified Rule 21 to include the disputed language, and for Section Mm4 (**limited export** with inadvertent export) the disputed language is omitted. Under the Mm3, Option 10 the generating facility would apply as a non-export interconnection, while for Mm4, Option 11 it would apply as a limited export interconnection.

Staff has reviewed Proposal A-B-2 in the Working Group 3 Report and the language in the Decision concerning the adoption of this proposal and concludes that the Decision adopted this proposal without modifications. Staff reads the plain language of the Decision to exclude exporting generation (i.e., limited export) from the interconnection studies that may affect subsequent interconnection requests or exclude them from the interconnection queue. Therefore, Staff determines that the language IREC proposes, while it is appropriate for Section Mm3 which is for non-export, is not required in Section Mm4 because Section Mm4 is for the interconnection of limited-export projects. As the IOUs’ have stated, under Mm4 the generating facility is still exporting and thus remains part of the interconnection queue and the export may affect subsequent interconnection requests. Therefore, this request by IREC is denied.

##### **5. IREC: PG&E’s proposed language contains minor inconsistencies with the language proposed by the other IOUs.**

---

<sup>98</sup> D.20-09-035 at 154.

<sup>99</sup> D.20-09-035 at 156-157.

<sup>100</sup> PG&E Rule 21 at Section C (Definitions).

Protested Issue and Replies: IREC notes that PG&E’s proposed language is inconsistent with the proposed language of the other IOUs. PG&E replies that it will submit a supplemental AL to correct this.

Disposition: PG&E submitted Supplemental AL 6286-E-A on November 19, 2021 correcting the inconsistencies. Staff finds PG&E has implemented the necessary changes to align its tariff with the other IOUs. Therefore, Staff finds this issue is resolved with the supplemental language submitted by PG&E.

**6. IREC: SCE proposes to revise its Interconnection Application forms, but PG&E and SDG&E have not.**

Protested Issue and Replies: IREC argues all the IOUs should revise their interconnection application forms. Additionally, IREC suggests revisions specific to SCE’s forms and recommends that if the other IOUs are required to revise their forms, they should pay attention to the use of defined terms.

IREC further argues that “SCE’s interconnection application forms do not use Rule 21’s defined terms” and suggest the following revisions:<sup>101</sup>

- Replacing “rated output” and “rated capacity” with “Gross Nameplate Rating” and “net capacity” with “Nameplate Rating” (Form 14-918<sup>102</sup>)
- Replacing “operating capacity” or “output” with “Generating Profile” (Form 14-918)
- Adding “Power” to “Certified Control System” (Form 14-918, Form 14-732<sup>103</sup>) and deleting “Generators” in the term “M. For Generators Certified Control System” (Form 14-918)

IREC also suggests that SCE should consider listing Protection Option No. 9 as a check box in Form 14-732 because SCE adds Protection Option Nos. 8 and 10, but not Protection Option No. 9.

PG&E replies that it included changes to address non-export scenarios in its update to forms in the Smart Connect/YourProjects AL 6270-E (Modifications to Various Pacific Gas and Electric Company's Electric Rule 21 Filed Forms to Support the Consolidation of its "YourProjects" Generator Application and Service Plan Application Online Portals). PG&E also states “While this AL is approved and effective, PG&E is open to additional changes on its forms for the non-export scenarios. PG&E is contemplating additional changes to its forms for its new portal in succeeding roll-out.”<sup>104</sup>

SDG&E replies that it will revise its Interconnection Application Form consistent with SCE’s proposed revisions.

SCE opposes most of IREC’s proposed modifications to its Interconnection Application forms and states IREC’s proposed language should be rejected as the section where IREC’s proposed language is located was not modified by the AL filings. SCE gives the following reasons:

---

<sup>101</sup> IREC Protest at 6-8.

<sup>102</sup> Form 14-918 - Rule 21 Exporting Generating Facility Interconnection Request

<sup>103</sup> Form 14-732, Generating Facility Interconnection Application

<sup>104</sup> PG&E Reply to IREC Protest at 6.

- Form 14-918 - Rule 21 Exporting Generating Facility Interconnection Request:
  - Replacing “rated output” with “Gross Nameplate Rating” – SCE states that “rated output” is existing language and used consistently in Form 14-918 and Rule 21, and not intended to represent a Rule 21 defined term.
  - Replacing “operating capacity” with “Generating Profile” – SCE states that “Generating Profile” is not a defined term and is not used in Rule 21 or its Current AL.
  - Replacing “net capacity” with “Nameplate Rating” – SCE states that the section IREC recommends changes to was not modified by the AL filings and the term should be kept to retain consistent language in Form 14-918 and Rule 21.
  - Adding “power” to the term “certified [power] control system” SCE agrees and will make the change in a supplemental AL.
  
- Form 14-732, Generating Facility Interconnection Application: SCE states no changes are required because Option No. 9 is listed in Form 14-918, the Rule 21 Exporting Generating Facility Interconnection Request Form.

Disposition: PG&E’s AL 6270-E (Modifications to Various Pacific Gas and Electric Company's Electric Rule 21 Filed Forms to Support the Consolidation of its "YourProjects" Generator Application and Service Plan Application Online Portals) was not protested, was approved and became effective on August 30, 2021. The purpose of AL 6270-E was to modify PG&E’s Rule 21 Filed Forms 79-1174-02 (PG&E’s Rule 21 Generator Interconnection Application), 79-1151B (Application Net Energy Metering Interconnection for Solar And/Or Wind Electric Generating Facilities Of 30 Kilowatts or Less), and 79-1151B-02 Application Net Energy Metering (NEM2) Interconnection for Solar And/Or Wind Electric Generating Facilities Of 30 Kilowatts or Less). According to PG&E, the changes were made to improve and consolidate PG&E customer generator application, and service planning, web portals into a new portal called YourProjects (previously known as “Smart Connect”). The changes included, but were not limited to:

- Updates Non-Export option selection, as described in changes due to ongoing Working Group 2/3 discussions with stakeholders and IOUs.
- Adds limited export questions (related to the deployment of Power Control Systems [PCSs], relays, or derated inverters).
- Revisions related to back-up generator interconnections, with additional questions related to the nature of the control device being used (e.g., ATS, contactor, or breaker).

Future updates to the Smart Connect/YourProjects are beyond the scope of the Current ALs. Staff anticipates that PG&E will update its forms as necessary at the next roll-out of the Smart Connect/YourProjects tool. Therefore, because PG&E AL 6270-E (Modifications to Various Pacific Gas and Electric Company's Electric Rule 21 Filed Forms to Support the Consolidation of its "YourProjects" Generator Application and Service Plan Application Online Portals) was already approved and changes to this tool are beyond the scope of this AL, Staff finds that no further action is required by PG&E at this moment regarding the Smart Connect/YourProjects until its next roll out of this tool.

However, on January 7, 2022, PG&E submitted a partial supplemental to its AL (PG&E AL 6286-E-B) proposing changes to align verbiage for its interconnection application forms with those of the other IOUs. PG&E proposes the following modifications to:

- Form 79-1174-02, the Rule 21 Generator Interconnection Application:
  - Attachment B (Non-Export)
    - Inclusion of the word “Certified” when referring to Power Control Systems for Option 8 (Non-Export)
    - Edits to account for Option 10 (Inadvertent Export) and Option 11 (Inadvertent/Limited Export) and OLRT requirements
  - Attachment D (Solar Technology), Attachment E (Wind Turbine Technology), Attachment F (Machine-Based Technology), Attachment G (Fuel Cell Technology), and Attachment H (Energy Storage Technology)
    - Edits to account for PCS Option 9 (Limited Export)

Staff finds these edits align PG&E’s forms with those of the other IOUs, therefore the issue of revising Interconnection Application Forms and aligning the forms with that of the other IOUs is resolved for PG&E.

SDG&E submitted Supplemental AL 3822-E-A on November 19, 2021 and AL 3822-E-B on January 7, 2022 updating its Interconnection Application Forms to align them with the other IOUs. Although SDG&E agreed to align its forms with that of SCE (which opposed the majority of IREC’s recommended language), SDG&E instead implemented revisions to its forms using the language proposed by IREC. Staff finds SDG&E has implemented the necessary changes to its forms. Therefore, Staff finds this issue is resolved for SDG&E.

SCE submitted Supplemental 4559-E-A on January 7, 2022 modifying Form 14-732, Generating Facility Interconnection Application and Form 14-918, Rule 21 Exporting Generating Facility Interconnection Request, to provide consistency among forms of the other IOUs. SCE has adopted IREC’s recommendations. Therefore, Staff finds this issue is resolved for SCE.

### ***C. Conclusion***

Staff finds that the IOUs have provided the necessary and clear language in the Rule 21 tariff modifications, and within the appropriate sections of Rule 21, to implement OPs 7, 49, 50 and 52 (SCE only) of D.20-09-035, including resolving topics 5 and 6 of IREC’s protest in the Supplemental ALs. Therefore, Staff concludes the IOUs have adequately complied with these OPs in PG&E AL 6286-E, 6286-E-A and 6286-E-B, SCE AL 4559-E and 4559-E-A, and SDG&E AL 3822-E, 3822-E-A and 3822-E-B and corresponding substitute sheets.

For the foregoing reasons, Staff denies both Tesla’s and IREC’s protest for the topics not resolved in the Supplemental ALs, and concludes that PG&E, SCE and SDG&E have met the requirements set forth in D.20-09-035 OPs 7, 49, 50, and 52. Therefore, PG&E AL 6286-E, 6286-E-A and 6286-E-B, SCE AL 4559-E and 4559-E-A, and SDG&E AL 3822-E, 3822-E-A and 3822-E-B and corresponding substitute sheets are approved.

January 7, 2022

**Advice 6286-E-B**

(Pacific Gas and Electric Company ID U 39 E)

Public Utilities Commission of the State of California

**Subject: Second Supplemental: Advice Letter Modifying Electric Rule 21 Pursuant to Ordering Paragraphs 7, 49, 50 Decision 20-09-035 for Working Group 2 and 3**

**Purpose**

Pacific Gas and Electric Company (PG&E) hereby submits this second supplemental Tier 1 Advice Letter (AL) to revise Electric Rule 21 interconnection application forms- *Generating Facility Interconnections* - in compliance with the California Public Utilities Commission (CPUC, Commission) Decision (D.) D.20-09-035<sup>1</sup> (WG 2 & 3 Decision) Ordering Paragraph (OP) 55 and as described below, to address OPs 7, 49 and 50.

This Tier 1 advice letter partially supplements PG&E's previous advice letters 6286-E, submitted on August 6, 2021, and 6286-E-A, submitted on November 19, 2021. Through this advice letter, PG&E seeks to update our existing interconnection application forms to align with those of San Diego Gas & Electric Company and Southern California Edison Company.

**Background****Rulemaking 17-07-007 and Decision 20-09-035**

On July 13, 2017, The Commission adopted Order Instituting Rulemaking (R.) 17-07-007 to consider refinements to Electric Tariff Rule 21 of Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E), and Southern California Edison Company (SCE) (jointly, Utilities or IOUs) regarding the interconnection of distributed energy resources.<sup>2</sup>

---

<sup>1</sup> [Decision 20-09-035](#) - Date of Issuance 9/30/2020 - *Decision Adopting Recommendations from Working Groups Two, Three, and Subgroup*

<sup>2</sup> The Rule 21 tariff describes the interconnection, operating, and metering requirements for certain generating and storage facilities seeking to connect to the electric distribution system. Rule 21 provides customers access to the electric grid to install generating or storage facilities while protecting the safety and reliability of the distribution and transmission systems at the local and system levels. (See R.17-07-007 at p2.)

The October 2, 2017 *Scoping Memo of Assigned Commissioner and Administrative Law Judge* (Scoping Memo) set forth the scope and schedule of the proceeding. The Scoping Memo was subsequently revised in the *Assigned Commissioner's Amended Scoping Memo and Joint Administrative Law Judge Ruling issued November 16, 2018* (Amended Scoping Memo). Pursuant to the Scoping Memo, the proceeding is to be conducted in three phases that address technical issues, cost-related issues, and issues related to small multi-jurisdictional utilities. The Scoping Memo also established the working group process, whereby resolution of the technical issues of the proceeding would be proposed by six working groups, Working Groups One through Six. The Amended Scoping Memo pared down the number of working groups to four and delegated certain issues to the Smart Inverter Working Group.<sup>3</sup> D.19-03-013 adopted certain recommendations made by Working Group One. The WG 2 & 3 Decision resolves the set of issues assigned to Working Groups Two and Three and the recommendations from Vehicle-to-Grid Alternating Current (V2G AC) Subgroup. Also, the WG 2 & 3 Decision's advice letter matrix established a series of advice letters to implement the Decision according to a schedule.

#### Decision 21-01-027

On January 21, 2021, the CPUC issued D. 21-01-027 *Correcting Errors in Decision 20-09-035*. It noted for the purposes of this advice letter that references to ordering paragraph numbers 47, 50, 51, 53, should reference final decision ordering paragraph number(s) 46, 49, 50, 52.<sup>4</sup>

#### Advice Letters 5988-E and 5988-E-A, and Protests Thereto

Tier 1 AL 5988-E<sup>5</sup> was timely submitted on October 30, 2020, and addressed OPs 7, 13, 14, 46, 49, 50 and 52 (the last for SCE only) (numbers as corrected by D. 21-01-027<sup>6</sup>). Protests were received from The Interstate Renewable Energy Council, Inc. (IREC) and from California Solar & Storage Association (CALSSA) on November 19, 2020. PG&E responded to those protests on November 30, 2020.

To resolve AL 5988-E, Energy Division encouraged the Utilities to work with the protesting parties to resolve the consensus items for AL 5988-E. SCE thereupon coordinated a series of meeting in March and April with IREC (whose protest issues more or less aligned with those of CALSSA) to see where consensus could be achieved.

---

<sup>3</sup> The Smart Inverter Working Group (SIWG) grew out of a collaboration between the Commission and the California Energy Commission in early 2013. The collaboration identified the development of advanced inverter functionality as an important strategy to mitigate the impact of high penetrations of distributed energy resources. [as explained in footnote 2 in D. 20-09-035]

<sup>4</sup> See D. 20-09-035 OP1 Table labeled *Decision 20-09-035 Ordering Paragraph Corrections*, last line under OP 55.

<sup>5</sup> [AL 5988-E](#) - *Advice Letter Modifying Electric Rule 21 Pursuant to Decision 20-09-035 for Working Group 2 and 3*

<sup>6</sup> [D.21-01-027](#) *ORDER CORRECTING ERRORS IN DECISION 20-09-035* – issued January 21, 2021.

Supplemental AL 5988-E-A was submitted by PG&E on May 1, 2021. It addressed those ordering paragraphs where consensus had been achieved with protesting parties. However, based on guidance from the CPUC, AL 5988-E-A did not address OPs 7, 49 and 50, the topic of this advice letter, as PG&E had not reached consensus with the protesting parties on language for those ordering paragraphs.

#### Advice Letter 6286-E

On August 6, 2021, pursuant to D. 20-09-035 and Energy Division's guidance, PG&E submitted AL 6286-E addressing Ordering Paragraphs 7, 49, and 50, modifying Electric Rule 21 to address in new sections Mm1, Mm2, Mm3 and Mm4 the interconnection application process and deployment of a Power Control System (PCS) for non-export and limited export (in OP 49) and for inadvertent export (in OP 50) projects. Additionally, OP 7 addresses associated changes to the Rule 21 technical review screens K, L and M.

IREC filed another protest on September 2, 2021, titled: *IREC's Protest to San Diego Gas & Electric's Advice Letter 3822-E, Pacific Gas and Electric's Advice Letter 6286-E, and Southern California Edison's Advice Letter 4559-E - Modifications to the Electric Rule 21 Inadvertent Export Pursuant to Decision 20-09-035.*

In its protest, IREC stated, "*The letters propose modifications to Rule 21 required by Ordering Paragraphs 7, 49 and 50 of Decision 20-09-035 (the Decision). These changes principally relate to identifying the requirements for systems seeking to control export through the use of a Power Control System (PCS) and the manner in which those systems will be evaluated under the interconnection screens in Rule 21.*" IREC chiefly contended that the three IOUs' Advice Letters were not in compliance with the Decision.

PG&E filed its "*Reply to the Protest from Interstate Renewable Energy Council, Inc.'s to Advice 6286-E – Advice Letter Modifying Electric Rule 21 Pursuant to Ordering Paragraphs 7, 49, 50 Decision 20-09-035 for Working Group 2 and 3*" on September 10, 2021 (September 10, 2021 Reply), in which it refuted some of IREC's contentions, but also committed to submitting a supplemental advice letter to align its Rule 21 language with that of the other IOUs.

#### Advice Letter 6286-E-A

On November 19, 2021, at the CPUC Energy Division's request that the IOUs' tariff language be aligned, PG&E submitted Supplemental AL 6286-E-A to make changes it had committed to in its September 10, 2021 Reply, capitalizing defined terms, removing extra words, and generally updating language for consistency and clarity.

## Scope of this Advice Letter and Tariff Revisions

Following PG&E's submittal of AL 6286-E-A, the CPUC Energy Division requested that the IOUs meet and confer on the appropriate language needed to align the interconnection forms across the three IOUs. As directed, the IOUs conferred on revised language based on stakeholder comments, and PG&E modified its forms based on those IOU discussions.

Through this Supplemental Advice Letter 6286-E-B, PG&E proposes changes to align verbiage for its interconnection application forms with those of the other IOUs, as shown below.

### Form 79-1174-02B

PG&E proposes to incorporate the modifications shown below into Form 79-1174-02B, the Rule 21 Generator Interconnection Application - Attachment B (NON-EXPORT):

#### **Protection Options**

##### **Parallel Only:**

Please select one Rule 21 Screen I option below: *(note: other options that are not being revised were not included here)*

- Certified** Power Control System (PCS) Non-Export (Option 8): A PCS is employed to prevent export. For this option, the open loop response time of the PCS must be less than 2 seconds.

##### **Inadvertent Export:** *(note: other language and options that are not being revised were not included here)*

Please select one Rule 21 Screen I option below:

- Certified** Power Control System (PCS) Inadvertent/~~Limited Export~~ (Option ~~9~~10): A PCS is employed to allow inadvertent/~~limited~~ export. For this option, the open loop response time of the PCS must be ~~less~~ **greater** than 2 seconds ~~for limited export~~ and ~~less than or equal to~~ **no more than** 10 seconds ~~for inadvertent export~~.
- Certified** Power Control System (PCS) Inadvertent/Limited Export (Option 11): A PCS is employed to allow inadvertent limited export. For this option, the open loop response time of the PCS must be greater than 2 seconds and no more than 10 seconds.

Forms 79-1174-02D - 79-1174-02H

PG&E further proposes the following additions in its interconnection application forms, as shown below:

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
Limited Export	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes	<input type="checkbox"/> Yes
Will the generator export be limited?	<input type="checkbox"/> No	<input type="checkbox"/> No	<input type="checkbox"/> No	<input type="checkbox"/> No
If yes, please indicate how export will be limited.	<input type="checkbox"/> Power Control System (PCS - Option 9)	<input type="checkbox"/> Power Control System (PCS - Option 9)	<input type="checkbox"/> Power Control System (PCS - Option 9)	<input type="checkbox"/> Power Control System (PCS - Option 9)
	<input type="checkbox"/> Relay	<input type="checkbox"/> Relay	<input type="checkbox"/> Relay	<input type="checkbox"/> Relay
	<input type="checkbox"/> Derated Inverter			

PG&E proposes to incorporate this modification into the following forms:

- Form 79-1174-02D: Rule 21 Generator Interconnection Application - Attachment D (SOLAR (PV) TECHNOLOGY)
- Form 79-1174-02E: Rule 21 Generator Interconnection Application - Attachment E (WIND TURBINE TECHNOLOGY)
- Form 79-1174-02F: Rule 21 Generator Interconnection Application - Attachment F (MACHINE-BASED TECHNOLOGY)
- Form 79-1174-02G: Rule 21 Generator Interconnection Application - Attachment G (FUEL CELL TECHNOLOGY)
- Form 79-1174-02H: Rule 21 Generator Interconnection Application - Attachment H (ENERGY STORAGE TECHNOLOGY)

Redline tariff revisions are shown in Attachment 2 for the above forms.

**Protests**

PG&E asks that the Commission, pursuant to GO 96-B, General Rule 7.5.1, maintain the original protest and comment period designated in AL 6286-E and not reopen the protest period.

**Effective Date**

Pursuant to General Order (GO) 96-B, Rule 5.1, this advice letter is submitted with a Tier 1 designation. PG&E requests that this advice letter become effective on March 17, 2022 to coincide with planned implementation of these modifications into PG&E's online application portal, YourProjects.

**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.17-07-007 (Rule 21), R. 14-07-002 (NEM Successor) and R.19-09-009 (Microgrid). 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/

Sidney Bob Dietz II  
Director, Regulatory Relations

cc: Service List R.17-07-007  
Service List R.14-07-002  
Service List R.19-09-009

**Attachments:**

**Attachment 1** – Clean Tariff

**Attachment 2** – Redline Tariff Revisions



# 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: 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) #: 6286-E-B

Tier Designation: 1

Subject of AL: Second Supplemental: Advice Letter Modifying Electric Rule 21 Pursuant to Ordering Paragraphs 7, 49, 50 Decision 20-09-035 for Working Group 2 and 3

Keywords (choose from CPUC listing): Compliance, Forms

AL Type:  Monthly  Quarterly  Annual  One-Time  Other:

If AL submitted in compliance with a Commission order, indicate relevant Decision/Resolution #: D.20-09-035

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: 3/17/22

No. of tariff sheets: 8

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 proposed<sup>1</sup>: N/A

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

<sup>1</sup>Discuss 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](mailto:EDTariffUnit@cpuc.ca.gov)

Name: Sidney Bob Dietz II, 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](mailto:PGETariffs@pge.com)

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

<b>Cal P.U.C. Sheet No.</b>	<b>Title of Sheet</b>	<b>Cancelling Cal P.U.C. Sheet No.</b>
52478-E	Electric Sample Form No. 79-1174-02B Rule 21 Generator Interconnection Application - Attachment B Sheet 1	50664-E
52479-E	Electric Sample Form No. 79-1174-02D Rule 21 Generator Interconnection Application - Attachment D Sheet 1	51233-E
52480-E	Electric Sample Form No. 79-1174-02E Rule 21 Generator Interconnection Application - Attachment E Sheet 1	50666-E
52481-E	Electric Sample Form No. 79-1174-02F Rule 21 Generator Interconnection Application - Attachment F Sheet 1	50667-E
52482-E	Electric Sample Form No. 79-1174-02G Rule 21 Generator Interconnection Application - Attachment G Sheet 1	50668-E
52483-E	Electric Sample Form No. 79-1174-02H Rule 21 Generator Interconnection Application - Attachment H Sheet 1	50669-E
52484-E	ELECTRIC TABLE OF CONTENTS Sheet 1	52462-E
52485-E	ELECTRIC TABLE OF CONTENTS Sheet 25	51240-E



**Electric Sample Form No. 79-1174-02B**  
Rule 21 Generator Interconnection Application - Attachment B

Sheet 1

**Please Refer to Attached  
Sample Form**

(Continued)

*Advice* 6286-E-B  
*Decision* D.20-09-035

*Issued by*  
**Robert S. Kenney**  
*Vice President, Regulatory Affairs*

*Submitted* January 7, 2022  
*Effective* March 17, 2022  
*Resolution* \_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT B

### NON-EXPORT

#### Operating Mode

Please select one option below:

- Parallel Operation (no export):** The Generating Facility will interconnect and operate “in parallel” with PG&E’s Electric System for more than one (1) second.

Please supply all of the information requested for the Generating Facility. Be sure to supply adequate information including diagrams and written descriptions regarding the protective relays that will be used to detect faults or abnormal operating conditions on PG&E’s Electric System.

- Inadvertent Export:** The Generating Facility will interconnect and operate, providing unscheduled and uncompensated export of real power for a duration exceeding two (2) seconds but fewer than sixty (60) seconds. The expected frequency of “inadvertent export” occurrences should be less than two occurrences per 24-hour period. Protective Functions, technical requirements and operational limitations are described in Rule 21, Section M.

Be sure to supply adequate information including diagrams and written descriptions regarding the switching device or scheme that will be used to limit the parallel operation period to one second or less. Please also describe the back up or protective device and controls that will trip the Generating Facility should the transfer switch or scheme not complete the transfer in one second or less.

- Uncompensated Export:** A Generating Facility Interconnection Export Addendum that provides for parallel operation of the Generating Facility and the occasional, continuous, non-compensated, export of generator facilities sized 2 MW or less to PG&E’s Electric System. Continuous export is export greater than 60 seconds in duration. This addendum must be executed in concert with the generating facility interconnection agreement.

- Momentary Parallel Operation (Make Before Break):** The Generating Facility will interconnect and operate on a “momentary parallel” basis with PG&E’s Electric System for a duration of one (1) second or less through transfer switches or operating schemes specifically designed and engineered for such operation.

Be sure to supply adequate information including diagrams and written descriptions regarding the switching device or scheme that will be used to limit the parallel operation period to one second or less. Please also describe the back up or protective device and controls that will trip the Generating Facility should the transfer switch or scheme not complete the transfer in one second or less.

- Isolated Operation (Break Before Make):** The Generating Facility will be “isolated” and prevented from becoming interconnected with PG&E’s Electric System through a transfer switch or operating scheme specifically designed and engineered for such operation.

Be sure to supply adequate information including diagrams and written descriptions regarding the isolating switching device or scheme that will be used to prevent the Generating Facility from operating in parallel with PG&E’s Electric System.

Note: There is no application fee for Generating Facilities employing Isolated Operation mode, however, an application is needed to satisfy PG&E’s notice requirements for operating an isolated Generating Facility as per California Health and Safety Code Section 119085 (b)



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT B

### NON-EXPORT

#### Protection Options

##### Parallel Only:

Please select one Rule 21 Screen I option below:

- Reverse Power (Option 1): A **reverse-power protection device** will be installed to measure any export of power and trip the Generating Facility or open an intertie breaker to isolate the Generating Facility if limits are exceeded.
- Under Power (Option 2): An **under-power protection device** will be installed to measure the inflow of power and trip or reduce the output of the Generating Facility if limits are not maintained.
- Non-Islanding (Option 3): The Generating Facility Interconnection Facility equipment has been **certified as non-islanding and the incidental export of power will be limited by the design of the interconnection**. If this option is to be used, the nominal ampere rating of the service entrance equipment (service panel rating) that is used by the host Customer facility is:  
\_\_\_\_\_.
- Gross Nameplate 50% or Less (Option 4): The **Gross Nameplate Rating of the Generating Facility will not exceed 50% of the host Customer facility's minimum electrical load over the past 12 months**. If this option is to be used, the minimum load of the host Customer facility must be stated in the space provided above.
- AC/DC Converter (Option 7): An AC/DC Converter is employed to prevent export by only allowing one way power flow.
- Certified Power Control System (PCS) Non-Export (Option 8): A PCS is employed to prevent export. For this option, the open loop response time of the PCS must be less than 2 seconds.

Please indicate:

- Qualifying Facility (QF) Status will be obtained from the FERC for this Generating Facility.

Instructions and Notes: Parties operating Generating Facilities (QF) complying with all of the requirements for qualification as either a small power production facility or cogeneration facility pursuant to the regulations of the FERC (18 Code of Federal Regulations Part 292, Section 292.203 et seq.) implementing the Public Utility Regulatory Policies Act of 1978 (16 U.S.C.A. Section 796, et seq.), or any successor requirements for Qualifying Facilities, may seek certification from FERC to have the Generating Facility designated as a Qualifying Facility or "QF." In summary, QFs are Generating Facilities using renewable or alternative fuels as a primary energy source or facilities that utilize the thermal energy given off by the generation process for some other useful purpose. QFs enjoy certain rights and privileges not available to non-QF Generating Facilities.

QF status is not required to interconnect and operate in parallel with PG&E's Electric System.



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT B

### NON-EXPORT

---

#### Inadvertent Export:

The Generating Facility **completely offsets their facility load** by being (a) optimally sized to meet their peak demand with load following functionality on the Generator controls and (b) ensuring conditional (inadvertent) export of electric power from the Generation Facility to Distribution Provider's Distribution or Transmission System occurs no more frequently than twice in any 24 hour period and the exports are greater than 2 seconds but no more than more than 60 seconds.

Please select one Rule 21 Screen I option below:

- Reverse Power (Option 5): Two **reverse-power protection devices** will be installed to measure any export of power and trip the Generating Facility or open an intertie breaker to isolate the Generating Facility if limits are exceeded.
- Under Power (Option 5): A **reverse-power protection devices** will be installed to measure any export of power and trip the Generating Facility or open an intertie breaker to isolate the Generating Facility if limits are exceeded; AND an **under-power protection device** will be installed to measure the inflow of power and trip or reduce the output of the Generating Facility if limits are not maintained.
- Non-islanding Inverters (Option 6): Designed to detect and disconnect from a stable Unintended Island with matched load and generation.
- Certified Power Control System (PCS) Inadvertent (Option 10): A PCS is employed to allow inadvertent export. For this option, the open loop response time of the PCS must be greater than 2 seconds and no more than 10 seconds.
- Certified Power Control System (PCS) Inadvertent/Limited Export (Option 11): A PCS is employed to allow inadvertent limited export. For this option, the open loop response time of the PCS must be greater than 2 seconds and no more than 10 seconds.

Please indicate:

- Qualifying Facility (QF) Status will be obtained from the FERC for this Generating Facility.

Instructions and Notes: Parties operating Generating Facilities (QF) complying with all of the requirements for qualification as either a small power production facility or cogeneration facility pursuant to the regulations of the FERC (18 Code of Federal Regulations Part 292, Section 292.203 et seq.) implementing the Public Utility Regulatory Policies Act of 1978 (16 U.S.C.A. Section 796, et seq.), or any successor requirements for Qualifying Facilities, may seek certification from FERC to have the Generating Facility designated as a Qualifying Facility or "QF." In summary, QFs are Generating Facilities using renewable or alternative fuels as a primary energy source or facilities that utilize the thermal energy given off by the generation process for some other useful purpose. QFs enjoy certain rights and privileges not available to non-QF Generating Facilities.

QF status is not required to interconnect and operate in parallel with PG&E's Electric System.

#### Uncompensated Export:

Please provide Maximum Expected Facility Net Export (kW): \_\_\_\_\_

With the approval of PG&E, a Producer that wishes to retain the option to export power from a Generating Facility to PG&E's Electric System may use a different protection scheme that provides for the detection of faults and other abnormal operating conditions.



**Electric Sample Form No. 79-1174-02D**  
Rule 21 Generator Interconnection Application - Attachment D

Sheet 1

**Please Refer to Attached  
Sample Form**

(Continued)

*Advice* 6286-E-B  
*Decision* D.20-09-035

*Issued by*  
**Robert S. Kenney**  
*Vice President, Regulatory Affairs*

*Submitted* January 7, 2022  
*Effective* March 17, 2022  
*Resolution* \_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT D

## SOLAR (PV) TECHNOLOGY

**Part I - Describing the Generating Facility and Host Customer's Electrical Facilities**

Please complete the following table for the specific generator technology indicated.

Instructions				
Inverter	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>Please indicate the number of each <b>"type"</b> and <b>quantity</b> of Generator being installed</p> <p>Be sure all Generators classified as one "type" are identical in all respects.</p> <p>If only one type of Generator is to be used, only one column needs to be completed.</p>				
<p>A - Generator/Inverter Manufacturer</p> <p>Enter the brand name of the Generator.</p>				
<p>B - Generator/Inverter Model</p> <p>Enter the model name or number assigned by the manufacturer of the Generator.</p>				
<p>C - Generator/Inverter Software Version</p> <p>If this Generator's control and or protective functions are dependent on a software program supplied by the manufacturer of the equipment, please provide the version or release number for the software that will be used.</p>				
<p>D - Is the Generator/Inverter certified?</p> <p>Applicant has verified that all major solar system components are on the verified equipment list maintained by the California Energy Commission and other equipment, as determined by PG&amp;E, has been verified by the customer as having safety certification from a nationally recognized testing laboratory.</p> <p>See PG&amp;E's Rule 21, Section L for additional information regarding Generator certification.</p>	<p style="text-align: center;">___ Yes</p> <p style="text-align: center;">___ No</p>	<p style="text-align: center;">___ Yes</p> <p style="text-align: center;">___ No</p>	<p style="text-align: center;">___ Yes</p> <p style="text-align: center;">___ No</p>	<p style="text-align: center;">___ Yes</p> <p style="text-align: center;">___ No</p>



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT D

## SOLAR (PV) TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
E - Modules.	<u>Manufacturer</u>  <u>Model #.</u>  <u>Quantity</u>	<u>Manufacturer</u>  <u>Model #.</u>  <u>Quantity</u>	<u>Manufacturer</u>  <u>Model #.</u>  <u>Quantity</u>	<u>Manufacturer</u>  <u>Model #.</u>  <u>Quantity</u>
F - Gross Nameplate Rating (kVA)  This is the capacity value normally supplied by the manufacturer and stamped on the Generator's nameplate.  This value is not required where the manufacturer provides only a kW rating. However, where both kVA and kW values are available, please indicate both.				
G - Operating Voltage  This value should be the voltage rating designated by the manufacturer and used in this Generating Facility.  Please indicate phase-to-phase voltages for 3-phase installations.  See PG&E's Rule 21, Section H.2.b. and Table H.1., for additional information.				
H - Power Factor Rating  This value should be the nominal power factor rating designated by the manufacturer for the Generator.  See PG&E's Rule 21, Section H.2.i. for additional information.				
I - PF Adjustment Range  Where the power factor of the Generator is adjustable, please indicate the maximum and minimum operating values.  See PG&E's Rule 21, Section H.2.i.				
J - Wiring Configuration  Please indicate whether the Generator is a single-phase or three-phase device. See PG&E's Rule 21, Section H.3.				



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT D

## SOLAR (PV) TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<b>K - AC Disconnect</b> For systems requiring an AC Disconnect only, please include the requested information about the AC Disconnect. See PG&E's Rule 21, Section H.1.d  Located within 10 feet of the PG&E meter?	_____ Manufacturer _____ Model # _____ Rating (amps)  ____ Yes ____ No			
<b>L - Lineside Tap</b> Where is the point of interconnection in relation to the main breaker? PG&E has special requirements for a lineside tap. Contact PG&E at: <a href="mailto:Rule21Gen@PGE.com">Rule21Gen@PGE.com</a> for more information.	_____ Customer side  ____ PG&E side			
<b>N - Warranty or Service Agreement</b> Applicant has verified that (i) a warranty of at least 10 years has been provided on all equipment and on its installation, or (ii) have a 10-year service warranty or executed "agreement" ensuring proper maintenance and continued system performance.	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No
<b>O - Solar Ready Electric Panel</b> Is the Generating Facility connecting to a circuit breaker on the supply side of the main breaker?	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No
<b>P - Green Meter Adapter (GMA)</b> Will a GMA be installed?	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No
<b>Q - Distribution Interconnect Handbook (DIH) and Greenbook Requirements</b> Does this interconnection meet the DIH and Greenbook Requirements	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No
<b>R - Gas Clearance Requirements</b> Certify that this interconnection meets Greenbook Gas Clearance Requirements?	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT D

## SOLAR (PV) TECHNOLOGY

<p>S - Basic Single Line Diagram (SLD)</p> <p>If the interconnection is eligible to use a Basic SLD, please include the requested information.</p>	<p>Panel Voltage (Volts)</p> <hr/> <p>Main Breaker (Amps)</p> <hr/> <p>PV Breaker Size (Amps)</p>	<p>Panel Voltage (Volts)</p> <hr/> <p>Main Breaker (Amps)</p> <hr/> <p>PV Breaker Size (Amps)</p>	<p>Panel Voltage (Volts)</p> <hr/> <p>Main Breaker (Amps)</p> <hr/> <p>PV Breaker Size (Amps)</p>	<p>Panel Voltage (Volts)</p> <hr/> <p>Main Breaker (Amps)</p> <hr/> <p>PV Breaker Size (Amps)</p>
<p>T - Back-up Generator Operation</p> <p>Will the generator be operated as a back-up?</p> <p>If yes, please indicate the control device that will be used.</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Automatic Transfer Switch</p> <p><input type="checkbox"/> Contactor</p> <p><input type="checkbox"/> Breaker</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Automatic Transfer Switch</p> <p><input type="checkbox"/> Contactor</p> <p><input type="checkbox"/> Breaker</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Automatic Transfer Switch</p> <p><input type="checkbox"/> Contactor</p> <p><input type="checkbox"/> Breaker</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Automatic Transfer Switch</p> <p><input type="checkbox"/> Contactor</p> <p><input type="checkbox"/> Breaker</p>
<p>U - Limited Export</p> <p>Will the generator export be limited?</p> <p>If yes, please indicate how export will be limited.</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Power Control System (PCS - Option 9)</p> <p><input type="checkbox"/> Relay</p> <p><input type="checkbox"/> Derated Inverter</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Power Control System (PCS - Option 9)</p> <p><input type="checkbox"/> Relay</p> <p><input type="checkbox"/> Derated Inverter</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Power Control System (PCS - Option 9)</p> <p><input type="checkbox"/> Relay</p> <p><input type="checkbox"/> Derated Inverter</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Power Control System (PCS - Option 9)</p> <p><input type="checkbox"/> Relay</p> <p><input type="checkbox"/> Derated Inverter</p>

### Part II Solar Statistics Data Fields

Per Appendix A of CPUC D. 14-11-001, the following data fields must all be completed, in their entirety, in order to initiate PG&E's interconnection review of the proposed Generating Facility. *Only complete Part II if the solar generating facility is serving as part of a Net Energy Metering (NEM2) arrangement..*

**A. Customer Sector** (Check one)

- |   |                                      |                                     |
|---|--------------------------------------|-------------------------------------|
| <input type="checkbox"/> Residential      | <input type="checkbox"/> Educational | <input type="checkbox"/> Industrial |
| <input type="checkbox"/> Commercial       | <input type="checkbox"/> Military    | <input type="checkbox"/> Non-Profit |
| <input type="checkbox"/> Other Government |                                      |                                     |



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT D

## SOLAR (PV) TECHNOLOGY

**B. Are Performance Monitoring and Reporting Services (PMRS) being utilized?**

Yes  No

If yes, please indicate who is receiving the data? (check all that apply)

Customer

3<sup>rd</sup> Party (list name) \_\_\_\_\_

**C. Are there electric vehicles charging on site at the above generating facility address?**

Yes  No

If yes, please indicate how many electric vehicles \_\_\_\_\_

**D. System Ownership and Financing**

**i. System Owner** (check one):

PG&E Customer Owned

If PG&E Customer Owned, please answer the following:

Indicate the System Cost paid by Customer: \$ \_\_\_\_\_

Property Assessed Clean Energy (PACE) Financed?

Yes

No

If Yes, PACE financed by which entity? \_\_\_\_\_

Third Party Owned

If Third Party Owned, please answer the following:

Claimed Federal Investment Tax Credit (ITC) Cost Basis: \$ \_\_\_\_\_

Name of Developer at the time of sale:

Contract Type:  PPA  Lease  Pre-Paid Lease  Other \_\_\_\_\_

**ii. Rebate Information:**

Did you participate in a California rebate program?  Yes  No

Please indicate the rebate program that you participated in: \_\_\_\_\_

Rebate Amount: \$ \_\_\_\_\_

If you are participating in the Single-family Affordable Solar Home (SASH) program, please provide SASH project number: \_\_\_\_\_

**E. Additional Generating Facility Information (Solar PV Only)**

**i. Mounting Method:**  Rooftop  Ground  Mixed

**ii. Tracking Type:**  Fixed  Single-Axis  Dual-Axis  Mixed

If fixed, please indicate: Tilt: \_\_\_\_\_ degrees Azimuth: \_\_\_\_\_ degrees

**F. Installer's/Vendor's California State Contractor License Number:** \_\_\_\_\_



**Electric Sample Form No. 79-1174-02E**  
Rule 21 Generator Interconnection Application - Attachment E

Sheet 1

**Please Refer to Attached  
Sample Form**

(Continued)

*Advice* 6286-E-B  
*Decision* D.20-09-035

*Issued by*  
**Robert S. Kenney**  
*Vice President, Regulatory Affairs*

*Submitted* January 7, 2022  
*Effective* March 17, 2022  
*Resolution* \_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT E

### WIND TURBINE TECHNOLOGY

Please complete the following table for the specific generator technology indicated.

Instructions				
Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>Please indicate the number of each <b>“type”</b> and <b>quantity</b> of Generator being installed</p> <p>Be sure all Generators classified as one “type” are identical in all respects.</p> <p>If only one type of Generator is to be used, only one column needs to be completed.</p>	Type: _____ Qty.: _____	Type: _____ Qty.: _____	Type: _____ Qty.: _____	Type: _____ Qty.: _____
A - Generator/Inverter Manufacturer Enter the brand name of the Generator.				
B - Generator/Inverter Model Enter the model name or number assigned by the manufacturer of the Generator.				
C - Generator/Inverter Software Version If this Generator’s control and or protective functions are dependent on a software program supplied by the manufacturer of the equipment, please provide the version or release number for the software that will be used.				
D - Is the Inverter certified?  Applicant has verified that all major solar system components are on the verified equipment list maintained by the California Energy Commission and other equipment, as determined by PG&E, has been verified by the customer as having safety certification from a nationally recognized testing laboratory.  See PG&E’s Rule 21, Section L for additional information regarding Generator certification.	<input type="checkbox"/> Yes <input type="checkbox"/> No			
E - Generator Design  Please indicate the design of each Generator.  Designate “Inverter” anytime an inverter is used as the interface between the Generator and the electric system regardless of the primary power production/storage device used.	<input type="checkbox"/> Synch <input type="checkbox"/> Induct. <input type="checkbox"/> Inverter			



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT E

### WIND TURBINE TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p><b>F - Gross Nameplate Rating (kVA)</b></p> <p>This is the capacity value normally supplied by the manufacturer and stamped on the Generator's nameplate.</p> <p>This value is not required where the manufacturer provides only a kW rating. However, where both kVA and kW values are available, please indicate both.</p>				
<p><b>G - Operating Voltage</b></p> <p>This value should be the voltage rating designated by the manufacturer and used in this Generating Facility.</p> <p>Please indicate phase-to-phase voltages for 3-phase installations.</p> <p>See PG&amp;E's Rule 21, Section H.2.b. and Table H.1., for additional information.</p>				
<p><b>H - Power Factor Rating</b></p> <p>This value should be the nominal power factor rating designated by the manufacturer for the Generator.</p> <p>See PG&amp;E's Rule 21, Section H.2.i. for additional information.</p>				
<p><b>I - PF Adjustment Range</b></p> <p>Where the power factor of the Generator is adjustable, please indicate the maximum and minimum operating values.</p> <p>See PG&amp;E's Rule 21, Section H.2.i.</p>				
<p><b>J - Wiring Configuration</b></p> <p>Please indicate whether the Generator is a single-phase or three-phase device. See PG&amp;E's Rule 21, Section H.3.</p>				
<p><b>K - (MP) 3-Phase Winding Configuration</b></p> <p>(Choose One)</p> <p>For three-phase generating units, please indicate the configuration of the Generator's windings or inverter systems.</p>	<p><input type="checkbox"/> 3 Wire Delta</p> <p><input type="checkbox"/> 3 Wire Wye</p> <p><input type="checkbox"/> 4 Wire Wye</p>	<p><input type="checkbox"/> 3 Wire Delta</p> <p><input type="checkbox"/> 3 Wire Wye</p> <p><input type="checkbox"/> 4 Wire Wye</p>	<p><input type="checkbox"/> 3 Wire Delta</p> <p><input type="checkbox"/> 3 Wire Wye</p> <p><input type="checkbox"/> 4 Wire Wye</p>	<p><input type="checkbox"/> 3 Wire Delta</p> <p><input type="checkbox"/> 3 Wire Wye</p> <p><input type="checkbox"/> 4 Wire Wye</p>



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT E

### WIND TURBINE TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>L - (MP) Neutral Grounding System Used (Choose One)</p> <p>Wye connected generating units are often grounded – either through a resistor or directly, depending upon the nature of the electrical system to which the Generator is connected.</p> <p>If the grounding method used at this facility is not listed, please attach additional descriptive information.</p>	<p>___ Ungrounded</p> <p>___ Solidly Grounded</p> <p>___ Ground Resistor</p> <p>___ Ohms</p>	<p>___ Ungrounded</p> <p>___ Solidly Grounded</p> <p>___ Ground Resistor</p> <p>___ Ohms</p>	<p>___ Ungrounded</p> <p>___ Solidly Grounded</p> <p>___ Ground Resistor</p> <p>___ Ohms</p>	<p>___ Ungrounded</p> <p>___ Solidly Grounded</p> <p>___ Ground Resistor</p> <p>___ Ohms</p>
<p>M - Induction Generators Only:</p> <p style="padding-left: 40px;">Locked Rotor Current: _____ (Amps)</p> <p style="padding-left: 40px;"><b>Stator Resistance:</b> _____ (%)</p> <p style="padding-left: 40px;">Stator Leakage Reactance: _____ (%)</p> <p style="padding-left: 40px;">Rotor Resistance: _____ (%)</p> <p style="padding-left: 40px;">Rotor Leakage Reactance: _____ (%)</p> <p>If the Generator is of an induction design, please provide the “locked rotor current” value supplied by the manufacturer.</p> <p>If this value is not available, the stator resistance, stator leakage reactance, rotor resistance, rotor leakage reactance values supplied by the manufacturer may be used to determine the locked rotor current.</p> <p>If the Generator’s Gross Nameplate Capacity is 10 MW or greater, PG&amp;E may request additional data to better model the nature and behavior of the Generator with relation to its Electric System.</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>
<p>N - Short Circuit Current Produced by Generator</p>	<p>_____ (Amps)</p>	<p>_____ (Amps)</p>	<p>_____ (Amps)</p>	<p>_____ (Amps)</p>
<p>O - AC Disconnect</p> <p>For systems requiring an AC Disconnect only, please include the requested information about the AC Disconnect.</p> <p>See PG&amp;E’s Rule 21, Section H.1.d</p> <p>Located within 10 feet of the PG&amp;E meter?</p>	<p>_____ Manufacturer</p> <p>_____ Model #</p> <p>_____ Rating (amps)</p> <p>___ Yes</p> <p>___ No</p>	<p>_____ Manufacturer</p> <p>_____ Model #</p> <p>_____ Rating (amps)</p> <p>___ Yes</p> <p>___ No</p>	<p>_____ Manufacturer</p> <p>_____ Model #</p> <p>_____ Rating (amps)</p> <p>___ Yes</p> <p>___ No</p>	<p>_____ Manufacturer</p> <p>_____ Model #</p> <p>_____ Rating (amps)</p> <p>___ Yes</p> <p>___ No</p>
<p>P - Lineside Tap</p> <p>Where is the point of interconnection in relation to the main breaker?</p> <p>PG&amp;E has special requirements for a lineside tap.</p> <p>Contact PG&amp;E at: <a href="mailto:Rule21Gen@PGE.com">Rule21Gen@PGE.com</a> for more information.</p>	<p>_____ Customer side</p> <p>_____ PG&amp;E side</p>			



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT E

### WIND TURBINE TECHNOLOGY

<b>Q – Warranty or Service Agreement</b> Applicant has verified that (i) a warranty of at least 10 years has been provided on all equipment and on its installation, or (ii) have a 10-year service warranty or executed “agreement” ensuring proper maintenance and continued system performance.	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<b>R - Distribution Interconnect Handbook (DIH) and Greenbook Requirements</b> Does this interconnection meet the DIH and Greenbook Requirements	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<b>S - Gas Clearance Requirements</b> Certify that this interconnection meets Greenbook Gas Clearance Requirements?	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<b>T - Back-up Generator Operation</b> Will the generator be operated as a back-up?  If yes, please indicate control device.	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker
<b>U - Limited Export</b> Will the generator export be limited?  If yes, please indicate how export will be limited.	___ Yes ___ No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	___ Yes ___ No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	___ Yes ___ No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	___ Yes ___ No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter



**Electric Sample Form No. 79-1174-02F**  
Rule 21 Generator Interconnection Application - Attachment F

Sheet 1

**Please Refer to Attached  
Sample Form**

(Continued)

*Advice* 6286-E-B  
*Decision* D.20-09-035

*Issued by*  
**Robert S. Kenney**  
*Vice President, Regulatory Affairs*

*Submitted* January 7, 2022  
*Effective* March 17, 2022  
*Resolution* \_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT F

### **MACHINE-BASED TECHNOLOGY**

Please complete the following table for the specific generator technology indicated.

Instructions				
Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>Please indicate the number of each <b>“type” and quantity</b> of Generator being installed.</p> <p>Be sure all Generators classified as one “type” are identical in all respects.</p> <p>If only one type of Generator is to be used, only one column needs to be completed.</p>				
<p>A - Generator/Inverter Manufacturer Enter the brand name of the Generator.</p>				
<p>B - Generator/Inverter Model Enter the model name or number assigned by the manufacturer of the Generator.</p>				
<p>C - Generator/Inverter Software Version If this Generator’s control and or protective functions are dependent on a software program supplied by the manufacturer of the equipment, please provide the version or release number for the software that will be used.</p>				
<p>D - Is the Generator/Inverter certified? Applicant has verified that all major solar system components are on the verified equipment list maintained by the California Energy Commission and other equipment, as determined by PG&amp;E, has been verified by the customer as having safety certification from a nationally recognized testing laboratory. See PG&amp;E’s Rule 21, Section L for additional information regarding Generator certification.</p>	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<p>F - Gross Nameplate Rating (kVA) This is the capacity value normally supplied by the manufacturer and stamped on the Generator’s nameplate.  This value is not required where the manufacturer provides only a kW rating. However, where both kVA and kW values are available, please indicate both.</p>				



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT F

### **MACHINE-BASED TECHNOLOGY**

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p><b>G - Operating Voltage</b></p> <p>This value should be the voltage rating designated by the manufacturer and used in this Generating Facility.</p> <p>Please indicate phase-to-phase voltages for 3-phase installations.</p> <p>See PG&amp;E's Rule 21, Section H.2.b. and Table H.1., for additional information.</p>				
<p><b>H - Power Factor Rating</b></p> <p>This value should be the nominal power factor rating designated by the manufacturer for the Generator.</p> <p>See PG&amp;E's Rule 21, Section H.2.i. for additional information.</p>				
<p><b>I - PF Adjustment Range</b></p> <p>Where the power factor of the Generator is adjustable, please indicate the maximum and minimum operating values.</p> <p>See PG&amp;E's Rule 21, Section H.2.i.</p>				
<p><b>J - Wiring Configuration</b></p> <p>Please indicate whether the Generator is a single-phase or three-phase device. See PG&amp;E's Rule 21, Section H.3.</p>				
<p><b>K - (MP) 3-Phase Winding Configuration (Choose One)</b></p> <p>For three-phase generating units, please indicate the configuration of the Generator's windings or inverter systems.</p>	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye
<p><b>L - (MP) Neutral Grounding System Used (Choose One)</b></p> <p>Wye connected generating units are often grounded – either through a resistor or directly, depending upon the nature of the electrical system to which the Generator is connected.</p> <p>If the grounding method used at this facility is not listed, please attach additional descriptive information.</p>	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT F

### MACHINE-BASED TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p><b>M – Synchronous Generators Only:</b> If the Generator is of a synchronous design, please provide the synchronous reactance, transient reactance, and subtransient reactance values supplied by the manufacturer. This information is necessary to determine the short circuit contribution of the Generator and as data in load flow and short circuit computer models of PG&amp;E's Electric System. If the Generator's Gross Nameplate Capacity is 10 MW or greater, PG&amp;E may request additional data to better model the nature and behavior of the Generator with relation to its Electric System.</p> <p style="margin-left: 40px;">Synchronous Reactance: _____ (Xd %)</p> <p style="margin-left: 40px;">Transient Reactance: _____ (Xd %)</p> <p style="margin-left: 40px;">Subtransient Reactance: _____ (Xd %)</p>	<p>_____ (Xd %)</p> <p>_____ (Xd %)</p> <p>_____ (Xd %)</p>	<p>_____ (Xd %)</p> <p>_____ (Xd %)</p> <p>_____ (Xd %)</p>	<p>_____ (Xd %)</p> <p>_____ (Xd %)</p> <p>_____ (Xd %)</p>	<p>_____ (Xd %)</p> <p>_____ (Xd %)</p> <p>_____ (Xd %)</p>
<p><b>N - Induction Generators Only:</b></p> <p style="margin-left: 40px;">Locked Rotor Current: _____ (Amps)</p> <p style="margin-left: 40px;"><b>Stator Resistance:</b> _____ (%)</p> <p style="margin-left: 40px;">Stator Leakage Reactance: _____ (%)</p> <p style="margin-left: 40px;">Rotor Resistance: _____ (%)</p> <p style="margin-left: 40px;">Rotor Leakage Reactance: _____ (%)</p> <p>If the Generator is of an induction design, please provide the "locked rotor current" value supplied by the manufacturer.</p> <p>If this value is not available, the stator resistance, stator leakage reactance, rotor resistance, rotor leakage reactance values supplied by the manufacturer may be used to determine the locked rotor current.</p> <p>If the Generator's Gross Nameplate Capacity is 10 MW or greater, PG&amp;E may request additional data to better model the nature and behavior of the Generator with relation to its Electric System.</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>
<p><b>O - Short Circuit Current Produced by Generator</b></p>	<p>_____ (Amps)</p>	<p>_____ (Amps)</p>	<p>_____ (Amps)</p>	<p>_____ (Amps)</p>



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT F

### MACHINE-BASED TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p><b>P – For Generators that are Started as a “Motor” Only:</b> This information is needed only for Generators that are started by “motoring” the generator.</p> <p>See PG&amp;E’s Rule 21, Sections L.3.d. and L.7.b. for significance and additional information.</p> <p>If this question was answered in Part IV, question C of this Application, it need not be answered here.</p> <p>1. In-Rush Current:</p> <p>2. Host Customer’s Service Entrance Panel (Main Panel) Continuous Current Rating:</p>	<p>_____</p> <p>(Amps)</p> <p>_____</p> <p>(Amps)</p>			
<p><b>Q – Prime Mover Type</b></p> <p>Please indicate the type and fuel used as the prime mover or source of energy for the Generator.</p> <p>1 = Natural Gas 2 = Diesel Fueled 3 = Other Fuel</p>	<p>1   2   3</p>	<p>1   2   3</p>	<p>1   2   3</p>	<p>1   2   3</p>
<p><b>R - AC Disconnect</b></p> <p>For systems requiring an AC Disconnect only, please include the requested information about the AC Disconnect.</p> <p>See PG&amp;E’s Rule 21, Section H.1.d</p> <p>Located within 10 feet of the PG&amp;E meter?</p>	<p>_____</p> <p>Manufacturer</p> <p>_____</p> <p>Model #</p> <p>_____</p> <p>Rating (amps)</p> <p>___ Yes ___ No</p>	<p>_____</p> <p>Manufacturer</p> <p>_____</p> <p>Model #</p> <p>_____</p> <p>Rating (amps)</p> <p>___ Yes ___ No</p>	<p>_____</p> <p>Manufacturer</p> <p>_____</p> <p>Model #</p> <p>_____</p> <p>Rating (amps)</p> <p>___ Yes ___ No</p>	<p>_____</p> <p>Manufacturer</p> <p>_____</p> <p>Model #</p> <p>_____</p> <p>Rating (amps)</p> <p>___ Yes ___ No</p>
<p><b>S - Lineside Tap</b></p> <p>Where is the point of interconnection in relation to the main breaker?</p> <p>PG&amp;E has special requirements for a lineside tap.</p> <p>Contact PG&amp;E at: <a href="mailto:Rule21Gen@PGE.com">Rule21Gen@PGE.com</a> for more information.</p>	<p>_____</p> <p>Customer side</p> <p>_____ PG&amp;E side</p>	<p>_____</p> <p>Customer side</p> <p>_____ PG&amp;E side</p>	<p>_____</p> <p>Customer side</p> <p>_____ PG&amp;E side</p>	<p>_____ Customer side</p> <p>_____ PG&amp;E side</p>
<p><b>T – Warranty or Service Agreement</b></p> <p>Applicant has verified that (i) a warranty of at least 10 years has been provided on all equipment and on its installation, or (ii) have a 10-year service warranty or executed</p>	<p>___ Yes ___ No</p>	<p>___ Yes ___ No</p>	<p>___ Yes ___ No</p>	<p>___ Yes ___ No</p>



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT F

### MACHINE-BASED TECHNOLOGY

<p>“agreement” ensuring proper maintenance and continued system performance.</p>				
<p><b>U - Cogeneration</b> Please indicate whether this Generating Facility meets the definition of cogeneration in PUC 216.6 (5% useful thermal and 42.5% efficient):</p>	<p>___ Yes ___ No</p>	<p>___ Yes ___ No</p>	<p>___ Yes ___ No</p>	<p>___ Yes ___ No</p>
<p><b>V - Distribution Interconnect Handbook (DIH) and Greenbook Requirements</b> Does this interconnection meet the DIH and Greenbook Requirements</p>	<p>___ Yes ___ No</p>	<p>___ Yes ___ No</p>	<p>___ Yes ___ No</p>	<p>___ Yes ___ No</p>
<p><b>W - Gas Clearance Requirements</b> Certify that this interconnection meets Greenbook Gas Clearance Requirements?</p>	<p>___ Yes ___ No</p>	<p>___ Yes ___ No</p>	<p>___ Yes ___ No</p>	<p>___ Yes ___ No</p>
<p><b>X - Back-up Generator Operation</b> Will the generator be operated as a back-up?  If yes, please indicate control device.</p>	<p>___ Yes ___ No</p> <p><input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker</p>	<p>___ Yes ___ No</p> <p><input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker</p>	<p>___ Yes ___ No</p> <p><input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker</p>	<p>___ Yes ___ No</p> <p><input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker</p>
<p><b>Y - Limited Export</b> Will the generator export be limited?  If yes, please indicate how export will be limited.</p>	<p>___ Yes ___ No</p> <p><input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter</p>	<p>___ Yes ___ No</p> <p><input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter</p>	<p>___ Yes ___ No</p> <p><input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter</p>	<p>___ Yes ___ No</p> <p><input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter</p>



**Electric Sample Form No. 79-1174-02G**  
Rule 21 Generator Interconnection Application - Attachment G

Sheet 1

**Please Refer to Attached  
Sample Form**

(Continued)

*Advice* 6286-E-B  
*Decision* D.20-09-035

*Issued by*  
**Robert S. Kenney**  
*Vice President, Regulatory Affairs*

*Submitted* January 7, 2022  
*Effective* March 17, 2022  
*Resolution* \_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT G

### FUEL CELL TECHNOLOGY

Please complete the following table for the specific generator technology indicated.

Instructions				
Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>Please indicate the number of each <b>“type” and quantity</b> of Generator being installed.</p> <p>Be sure all Generators classified as one “type” are identical in all respects.</p> <p>If only one type of Generator is to be used, only one column needs to be completed.</p>				
<p>A - Generator/Inverter Manufacturer</p> <p>Enter the brand name of the Generator.</p>				
<p>B - Generator/Inverter Model</p> <p>Enter the model name or number assigned by the manufacturer of the Generator.</p>				
<p>C - Generator/Inverter Software Version</p> <p>If this Generator’s control and or protective functions are dependent on a software program supplied by the manufacturer of the equipment, please provide the version or release number for the software that will be used.</p>				
<p>D - Is the Generator/Inverter certified?</p> <p>Applicant has verified that all major solar system components are on the verified equipment list maintained by the California Energy Commission and other equipment, as determined by PG&amp;E, has been verified by the customer as having safety certification from a nationally recognized testing laboratory.</p> <p>See PG&amp;E’s Rule 21, Section L for additional information regarding Generator certification.</p>	<input type="checkbox"/> Yes  <input type="checkbox"/> No			



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT G

### FUEL CELL TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<b>E - Generator Design</b> Please indicate the design of each Generator. Designate "Inverter" anytime an inverter is used as the interface between the Generator and the electric system regardless of the primary power production/storage device used.	<input type="checkbox"/> Synch <input type="checkbox"/> Induct. <input type="checkbox"/> Inverter			
<b>F - Gross Nameplate Rating (kVA)</b> This is the capacity value normally supplied by the manufacturer and stamped on the Generator's nameplate. This value is not required where the manufacturer provides only a kW rating. However, where both kVA and kW values are available, please indicate both.				
<b>G - Operating Voltage</b> This value should be the voltage rating designated by the manufacturer and used in this Generating Facility. Please indicate phase-to-phase voltages for 3-phase installations. See PG&E's Rule 21, Section H.2.b. and Table H.1., for additional information.				
<b>H - Power Factor Rating</b> This value should be the nominal power factor rating designated by the manufacturer for the Generator. See PG&E's Rule 21, Section H.2.i. for additional information.				
<b>I - PF Adjustment Range</b> Where the power factor of the Generator is adjustable, please indicate the maximum and minimum operating values. See PG&E's Rule 21, Section H.2.i.				
<b>J - Wiring Configuration</b> Please indicate whether the Generator is a single-phase or three-phase device. See PG&E's Rule 21, Section H.3.				
<b>K - (MP) 3-Phase Winding Configuration (Choose One)</b> For three-phase generating units, please indicate the configuration of the Generator's windings or inverter systems.	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT G

## FUEL CELL TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>L - (MP) Neutral Grounding System Used (Choose One)</p> <p>Wye connected generating units are often grounded – either through a resistor or directly, depending upon the nature of the electrical system to which the Generator is connected.</p> <p>If the grounding method used at this facility is not listed, please attach additional descriptive information.</p>	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms
M - Short Circuit Current Produced by Generator	_____ (Amps)	_____ (Amps)	_____ (Amps)	_____ (Amps)
<p>N – Prime Mover Type</p> <p>Please indicate the type and fuel used as the prime mover or source of energy for the Generator.</p> <p>1 = Natural Gas 2 = Diesel Fueled 3 = Other Fuel</p>	1   2   3	1   2   3	1   2   3	1   2   3
<p>O - AC Disconnect</p> <p>For systems requiring an AC Disconnect only, please include the requested information about the AC Disconnect.</p> <p>See PG&amp;E's Rule 21, Section H.1.d</p> <p>Located within 10 feet of the PG&amp;E meter?</p>	_____ Manufacturer _____ Model # _____ Rating (amps)	_____ Manufacturer _____ Model # _____ Rating (amps)	_____ Manufacturer _____ Model # _____ Rating (amps)	_____ Manufacturer _____ Model # _____ Rating (amps)
<p>P - Lineside Tap</p> <p>Where is the point of interconnection in relation to the main breaker?</p> <p>PG&amp;E has special requirements for a lineside tap.</p> <p>Contact PG&amp;E at: <a href="mailto:Rule21Gen@PGE.com">Rule21Gen@PGE.com</a> for more information.</p>	_____ Customer side _____ PG&E side			
<p>Q – Warranty or Service Agreement</p> <p>Applicant has verified that (i) a warranty of at least 10 years has been provided on all equipment and on its installation, or (ii) have a 10-year service warranty or executed “agreement” ensuring proper maintenance and continued system performance.</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No			



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT G

### FUEL CELL TECHNOLOGY

<b>R - Cogeneration</b> Please indicate whether this Generating Facility meets the definition of cogeneration in PUC 216.6 (5% useful thermal and 42.5% efficient):	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<b>S - Distribution Interconnect Handbook (DIH) and Greenbook Requirements</b> Does this interconnection meet the DIH and Greenbook Requirements	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<b>T - Gas Clearance Requirements</b> Certify that this interconnection meets Greenbook Gas Clearance Requirements?	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<b>U - Back-up Generator Operation</b> Will the generator be operated as a back-up?  If yes, please indicate control device.	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker
<b>V - Limited Export</b> Will the generator export be limited?  If yes, please indicate how export will be limited.	___ Yes ___ No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	___ Yes ___ No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	___ Yes ___ No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	___ Yes ___ No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter



**Electric Sample Form No. 79-1174-02H**  
Rule 21 Generator Interconnection Application - Attachment H

Sheet 1

**Please Refer to Attached  
Sample Form**

(Continued)

*Advice* 6286-E-B  
*Decision* D.20-09-035

*Issued by*  
**Robert S. Kenney**  
*Vice President, Regulatory Affairs*

*Submitted* January 7, 2022  
*Effective* March 17, 2022  
*Resolution* \_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### **ENERGY STORAGE TECHNOLOGY**

Please complete the following table for the specific generator technology indicated.

Instructions				
Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>Please indicate the number of each <b>“type” and quantity</b> of Generator being installed.</p> <p>Be sure all Generators classified as one “type” are identical in all respects.</p> <p>If only one type of Generator is to be used, only one column needs to be completed.</p>				
<p>A - Generator/Inverter Manufacturer</p> <p>Enter the brand name of the Generator.</p>				
<p>B - Generator/Inverter Model</p> <p>Enter the model name or number assigned by the manufacturer of the Generator.</p>				
<p>C - Generator/Inverter Software Version</p> <p>If this Generator’s control and or protective functions are dependent on a software program supplied by the manufacturer of the equipment, please provide the version or release number for the software that will be used.</p>				
<p>D - Is the Generator/Inverter certified?</p> <p>Applicant has verified that all major solar system components are on the verified equipment list maintained by the California Energy Commission and other equipment, as determined by PG&amp;E, has been verified by the customer as having safety certification from a nationally recognized testing laboratory.</p> <p>See PG&amp;E’s Rule 21, Section L for additional information regarding Generator certification.</p>	<input type="checkbox"/> Yes  <input type="checkbox"/> No			
<p>E - Generator Design</p> <p>Please indicate the design of each Generator.</p> <p>Designate “Inverter” anytime an inverter is used as the interface between the Generator and the electric system regardless of the primary power production/storage device used.</p>	<input type="checkbox"/> Synch  <input type="checkbox"/> Induct.  <input type="checkbox"/> Inverter			



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### ENERGY STORAGE TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p><b>F - Gross Nameplate Rating (kVA)</b></p> <p>This is the capacity value normally supplied by the manufacturer and stamped on the Generator's nameplate.</p> <p>This value is not required where the manufacturer provides only a kW rating. However, where both kVA and kW values are available, please indicate both.</p>				
<p><b>G - Energy Storage Electrical Source Function</b> (in addition, please complete section: "Additional Information Required for Energy Storage")</p>	<p>Max kWh Capacity:</p> <hr/> <p>Rated kW Discharge:</p> <hr/>	<p>Max kWh Capacity:</p> <hr/> <p>Rated kW Discharge:</p> <hr/>	<p>Max kWh Capacity:</p> <hr/> <p>Rated kW Discharge:</p> <hr/>	<p>Max kWh Capacity:</p> <hr/> <p>Rated kW Discharge:</p> <hr/>
<p><b>H - Operating Voltage</b></p> <p>This value should be the voltage rating designated by the manufacturer and used in this Generating Facility.</p> <p>Please indicate phase-to-phase voltages for 3-phase installations.</p> <p>See PG&amp;E's Rule 21, Section H.2.b. and Table H.1., for additional information.</p>				
<p><b>I - Power Factor Rating</b></p> <p>This value should be the nominal power factor rating designated by the manufacturer for the Generator.</p> <p>See PG&amp;E's Rule 21, Section H.2.i. for additional information.</p>				
<p><b>J - PF Adjustment Range</b></p> <p>Where the power factor of the Generator is adjustable, please indicate the maximum and minimum operating values.</p> <p>See PG&amp;E's Rule 21, Section H.2.i.</p>				
<p><b>K - Wiring Configuration</b></p> <p>Please indicate whether the Generator is a single-phase or three-phase device. See PG&amp;E's Rule 21, Section H.3.</p>				



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### ENERGY STORAGE TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<b>L - (MP) 3-Phase Winding Configuration (Choose One)</b> For three-phase generating units, please indicate the configuration of the Generator's windings or inverter systems.	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye
<b>M - (MP) Neutral Grounding System Used (Choose One)</b> Wye connected generating units are often grounded – either through a resistor or directly, depending upon the nature of the electrical system to which the Generator is connected. If the grounding method used at this facility is not listed, please attach additional descriptive information.	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms
<b>N - Short Circuit Current Produced by Generator:</b>	<input type="text"/> (Amps)	<input type="text"/> (Amps)	<input type="text"/> (Amps)	<input type="text"/> (Amps)
<b>O – Prime Mover Type</b> Please indicate the type and fuel used as the prime mover or source of energy for the Generator. 1 = Natural Gas 2 = Diesel Fueled 3 = Other Fuel	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
<b>P - AC Disconnect</b> For systems requiring an AC Disconnect only, please include the requested information about the AC Disconnect. See PG&E's Rule 21, Section H.1.d  Located within 10 feet of the PG&E meter?	<input type="text"/> Manufacturer  <input type="text"/> Model #  <input type="text"/> Rating (amps)  <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="text"/> Manufacturer  <input type="text"/> Model #  <input type="text"/> Rating (amps)  <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="text"/> Manufacturer  <input type="text"/> Model #  <input type="text"/> Rating (amps)  <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="text"/> Manufacturer  <input type="text"/> Model #  <input type="text"/> Rating (amps)  <input type="checkbox"/> Yes <input type="checkbox"/> No



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### ENERGY STORAGE TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<b>Q - Energy Storage (ES) System</b> (For important sizing information related to DC-Coupled configurations, see sizing note below).	_____ Manufacturer  _____ Model #  _____ Quantity of Units	_____ Manufacturer  _____ Model #  _____ Quantity of Units	_____ Manufacturer  _____ Model #  _____ Quantity of Units	_____ Manufacturer  _____ Model #  _____ Quantity of Units
<b>R - Lineside Tap</b> Where is the point of interconnection in relation to the main breaker?  PG&E has special requirements for a lineside tap. Contact PG&E at: <a href="mailto:Rule21Gen@PGE.com">Rule21Gen@PGE.com</a> for more information.	_____ Customer side  _____ PG&E side	_____ Customer side  _____ PG&E side	_____ Customer side  _____ PG&E side	_____ Customer side  _____ PG&E side
<b>S – Warranty or Service Agreement</b> Applicant has verified that (i) a warranty of at least 10 years has been provided on all equipment and on its installation, or (ii) have a 10-year service warranty or executed “agreement” ensuring proper maintenance and continued system performance.	_____ Yes _____ No	_____ Yes _____ No	_____ Yes _____ No	_____ Yes _____ No
<b>T - Distribution Interconnect Handbook (DIH) and Greenbook Requirements</b> Does this interconnection meet the DIH and Greenbook Requirements	_____ Yes _____ No	_____ Yes _____ No	_____ Yes _____ No	_____ Yes _____ No
<b>U - Gas Clearance Requirements</b> Certify that this interconnection meets Greenbook Gas Clearance Requirements?	_____ Yes _____ No	_____ Yes _____ No	_____ Yes _____ No	_____ Yes _____ No
<b>V - Basic Single Line Diagram (SLD)</b> If the interconnection is eligible to use a Basic SLD, please include the requested information.   Can this system be used as a back-up	_____ Panel Voltage (Volts)  _____ Main Breaker (Amps)  _____ Storage Breaker Size (Amps)	_____ Panel Voltage (Volts)  _____ Main Breaker (Amps)  _____ Storage Breaker Size (Amps)	_____ Panel Voltage (Volts)  _____ Main Breaker (Amps)  _____ Storage Breaker	_____ Panel Voltage (Volts)  _____ Main Breaker (Amps)  _____ Storage Breaker Size (Amps)



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### ENERGY STORAGE TECHNOLOGY

<p>generator?</p> <p>If so, please include the requested information for the back-up controller or other device.</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No  Manufacture r  Make  Model No.	<input type="checkbox"/> Yes <input type="checkbox"/> No  Manufacture r  Make  Model No.	Size (Amps)  <input type="checkbox"/> Yes <input type="checkbox"/> No  Manufactur er  Make  Model No.	<input type="checkbox"/> Yes <input type="checkbox"/> No  Manufacture r  Make  Model No.
<p>W - Back-up Generator Operation</p> <p>Will the generator be operated as a back-up?</p> <p>If yes, please indicate control device.</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker
<p>X - Limited Export</p> <p>Will the generator export be limited?</p> <p>If yes, please indicate how export will be limited.</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### ENERGY STORAGE TECHNOLOGY

**Energy Storage Charging Function:**

Rated Charge Demand (Load): \_\_\_\_\_ kW

Estimated annual Net Energy Usage\* of the energy storage device(s): \_\_\_\_\_ kWh

\*Net Energy usage = (kWh input, including charging, storage device auxiliary loads and losses) – (kWh output including discharging)

Will the Distribution Grid be used to charge the storage device:       Yes       No

If no: Provide technical description of control systems including (e.g. Nationally-certified piece of equipment, Relays/metering):

Source of energy for Charging: \_\_\_\_\_

Mechanism to prevent charging from the Distribution System: \_\_\_\_\_

If Yes: Will charging the storage device(s) increase the host facility's existing peak load demand:

Yes       No

If Yes: Provide the following loading information:

Amount of added peak demand: \_\_\_\_\_ kW

If no: Provide technical description of controls systems including:

Charging periods: \_\_\_\_\_

Mechanism to prevent charging from the Distribution System during host facility peak:

\_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### **ENERGY STORAGE TECHNOLOGY**

#### **Expedited Interconnection Process Selection for Non-Export Energy Storage:**

- This project meets the requirements identified in Rule 21 Section N and this process is being selected for expedited interconnection.

#### Note on Sizing (DC-Coupled Configurations)

The size of the storage system in DC-coupled NEM-eligible generator plus storage systems is the lesser of the shared inverter's (or inverters') nameplate capacity (capacities summed) and the storage device's (devices') maximum continuous discharge capacity (capacities summed) listed on the device's (devices') technical specifications sheets. A storage device's maximum continuous discharge capacity may be listed on technical specification sheets using different terminology. Note: PG&E will use common sense to determine whether a device's technical specification sheet includes the appropriate metric for purposes of determining system size, regardless of the terminology used. If that metric is not included, PG&E may rely on the inverter's nameplate rating.

For example:

- What is the maximum continuous discharge capability for each storage unit?  
\_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = . total \_\_\_\_\_
- What is each inverter's nameplate rating?  
\_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = . total \_\_\_\_\_



**ELECTRIC TABLE OF CONTENTS**

Sheet 1

**TABLE OF CONTENTS**

<b>SCHEDULE</b>	<b>TITLE OF SHEET</b>	<b>CAL P.U.C. SHEET NO.</b>	
Title Page.....		<b>52484-E</b>	(T)
Rate Schedules.....	52463,52464,52465,52466,52467,52468,52469,49654,48268-E		
Preliminary Statements.....	52470,48064,48075,41723,49327,48076,51192-E		
Rules.....	50556,49742,48369-E		
Maps, Contracts and Deviations.....	37960-E		
Sample Forms.....	47207,49743,49301, <b>52485</b> ,49303,49304,		(T)
	51241,51242,49307,49308,49309,49310,49311-E		

(Continued)

Advice 6286-E-B  
Decision D.20-09-035

Issued by  
**Robert S. Kenney**  
Vice President, Regulatory Affairs

Submitted January 7, 2022  
Effective March 17, 2022  
Resolution



**ELECTRIC TABLE OF CONTENTS**

Sheet 25

FORM	TITLE OF SHEET	CAL P.U.C. SHEET NO.
<b>Sample Forms</b>		
<b>Rule 21 Generating Facility Interconnections (Cont'd)</b>		
79-1174-02	Rule 21 Generator Interconnection Application.....	49266-E
79-1174-02A	Rule 21 Generator Interconnection Application – Attachment A .....	49769-E
79-1174-02B	Rule 21 Generator Interconnection Application – Attachment B .....	<b>52478-E</b> (T)
79-1174-02C	Rule 21 Generator Interconnection Application – Attachment C .....	49269-E
79-1174-02D	Rule 21 Generator Interconnection Application – Attachment D .....	<b>52479-E</b> (T)
79-1174-02E	Rule 21 Generator Interconnection Application – Attachment E .....	<b>52480-E</b>
79-1174-02F	Rule 21 Generator Interconnection Application – Attachment F .....	<b>52481-E</b>
79-1174-02G	Rule 21 Generator Interconnection Application – Attachment G .....	<b>52482-E</b>
79-1174-02H	Rule 21 Generator Interconnection Application – Attachment H .....	<b>52483-E</b> (T)
79-1174-02I	Rule 21 Generator Interconnection Application – Attachment I.....	49275-E
79-1174-02J	Rule 21 Generator Interconnection Application – Attachment J.....	49276-E
79-1174-02K	Rule 21 Generator Interconnection Application – Attachment K .....	49277-E
79-1174-02L	Rule 21 Generator Interconnection Application – Attachment L.....	49278-E
79-1174-02M	Rule 21 Generator Interconnection Application – Attachment M.....	49279-E
79-1174-02N	Rule 21 Generator Interconnection Application – Attachment N .....	49280-E
79-1175	Rule 21 Consent to Assignment Form for Non-NEM Projects.....	48657-E
79-1181	Rule 21 Pre-Application Report Request .....	48663-E
79-1191	Interconnection Agreement for Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT) Generating Facility .....	49295-E
79-1197	Local Government Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT) Re-Allocation Request .....	48676-E
79-1198-02	Interconnection Agreement for Net Energy Metering (NEM2) and Renewable Electrical Generating Facility Sized Greater than 1,000 kW .....	50574-E
79-1199	Agreement and Customer Authorization Non-Export Standalone Energy Storage of 30 Kilowatts or Less .....	48678-E
79-1200	Rule 21 Generator Interconnection Agreement for Exporting Generating Facilities .....	48679-E
79-1204	Pilot Pedestal Program Application .....	48680-E
79-1211	Generating Facility Material Modification Notification Worksheet.....	50316-E

(Continued)

Advice 6286-E-B  
January 7, 2022

## **Attachment 2**

### **Redline Tariff Revisions**



**Electric Sample Form No. 79-1174-02B**  
Rule 21 Generator Interconnection Application - Attachment B

Sheet 1

**Please Refer to Attached  
Sample Form**

(Continued)

*Advice* 6286-E-B  
*Decision* D.20-09-035

*Issued by*  
**Robert S. Kenney**  
*Vice President, Regulatory Affairs*

*Submitted* January 7, 2022  
*Effective* \_\_\_\_\_  
*Resolution* \_\_\_\_\_

# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT B

### NON-EXPORT

#### Operating Mode

Please select one option below:

- Parallel Operation (no export):** The Generating Facility will interconnect and operate “in parallel” with PG&E’s Electric System for more than one (1) second.

Please supply all of the information requested for the Generating Facility. Be sure to supply adequate information including diagrams and written descriptions regarding the protective relays that will be used to detect faults or abnormal operating conditions on PG&E’s Electric System.

- Inadvertent Export:** The Generating Facility will interconnect and operate, providing unscheduled and uncompensated export of real power for a duration exceeding two (2) seconds but fewer than sixty (60) seconds. The expected frequency of “inadvertent export” occurrences should be less than two occurrences per 24-hour period. Protective Functions, technical requirements and operational limitations are described in Rule 21, Section M.

Be sure to supply adequate information including diagrams and written descriptions regarding the switching device or scheme that will be used to limit the parallel operation period to one second or less. Please also describe the back up or protective device and controls that will trip the Generating Facility should the transfer switch or scheme not complete the transfer in one second or less.

- Uncompensated Export:** A Generating Facility Interconnection Export Addendum that provides for parallel operation of the Generating Facility and the occasional, continuous, non-compensated, export of generator facilities sized 2 MW or less to PG&E’s Electric System. Continuous export is export greater than 60 seconds in duration. This addendum must be executed in concert with the generating facility interconnection agreement.

- Momentary Parallel Operation (Make Before Break):** The Generating Facility will interconnect and operate on a “momentary parallel” basis with PG&E’s Electric System for a duration of one (1) second or less through transfer switches or operating schemes specifically designed and engineered for such operation.

Be sure to supply adequate information including diagrams and written descriptions regarding the switching device or scheme that will be used to limit the parallel operation period to one second or less. Please also describe the back up or protective device and controls that will trip the Generating Facility should the transfer switch or scheme not complete the transfer in one second or less.

- Isolated Operation (Break Before Make):** The Generating Facility will be “isolated” and prevented from becoming interconnected with PG&E’s Electric System through a transfer switch or operating scheme specifically designed and engineered for such operation.

Be sure to supply adequate information including diagrams and written descriptions regarding the isolating switching device or scheme that will be used to prevent the Generating Facility from operating in parallel with PG&E’s Electric System.

Note: There is no application fee for Generating Facilities employing Isolated Operation mode, however, an application is needed to satisfy PG&E’s notice requirements for operating an isolated Generating Facility as per California Health and Safety Code Section 119085 (b)

# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT B

### NON-EXPORT

#### Protection Options

##### Parallel Only:

Please select one Rule 21 Screen I option below:

- Reverse Power (Option 1): A **reverse-power protection device** will be installed to measure any export of power and trip the Generating Facility or open an intertie breaker to isolate the Generating Facility if limits are exceeded.
- Under Power (Option 2): An **under-power protection device** will be installed to measure the inflow of power and trip or reduce the output of the Generating Facility if limits are not maintained.
- Non-Islanding (Option 3): The Generating Facility Interconnection Facility equipment has been **certified as non-islanding and the incidental export of power will be limited by the design of the interconnection**. If this option is to be used, the nominal ampere rating of the service entrance equipment (service panel rating) that is used by the host Customer facility is:  
\_\_\_\_\_.
- Gross Nameplate 50% or Less (Option 4): The **Gross Nameplate Rating of the Generating Facility will not exceed 50% of the host Customer facility's minimum electrical load over the past 12 months**. If this option is to be used, the minimum load of the host Customer facility must be stated in the space provided above.
- AC/DC Converter (Option 7): An AC/DC Converter is employed to prevent export by only allowing one way power flow.
- Certified** Power Control System (PCS) Non-Export (Option 8): A PCS is employed to prevent export. For this option, the open loop response time of the PCS must be less than 2 seconds.

Please indicate:

- Qualifying Facility (QF) Status will be obtained from the FERC for this Generating Facility.

Instructions and Notes: Parties operating Generating Facilities (QF) complying with all of the requirements for qualification as either a small power production facility or cogeneration facility pursuant to the regulations of the FERC (18 Code of Federal Regulations Part 292, Section 292.203 et seq.) implementing the Public Utility Regulatory Policies Act of 1978 (16 U.S.C.A. Section 796, et seq.), or any successor requirements for Qualifying Facilities, may seek certification from FERC to have the Generating Facility designated as a Qualifying Facility or "QF." In summary, QFs are Generating Facilities using renewable or alternative fuels as a primary energy source or facilities that utilize the thermal energy given off by the generation process for some other useful purpose. QFs enjoy certain rights and privileges not available to non-QF Generating Facilities.

QF status is not required to interconnect and operate in parallel with PG&E's Electric System.



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT B

### NON-EXPORT

#### Inadvertent Export:

The Generating Facility **completely offsets their facility load** by being (a) optimally sized to meet their peak demand with load following functionality on the Generator controls and (b) ensuring conditional (inadvertent) export of electric power from the Generation Facility to Distribution Provider's Distribution or Transmission System occurs no more frequently than twice in any 24 hour period and the exports are greater than 2 seconds but no more than more than 60 seconds.

Please select one Rule 21 Screen I option below:

- Reverse Power (Option 5): Two **reverse-power protection devices** will be installed to measure any export of power and trip the Generating Facility or open an intertie breaker to isolate the Generating Facility if limits are exceeded.
- Under Power (Option 5): A **reverse-power protection devices** will be installed to measure any export of power and trip the Generating Facility or open an intertie breaker to isolate the Generating Facility if limits are exceeded; AND an **under-power protection device** will be installed to measure the inflow of power and trip or reduce the output of the Generating Facility if limits are not maintained.
- Non-islanding Inverters (Option 6): Designed to detect and disconnect from a stable Unintended Island with matched load and generation.
- ~~Certified~~ Power Control System (PCS) Inadvertent/~~Limited Export~~ (Option ~~9~~10): A PCS is employed to allow inadvertent/~~limited~~ export. For this option, the open loop response time of the PCS must be ~~less-greater~~ than 2 seconds ~~for limited export~~ and ~~less than or equal to no more than~~ 10 seconds ~~for inadvertent export~~.
- Certified Power Control System (PCS) Inadvertent/Limited Export (Option 11): A PCS is employed to allow inadvertent limited export. For this option, the open loop response time of the PCS must be greater than 2 seconds and no more than 10 seconds.

Please indicate:

- Qualifying Facility (QF) Status will be obtained from the FERC for this Generating Facility.  
Instructions and Notes: Parties operating Generating Facilities (QF) complying with all of the requirements for qualification as either a small power production facility or cogeneration facility pursuant to the regulations of the FERC (18 Code of Federal Regulations Part 292, Section 292.203 et seq.) implementing the Public Utility Regulatory Policies Act of 1978 (16 U.S.C.A. Section 796, et seq.), or any successor requirements for Qualifying Facilities, may seek certification from FERC to have the Generating Facility designated as a Qualifying Facility or "QF." In summary, QFs are Generating Facilities using renewable or alternative fuels as a primary energy source or facilities that utilize the thermal energy given off by the generation process for some other useful purpose. QFs enjoy certain rights and privileges not available to non-QF Generating Facilities.

QF status is not required to interconnect and operate in parallel with PG&E's Electric System.

#### Uncompensated Export:

Please provide Maximum Expected Facility Net Export (kW): \_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT B

### **NON-EXPORT**

---

With the approval of PG&E, a Producer that wishes to retain the option to export power from a Generating Facility to PG&E's Electric System may use a different protection scheme that provides for the detection of faults and other abnormal operating conditions.



**Electric Sample Form No. 79-1174-02D**  
Rule 21 Generator Interconnection Application - Attachment D

Sheet 1

**Please Refer to Attached  
Sample Form**

(Continued)

*Advice* 6286-E-B  
*Decision* D.20-09-035

*Issued by*  
**Robert S. Kenney**  
*Vice President, Regulatory Affairs*

*Submitted* January 7, 2022  
*Effective* \_\_\_\_\_  
*Resolution* \_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT D

## SOLAR (PV) TECHNOLOGY

### Part I - Describing the Generating Facility and Host Customer's Electrical Facilities

Please complete the following table for the specific generator technology indicated.

Instructions				
Inverter	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>Please indicate the number of each <b>"type" and quantity</b> of Generator being installed</p> <p>Be sure all Generators classified as one "type" are identical in all respects.</p> <p>If only one type of Generator is to be used, only one column needs to be completed.</p>				
<p>A - Generator/Inverter Manufacturer</p> <p>Enter the brand name of the Generator.</p>				
<p>B - Generator/Inverter Model</p> <p>Enter the model name or number assigned by the manufacturer of the Generator.</p>				
<p>C - Generator/Inverter Software Version</p> <p>If this Generator's control and or protective functions are dependent on a software program supplied by the manufacturer of the equipment, please provide the version or release number for the software that will be used.</p>				
<p>D - Is the Generator/Inverter certified?</p> <p>Applicant has verified that all major solar system components are on the verified equipment list maintained by the California Energy Commission and other equipment, as determined by PG&amp;E, has been verified by the customer as having safety certification from a nationally recognized testing laboratory.</p> <p>See PG&amp;E's Rule 21, Section L for additional information regarding Generator certification.</p>	<input type="checkbox"/> Yes  <input type="checkbox"/> No			



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT D

## SOLAR (PV) TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
E - Modules.	<u>Manufacturer</u>  <u>Model #.</u>  <u>Quantity</u>	<u>Manufacturer</u>  <u>Model #.</u>  <u>Quantity</u>	<u>Manufacturer</u>  <u>Model #.</u>  <u>Quantity</u>	<u>Manufacturer</u>  <u>Model #.</u>  <u>Quantity</u>
F - Gross Nameplate Rating (kVA)  This is the capacity value normally supplied by the manufacturer and stamped on the Generator's nameplate.  This value is not required where the manufacturer provides only a kW rating. However, where both kVA and kW values are available, please indicate both.				
G - Operating Voltage  This value should be the voltage rating designated by the manufacturer and used in this Generating Facility.  Please indicate phase-to-phase voltages for 3-phase installations.  See PG&E's Rule 21, Section H.2.b. and Table H.1., for additional information.				
H - Power Factor Rating  This value should be the nominal power factor rating designated by the manufacturer for the Generator.  See PG&E's Rule 21, Section H.2.i. for additional information.				
I - PF Adjustment Range  Where the power factor of the Generator is adjustable, please indicate the maximum and minimum operating values.  See PG&E's Rule 21, Section H.2.i.				
J - Wiring Configuration  Please indicate whether the Generator is a single-phase or three-phase device. See PG&E's Rule 21, Section H.3.				



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT D

## SOLAR (PV) TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<b>K - AC Disconnect</b> For systems requiring an AC Disconnect only, please include the requested information about the AC Disconnect.  See PG&E's Rule 21, Section H.1.d  Located within 10 feet of the PG&E meter?	_____ Manufacturer  _____ Model #  _____ Rating (amps)  ____ Yes ____ No			
<b>L - Lineside Tap</b> Where is the point of interconnection in relation to the main breaker?  PG&E has special requirements for a lineside tap. Contact PG&E at: <a href="mailto:Rule21Gen@PGE.com">Rule21Gen@PGE.com</a> for more information.	_____ Customer side  ____ PG&E side			
<b>N - Warranty or Service Agreement</b> Applicant has verified that (i) a warranty of at least 10 years has been provided on all equipment and on its installation, or (ii) have a 10-year service warranty or executed "agreement" ensuring proper maintenance and continued system performance.	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No
<b>O - Solar Ready Electric Panel</b> Is the Generating Facility connecting to a circuit breaker on the supply side of the main breaker?	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No
<b>P - Green Meter Adapter (GMA)</b> Will a GMA be installed?	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No
<b>Q - Distribution Interconnect Handbook (DIH) and Greenbook Requirements</b> Does this interconnection meet the DIH and Greenbook Requirements	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No
<b>R - Gas Clearance Requirements</b> Certify that this interconnection meets Greenbook Gas Clearance Requirements?	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No	____ Yes ____ No



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT D

## SOLAR (PV) TECHNOLOGY

<p>S - Basic Single Line Diagram (SLD)</p> <p>If the interconnection is eligible to use a Basic SLD, please include the requested information.</p>	<p>Panel Voltage (Volts)</p> <hr/> <p>Main Breaker (Amps)</p> <hr/> <p>PV Breaker Size (Amps)</p>	<p>Panel Voltage (Volts)</p> <hr/> <p>Main Breaker (Amps)</p> <hr/> <p>PV Breaker Size (Amps)</p>	<p>Panel Voltage (Volts)</p> <hr/> <p>Main Breaker (Amps)</p> <hr/> <p>PV Breaker Size (Amps)</p>	<p>Panel Voltage (Volts)</p> <hr/> <p>Main Breaker (Amps)</p> <hr/> <p>PV Breaker Size (Amps)</p>
<p>T - Back-up Generator Operation</p> <p>Will the generator be operated as a back-up?</p> <p>If yes, please indicate the control device that will be used.</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Automatic Transfer Switch</p> <p><input type="checkbox"/> Contactor</p> <p><input type="checkbox"/> Breaker</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Automatic Transfer Switch</p> <p><input type="checkbox"/> Contactor</p> <p><input type="checkbox"/> Breaker</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Automatic Transfer Switch</p> <p><input type="checkbox"/> Contactor</p> <p><input type="checkbox"/> Breaker</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Automatic Transfer Switch</p> <p><input type="checkbox"/> Contactor</p> <p><input type="checkbox"/> Breaker</p>
<p>U - Limited Export</p> <p>Will the generator export be limited?</p> <p>If yes, please indicate how export will be limited.</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Power Control System (PCS - <u>Option 9</u>)</p> <p><input type="checkbox"/> Relay</p> <p><input type="checkbox"/> Derated Inverter</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Power Control System (PCS - <u>Option 9</u>)</p> <p><input type="checkbox"/> Relay</p> <p><input type="checkbox"/> Derated Inverter</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Power Control System (PCS - <u>Option 9</u>)</p> <p><input type="checkbox"/> Relay</p> <p><input type="checkbox"/> Derated Inverter</p>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Power Control System (PCS - <u>Option 9</u>)</p> <p><input type="checkbox"/> Relay</p> <p><input type="checkbox"/> Derated Inverter</p>

### Part II Solar Statistics Data Fields

Per Appendix A of CPUC D. 14-11-001, the following data fields must all be completed, in their entirety, in order to initiate PG&E's interconnection review of the proposed Generating Facility. *Only complete Part II if the solar generating facility is serving as part of a Net Energy Metering (NEM2) arrangement..*

**A. Customer Sector** (Check one)

- |   |                                      |                                     |
|---|--------------------------------------|-------------------------------------|
| <input type="checkbox"/> Residential      | <input type="checkbox"/> Educational | <input type="checkbox"/> Industrial |
| <input type="checkbox"/> Commercial       | <input type="checkbox"/> Military    | <input type="checkbox"/> Non-Profit |
| <input type="checkbox"/> Other Government |                                      |                                     |



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT D

## SOLAR (PV) TECHNOLOGY

**B. Are Performance Monitoring and Reporting Services (PMRS) being utilized?**

Yes  No

If yes, please indicate who is receiving the data? (check all that apply)

Customer

3<sup>rd</sup> Party (list name) \_\_\_\_\_

**C. Are there electric vehicles charging on site at the above generating facility address?**

Yes  No

If yes, please indicate how many electric vehicles \_\_\_\_\_

**D. System Ownership and Financing**

**i. System Owner** (check one):

PG&E Customer Owned

If PG&E Customer Owned, please answer the following:

Indicate the System Cost paid by Customer: \$ \_\_\_\_\_

Property Assessed Clean Energy (PACE) Financed?

Yes

No

If Yes, PACE financed by which entity? \_\_\_\_\_

Third Party Owned

If Third Party Owned, please answer the following:

Claimed Federal Investment Tax Credit (ITC) Cost Basis: \$ \_\_\_\_\_

Name of Developer at the time of sale:

\_\_\_\_\_

Contract Type:  PPA  Lease  Pre-Paid Lease  Other \_\_\_\_\_

**ii. Rebate Information:**

Did you participate in a California rebate program?  Yes  No

Please indicate the rebate program that you participated in: \_\_\_\_\_

Rebate Amount: \$ \_\_\_\_\_

If you are participating in the Single-family Affordable Solar Home (SASH) program, please provide SASH project number: \_\_\_\_\_

**E. Additional Generating Facility Information (Solar PV Only)**

**i. Mounting Method:**  Rooftop  Ground  Mixed

**ii. Tracking Type:**  Fixed  Single-Axis  Dual-Axis  Mixed

If fixed, please indicate: Tilt: \_\_\_\_\_ degrees Azimuth: \_\_\_\_\_ degrees

**F. Installer's/Vendor's California State Contractor License Number:** \_\_\_\_\_



**Electric Sample Form No. 79-1174-02E**  
Rule 21 Generator Interconnection Application - Attachment E

Sheet 1

**Please Refer to Attached  
Sample Form**

(Continued)

*Advice* 6286-E-B  
*Decision* D.20-09-035

*Issued by*  
**Robert S. Kenney**  
*Vice President, Regulatory Affairs*

*Submitted* January 7, 2022  
*Effective* \_\_\_\_\_  
*Resolution* \_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT E

### WIND TURBINE TECHNOLOGY

Please complete the following table for the specific generator technology indicated.

Instructions				
Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>Please indicate the number of each <b>“type”</b> and <b>quantity</b> of Generator being installed</p> <p>Be sure all Generators classified as one “type” are identical in all respects.</p> <p>If only one type of Generator is to be used, only one column needs to be completed.</p>	Type: _____ Qty.: _____	Type: _____ Qty.: _____	Type: _____ Qty.: _____	Type: _____ Qty.: _____
A - Generator/Inverter Manufacturer Enter the brand name of the Generator.				
B - Generator/Inverter Model Enter the model name or number assigned by the manufacturer of the Generator.				
C - Generator/Inverter Software Version If this Generator’s control and or protective functions are dependent on a software program supplied by the manufacturer of the equipment, please provide the version or release number for the software that will be used.				
D - Is the Inverter certified?  Applicant has verified that all major solar system components are on the verified equipment list maintained by the California Energy Commission and other equipment, as determined by PG&E, has been verified by the customer as having safety certification from a nationally recognized testing laboratory.  See PG&E’s Rule 21, Section L for additional information regarding Generator certification.	<input type="checkbox"/> Yes <input type="checkbox"/> No			
E - Generator Design  Please indicate the design of each Generator.  Designate “Inverter” anytime an inverter is used as the interface between the Generator and the electric system regardless of the primary power production/storage device used.	<input type="checkbox"/> Synch <input type="checkbox"/> Induct. <input type="checkbox"/> Inverter			



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT E

### WIND TURBINE TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p><b>F - Gross Nameplate Rating (kVA)</b></p> <p>This is the capacity value normally supplied by the manufacturer and stamped on the Generator's nameplate.</p> <p>This value is not required where the manufacturer provides only a kW rating. However, where both kVA and kW values are available, please indicate both.</p>				
<p><b>G - Operating Voltage</b></p> <p>This value should be the voltage rating designated by the manufacturer and used in this Generating Facility.</p> <p>Please indicate phase-to-phase voltages for 3-phase installations.</p> <p>See PG&amp;E's Rule 21, Section H.2.b. and Table H.1., for additional information.</p>				
<p><b>H - Power Factor Rating</b></p> <p>This value should be the nominal power factor rating designated by the manufacturer for the Generator.</p> <p>See PG&amp;E's Rule 21, Section H.2.i. for additional information.</p>				
<p><b>I - PF Adjustment Range</b></p> <p>Where the power factor of the Generator is adjustable, please indicate the maximum and minimum operating values.</p> <p>See PG&amp;E's Rule 21, Section H.2.i.</p>				
<p><b>J - Wiring Configuration</b></p> <p>Please indicate whether the Generator is a single-phase or three-phase device. See PG&amp;E's Rule 21, Section H.3.</p>				
<p><b>K - (MP) 3-Phase Winding Configuration</b></p> <p>(Choose One)</p> <p>For three-phase generating units, please indicate the configuration of the Generator's windings or inverter systems.</p>	<p><input type="checkbox"/> 3 Wire Delta</p> <p><input type="checkbox"/> 3 Wire Wye</p> <p><input type="checkbox"/> 4 Wire Wye</p>	<p><input type="checkbox"/> 3 Wire Delta</p> <p><input type="checkbox"/> 3 Wire Wye</p> <p><input type="checkbox"/> 4 Wire Wye</p>	<p><input type="checkbox"/> 3 Wire Delta</p> <p><input type="checkbox"/> 3 Wire Wye</p> <p><input type="checkbox"/> 4 Wire Wye</p>	<p><input type="checkbox"/> 3 Wire Delta</p> <p><input type="checkbox"/> 3 Wire Wye</p> <p><input type="checkbox"/> 4 Wire Wye</p>



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT E

### WIND TURBINE TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>L - (MP) Neutral Grounding System Used (Choose One)</p> <p>Wye connected generating units are often grounded – either through a resistor or directly, depending upon the nature of the electrical system to which the Generator is connected.</p> <p>If the grounding method used at this facility is not listed, please attach additional descriptive information.</p>	<p>___ Ungrounded</p> <p>___ Solidly Grounded</p> <p>___ Ground Resistor</p> <p>___ Ohms</p>	<p>___ Ungrounded</p> <p>___ Solidly Grounded</p> <p>___ Ground Resistor</p> <p>___ Ohms</p>	<p>___ Ungrounded</p> <p>___ Solidly Grounded</p> <p>___ Ground Resistor</p> <p>___ Ohms</p>	<p>___ Ungrounded</p> <p>___ Solidly Grounded</p> <p>___ Ground Resistor</p> <p>___ Ohms</p>
<p>M - Induction Generators Only:</p> <p style="padding-left: 40px;">Locked Rotor Current: _____ (Amps)</p> <p style="padding-left: 40px;"><b>Stator Resistance:</b> _____ (%)</p> <p style="padding-left: 40px;">Stator Leakage Reactance: _____ (%)</p> <p style="padding-left: 40px;">Rotor Resistance: _____ (%)</p> <p style="padding-left: 40px;">Rotor Leakage Reactance: _____ (%)</p> <p>If the Generator is of an induction design, please provide the “locked rotor current” value supplied by the manufacturer.</p> <p>If this value is not available, the stator resistance, stator leakage reactance, rotor resistance, rotor leakage reactance values supplied by the manufacturer may be used to determine the locked rotor current.</p> <p>If the Generator’s Gross Nameplate Capacity is 10 MW or greater, PG&amp;E may request additional data to better model the nature and behavior of the Generator with relation to its Electric System.</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>
<p>N - Short Circuit Current Produced by Generator</p>	<p>_____ (Amps)</p>	<p>_____ (Amps)</p>	<p>_____ (Amps)</p>	<p>_____ (Amps)</p>
<p>O - AC Disconnect</p> <p>For systems requiring an AC Disconnect only, please include the requested information about the AC Disconnect.</p> <p>See PG&amp;E’s Rule 21, Section H.1.d</p> <p>Located within 10 feet of the PG&amp;E meter?</p>	<p>_____ Manufacturer</p> <p>_____ Model #</p> <p>_____ Rating (amps)</p> <p>___ Yes</p> <p>___ No</p>	<p>_____ Manufacturer</p> <p>_____ Model #</p> <p>_____ Rating (amps)</p> <p>___ Yes</p> <p>___ No</p>	<p>_____ Manufacturer</p> <p>_____ Model #</p> <p>_____ Rating (amps)</p> <p>___ Yes</p> <p>___ No</p>	<p>_____ Manufacturer</p> <p>_____ Model #</p> <p>_____ Rating (amps)</p> <p>___ Yes</p> <p>___ No</p>
<p>P - Lineside Tap</p> <p>Where is the point of interconnection in relation to the main breaker?</p> <p>PG&amp;E has special requirements for a lineside tap.</p> <p>Contact PG&amp;E at: <a href="mailto:Rule21Gen@PGE.com">Rule21Gen@PGE.com</a> for more information.</p>	<p>_____ Customer side</p> <p>_____ PG&amp;E side</p>			



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT E

## WIND TURBINE TECHNOLOGY

<p>Q – Warranty or Service Agreement</p> <p>Applicant has verified that (i) a warranty of at least 10 years has been provided on all equipment and on its installation, or (ii) have a 10-year service warranty or executed “agreement” ensuring proper maintenance and continued system performance.</p>	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<p>R - Distribution Interconnect Handbook (DIH) and Greenbook Requirements</p> <p>Does this interconnection meet the DIH and Greenbook Requirements</p>	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<p>S - Gas Clearance Requirements</p> <p>Certify that this interconnection meets Greenbook Gas Clearance Requirements?</p>	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<p>T - Back-up Generator Operation</p> <p>Will the generator be operated as a back-up?</p> <p>If yes, please indicate control device.</p>	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker
<p><u>U - Limited Export</u></p> <p><u>Will the generator export be limited?</u></p> <p><u>If yes, please indicate how export will be limited.</u></p>	<u>___ Yes</u> <u>___ No</u>  <input type="checkbox"/> <u>Power Control System (PCS - Option 9)</u>  <input type="checkbox"/> <u>Relay</u>  <input type="checkbox"/> <u>Derated Inverter</u>	<u>___ Yes</u> <u>___ No</u>  <input type="checkbox"/> <u>Power Control System (PCS - Option 9)</u>  <input type="checkbox"/> <u>Relay</u>  <input type="checkbox"/> <u>Derated Inverter</u>	<u>___ Yes</u> <u>___ No</u>  <input type="checkbox"/> <u>Power Control System (PCS - Option 9)</u>  <input type="checkbox"/> <u>Relay</u>  <input type="checkbox"/> <u>Derated Inverter</u>	<u>___ Yes</u> <u>___ No</u>  <input type="checkbox"/> <u>Power Control System (PCS - Option 9)</u>  <input type="checkbox"/> <u>Relay</u>  <input type="checkbox"/> <u>Derated Inverter</u>
<p><del>U—Limited-Export</del></p> <p><del>Will the generator export be limited?</del></p> <p><del>If yes, please indicate how export will be limited.</del></p>	<del>___ Yes</del> <del>___ No</del>  <del><input type="checkbox"/> <u>Power Control System (PCS)</u></del>  <del><input type="checkbox"/> <u>Relay</u></del>  <del><input type="checkbox"/> <u>Derated Inverter</u></del>	<del>___ Yes</del> <del>___ No</del>  <del><input type="checkbox"/> <u>Power Control System (PCS)</u></del>  <del><input type="checkbox"/> <u>Relay</u></del>  <del><input type="checkbox"/> <u>Derated Inverter</u></del>	<del>___ Yes</del> <del>___ No</del>  <del><input type="checkbox"/> <u>Power Control System (PCS)</u></del>  <del><input type="checkbox"/> <u>Relay</u></del>  <del><input type="checkbox"/> <u>Derated Inverter</u></del>	<del>___ Yes</del> <del>___ No</del>  <del><input type="checkbox"/> <u>Power Control System (PCS)</u></del>  <del><input type="checkbox"/> <u>Relay</u></del>  <del><input type="checkbox"/> <u>Derated Inverter</u></del>



**Electric Sample Form No. 79-1174-02F**  
Rule 21 Generator Interconnection Application - Attachment F

Sheet 1

**Please Refer to Attached  
Sample Form**

(Continued)

*Advice* 6286-E-B  
*Decision* D.20-09-035

*Issued by*  
**Robert S. Kenney**  
*Vice President, Regulatory Affairs*

*Submitted* January 7, 2022  
*Effective* \_\_\_\_\_  
*Resolution* \_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT F

### MACHINE-BASED TECHNOLOGY

Please complete the following table for the specific generator technology indicated.

Instructions				
Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>Please indicate the number of each <b>“type” and quantity</b> of Generator being installed.</p> <p>Be sure all Generators classified as one “type” are identical in all respects.</p> <p>If only one type of Generator is to be used, only one column needs to be completed.</p>				
<p>A - Generator/Inverter Manufacturer Enter the brand name of the Generator.</p>				
<p>B - Generator/Inverter Model Enter the model name or number assigned by the manufacturer of the Generator.</p>				
<p>C - Generator/Inverter Software Version If this Generator’s control and or protective functions are dependent on a software program supplied by the manufacturer of the equipment, please provide the version or release number for the software that will be used.</p>				
<p>D - Is the Generator/Inverter certified? Applicant has verified that all major solar system components are on the verified equipment list maintained by the California Energy Commission and other equipment, as determined by PG&amp;E, has been verified by the customer as having safety certification from a nationally recognized testing laboratory. See PG&amp;E’s Rule 21, Section L for additional information regarding Generator certification.</p>	<input type="checkbox"/> Yes  <input type="checkbox"/> No			
<p>F - Gross Nameplate Rating (kVA) This is the capacity value normally supplied by the manufacturer and stamped on the Generator’s nameplate.  This value is not required where the manufacturer provides only a kW rating. However, where both kVA and kW values are available, please indicate both.</p>				



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT F

### **MACHINE-BASED TECHNOLOGY**

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p><b>G - Operating Voltage</b></p> <p>This value should be the voltage rating designated by the manufacturer and used in this Generating Facility.</p> <p>Please indicate phase-to-phase voltages for 3-phase installations.</p> <p>See PG&amp;E's Rule 21, Section H.2.b. and Table H.1., for additional information.</p>				
<p><b>H - Power Factor Rating</b></p> <p>This value should be the nominal power factor rating designated by the manufacturer for the Generator.</p> <p>See PG&amp;E's Rule 21, Section H.2.i. for additional information.</p>				
<p><b>I - PF Adjustment Range</b></p> <p>Where the power factor of the Generator is adjustable, please indicate the maximum and minimum operating values.</p> <p>See PG&amp;E's Rule 21, Section H.2.i.</p>				
<p><b>J - Wiring Configuration</b></p> <p>Please indicate whether the Generator is a single-phase or three-phase device. See PG&amp;E's Rule 21, Section H.3.</p>				
<p><b>K - (MP) 3-Phase Winding Configuration (Choose One)</b></p> <p>For three-phase generating units, please indicate the configuration of the Generator's windings or inverter systems.</p>	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye
<p><b>L - (MP) Neutral Grounding System Used (Choose One)</b></p> <p>Wye connected generating units are often grounded – either through a resistor or directly, depending upon the nature of the electrical system to which the Generator is connected.</p> <p>If the grounding method used at this facility is not listed, please attach additional descriptive information.</p>	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT F

### MACHINE-BASED TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p><b>M – Synchronous Generators Only:</b> If the Generator is of a synchronous design, please provide the synchronous reactance, transient reactance, and subtransient reactance values supplied by the manufacturer. This information is necessary to determine the short circuit contribution of the Generator and as data in load flow and short circuit computer models of PG&amp;E's Electric System. If the Generator's Gross Nameplate Capacity is 10 MW or greater, PG&amp;E may request additional data to better model the nature and behavior of the Generator with relation to its Electric System.</p> <p style="margin-left: 40px;">Synchronous Reactance: _____ (Xd %)</p> <p style="margin-left: 40px;">Transient Reactance: _____ (Xd %)</p> <p style="margin-left: 40px;">Subtransient Reactance: _____ (Xd %)</p>	<p>_____ (Xd %)</p> <p>_____ (Xd %)</p> <p>_____ (Xd %)</p>	<p>_____ (Xd %)</p> <p>_____ (Xd %)</p> <p>_____ (Xd %)</p>	<p>_____ (Xd %)</p> <p>_____ (Xd %)</p> <p>_____ (Xd %)</p>	<p>_____ (Xd %)</p> <p>_____ (Xd %)</p> <p>_____ (Xd %)</p>
<p><b>N - Induction Generators Only:</b></p> <p style="margin-left: 40px;">Locked Rotor Current: _____ (Amps)</p> <p style="margin-left: 40px;"><b>Stator Resistance:</b> _____ (%)</p> <p style="margin-left: 40px;">Stator Leakage Reactance: _____ (%)</p> <p style="margin-left: 40px;">Rotor Resistance: _____ (%)</p> <p style="margin-left: 40px;">Rotor Leakage Reactance: _____ (%)</p> <p>If the Generator is of an induction design, please provide the "locked rotor current" value supplied by the manufacturer.</p> <p>If this value is not available, the stator resistance, stator leakage reactance, rotor resistance, rotor leakage reactance values supplied by the manufacturer may be used to determine the locked rotor current.</p> <p>If the Generator's Gross Nameplate Capacity is 10 MW or greater, PG&amp;E may request additional data to better model the nature and behavior of the Generator with relation to its Electric System.</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>	<p>_____ (Amps)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p> <p>_____ (%)</p>
<p><b>O - Short Circuit Current Produced by Generator</b></p>	<p>_____ (Amps)</p>	<p>_____ (Amps)</p>	<p>_____ (Amps)</p>	<p>_____ (Amps)</p>



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT F

### MACHINE-BASED TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p><b>P – For Generators that are Started as a “Motor” Only:</b> This information is needed only for Generators that are started by “motoring” the generator.</p> <p>See PG&amp;E’s Rule 21, Sections L.3.d. and L.7.b. for significance and additional information.</p> <p>If this question was answered in Part IV, question C of this Application, it need not be answered here.</p> <p>1. In-Rush Current:</p> <p>2. Host Customer’s Service Entrance Panel (Main Panel) Continuous Current Rating:</p>	_____ (Amps)	_____ (Amps)	_____ (Amps)	_____ (Amps)
<p><b>Q – Prime Mover Type</b></p> <p>Please indicate the type and fuel used as the prime mover or source of energy for the Generator.</p> <p>1 = Natural Gas 2 = Diesel Fueled 3 = Other Fuel</p>	1   2   3	1   2   3	1   2   3	1   2   3
<p><b>R - AC Disconnect</b></p> <p>For systems requiring an AC Disconnect only, please include the requested information about the AC Disconnect.</p> <p>See PG&amp;E’s Rule 21, Section H.1.d</p> <p>Located within 10 feet of the PG&amp;E meter?</p>	_____ Manufacturer  _____ Model #  _____ Rating (amps)  <input type="checkbox"/> Yes <input type="checkbox"/> No			
<p><b>S - Lineside Tap</b></p> <p>Where is the point of interconnection in relation to the main breaker?</p> <p>PG&amp;E has special requirements for a lineside tap.</p> <p>Contact PG&amp;E at: <a href="mailto:Rule21Gen@PGE.com">Rule21Gen@PGE.com</a> for more information.</p>	_____ Customer side  <input type="checkbox"/> PG&E side	_____ Customer side  <input type="checkbox"/> PG&E side	_____ Customer side  <input type="checkbox"/> PG&E side	<input type="checkbox"/> Customer side  <input type="checkbox"/> PG&E side
<p><b>T – Warranty or Service Agreement</b></p> <p>Applicant has verified that (i) a warranty of at least 10 years has been provided on all equipment and on its installation, or (ii) have a 10-year service warranty or executed</p>	<input type="checkbox"/> Yes  <input type="checkbox"/> No			



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT F

### MACHINE-BASED TECHNOLOGY

"agreement" ensuring proper maintenance and continued system performance.				
<b>U - Cogeneration</b> Please indicate whether this Generating Facility meets the definition of cogeneration in PUC 216.6 (5% useful thermal and 42.5% efficient):	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<b>V - Distribution Interconnect Handbook (DIH) and Greenbook Requirements</b> Does this interconnection meet the DIH and Greenbook Requirements	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<b>W - Gas Clearance Requirements</b> Certify that this interconnection meets Greenbook Gas Clearance Requirements?	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<b>X - Back-up Generator Operation</b> Will the generator be operated as a back-up?  If yes, please indicate control device.	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	___ Yes ___ No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker
<u>Y - Limited Export</u> <u>Will the generator export be limited?</u>  <u>If yes, please indicate how export will be limited.</u>	___ Yes ___ No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	___ Yes ___ No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	___ Yes ___ No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	___ Yes ___ No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter
<del>Y - Limited Export</del> <del>Will the generator export be limited?</del>  <del>If yes, please indicate how export will be limited.</del>	<del>___ Yes</del> <del>___ No</del>  <del><input type="checkbox"/> Power Control System (PCS)</del>  <del><input type="checkbox"/> Relay</del>  <del><input type="checkbox"/> Derated Inverter</del>	<del>___ Yes</del> <del>___ No</del>  <del><input type="checkbox"/> Power Control System (PCS)</del>  <del><input type="checkbox"/> Relay</del>	<del>___ Yes</del> <del>___ No</del>  <del><input type="checkbox"/> Power Control System (PCS)</del>  <del><input type="checkbox"/> Relay</del>	<del>___ Yes</del> <del>___ No</del>  <del><input type="checkbox"/> Power Control System (PCS)</del>  <del><input type="checkbox"/> Relay</del>  <del><input type="checkbox"/> Derated Inverter</del>



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT F

### MACHINE-BASED TECHNOLOGY

	<del>☐ Derated Inverter</del>	<del>☐ Derated Inverter</del>	<del>☐ Derated Inverter</del>	<del>Inverter</del>
--	-------------------------------	-------------------------------	-------------------------------	---------------------



**Electric Sample Form No. 79-1174-02G**  
Rule 21 Generator Interconnection Application - Attachment G

Sheet 1

**Please Refer to Attached  
Sample Form**

(Continued)

*Advice* 6286-E-B  
*Decision* D.20-09-035

*Issued by*  
**Robert S. Kenney**  
*Vice President, Regulatory Affairs*

*Submitted* January 7, 2022  
*Effective* \_\_\_\_\_  
*Resolution* \_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT G

## FUEL CELL TECHNOLOGY

Please complete the following table for the specific generator technology indicated.

Instructions				
Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>Please indicate the number of each <b>“type” and quantity</b> of Generator being installed.</p> <p>Be sure all Generators classified as one “type” are identical in all respects.</p> <p>If only one type of Generator is to be used, only one column needs to be completed.</p>				
<p>A - Generator/Inverter Manufacturer</p> <p>Enter the brand name of the Generator.</p>				
<p>B - Generator/Inverter Model</p> <p>Enter the model name or number assigned by the manufacturer of the Generator.</p>				
<p>C - Generator/Inverter Software Version</p> <p>If this Generator’s control and or protective functions are dependent on a software program supplied by the manufacturer of the equipment, please provide the version or release number for the software that will be used.</p>				
<p>D - Is the Generator/Inverter certified?</p> <p>Applicant has verified that all major solar system components are on the verified equipment list maintained by the California Energy Commission and other equipment, as determined by PG&amp;E, has been verified by the customer as having safety certification from a nationally recognized testing laboratory.</p> <p>See PG&amp;E’s Rule 21, Section L for additional information regarding Generator certification.</p>	<p style="text-align: center;">___ Yes</p> <p style="text-align: center;">___ No</p>	<p style="text-align: center;">___ Yes</p> <p style="text-align: center;">___ No</p>	<p style="text-align: center;">___ Yes</p> <p style="text-align: center;">___ No</p>	<p style="text-align: center;">___ Yes</p> <p style="text-align: center;">___ No</p>



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT G

### FUEL CELL TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<b>E - Generator Design</b> Please indicate the design of each Generator. Designate "Inverter" anytime an inverter is used as the interface between the Generator and the electric system regardless of the primary power production/storage device used.	<input type="checkbox"/> Synch  <input type="checkbox"/> Induct.  <input type="checkbox"/> Inverter			
<b>F - Gross Nameplate Rating (kVA)</b> This is the capacity value normally supplied by the manufacturer and stamped on the Generator's nameplate.  This value is not required where the manufacturer provides only a kW rating. However, where both kVA and kW values are available, please indicate both.				
<b>G - Operating Voltage</b> This value should be the voltage rating designated by the manufacturer and used in this Generating Facility.  Please indicate phase-to-phase voltages for 3-phase installations.  See PG&E's Rule 21, Section H.2.b. and Table H.1., for additional information.				
<b>H - Power Factor Rating</b> This value should be the nominal power factor rating designated by the manufacturer for the Generator.  See PG&E's Rule 21, Section H.2.i. for additional information.				
<b>I - PF Adjustment Range</b> Where the power factor of the Generator is adjustable, please indicate the maximum and minimum operating values.  See PG&E's Rule 21, Section H.2.i.				
<b>J - Wiring Configuration</b> Please indicate whether the Generator is a single-phase or three-phase device. See PG&E's Rule 21, Section H.3.				
<b>K - (MP) 3-Phase Winding Configuration</b> (Choose One)  For three-phase generating units, please indicate the configuration of the Generator's windings or inverter systems.	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye



# INTERCONNECTION APPLICATION (Form 79-1174-02) ATTACHMENT G

## FUEL CELL TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>L - (MP) Neutral Grounding System Used (Choose One)</p> <p>Wye connected generating units are often grounded – either through a resistor or directly, depending upon the nature of the electrical system to which the Generator is connected.</p> <p>If the grounding method used at this facility is not listed, please attach additional descriptive information.</p>	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms
M - Short Circuit Current Produced by Generator	_____ (Amps)	_____ (Amps)	_____ (Amps)	_____ (Amps)
<p>N – Prime Mover Type</p> <p>Please indicate the type and fuel used as the prime mover or source of energy for the Generator.</p> <p>1 = Natural Gas            2 = Diesel Fueled            3 = Other Fuel</p>	1   2   3	1   2   3	1   2   3	1   2   3
<p>O - AC Disconnect</p> <p>For systems requiring an AC Disconnect only, please include the requested information about the AC Disconnect.</p> <p>See PG&amp;E's Rule 21, Section H.1.d</p> <p>Located within 10 feet of the PG&amp;E meter?</p>	_____ Manufacturer _____ Model # _____ Rating (amps)	_____ Manufacturer _____ Model # _____ Rating (amps)	_____ Manufacturer _____ Model # _____ Rating (amps)	_____ Manufacturer _____ Model # _____ Rating (amps)
<p>P - Lineside Tap</p> <p>Where is the point of interconnection in relation to the main breaker?</p> <p>PG&amp;E has special requirements for a lineside tap.</p> <p>Contact PG&amp;E at: <a href="mailto:Rule21Gen@PGE.com">Rule21Gen@PGE.com</a> for more information.</p>	_____ Customer side _____ PG&E side			
<p>Q – Warranty or Service Agreement</p> <p>Applicant has verified that (i) a warranty of at least 10 years has been provided on all equipment and on its installation, or (ii) have a 10-year service warranty or executed "agreement" ensuring proper maintenance and continued system performance.</p>	<input type="checkbox"/> Yes <input type="checkbox"/> No			



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT G

### FUEL CELL TECHNOLOGY

<b>R - Cogeneration</b> Please indicate whether this Generating Facility meets the definition of cogeneration in PUC 216.6 (5% useful thermal and 42.5% efficient):	<input type="checkbox"/> Yes <input type="checkbox"/> No			
<b>S - Distribution Interconnect Handbook (DIH) and Greenbook Requirements</b> Does this interconnection meet the DIH and Greenbook Requirements	<input type="checkbox"/> Yes <input type="checkbox"/> No			
<b>T - Gas Clearance Requirements</b> Certify that this interconnection meets Greenbook Gas Clearance Requirements?	<input type="checkbox"/> Yes <input type="checkbox"/> No			
<b>U - Back-up Generator Operation</b> Will the generator be operated as a back-up?  If yes, please indicate control device.	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker
<u>V - Limited Export</u> <u>Will the generator export be limited?</u>  <u>If yes, please indicate how export will be limited.</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter
<del>V - Limited Export</del> <del>Will the generator export be limited?</del>  <del>If yes, please indicate how export will be limited.</del>	<del><input type="checkbox"/> Yes</del> <del><input type="checkbox"/> No</del>  <del><input type="checkbox"/> Power Control System (PCS)</del>  <del><input type="checkbox"/> Relay</del>  <del><input type="checkbox"/> Derated Inverter</del>	<del><input type="checkbox"/> Yes</del> <del><input type="checkbox"/> No</del>  <del><input type="checkbox"/> Power Control System (PCS)</del>  <del><input type="checkbox"/> Relay</del>  <del><input type="checkbox"/> Derated Inverter</del>	<del><input type="checkbox"/> Yes</del> <del><input type="checkbox"/> No</del>  <del><input type="checkbox"/> Power Control System (PCS)</del>  <del><input type="checkbox"/> Relay</del>  <del><input type="checkbox"/> Derated Inverter</del>	<del><input type="checkbox"/> Yes</del> <del><input type="checkbox"/> No</del>  <del><input type="checkbox"/> Power Control System (PCS)</del>  <del><input type="checkbox"/> Relay</del>  <del><input type="checkbox"/> Derated Inverter</del>



**Electric Sample Form No. 79-1174-02H**  
Rule 21 Generator Interconnection Application - Attachment H

Sheet 1

**Please Refer to Attached  
Sample Form**

(Continued)

*Advice* 6286-E-B  
*Decision* D.20-09-035

*Issued by*  
**Robert S. Kenney**  
*Vice President, Regulatory Affairs*

*Submitted* January 7, 2022  
*Effective* \_\_\_\_\_  
*Resolution* \_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### **ENERGY STORAGE TECHNOLOGY**

Please complete the following table for the specific generator technology indicated.

Instructions				
Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p>Please indicate the number of each <b>“type” and quantity</b> of Generator being installed.</p> <p>Be sure all Generators classified as one “type” are identical in all respects.</p> <p>If only one type of Generator is to be used, only one column needs to be completed.</p>				
<p><b>A - Generator/Inverter Manufacturer</b></p> <p>Enter the brand name of the Generator.</p>				
<p><b>B - Generator/Inverter Model</b></p> <p>Enter the model name or number assigned by the manufacturer of the Generator.</p>				
<p><b>C - Generator/Inverter Software Version</b></p> <p>If this Generator’s control and or protective functions are dependent on a software program supplied by the manufacturer of the equipment, please provide the version or release number for the software that will be used.</p>				
<p><b>D - Is the Generator/Inverter certified?</b></p> <p>Applicant has verified that all major solar system components are on the verified equipment list maintained by the California Energy Commission and other equipment, as determined by PG&amp;E, has been verified by the customer as having safety certification from a nationally recognized testing laboratory.</p> <p>See PG&amp;E’s Rule 21, Section L for additional information regarding Generator certification.</p>	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No	___ Yes ___ No
<p><b>E - Generator Design</b></p> <p>Please indicate the design of each Generator.</p> <p>Designate “Inverter” anytime an inverter is used as the interface between the Generator and the electric system regardless of the primary power production/storage device used.</p>	___ Synch ___ Induct. ___ Inverter			



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### ENERGY STORAGE TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<p><b>F - Gross Nameplate Rating (kVA)</b></p> <p>This is the capacity value normally supplied by the manufacturer and stamped on the Generator's nameplate.</p> <p>This value is not required where the manufacturer provides only a kW rating. However, where both kVA and kW values are available, please indicate both.</p>				
<p><b>G - Energy Storage Electrical Source Function</b> (in addition, please complete section: "Additional Information Required for Energy Storage")</p>	<p>Max kWh Capacity:</p> <hr/> <p>Rated kW Discharge:</p> <hr/>	<p>Max kWh Capacity:</p> <hr/> <p>Rated kW Discharge:</p> <hr/>	<p>Max kWh Capacity:</p> <hr/> <p>Rated kW Discharge:</p> <hr/>	<p>Max kWh Capacity:</p> <hr/> <p>Rated kW Discharge:</p> <hr/>
<p><b>H - Operating Voltage</b></p> <p>This value should be the voltage rating designated by the manufacturer and used in this Generating Facility.</p> <p>Please indicate phase-to-phase voltages for 3-phase installations.</p> <p>See PG&amp;E's Rule 21, Section H.2.b. and Table H.1., for additional information.</p>				
<p><b>I - Power Factor Rating</b></p> <p>This value should be the nominal power factor rating designated by the manufacturer for the Generator.</p> <p>See PG&amp;E's Rule 21, Section H.2.i. for additional information.</p>				
<p><b>J - PF Adjustment Range</b></p> <p>Where the power factor of the Generator is adjustable, please indicate the maximum and minimum operating values.</p> <p>See PG&amp;E's Rule 21, Section H.2.i.</p>				
<p><b>K - Wiring Configuration</b></p> <p>Please indicate whether the Generator is a single-phase or three-phase device. See PG&amp;E's Rule 21, Section H.3.</p>				



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### ENERGY STORAGE TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<b>L - (MP) 3-Phase Winding Configuration (Choose One)</b> For three-phase generating units, please indicate the configuration of the Generator's windings or inverter systems.	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye	<input type="checkbox"/> 3 Wire Delta <input type="checkbox"/> 3 Wire Wye <input type="checkbox"/> 4 Wire Wye
<b>M - (MP) Neutral Grounding System Used (Choose One)</b> Wye connected generating units are often grounded – either through a resistor or directly, depending upon the nature of the electrical system to which the Generator is connected. If the grounding method used at this facility is not listed, please attach additional descriptive information.	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms	<input type="checkbox"/> Ungrounded <input type="checkbox"/> Solidly Grounded <input type="checkbox"/> Ground Resistor <input type="checkbox"/> Ohms
<b>N - Short Circuit Current Produced by Generator:</b>	<input type="text"/> (Amps)	<input type="text"/> (Amps)	<input type="text"/> (Amps)	<input type="text"/> (Amps)
<b>O – Prime Mover Type</b> Please indicate the type and fuel used as the prime mover or source of energy for the Generator. 1 = Natural Gas 2 = Diesel Fueled 3 = Other Fuel	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3
<b>P - AC Disconnect</b> For systems requiring an AC Disconnect only, please include the requested information about the AC Disconnect. See PG&E's Rule 21, Section H.1.d  Located within 10 feet of the PG&E meter?	<input type="text"/> Manufacturer  <input type="text"/> Model #  <input type="text"/> Rating (amps)  <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="text"/> Manufacturer  <input type="text"/> Model #  <input type="text"/> Rating (amps)  <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="text"/> Manufacturer  <input type="text"/> Model #  <input type="text"/> Rating (amps)  <input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="text"/> Manufacturer  <input type="text"/> Model #  <input type="text"/> Rating (amps)  <input type="checkbox"/> Yes <input type="checkbox"/> No



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### ENERGY STORAGE TECHNOLOGY

Generator Information	Existing Generator type 1	Existing Generator type 2	New Generator type 1	New Generator type 2
<b>Q - Energy Storage (ES) System</b> (For important sizing information related to DC-Coupled configurations, see sizing note below).	_____ Manufacturer  _____ Model #  _____ Quantity of Units	_____ Manufacturer  _____ Model #  _____ Quantity of Units	_____ Manufacturer  _____ Model #  _____ Quantity of Units	_____ Manufacturer  _____ Model #  _____ Quantity of Units
<b>R - Lineside Tap</b> Where is the point of interconnection in relation to the main breaker?  PG&E has special requirements for a lineside tap. Contact PG&E at: <a href="mailto:Rule21Gen@PGE.com">Rule21Gen@PGE.com</a> for more information.	_____ Customer side  _____ PG&E side	_____ Customer side  _____ PG&E side	_____ Customer side  _____ PG&E side	_____ Customer side  _____ PG&E side
<b>S – Warranty or Service Agreement</b> Applicant has verified that (i) a warranty of at least 10 years has been provided on all equipment and on its installation, or (ii) have a 10-year service warranty or executed “agreement” ensuring proper maintenance and continued system performance.	_____ Yes _____ No	_____ Yes _____ No	_____ Yes _____ No	_____ Yes _____ No
<b>T - Distribution Interconnect Handbook (DIH) and Greenbook Requirements</b> Does this interconnection meet the DIH and Greenbook Requirements	_____ Yes _____ No	_____ Yes _____ No	_____ Yes _____ No	_____ Yes _____ No
<b>U - Gas Clearance Requirements</b> Certify that this interconnection meets Greenbook Gas Clearance Requirements?	_____ Yes _____ No	_____ Yes _____ No	_____ Yes _____ No	_____ Yes _____ No
<b>V - Basic Single Line Diagram (SLD)</b> If the interconnection is eligible to use a Basic SLD, please include the requested information.   Can this system be used as a back-up	_____ Panel Voltage (Volts)  _____ Main Breaker (Amps)  _____ Storage Breaker Size (Amps)	_____ Panel Voltage (Volts)  _____ Main Breaker (Amps)  _____ Storage Breaker Size (Amps)	_____ Panel Voltage (Volts)  _____ Main Breaker (Amps)  _____ Storage Breaker	_____ Panel Voltage (Volts)  _____ Main Breaker (Amps)  _____ Storage Breaker Size (Amps)



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### ENERGY STORAGE TECHNOLOGY

generator?  If so, please include the requested information for the back-up controller or other device.	<input type="checkbox"/> Yes <input type="checkbox"/> No  _____ Manufacturer  _____ Make  _____ Model No.	<input type="checkbox"/> Yes <input type="checkbox"/> No  _____ Manufacture r  _____ Make  _____ Model No.	Size (Amps)  <input type="checkbox"/> Yes <input type="checkbox"/> No  _____ Manufactur er  _____ Make  _____ Model No.	<input type="checkbox"/> Yes <input type="checkbox"/> No  _____ Manufacture r  _____ Make  _____ Model No.
W - Back-up Generator Operation Will the generator be operated as a back-up?  If yes, please indicate control device.	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Automatic Transfer Switch <input type="checkbox"/> Contactor <input type="checkbox"/> Breaker
<u>X - Limited Export</u> <u>Will the generator export be limited?</u>  <u>If yes, please indicate how export will be limited.</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter	<input type="checkbox"/> Yes <input type="checkbox"/> No  <input type="checkbox"/> Power Control System (PCS - Option 9)  <input type="checkbox"/> Relay  <input type="checkbox"/> Derated Inverter
<del>X - Limited Export</del> <del>Will the generator export be limited?</del>  <del>If yes, please indicate how export will be limited.</del>	<del><input type="checkbox"/> Yes  <input type="checkbox"/> No   <input type="checkbox"/> Power Control System (PCS)   <input type="checkbox"/> Relay   <input type="checkbox"/> Derated Inverter</del>	<del><input type="checkbox"/> Yes  <input type="checkbox"/> No   <input type="checkbox"/> Power Control System (PCS)   <input type="checkbox"/> Relay   <input type="checkbox"/> Derated Inverter</del>	<del><input type="checkbox"/> Yes  <input type="checkbox"/> No   <input type="checkbox"/> Power Control System (PCS)   <input type="checkbox"/> Relay   <input type="checkbox"/> Derated Inverter</del>	<del><input type="checkbox"/> Yes  <input type="checkbox"/> No   <input type="checkbox"/> Power Control System (PCS)   <input type="checkbox"/> Relay   <input type="checkbox"/> Derated Inverter</del>



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### ENERGY STORAGE TECHNOLOGY

**Energy Storage Charging Function:**

Rated Charge Demand (Load): \_\_\_\_\_ kW

Estimated annual Net Energy Usage\* of the energy storage device(s): \_\_\_\_\_ kWh

\*Net Energy usage = (kWh input, including charging, storage device auxiliary loads and losses) – (kWh output including discharging)

Will the Distribution Grid be used to charge the storage device:       Yes       No

If no: Provide technical description of control systems including (e.g. Nationally-certified piece of equipment, Relays/metering):

Source of energy for Charging: \_\_\_\_\_

Mechanism to prevent charging from the Distribution System: \_\_\_\_\_

If Yes: Will charging the storage device(s) increase the host facility's existing peak load demand:

Yes       No

If Yes: Provide the following loading information:

Amount of added peak demand: \_\_\_\_\_ kW

If no: Provide technical description of controls systems including:

Charging periods: \_\_\_\_\_

Mechanism to prevent charging from the Distribution System during host facility peak:

\_\_\_\_\_



# INTERCONNECTION APPLICATION (Form 79-1174-02)

## ATTACHMENT H

### ENERGY STORAGE TECHNOLOGY

#### **Expedited Interconnection Process Selection for Non-Export Energy Storage:**

- This project meets the requirements identified in Rule 21 Section N and this process is being selected for expedited interconnection.

#### Note on Sizing (DC-Coupled Configurations)

The size of the storage system in DC-coupled NEM-eligible generator plus storage systems is the lesser of the shared inverter's (or inverters') nameplate capacity (capacities summed) and the storage device's (devices') maximum continuous discharge capacity (capacities summed) listed on the device's (devices') technical specifications sheets. A storage device's maximum continuous discharge capacity may be listed on technical specification sheets using different terminology. Note: PG&E will use common sense to determine whether a device's technical specification sheet includes the appropriate metric for purposes of determining system size, regardless of the terminology used. If that metric is not included, PG&E may rely on the inverter's nameplate rating.

For example:

- What is the maximum continuous discharge capability for each storage unit?  
\_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = . total \_\_\_\_\_
- What is each inverter's nameplate rating?  
\_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ + \_\_\_\_\_ = . total \_\_\_\_\_

**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.  
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

East Bay Community Energy Ellison  
Schneider & Harris LLP Energy  
Management Service  
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  
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  
Water and Energy Consulting Wellhead  
Electric Company  
Western Manufactured Housing  
Communities Association (WMA)  
Yep Energy