

COM/MGA/jnf

Date of Issuance 6/4/2021

Decision 21-06-002 June 3, 2021

**BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA**

Order Instituting Rulemaking to  
Consider Streamlining Interconnection  
of Distributed Energy Resources and  
Improvements to Rule 21.

Rulemaking 17-07-007

**DECISION ADDRESSING REMAINING PHASE I ISSUES**

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## **DECISION ADDRESSING REMAINING PHASE I ISSUES**

### **Summary**

This decision is the culmination of a nearly four-year effort to streamline the interconnection application process for distributed energy resources. This decision considers Working Group Four proposals recommended to resolve each of the working group's assigned issues: the prevention of unintended islanding, streamlining interconnection procedures in advance of the future increase of zero net energy projects, consideration of safety and environmental standards, and accounting for the ability of distributed energy resources management systems to address flexibility needs. Additionally, this decision also considers two issues, not assigned to Working Group Four, involving the use of notifications in lieu of an interconnection application and distribution upgrade cost sharing.

The primary objective in this proceeding is to streamline the interconnection application process, which the adopted proposals aim to accomplish. Adopted proposals include: a modified, notification-only approach for certain projects; a study on costs shifts resulting from a prior distribution upgrade exemption; installation of protective equipment on large machine generators; an option for independent unintentional islanding studies; establishment of a working group to look at distribution-level solutions to anti-islanding; new anti-islanding screens in the interconnection application process for Pacific Gas and Electric Company; development of an interconnection guidebook on anti-islanding; improved efficiencies in the application process that allow for applications based on street address; choice of single batch applications; a future pilot to test operational alternatives to address operational flexibility constraints; and the development and finalization of a template

aggregator agreement. These adopted proposals also meet our other objectives of improving efficiency, transparency, certainty, and clarity.

## **1. Procedural Background**

This decision addresses Issues 11, 13, 18, 19, 29 and F, as listed in Section 2 below. In this section, we present the procedural background solely for these issues.

The November 16, 2018 *Assigned Commissioner's Amended Scoping Memo and Joint Administrative Law Judge Ruling* (Amended Scoping Memo) revised the scope and schedule for this proceeding in response to the *Motion of the California Solar & Storage Association to Update the Scope for the Proceeding* and the *Joint Motion of Southern California Edison Company, San Diego Gas & Electric Company and Pacific Gas and Electric Company to Revise Certain Deadlines*. The Amended Scoping Memo directed the following with respect to this decision:

- Added Issue F to the scope of issues;
- Assigned Issue F, as well as Issues 18, 19, and 29 to Working Group Four;
- Determined that it would be appropriate to use the comment and reply format to resolve Issue 13, which asks about the need and a process for distribution upgrade cost sharing among developers; and
- Assigned Issue 11 to Working Group Three, which discussed the issue and provided proposals in the Working Group Three Report.

Decision (D.) 20-09-035 addressed proposals from Working Groups Two and Three, including proposals related to Issue 11. Related to this decision, in D.20-09-035, the Commission underscored that many unanswered questions remain for consideration, in order to adopt a particular approach to address Issue 11 involving the use of a notification-based approach in lieu of an

application for non-exporting systems. The Commission concluded in that decision that it should not adopt a specific approach at that time. However, the Commission found value in the concept of the notification-based approach and concluded the concept should continue to be explored and proposals should be developed in this proceeding.

Working Group Four members began meeting, with a February 12, 2020 initial workshop. Following twelve in-person and virtual meetings, on August 13, 2020, representatives of Working Group Four filed the final Working Group Four Report (Report) describing the proposals developed and discussed by the working group. As noted in the Report, parties and other stakeholders participated in discussion of Issues 18, 19, 29 and F; development of the proposals to address those issues; and development of the Report.<sup>1</sup> To ensure parties had a good understanding of the proposals, the Administrative Law Judge facilitated a workshop on October 16, 2020, at which proposal sponsors presented the Working Group Four proposals and responded to questions on those proposals.

A November 16, 2020 Administrative Law Judge Ruling directed parties to respond to questions in three categories: 1) Working Group Four issues and the proposals provided in the Working Group Four Report; 2) Issue 11 regarding the use of a notification-based approach in lieu of an interconnection application for non-exporting storage systems; and 3) Issue 13 regarding the adoption of a process for distribution upgrade cost sharing among developers. On December 18, 2020, the following parties filed responses to the November 16, 2020 Ruling questions: California Energy Storage Association (CESA), California Solar

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<sup>1</sup> Report at 10.

and Storage Association (CALSSA), Clean Coalition, Green Power Institute, Interstate Renewable Energy Council, Inc. (IREC), Pacific Gas and Electric Company (PG&E), Public Advocates Office of the Public Utilities Commission (Public Advocates Office), San Diego Gas & Electric Company (SDG&E), Southern California Edison Company (SCE), and Tesla. The following parties filed reply comments on January 8, 2021: CALSSA, Clean Coalition, Green Power Institute, IREC, Public Advocates Office, and Tesla. The record for this decision stands submitted on January 8, 2021.

Phase I of this proceeding is closed.

## **2. Issues Before the Commission**

The following issues are addressed in this decision:

11. Should the Commission adopt a notification-based approach in lieu of an interconnection application for non-exporting storage systems that have a negligible impact on the distribution system and, if so, what should the approach entail?
13. Should the Commission adopt a process for distribution upgrade cost sharing among developers and, if so, what should the process be?
18. Should the Commission adopt changes to anti-islanding screen parameters to reflect research on islanding risks when using UL 1741-certified inverters in order to avoid unnecessary mitigations? If yes, what should those changes entail?
19. Should the Commission adopt the streamlined interconnection procedures (*e.g.*, standard configurations eligible for expedited review) to facilitate implementation of California Zero Net Energy building codes and, if so, what should those procedures entail?
29. Should the Commission establish a forum, either within this proceeding or externally to develop interconnection safety standards to address safety and environmental

risks as the interconnection of distributed energy resources devices grows?

- F. What interconnection rules should the Commission adopt to account for the ability of DERMS and aggregator commands to address operational flexibility need?

### **3. Issue 11: Use of Notifications In Lieu of Interconnection Applications**

As discussed below, this decision adopts a two-year trial of the notification-only approach in lieu of the current interconnection application approach. We conclude the Tesla Proposal is a good foundation for the notification-only approach and should be adopted, but with modifications to address safety concerns. We adopt a modified version of the Tesla Proposal in order to expedite the interconnection process for small, non-export systems. We expect to experience an increased number of requests for these systems in the future. The modified Tesla Proposal is a prudent solution since eligible projects are either exempt from or automatically pass all Rule 21 Initial Review screens used in the current interconnection application process. Below, we provide background information on Issue 11, an overview of the Tesla Proposal, party positions, and a discussion of the resolution of Issue 11.

#### **3.1. Issue 11 Background and Overview of Tesla Proposal**

As previously stated, D.20-09-035 addressed proposals from Working Groups Two and Three, including proposals related to Issue 11. Issue 11 asks whether the Commission should adopt a notification-based approach in lieu of an interconnection application for non-exporting storage systems that have a negligible impact on the distribution system and, if so, what should the approach entail. In D.20-09-035, the Commission found value in the concept of the notification-based approach and concluded that, because many questions



remained unanswered, exploration of the concept should continue in this proceeding.

The November 16, 2020 Ruling pursued such exploration through a set of questions to address related concerns the Commission must consider in order to adopt such an approach. The questions posed to parties delve into current Rule 21 requirements (including the definition of non-export systems and any needed revisions to that definition); the existence and related impact of increased storage installation; the timelines and fees necessary for a notification-only interconnection process; required revisions to the interconnection agreement; and cost responsibility for distribution upgrades related to load reductions. In addition to responding to the questions in the ruling, parties were also directed to comment on a proposal for a notification-only approach for a specified subset of project types, as submitted by Tesla in the Microgrids Rulemaking, (R.) 19-09-009 (Tesla Proposal). A copy of the Tesla Proposal was attached to the November 16, 2020 Ruling and is attached to this decision as Appendix A.<sup>2</sup>

The Tesla Proposal recommends that certain projects be allowed to use a notification-only approach instead of an application: i) projects not located on a networked secondary part of the utilities' grid; ii) projects that use certified equipment<sup>3</sup> set to non-export mode, either Import-Only or No Exchange mode;<sup>4</sup> and iii) projects with a capacity of less than or equal to 30 kilovolt amps (kVA). Tesla contends that a project meeting these three criteria would pass all relevant screens under Rule 21<sup>5</sup> and proceed to interconnection approval in all

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<sup>2</sup> November 16, 2020 Ruling at Attachment 2.

<sup>3</sup> Certified to UL 1741 SA, CSIP IEEE 2030.5 and UL 1741 PCS CRD.

<sup>4</sup> Import-Only and No-Exchange are modes contained within UL 1741 PCS.

<sup>5</sup> The Screens needing to be passed are Screens A, B, C, D, E, F, G, H, I, J, K, L, and M.

circumstances.<sup>6</sup> Tesla asserts that projects meeting these criteria would not have any grid impacts; thus, eliminating the need for study.<sup>7</sup> Furthermore, Tesla submits its proposed approach would dramatically reduce the complexity and timelines associated with deploying back-up solutions and would facilitate widespread adoption of distributed energy resources interconnection.<sup>8</sup>

Acknowledging that some parties may argue that an important part of the interconnection process is ensuring that interconnected projects are the same as those proposed, Tesla proposes simultaneous implementation of an approved attestation and audit framework. As part of the framework, Tesla recommends only developers with sufficient prior deployment experience would be qualified to use the notification-only process. Tesla suggests a floor of 20 successfully-deployed non-export projects (meeting the three criteria above) using the current process. Eligible developers would submit an attestation to the utility indicating they understand where the networked secondary part of a utility's grid is located and will not use the notification-only process for projects deployed on those parts of the utility's grid. The developer would then be allowed to use the notification-only process for appropriate projects, five percent of which may be audited at the utility's discretion. Projects found in violation would be required to cease operation and reapply through the standard interconnection process. Violations would result in developers being foreclosed from using the notification-only process for three months. Future use of the notification-only process by violators would require successful deployment of 40 projects using the standard

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<sup>6</sup> November 18, 2020 Ruling, Attachment 2 at 5-6.

<sup>7</sup> *Ibid.*

<sup>8</sup> *Ibid.*

interconnection application process as well as an explanation of how the developer would prevent future violations.

### **3.2. Issue 11 Party Positions**

The Commission previously indicated support for a notification-only approach and stated it would explore such options. At this time, the only option before us is the Tesla Proposal, which is broadly supported by CESA,<sup>9</sup> CALSSA,<sup>10</sup> Green Power Institute,<sup>11</sup> and Tesla. PG&E, SDG&E, and SCE oppose the adoption of a notification-only interconnection process.

PG&E asserts the notification-only approach would not ensure safe generator interconnection and points to the cumulative distribution system and substation capacity impacts that could result from multiple kVA projects being added to the grid without the engineering review performed in the current interconnection process.<sup>12</sup> SCE expresses a similar concern.<sup>13</sup> PG&E contends this could lead to overloaded distribution facilities and/or adverse voltage impacts (outside of Rule 2 limits) to other customers and voltage regulation equipment.<sup>14</sup> Noting that neither PG&E nor SCE have presented any evidence of the aggregate impacts and grid saturation, Tesla maintains the notification process itself will provide utilities the ability to assess the aggregate impacts of multiple smaller systems.<sup>15</sup>

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<sup>9</sup> CESA Opening Comments, December 18, 2020 at 5-6.

<sup>10</sup> CALSSA Opening Comments, December 18, 2020 at 8-11.

<sup>11</sup> Green Power Institute, Opening Comments, December 18, 2020 at 4.

<sup>12</sup> PG&E Opening Comments, December 18, 2020 at 28.

<sup>13</sup> SCE Opening Comments, December 18, 2020 at 24.

<sup>14</sup> PG&E Opening Comments, December 18, 2020 at 28.

<sup>15</sup> Tesla Reply Comments, January 8, 2021 at 12.

SDG&E states its lack of support arises from the need for an electrical release from the local authority having jurisdiction to verify the project meets applicable National Electric Code standards and requirements and can be safely interconnected to SDG&E's grid.<sup>16</sup> SDG&E further contends the notification-only process would also require verification of the power control system certification, verification the project would not exceed the transformer or secondary conductor rating, and verification of a Certificate of Insurance.<sup>17</sup> Tesla explains that the notification-only process would not change existing permitting requirements.<sup>18</sup>

SCE raises three main concerns with the Tesla Proposal. First, with respect to Tesla's recommendation that an eligible customer provide an attestation that the project would not be located in the utility's secondary network, SCE contends the customer would not have any way of knowing if they are connected to the secondary network.<sup>19</sup> Tesla agrees that a customer may not know this information but hopes the utilities would provide maps identifying the extent and boundaries of the secondary network.<sup>20</sup> Second, SCE submits the use of a UL power control system as one of the eligibility requirements is an insufficient safety measure. SCE asserts use of control systems to set a project to non-export mode is in its infancy and such use cannot verify the system is meeting operating requirements.<sup>21</sup> In response, Tesla notes that the proposal is a multi-part proposal with eligibility criteria, attestations, pre-qualifications, and audits,

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<sup>16</sup> SDG&E Opening Comments, December 18, 2020 at 2.

<sup>17</sup> *Id.* at 2-3.

<sup>18</sup> Tesla Reply Comments, January 8, 2021 at 12.

<sup>19</sup> SCE Opening Comments, December 18, 2020 at 26.

<sup>20</sup> Tesla Reply Comments, January 8, 2021 at 13.

<sup>21</sup> SCE Opening Comments, December 18, 2020 at 26.

which, together, ensure developers demonstrate ability to deploy conforming systems.<sup>22</sup> Third, SCE maintains establishing a 30 kVA project size limit is not a sufficient safety eligibility standard. SCE explains the 30 kVA level set in the current interconnection process relates to high voltage system impacts or short circuit contribution. SCE asserts setting the eligibility criteria at 30 kVA does not protect against low voltage concerns, such as service transformer and secondary connections.<sup>23</sup> Tesla contends because the systems proposed to use the notification-only process are non-exporting, low voltage systems would not be impacted.<sup>24</sup>

### **3.3. Resolution of Issue 11: Adoption of a Modified Notification-Only Approach for Non-Export Systems**

In justifying the need for a notification approach, Tesla contends there is an urgent need to facilitate the rapid deployment of distributed energy resources that can also be back up power solutions to customers.<sup>25</sup> Tesla highlights two current public emergencies impacting California customers: COVID-19 and its related financial impacts as well as annual wildfires and the related Public Safety Power Shutoffs. Tesla submits that, given these two crises, the rationale for implementing a notification-only process only grows stronger.<sup>26</sup>

We agree that these current and continuing circumstances warrant the Commission adoption of a notification-only approach for non-export systems. Furthermore, the multiple elements of the Tesla Proposal working together

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<sup>22</sup> Tesla Reply Comments, January 8, 2021 at 14-15.

<sup>23</sup> SCE Opening Comments, December 18, 2020 at 26.

<sup>24</sup> Tesla Reply Comments, January 8, 2021 at 14.

<sup>25</sup> November 18, 2020 Ruling, Attachment 2 at 5.

<sup>26</sup> *Ibid.*

should ensure developers demonstrate ability to deploy conforming systems. However, we recognize the existence of several safety concerns, including the unknown aggregate impact of interconnecting small, non-export systems. Hence, we should modify the Tesla Proposal to account for these safety concerns and adopt the proposal on a two-year trial basis, beginning 45 days from the issuance of this decision. During the two years, PG&E, SDG&E, and SCE are directed to collect data on the project, which will assist the Commission in determining whether the approach should be continued on a permanent basis. We underscore that projects interconnecting through the notification-only process, during this pilot, shall comply with all other requirements of Rule 21, including the interconnection fee for non-studies and consumer protections. As noted by SDG&E, adoption of the Notification-Only Approach pilot would also require modifications to the interconnection agreement template, including the specification that eligibility would pertain to non-export systems.<sup>27</sup>

In comments to the proposed decision, several parties questioned maintaining the \$800 interconnection application fee. CALSSA asserts the notification-only process will require less work on the part of the utility.<sup>28</sup> Hence, CALSSA urges the Commission to consider waiving the interconnection application fee or lowering the fee to align with the fee for net energy metering projects, which range from \$75 to \$145.<sup>29</sup> Tesla, CESA, and Green Power Institute agree.<sup>30</sup> However, SCE underscores the notification-only approach is proposed

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<sup>27</sup> SDG&E Opening Comments, December 18, 2020 at 4.

<sup>28</sup> CALSSA Opening Comments on Proposed Decision, April 27, 2021 at 4.

<sup>29</sup> *Ibid.*

<sup>30</sup> Tesla Opening Comments on Proposed Decision, April 27, 2021 at 4-5, CESA Opening Comments on Proposed Decision, April 27, 2021 at 3, and Green Power Institute Reply Comments on Proposed Decision, May 3, 2021 at 3.

as a pilot and waiving or reducing the application fee is premature. While CALSSA maintains less work is required, SCE lists the following new tasks that will occur, at least during the pilot stage: application and supporting information intake; review supporting documents to confirm pilot eligibility; update databases and systems of record with project information; develop a process and supporting system to implement the notification-only approach beyond the existing like-for-like equipment replacement; audit projects to ensure safe and reliable interconnection and provide feedback on pilot; and gather data on aggregate system impacts for pilot evaluation.<sup>31</sup>

We agree that it is premature to waive or reduce fees for an approach in a pilot stage. However, the application fee should be studied as part of the pilot evaluation. Accordingly, as part of the data collection discussed above, PG&E, SDG&E, and SCE shall collect data on monthly costs associated with all aspects of the pilot. PG&E, SDG&E, and SCE shall submit the monthly cost data in a Tier 1 Advice Letter (Information Only), 13 months after the pilot begins, for preliminary review by parties and Energy Division. At month 20, PG&E, SDG&E, and SCE shall submit the monthly cost data for the first 18 months of the pilot, as part of the data collection process discussed in Section 3.5.5.

Below, we discuss the four elements of this Notification-Only Approach pilot (eligibility requirements, developer and attestation requirements, notification package requirements, and audit requirements) as well as the data collection and determination of its continuation.

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<sup>31</sup> SCE Reply Comments on Proposed Decision, May 3, 2021 at 3.

### **3.3.1. Eligibility Requirements of the Notification-Only Approach**

We begin with the eligibility requirements. We find the following eight eligibility requirements and any related refinements should appropriately address the safety concerns underscored by the three utilities. While we adopt these requirements as safety measures, we note that the data collection and evaluation process may allow for easing of some of the measures. Given that this approach has not been undertaken before, the Commission must assure interconnection to the grid continues in a safe and reliable manner.

First, an eligible project shall total less than or equal to an aggregate of 30 kVA capacity, where the aggregate capacity applies to the sum of existing and new capacity. A project may consist of one of the following options: (1) one new non-export energy storage system, (2) one new non-export energy storage system plus one new non-export solar system, or (3) one new energy storage system plus any existing generation systems where the combined system is non-export. For the purposes of the Notification-Only Approach pilot, “new” is defined as not currently existing on a customer’s premises. We clarify that projects must have equipment that complies with Rule 21, including Section Hh.1.c (suitable equipment requirement), Section Hh.2.c (paralleling), and IEEE 1547 standards.<sup>32</sup> This requirement is consistent with the Rule 21 operating requirements and general interconnection and protective functions. Further, this equipment should be pre-approved by the utility prior to utilization to ensure safety. Equipment used to disconnect from parallel mode to island mode, reconnect from island mode to parallel mode and re-synchronize with the utilities’ grid should also be pre-approved by the utility. We expect customers will utilize this

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<sup>32</sup> See SCE Opening Comments on Proposed Decision, April 27, 2021 at 5.



pilot to serve their own load during Public Safety Power Shutoff events; hence this provision will allow these types of projects to proceed while ensuring protection of the utilities' distribution system. We further clarify that multi-tariff projects are not permitted at this stage of the pilot because, as stated by SCE, these projects complicate the utilization of power control systems and may result in such systems not functioning as intended.<sup>33</sup> We also add the restriction that the notification-only approach can only be used once per site, with the energy to be used by that site's customer of record. We share SCE's concern that setting the eligibility criteria at 30 kVA does not protect against low voltage concerns, such as service transformer and secondary connections. However, by restricting the notification-only approach pilot to only be used once per site, it is the Commission's aim to ensure that circuits are not overloaded. Furthermore, as part of the pilot, the utilities should study the impacts of the notification-only approach on the distribution grid and include the results in their data collection advice letter submittal described below.

In comments to the proposed decision, SCE cautions that the accumulation of 30 kW projects in small areas could negatively impact circuits. To address the concern of overloaded circuits, we adopt SCE's recommendation to limit each developer to 10 non-export projects for each distribution circuit.<sup>34</sup> We note that the nomenclature of what comprises a circuit varies among the utilities' Integration Capacity Analysis maps. For purposes of the Notification-Only Approach pilot, a circuit is defined as the smallest line segment for which a unique Integration Capacity Analysis hosting capacity is computed. While we

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<sup>33</sup> SCE Opening Comments on Proposed Decision, April 27, 2021 at 5.

<sup>34</sup> *Id.* at 4-5.

recognize each circuit is different and some circuits may not be able to handle the same number of projects, limiting each developer to 10 non-export projects for each distribution circuit for the pilot will ensure a level playing field across developers. We note the opposition of CALSSA and its contention that such numerical limits are arbitrary and result in extreme challenges.<sup>35</sup> Because this is a new approach, we must proceed cautiously with respect to safety concerns. However, as part of the evaluation of this pilot, we will collect data regarding this concern and adjust accordingly should the pilot be adopted as a permanent mechanism. Further, we reject the recommendation from SCE that “when multiple distribution circuits run along notification-only project, the project should be counted toward the higher level of pilot participating projects for that developer.”<sup>36</sup> We find limiting the number of projects on the circuit to be sufficient to limit safety concerns.

Second, eligible projects shall use a UL-certified Power Control System with an Open Loop response time of two seconds or less and attest to these settings. Furthermore, an eligible project’s Power Control System shall be set to a non-export mode (Import-Only and No-Exchange are other currently defined options.) We find this more stringent requirement should adequately address SCE’s concern that that the system would indeed pass Screen B (the Certified Equipment Screen). We agree with SCE that simply being certified to UL 1741 and UL Power Control Systems is not sufficient for passing Screen B, as the control system may only be certified to provide a specific set of functions.<sup>37</sup> However, the record of this proceeding does not contain data to corroborate the

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<sup>35</sup> CALSSA Reply Comments on Proposed Decision, May 3, 2021 at 1.

<sup>36</sup> SCE Opening Comments on Proposed Decision, April 27, 2021 at 4-5.

<sup>37</sup> SCE Opening Comments, December 18, 2020 at 21.

statement from SCE that it has reviewed such systems and found, “even after being certified, UL-control systems have not been able to demonstrate compliance with the two-second open-loop response time requirement.”<sup>38</sup> Furthermore, the attestation and audit elements of this pilot should provide additional safety precautions at this time. The Commission will continue to consider the safety implications of certifications in the final evaluation of this pilot.

Third, eligible projects shall be limited to 120 V or 240 V services that use a self-contained meter. In comments to the proposed decision, SCE highlighted Rule 21 section Hh.1.d, which requires the installation of a manually operated isolating switch near the Point of Connection to isolate the inverter from the distribution or transmission system.<sup>39</sup> SCE maintains that limiting the eligible projects to 120V or 240V that use the self-contained meter will ensure compliance with this Rule 21 requirement. While we impose this requirement, the Commission will revisit during the evaluation of this pilot to determine i) if the notification-only process can be applied beyond these limitations and ii) what tools are needed to allow such an expansion.

Fourth, eligible projects shall not be located on or within a quarter mile distance from any networked secondary portion of the utility’s grid. This helps to ensure the project would otherwise pass Screen A. In comments to the proposed decision, SCE highlights the concern that, in some cases, electrical equipment may extend past a given street requiring an additional buffer of a quarter mile. SCE explains that the buffer will ensure that projects are not

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<sup>38</sup> SCE Opening Comments on Proposed Decision, April 27, 2021 at 3.

<sup>39</sup> SCE Opening Comments on Proposed Decision, April 27, 2021 at 4.

inadvertently connected to a customer that is served from the networked secondary portion of the utility's grid.<sup>40</sup> In response, CESA argues this buffer is arbitrary and not substantiated from a safety or reliability perspective.<sup>41</sup> We find the buffer to be a reasonable safety precaution, at this time. However, the Commission will continue to consider the necessity of this requirement during the evaluation phase of the pilot.

To address the concern of SCE that the customer would not have any way of knowing if they are connected to the networked secondary portion of a utility's grid, we direct PG&E, SDG&E and SCE to provide information indicating where the networked secondary portions are located. This information shall be provided on each utility's website no later than 30 days from the issuance of this decision. If the Commission determines the notification-only approach should be adopted on a permanent basis, PG&E, SDG&E, and SCE would then be required to update their Rule 21 Tariff to include a link to the maps.

Fifth, eligible projects shall only be operated in a manner that does not increase a customer's monthly peak load. We recognize this is a contractual agreement between the customer and a utility. As such, as part of the audit process described below, a utility has the discretion to audit a customer's records to ensure this stipulation is being observed. We adopt this requirement to resolve the concern by PG&E that the impact of additional loading due to an energy storage system grid charging on the transformer could create the need for additional study in the current Interconnection application approach.<sup>42</sup>

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<sup>40</sup> *Id.* at 3.

<sup>41</sup> CESA Reply Comments on Proposed Decision, May 3, 2021 at 4-5.

<sup>42</sup> PG&E Opening Comments, December 18, 2020 at 25.

Sixth, eligible projects must use inverters pre-approved by the utility. We agree with SCE that this will ensure that non-certified inverters do not connect to the grid and potentially cause a safety concern.<sup>43</sup> CALSSA and CESA argue that pre-approval by the utility is not necessary when leveraging certified equipment on another entities' list. Utilities are ultimately responsible to make sure the equipment utilized operates in a safe manner and, therefore, should not rely on another entities' list. Hence, utilities' interconnection portals should be updated to provide this information. Accordingly, no later than 15 days from the issuance of this decision, PG&E, SDG&E, and SCE shall update their interconnection portals to include a list of pre-approved inverters.

Seventh, eligible projects connected to a single phase transformer with 120/240V secondary voltage must be installed such that the aggregated gross output is as balanced as practicable. This will ensure passage of Screen E, as noted by SCE.<sup>44</sup>

Eighth, eligible projects shall only be installed by eligible developers, as described below.

### **3.3.2. Developer and Attestation Requirements of the Notification-Only Approach**

In order to be qualified as an eligible developer within a utility's service territory, developers must have successfully deployed at least 20 non-export projects, within that service territory, that meet the eligibility criteria for the notification-only process through the current interconnection application process. Here, deployment is defined as having received a Permission To Operate. We note that past projects that achieved non-export through means

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<sup>43</sup> SCE Opening Comments on Proposed Decision, April 27, 2021 at 3.

<sup>44</sup> *Id.* at 4.

other than the recently adopted PCS CRD (*e.g.*, non-export relay) shall be deemed eligible. Further, developers seeking eligibility must file an attestation with the utility stating i) they understand where the networked secondary portions of the utility's grid are located and ii) the developer will not use the notification-only process for projects deployed on the networked secondary portions of the utility's grid. The combination of developer attestation and the amount of required developer experience should protect against safety gaps.

In comments to the proposed decision, SCE recommends that details regarding the process for developer approval be set forth in utilities' tariffs and advice letters implementing the pilot program.<sup>45</sup> Because the Notification-Only Approach is in pilot phase at this time, utilities should not revise Rule 21 tariffs to include the Notification-Only Approach pilot. For purposes of the pilot phase of the Notification-Only Approach, no later than 15 days following the issuance of this decision, PG&E, SDG&E, and SCE shall each file a Tier 1 Advice Letter indicating where on the utility's website interested developers will find instructions regarding how to request eligibility for participating in the Notification Only Approach pilot. As provided above, the eligibility request contents are limited to the following: i) the developer's name and contact information; ii) a list of no less than 20 non-export projects in the utilities' service territory that received Permission To Operate and how each project meets each of the eligibility criteria for the notification-only process as required by this decision; and iii) the two attestations regarding the networked secondary portion of the grid, as described in this decision. PG&E, SDG&E, and SCE shall respond to a developer request no later than 10 business days after receiving the request.

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<sup>45</sup> SCE Opening Comments on Proposed Decision, April 27, 2021 at 6.

In comments to the proposed decision, SCE recommends application of the 20 project requirement should commence upon issuance of the decision.<sup>46</sup> Tesla opposes this requirement noting that SCE does not explain why projects that meet the requirements of the pilot but that were deployed prior to the effective date of the decision are less demonstrative.<sup>47</sup> Green Power Institute agrees with Tesla asserting that if a developer has successfully deployed 20 projects, that developer has demonstrated an understanding of the laws, regulations, rules, and processes necessary to safely deploy a system.<sup>48</sup> We agree with Tesla and Green Power Institute; otherwise, developers would have to wait for months or even years to be eligible to utilize the pilot. SCE's requirement would unnecessarily delay use of the pilot and we decline to adopt it.

### **3.3.3. Notification Package Requirements of the Notification-Only Approach**

Developers and customers shall submit the following documentation as part of the notification package to the utility. The Notification Package of the Notification-Only Approach Pilot shall be submitted no later than 15 business days after a project system passes final permit inspection, which will allow sufficient time to assemble the attestations while providing utilities timely notice.<sup>49</sup>

We find that submission of the following documents appropriately addresses safety concerns raised above by the utilities.

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<sup>46</sup> *Ibid.*

<sup>47</sup> Tesla Reply Comments on Proposed Decision, May 3, 2021 at 4.

<sup>48</sup> Green Power Institute Reply Comments on Proposed Decision, May 3, 2021 at 5.

<sup>49</sup> Tesla Opening Comments on Proposed Decision, April 27, 2021 at 6-7; CESA Opening Comments on Proposed Decision, April 27, 2021 at 6; SCE Reply Comments on Proposed Decision, May 3, 2021 at 7; and Green Power Institute Reply Comments on Proposed Decision, May 3, 2021 at 4.

- Interconnection Application Form, which provides project contact information and general project information including meter and account identification, all of which the Commission finds necessary and reasonable to provide;<sup>50</sup>
- Certificate of Insurance from the customer;<sup>51</sup>
- Authority Having Jurisdiction Electrical Release;
- Attestation from the developer that, if the system was deployed on 240V service, it was deployed across the entire 240V service;
- Attestation from the developer that, if the system is found to be noncompliant, they will work with the utility and customer to bring the system into compliance and to pursue reinstatement of its Permission To Operate via a standard interconnection process;
- Attestations from developer and customer recognizing and stating they understand the auditing process, including the possibility of auditing of the customer's records to ensure the system will not increase a customer's monthly peak load, and that if the secondary system voltage effects are significant and the smart inverter functions can address these effects, the utility may require the non-export storage system to make those changes in settings, and
- Attestation from developer and customer that the system meets each of the eligibility criteria.

For simplicity and streamlining purposes, the final attestation listed above should be a checklist of the items listed in section 3.3.1.

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<sup>50</sup> SCE recommends the notification package include a standard interconnection application and supporting information. SCE Opening Comments on Proposed Decision, April 27, 2021 at 3.

<sup>51</sup> SDG&E points out the Working Group 2 Report, which describes the Notification Worksheet template developed for the notification process adopted in D.19-03-013, states the notification-only package should include the certificate of insurance from the customer. SDG&E Opening Comments on Proposed Decision, April 27, 2021 at 3.



In comments to the proposed decision, CESA cautions the Commission that use of the Notification-Only Approach should not prevent projects from participating in the Self-Generation Incentive Program (SGIP). CESA explains that the SGIP process requires documentation of an express interconnection approval, which is not include in the Notification-Only Approach pilot.<sup>52</sup> CESA recommends the Commission proactively address this in the SGIP proceeding to ensure customers do not have to choose between the Notification-Only Approach and the SGIP. To alleviate this conflict, we confirm that PG&E, SDG&E and SCE shall issue documentation of Permission To Operate to qualifying projects upon receipt of the Notification Package. We clarify that the project may energize upon submission of the Notification Package. We adopt a modification of the SCE recommendation whereby utilities shall review the Notification Package for completeness and accuracy and identify projects that inadvertently did not follow the requirements of the Notification-Only Approach pilot or are ineligible for the Notification-Only Approach pilot. This review shall be completed within 15 business days of receipt of the Notification Package, at which point utilities shall notify developers of any missing requirements.<sup>53</sup> Developers shall work with utilities within five business days after notification to fix any issues. PG&E, SDG&E, and SCE may suspend a Permission To Operate if developer does not cure outstanding issues within the five business days or if there are safety and reliability issues identified.

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<sup>52</sup> CESA Opening Comments on Proposed Decision, April 27, 2021 at 5.

<sup>53</sup> SCE Reply Comments on Proposed Decision, May 3, 2021 at 4.

#### **3.3.4. Audit Requirements of the Notification-Only Approach**

As acknowledged by Tesla in its proposal, an important part of the interconnection process is ensuring that the system that is ultimately deployed and interconnected is, in fact, the same as the system that was described in the application. To address this concern, Tesla included an audit element in its proposal whereby up to five percent of the projects in the notification approach may be audited at the utility's discretion. We adopt this element of the Tesla Proposal but increase the number of projects audited to up to 20 percent of projects deployed. While the maximum level of audits may appear excessive, we underscore this is a pilot of an untested process. The Commission must balance interconnection safety with streamlining convenience. During the evaluation of the pilot, the Commission will review the experiences of utilities and developers and the outcomes of the audits to determine, at that time, whether to decrease the audit cap.

We note that where the 20 percent cannot be calculated, the utilities may round up (*e.g.*, if there are only two projects, the audit options are only zero, 50, or 100 percent – in such a case the utility may use 1 project to audit which is 50%). PG&E, SDG&E and SCE all express safety concerns with respect to the engineering aspects. Increasing the allowable audits from five to 20 percent of projects during the trial period will indicate to the utilities and the Commission whether the engineering studies that occur during the current Interconnection application process are necessary for this explicit subset of projects.

Should any of these projects be shown to violate the established criteria, the developer will be removed from the eligible list until they have: i) have successfully deployed an incremental 40 projects that meet the eligibility criteria

using the standard interconnection process and ii) explained to the utility how they intend to prevent any future violations. The utility may audit any other projects deployed via a notification-only process by that developer prior to their re-establishment of eligibility for the notification-only process. After the developer is reinstated on the eligible list, and should the developer be removed a second time, that developer will be permanently removed from the auditing Utility's eligible list and not be allowed to use the notification-only approach for the duration of this pilot. This provision is aimed to ensure that developers are cognizant of the projects they oversee. Moreover, any projects that are found noncompliant will automatically have the Permission To Operate revoked and will be required to request a new Permission To Operate through the current interconnection application process.

In comments to the proposed decision, SCE recommends the Commission require developers respond to an audit request within 10 business days and have certified personnel on site during the audit.<sup>54</sup> CALSSA argues these requirements are excessive.<sup>55</sup> While there is no consensus on the time to comply with the utility audit, for the purposes of the pilot stage, we establish a timeline of 20 business days. We agree with SCE, the developer is responsible for informing the customer of the impending system audit and should have certified personnel on site.<sup>56</sup> If the developer is not able to demonstrate what is required, it will lead to automatic revocation of the Permission To Operate and require the developer to re-apply for interconnection through the current interconnection application process.

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<sup>54</sup> SCE Opening Comments on Proposed Decision, April 27, 2021 at 7.

<sup>55</sup> CALSSA Reply Comments on Proposed Decision, May 3, 2021 at 3.

<sup>56</sup> SCE Opening Comments on Proposed Decision, April 27, 2021 at 7.

CESA and Green Power Institute request the Commission require the utilities to disclose what the audit would entail, contending a burdensome audit could undermine the Notification-Only Approach pilot.<sup>57</sup> In order to provide transparency to developers, PG&E, SDG&E and SCE are directed to propose details on audits in a Tier 2 Advice Letter to be submitted no later than 30 days from the issuance of this decision. A Tier 2 advice letter will allow for stakeholder involvement and feedback. We underscore that requirements adopted in this decision will not be relitigated in the advice letter process. Furthermore, until the Commission determines that the pilot data indicates functional testing is necessary, audits conducted in the pilot shall be restricted to review of generating facility equipment, control modes, and equipment settings for compliance with the eligibility requirements. However, nothing in this decision will impinge on the utilities' responsibility to maintain a safe and reliable electric grid. The audit process will be reviewed during the evaluation stage of the Notification-Only Approach pilot.

### **3.3.5. Data Collection for Continuation of the Notification-Only Approach**

We recognize that additional data is needed on what, if any, the aggregate impacts are of small, non-export systems on the grid. Accordingly, we adopt the notification-only approach, as described herein, on a pilot basis for a period of two years, beginning 45 days from the issuance of this decision. As described below, we establish a process to determine the data that should be collected during this time, which shall include cost data on implementing and administering the Notification-Only Approach pilot. PG&E, SDG&E and SCE

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<sup>57</sup> CESA Reply Comments on Proposed Decision, May 3, 2021 at 4 and Green Power Institute Reply Comments on Proposed Decision, May 3, 2021 at 2.

shall jointly provide the data results. As described below, the data will assist the Commission in evaluating the notification-only pilot.

PG&E and SCE assert the Commission has no data regarding the cumulative distribution system and substation capacity impacts that can result from multiple 30 kilowatt (kW) projects being added to the grid.<sup>58</sup> Tesla argues there is no risk, contending the utilities' assertions of aggregate impacts and grid saturation are nothing more than theoretical. While we find current circumstances warrant moving forward with the notification-only approach on a trial basis, we cannot turn a blind eye to these assertions. Hence, we direct the three utilities to host a workshop, no later than 30 days from the issuance of this decision, to garner recommendations on the data to be collected, as follows: to measure the impacts from the notification approach; to ascertain whether the safety measures we put in place are accurate and remain necessary; and to establish an interconnection fee for the notification-only approach that is commensurate with the costs to administer the approach. No later than 90 days from the issuance of this decision and with input from the Commission Energy Division, the three utilities shall jointly submit a Tier 1 Advice Letter indicating to the Commission the data they will collect and the method they propose to study the notification-only approach. The Tier 1 Advice Letter shall include discussion of the workshop and party positions.

Twenty months following the implementation date of the notification process, PG&E, SDG&E and SCE shall jointly submit a Tier 3 Advice Letter providing the first 18 months of pilot data and – based on the data – requesting to continue the notification-only approach as is, continue with modifications, or

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<sup>58</sup> PG&E Opening Comments, December 18, 2020 at 28 and SCE Opening Comments, December 18, 2020 at 24.

discontinue the notification-only approach. The Advice Letter shall also contain a proposal for a notification-only approach application fee to cover the costs of administering the approach post-pilot phase and taking into consideration the tasks utilities no longer perform. No later than 30 days prior to filing the Advice Letter, PG&E, SDG&E and SCE shall host a workshop in this proceeding to share and receive feedback on the contents of the draft advice letter. The purpose of the workshop is to ensure the required Tier 2 Advice Letter contains sufficient information, when submitted.

### **3.3.6. Implementation of the Notification-Only Approach Pilot**

D.19-03-013 directed PG&E, SDG&E, and SCE to begin to develop a utility notification process for interconnection related issues.<sup>59</sup> The three utilities shall extend this process to include the capability for customers and developers to file notification and proper documentation for projects applicable to the notification-only approach pilot adopted in this decision. The utilities shall complete this implementation no later than 45 days from the issuance of this decision. Accordingly, the notification-only approach shall be available to customers and developers on a pilot basis, no later than 45 days from the issuance of this decision.

## **4. Issue 13: Distribution Upgrade Cost Sharing**

This decision finds insufficient evidence to revise the current policy and process regarding distribution upgrade costs. Given the disparity between customers paying for distribution upgrades and customers of subsequent projects benefiting from the upgrades, we find value in continuing an exploration of the issue. Because of the unclear costs and benefits in the current

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<sup>59</sup> D.19-03-013 at Ordering Paragraph 7.

distribution upgrade process, however, we find it necessary to first address related issues. Most importantly, PG&E, SDG&E, and SCE are directed to perform a study on the costs of upgrades related to both net energy metering projects and non-net energy metering projects and file the data in this proceeding, or its successor, no later than 90 days from the issuance of this decision. Below, we provide background information, overview of party responses, and a discussion of the resolution of Issue 13.

#### **4.1. Issue 13 Background and Overview of Party Responses**

Parties were asked to respond to the question of Issue 13, which asks whether the Commission should adopt a process for distribution upgrade cost sharing among developers and, if so, what the process should be. In addition, parties were asked to provide a recommendation addressing any impacts of a distribution upgrade cost sharing approach on the implementation of other issues considered by Working Group 4.

IREC explains that the current cost-causation rule holds the customer who first triggers the need for an upgrade responsible for the entire cost of that upgrade, regardless of whether earlier generators contributed to the need for the upgrade, or the benefits that later-queued generators, or even ratepayers, may receive after the upgrade is complete.<sup>60</sup> IREC supports alternatives to the current process, including cost sharing. CALSSA also supports creation of a cost sharing option and presents a general proposal for a Shared Utility Reimbursement approach.<sup>61</sup> Tesla provides several proposals for a cost sharing program but supports a Pre-Emptive Upgrade Program, as it most directly and completely

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<sup>60</sup> IREC Opening Comments, December 18, 2020 at 9-10.

<sup>61</sup> CALSSA Opening Comments, December 18, 2020 at 12-13.

addresses the challenges the current framework presents to developers.<sup>62</sup> While it has no specific proposal, CESA also supports cost sharing and recommends utilities proactively evaluate the need for distribution upgrades and have developers pay their pro rata share when utilizing the upgraded capacity and investments.<sup>63</sup> Green Power Institute offers recommendations for how a proposal can be developed and includes a New York example.<sup>64</sup>

PG&E recommends the Commission maintain the current cost causation principle, contending developers installing generating resources that create distribution upgrades should be responsible for the cost associated with upgrades that solely benefit the applicant.<sup>65</sup> Referencing D.02-03-057, which exempts net energy metering projects less than 1 megawatt (MW) from costs associated with those upgrades, PG&E submits it would like to study the amount of cost shift to customers, who otherwise have not benefited from such upgrades.<sup>66</sup> SCE and SDG&E support continuation of current Rule 21 requirements, maintaining the existing tariff provides for a distribution group study process based upon specific criteria and that any expansion of or deviation from the existing process warrants further discussion and review.<sup>67</sup>

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<sup>62</sup> Tesla Opening Comments, December 18, 2020 at 10-13.

<sup>63</sup> CESA Opening Comments, December 18, 2020 at 6.

<sup>64</sup> Green Power Institute Opening Comments, December 18, 2020 at 5-7.

<sup>65</sup> PG&E Opening Comments, December 18, 2020 at 29.

<sup>66</sup> *Id.* at 29-30.

<sup>67</sup> SCE Opening Comments, December 18, 2020 at 27 and SDG&E Opening Comments, December 18, 2020 at 6-7.



#### **4.2. Resolution of Issue 13: Continuation of Current Cost Approach in Addition to Further Study**

Tesla contends the current distribution upgrades cost approach places unfair and undue burdens on individual projects given that subsequent projects benefit from these upgrades. CESA submits there are opportunities to proactively evaluate the need for distribution upgrades that can be pursued by the utilities with developers – who benefit from the upgrades--paying their pro rata share when using the upgraded distribution capacity and investments.<sup>68</sup> There is support, among some stakeholders, for the creation of an alternate cost-sharing mechanism but a formal proposal is not contained in the record. The Utilities underscore this lack of specifics.

SCE and SDG&E assert a distribution cost-sharing process already exists under Rule 21.<sup>69</sup> SCE submits any revisions must account for the fact that both Commission and FERC-jurisdictional projects interconnect to the distribution system.<sup>70</sup> SDG&E notes that no detailed proposals were offered in response to this issue.<sup>71</sup> PG&E, however, supports investigating cost sharing methods to the extent such costs are not shared by non-participants who would not benefit from such upgrades.<sup>72</sup>

Relatedly, PG&E points to D.02-03-057, which exempts net energy metering projects less than 1MW in size from paying for distribution upgrades it triggers, whether or not those upgrades benefit other customers. PG&E requests

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<sup>68</sup> CESA Opening Comments, December 18, 2020 at 6.

<sup>69</sup> SCE Opening Comments, December 18, 2020 at 27 and SDG&E Opening Comments, December 18, 2020 at 6-7.

<sup>70</sup> SCE Opening Comments, December 18, 2020 at 27.

<sup>71</sup> SDG&E Opening Comments, December 18, 2020 at 6-7.

<sup>72</sup> PG&E Opening Comments, December 18, 2020 at 29.

authorization to study the amount of cost shift, occurring with this exemption, to customers who have not benefitted from such upgrades.

This decision finds that the record does not provide for adoption of changes to the current cost-sharing process. Several parties present ideas but not full proposals. However, we recognize the possible existence of inequity in the current construct where individual projects are required to shoulder the costs of distribution upgrades even when subsequent projects benefit from the upgrades. We agree that cost sharing methods should be further investigated and have included this issue in the scope of Phase II of the proceeding. We further agree that future cost sharing methods should ensure costs are not shared by non-participants who do not benefit from such upgrades.

However, we also are concerned about the alleged cost shifts to customers due to the distribution upgrade exemption adopted in D.02-03-057. D.02-03-057 concluded that Public Utilities Code Section 2827(d) exempts generators eligible for net energy metering from paying for costs associated with interconnection studies, distribution system modifications, or application review fees but also recognized that this could result in a real (but undetermined) cost to ratepayers.<sup>73</sup> Consequently, the Commission directed PG&E, SDG&E, and SCE to track the costs associated with all interconnections and distinguish between i) projects under 10 kW and those between 10 kW to 1 MW, and ii) projects eligible for net energy metering and those not, in order to determine whether significantly different costs are incurred based on project size.<sup>74</sup> In comments to the proposed decision, PG&E reported that it no longer tracks this data due to the closing of

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<sup>73</sup> D.02-03-057 at Conclusion of Law 2 and Conclusion of Law 4.

<sup>74</sup> *Id.* at Ordering Paragraph 5.

the Net Energy Metering Memorandum Account.<sup>75</sup> PG&E supports the continued collection of this data, but contends it will take an additional three months to review all jobs that installed facilities for applicants that qualified for the provisions of D.02-03-057.

We find it reasonable to authorize PG&E, SDG&E, and SCE to further study this data. PG&E, SDG&E and SCE shall report the impact on non-net energy metering customers with respect to the costs shift of upgrades related to net energy metering projects, where the upgrades have not benefitted other interconnection customers or ratepayers. The utilities shall also study the impact of upgrades paid by non-net energy metering customers where the upgrades provided a benefit to others. In comments to the proposed decision, SDG&E noted that grid upgrades made by Utilities on behalf of ratepayers for existing grid planning purposes (*e.g.*, upgraded capacity, voltage support, etc.) can subsequently benefit private generator entities. SDG&E asserted this “unfairly places the burden of grid upgrades on ratepayers after benefits are received by private generation entities.”<sup>76</sup> We agree with SDG&E; the Commission should analyze the cost of grid upgrades borne by ratepayers benefiting subsequent generation customers. PG&E, SDG&E, and SCE shall file the results of these studies with the FERC-jurisdictional related information, as described below.

With respect to SCE’s concern regarding revisions to the current cost-sharing process and the potential impact to FERC-jurisdictional projects, we direct the Interconnection Discussion Forum to address this topic, no later than 120 days after the issuance of this decision. A report of the discussion and any

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<sup>75</sup> PG&E Opening Comments on Proposed Decision, April 27, 2021 at 5-6.

<sup>76</sup> SDG&E Opening Comments on Proposed Decision, April 27, 2021 at 3.

resolution shall be filed in this proceeding, along with the alleged cost shifts of grid upgrades discussed above, no later than 30 days after the discussion occurs. A workshop to discuss these reports shall be hosted by Utilities no later than 30 days after the filing of the reports.

Until these two sub-issues (cost shifts and impacts to FERC-jurisdictional projects) are addressed, the Commission cannot entertain proposals for revisions to the distribution cost-sharing process. While this decision closes Phase I of this rulemaking, we allow for continued discussion of revisions to the distribution upgrades cost-sharing process and will provide future instruction for the review of proposals for such revisions in Phase II, after further discussion of cost shift and FERC-jurisdictional aspects of the issue.

## **5. Working Group Four Issues**

Section five of this decision address the four issues assigned to Working Group Four: Issue 18, which addresses islanding concerns; Issue 19, which addresses streamlined interconnection for zero net energy projects; Issue 29, which considers a venue for addressing safety and environmental concerns; and Issue F, which considers interconnection rules for DERMS and resource aggregators. We discuss each of these four issues separately below.

### **5.1. Issue 18: Islanding Concerns**

We adopt several proposals to address islanding concerns from the interconnection of distributed energy resources. The adopted proposals include requiring protective equipment for machine generators, allowing customers to conduct independent unintentional islanding studies, establishing a working group to study unintentional islanding formation concerns, creation of new PG&E anti-islanding screens, and development of a guidebook on anti-islanding options. Below we provide an explanation of anti-islanding, the concerns Issue

18 looks to resolve, a brief description of each proposal, and a discussion of the resolution of Issue 18.

#### **5.1.1. Issue 18: Background and Overview**

Issue 18 involves the anti-islanding screen in the current Interconnection application process. Issue 18 asks whether the anti-islanding screen parameters should be revised to reflect research on islanding risks when UL 1741-certified inverters are used and thus avoid unnecessary mitigations. Below, we present an overview of the technical background, as provided in the Report.<sup>77</sup>

Islanding occurs when a portion of the distribution grid remains energized during a fault occurrence on the distribution system, which causes protection equipment to disconnect that section of the grid from the rest of the grid. While intentional islanding is a beneficial aspect in many applications, such as microgrids, here we consider islanding in an unintended context. Unintentional islanding is an unplanned island that persists for a time period of more than two seconds. Unintentional islanding can result in safety hazards, transient voltages and frequencies to customer equipment, or subsequent uncleared or delayed clearing faults. When a fault occurs on the distribution system, any distributed energy resources connected to the system must de-energize within two seconds to prevent unintentional islanding and the resulting negative impacts listed above.

The Report explains that while inverter-based distributed generators normally can avoid islanding through voltage sag detection during fault conditions, certain transmission line and substation transformer faults may prevent the voltage reduction required. Because of this, inverters are required to

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<sup>77</sup> Report at 14-22.

have islanding protection beyond voltage sag detection, including UL 1741 inverters. However, the Report highlights two concerns about the performance of these inverters, with respect to anti-islanding. First, inverters with different methods of anti-islanding protection may negatively interact with each other, compromising the anti-islanding effectiveness. Second, research has shown that inverter anti-islanding protection can fail when in proximity to large non-inverter-based machine generators; during high power factor; when there is a high level of generation compared to load; or when load closely matches generation. The Report underscores controversy surrounding interpretation of this lab-based research, noting the “chances are so small that all of the factors considered in the report ever align in real-world conditions.”<sup>78</sup>

PG&E, SDG&E, and SCE assess and manage the potential risks of unintentional islanding differently due to differences in the utilities’ system topographies. PG&E conducts additional screening of distributed energy resources and, when resources fail those screens, requires either reclosers<sup>79</sup> on machine generators or Direct Transfer Trip (DTT) equipment,<sup>80</sup> both of which involve lengthy timelines and add significant costs to interconnection.<sup>81</sup> Further, Bioenergy Association of California contends the costs of DTT also have negative impacts on Bioenergy Machine Generator Projects.<sup>82</sup> With respect to SDG&E’s systems, SDG&E does not utilize nor does it propose to develop an anti-islanding screen.

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<sup>78</sup> *Id.* at 17 describing two studies by Sandia National Lab that model how inverters would respond to certain grid conditions.

<sup>79</sup> Reclosers act like a circuit breaker to deenergize a resource when a fault occurs.

<sup>80</sup> DTT uses a communication link to trip the feeder breaker at the substation to isolate the generation from the substation and transmission system. (Report at 15-16.)

<sup>81</sup> Report at 16-17.

<sup>82</sup> *Id.* at 21-22.

Additionally, SDG&E requires inverters to be certified to UL 1741/UL 1741SA. In the case of SCE's systems, SCE also requires inverters to be certified to the most current approved testing standards and requires project-specific protections for non-inverter-based technology to protect against islanding but does not require DTT.

The Report asserts that further efforts are needed to explore ways to resolve concerns about unintentional island formation in efficient and effective manners.

#### **5.1.2. Issue 18: Proposal 18a**

Proposal 18a would require machine generators larger than 40 kW requesting interconnection to install a recloser or other protective equipment of similar function and cost if the utility determines that risk of unintentional islanding is a present concern, or it is reasonably anticipated that risk of unintentional islanding is likely to be a concern in the near future. In the case of the present concern, the cost of the protective equipment will be covered by the customer but in the case of a future concern, the cost will be covered by ratepayers. If supplemental review determines the proposed generator fails the anti-islanding screen due to existing machine generation, the utility will initiate installation of the required recloser and the protective equipment costs will be covered by ratepayers. CALSSA initiated this proposal, and it is supported by BAC, Foundation Windpower, IREC, SBUA, Tesla, and PG&E. While no party opposes this proposal, the proposal is not applicable to SCE or SDG&E because they do not perform enhanced anti-islanding screening based on the Sandia studies referenced in the proposal.

### **5.1.3. Issue 18: Proposal 18b**

Proposal 18b would require use of an hourly load profile in the generation-to-load calculation and use of 288-hour time periods for the generation profile. Further, Proposal 18b would require the utilities to determine that a project exceeds the screen threshold if the ratio of total generation to load exceeds 50 percent during the 288 hours. Applications for systems greater than 30 kW would be required to submit an hourly generation profile. CALSSA initiated this proposal, and it is supported by Clean Coalition, IREC, SBUA, and Tesla but opposed by PG&E. The proposal is not applicable to SCE or SDG&E because they do not perform enhanced anti-islanding screening based on the Sandia studies referenced in the proposal.

### **5.1.4. Issue 18: Proposal 18c**

Proposal 18c would provide interconnection customers with the option to hire an independent analyst to perform a risk of unintentional islanding study, if the utility determines anti-islanding mitigation may be required. The Report underscores the study should include the elements described in Annex 2 of the Report, which is attached to this decision as Appendix C.<sup>83</sup> CALSSA initiated this proposal, and it is supported by BAC, Clean Coalition, Green Power Institute, IREC, SBUA, Tesla and PG&E. The proposal is not applicable to SCE or SDG&E because they do not perform enhanced anti-islanding screening based on the Sandia studies referenced in the proposal.

### **5.1.5. Issue 18: Proposal 18d**

Proposal 18d recommends the Commission organize an Unintentional Islanding Working Group to explore distribution-system-level solutions to anti-islanding. The working group would be tasked with evaluating solutions

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<sup>83</sup> CALSSA Opening Comments on Proposed Decision, April 27, 2021 at 3.



and recommending next steps in the continuance of islanding (and anti-islanding) research and development at the distribution and transmission system levels. IREC initiated this proposal, and it is supported by BAC, CALSSA, Clean Coalition, SBUA, Tesla, PG&E and SDG&E. No party opposes this proposal.

**5.1.6. Issue 18: Proposal 18e**

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

Additionally, Proposal 18e would require that utilities performing enhanced anti-islanding screening host two workshops with inverter manufacturers and other stakeholders to: i) consider changes to the definition of preferred anti-islanding methods and ii) consider whether the threshold in Screen 5 should be increased from 70 to 100 percent or some value in between. Proposal 18e would require these workshops to be held no later than two years following the issuance of the Report.

PG&E initiated this proposal, and it is supported by BAC, CALSSA, Clean Coalition, IREC, SBUA, and Tesla. The proposal is not applicable to SCE or SDG&E because they do not perform enhanced anti-islanding screen based on the Sandia studies referenced in the proposal.

**5.1.7. Issue 18: Proposal 18f**

Proposal 18f recommends the development of a guide to provide anti-islanding options with clearly identifiable costs and the circumstances requiring the options. BAC initiated the proposal, and it is supported by Green Power Institute, SBUA, and PG&E. The proposal is opposed by SCE and SDG&E.

**5.1.8. Issue 18: Proposal 18g**

Proposal 18g would require the utilities to continue to assess and offer new or alternative least-cost anti-islanding solutions that meet each utility's anti-islanding requirements. The proposal would also require the utilities to evaluate new technologies, as they are developed, and attempt to choose the lowest cost option that also meets anti-islanding requirements. BAC initiated this proposal, and it is supported by Clean Coalition, Green Power Institute, and SBUA. All three utilities oppose Proposal 18g.

**5.1.9. Issue 18: Proposal 18h**

Proposal 18h would require the establishment of a timeline to conduct Risk of Islanding studies and determine anti-islanding requirements. BAC initiated Proposal 18h, which is supported by Green Power Institute and SBUA but opposed by the utilities.

**5.1.10. Issue 18: Proposal 18i**

Proposal 18i recommends the Commission and California Energy Commission support use of Electric Program Investment Charge funding to identify and demonstrate additional and less expensive options for anti-islanding, develop an Interconnection Guide, and demonstrate technologies that provide anti-islanding and islanding (microgrid) solutions. BAC initiated Proposal 18i, which is supported by Clean Coalition, Green Power Institute, SBUA, and PG&E. SCE and SDG&E oppose Proposal 18i.

#### **5.1.11. Resolution of Issue 18**

We address each of the proposals below, individually, beginning with those where consensus was reached and followed by those proposals where parties disagreed.

Participants of Working Group Four succeeded in developing consensus in four proposals: 18a, 18c, 18d, and 18e. To be clear, the consensus reached in Proposals 18a, 18c and 18e does not include SDG&E and SCE, because these proposals are not applicable to the two utilities given the configurations of their transmission and distribution systems. We find each of these consensus proposals reasonably address utility concerns regarding islanding risks.

We find Proposal 18a would protect UL 1741 tested inverter-based generation from bearing costs of anti-islanding risks created by rotating machines, which are not required to have UL 1741 active anti-islanding protections.<sup>84</sup> Instead machine generators will be responsible for mitigation costs at interconnection. We agree that ratepayer cost impacts should be minimal because increased interconnection of Rule 21 certified distributed energy resources will reduce the need for protective equipment on future installations.<sup>85</sup> However, while we do not anticipate any significant utility costs in the implementation of Proposal 18a, we agree with Public Advocates Office that PG&E should record those costs and report on them every three years.<sup>86</sup> Proposal 18a should be adopted. Proposal 18a should not apply to existing rotating machine projects already interconnected or on the interconnection queue as of the date of the issuance of this decision.

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<sup>84</sup> *Id.* at 23.

<sup>85</sup> PG&E Opening Comments, December 18, 2020 at 7.

<sup>86</sup> Public Advocates Office Reply Comments, January 8, 2020 at 2.

We now turn to Proposal 18c, which is also a consensus proposal and solely applicable to PG&E. In the current process, a utility conducts a System Impact Study where the Islanding Screen determines if mitigations are required. Following the results of the System Impact Study, the customer would either agree to the mitigations and enter into an Interconnection Agreement or proceed to a Facilities Study for further study.<sup>87</sup> Proposal 18c allows for an independent analysis of the risk of unintentional islanding and, if unintentional islanding is found to be likely, allows for studying alternative methods to DTT and reclosers. The Report explains that the current anti-islanding screen is not always accurate and can sometime result in unnecessary mitigations, and therefore unnecessary costs.

Asserting the independent study allowed in Proposal 18c is not only more accurate than PG&E's anti-islanding screen, the Report also contends Proposal 18c could save 20 business days in study time.<sup>88</sup> As noted in the Report, a facilities study can take up to 60 business days to complete, whereas the proposal provides a 40-day time limit for the independent study.<sup>89</sup> The Report states that "without a timeline, projects could stay within the study phase indefinitely, causing later queued projects to fail Screen R and be forced into the Distribution Group Study Process."<sup>90</sup> However, the Report does not indicate what would happen if the 40-day time limit for the independent study is exceeded. In comments to the proposed decision, PG&E requests the System Impact Study's mitigations be put in place rather than allowing for a utility study that would add 60 days to the

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<sup>87</sup> Report at 26.

<sup>88</sup> *Ibid.*

<sup>89</sup> *Id.* at 25-26.

<sup>90</sup> *Id.* at 26.

timeline, as recommended in the proposed decision.<sup>91</sup> Asserting no safety concern, Green Power Institute contends there is no reason to require potentially costly mitigation measures because the study takes longer than 40 days.<sup>92</sup> Because our purpose here is to limit the amount of time spent in study, we will allow for an extension of the 40 business day timeline for the independent study, upon mutual agreement between the utility and customer. However, if the independent evaluator's study is not able to meet the deadline and the utility and customer cannot agree upon an extension, mitigations required by the System Impact Study shall be used.

We find Proposal 18c would provide a streamlined third-party option for customers when anti-islanding mitigation is required by the utility. Proposal 18c could also result in savings of both time and expenses for the customer, while providing assurance to PG&E with respect to islanding and anti-islanding protections. The 40-day time limit for the independent study ensures continuation of the interconnection process for the utility. Proposal 18c should be adopted, along with the contents of Annex 2 (Appendix C of this decision).

Proposal 18d would establish a working group to collaboratively explore, evaluate, and recommend distribution-system-level solutions to anti-islanding. Again, Proposal 18d is a consensus proposal. The Report explains that it is challenging to adopt system-level architectures to mitigate islanding, through individual Rule 21 applications, that would benefit all distributed energy resources now and into the future.<sup>93</sup> However, the Report asserts that some islanding solutions could benefit non-distributed energy resources ratepayers or

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<sup>91</sup> PG&E Opening Comments on Proposed Decision, April 27, 2021 at 3.

<sup>92</sup> Green Power Institute Reply Comments on Proposed Decision, May 3, 2021 at 4.

<sup>93</sup> Report at 29.

grid reliability in general.<sup>94</sup> The Report concludes that as the combination of generator types and technologies grow on the distribution system, mitigating islanding risk on a project-by project basis may be inefficient and ineffective.<sup>95</sup> We find that unintentional islanding should be considered a distribution system issue, which could allow for mitigation solutions beyond individual projects and pockets. We find Proposal 18d, which establishes a working group to study islanding research and development of solutions, to be a forward-looking solution to addressing islanding concerns. The Commission should adopt Proposal 18d.

Accordingly, this decision establishes the Unintentional Islanding Working Group to review, discuss, evaluate, and recommend distribution system level solutions to island formation arising from increased distributed energy resources penetration. Energy Division is authorized to commence and facilitate an Unintentional Islanding Working Group no later than 180 days from the issuance of this decision. This timeline allows the adopted proposals related to unintentional islanding to be implemented. The announcement of the commencement of this group should be noticed on the service lists for the Microgrid Rulemaking (R.19-09-009), the Distribution Resources Plans proceeding (R.14-08-013) and the Integrated distributed energy resources proceeding (R.14-10-003) along with this proceeding. Representatives of PG&E, SDG&E, and SCE shall participate in the monthly working group, along with parties and interested stakeholders. The working group is instructed to discuss and develop solutions to the list of questions contained in the Report, a copy of

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<sup>94</sup> *Ibid.*

<sup>95</sup> *Id.* at 31.

which is provided in Appendix B of this decision. The working group shall file a final report, not later than two years from the commencement date of the working group.

As discussed in the Report and in party comments, outside experts should be invited to participate in the Unintentional Islanding Working Group.<sup>96</sup> Hence, PG&E, SDG&E, and SCE are directed to contact the National Renewable Energy Laboratory, Electric Power Research Institute, and Sandia National Labs, as well as organizations where potential expertise could be available, and invite their participation in this working group.<sup>97</sup> Utilities shall initiate contact with these organizations, either via phone or email, within 30 days from the issuance of this decision. Initiating this contact five months before the commencement of the working group should allow Utilities to determine who from these organizations would provide the working group with the expertise needed to develop appropriate report recommendations to the Commission.

Proposal 18e, the remaining consensus proposal for Issue 18, would require PG&E to adopt new anti-islanding screens. Again, due to system configurations, this proposal does not apply to SDG&E or SCE. We find Proposal 18e to be a reasonable step forward to ensure grid safety and reliability, consistent with other proposals for Issue 18, especially as distributed energy resources penetration increases. Furthermore, we note PG&E's response to Green Power Institute that the lack of islanding events corresponds with the

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<sup>96</sup> *Id.* at 32 and 33, PG&E Opening Comments, December 18, 2020 at 11, SDG&E Opening Comments, December 18, 2020 at 12, and SCE Opening Comments, December 18, 2020 at 8.

<sup>97</sup> PG&E Opening Comments, December 18, 2020 at 11, SDG&E Opening Comments, December 18, 2020 at 12, and SCE Opening Comments, December 18, 2020 at 8.

success of existing PG&E unintended islanding methods.<sup>98</sup> While the adoption of Proposal 18d – establishing an Unintentional Islanding Working Group – is a step in the right direction, we agree with PG&E that the working group could take years to determine a screening process. Adoption of Proposal 18e at this time is a prudent step to ensure unintended islanding is not an issue while further research is being performed.

CALSSA asserts the details of the Proposal 18e are crucial to its success and asks the Commission to ensure the details are contained in the decision.<sup>99</sup> Green Power Institute supports the additional elements.<sup>100</sup> We agree.

Proposal 18e and the new anti-islanding flow chart and Screens in Appendix D should be adopted. As part of Proposal 18e, PG&E shall host a workshop, no later than August 12, 2022, to discuss the definition of preferred anti-islanding methods and whether the threshold in Screen 5 of Appendix D should be increased from 70 percent.

We now move to a discussion of Issue 18 proposals where consensus was not reached: Proposal 18b, 18f, 18g, 18h, and 18i.

Proposal 18b would change the generation-to-load calculation to reflect solar power generation variation over the course of the year without changing the ratio thresholds in the two criteria in the current PG&E screen. We note this proposal only applies to PG&E but is opposed by PG&E. Proponents contend PG&E's current calculation of generation-to-load may not be reflective of all months of the year, particularly for solar generation. PG&E submits the proposal would require the use of hourly load and generation data in place of minimum

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<sup>98</sup> Report at 40.

<sup>99</sup> CALSSA Opening Comments on Proposed Decision, April 27, 2021 at 3-4.

<sup>100</sup> Green Power Institute Opening Comments on Proposed Decision, May 3, 2021 at 3-4.



load for the calendar year. PG&E argues, however, that there is no separate hourly load or generation data available. PG&E contends a method needs to be developed to derive this data.<sup>101</sup>

In response to the questions posed in the November 19, 2020 Ruling, PG&E states that a new method would cost in the range of \$500,000 and would take 18-24 months with extensive engineering effort to develop and test. PG&E cautions “we may spend valuable engineering time and effort in developing products that may not be very useful in the long term.” PG&E asserts that as more and more solar and storage connect to the grid, there will be less need for this new method “due to the increased generation resulting in a high failure rate of hourly generation to load ratio.”<sup>102</sup> PG&E explains the generation to load ratio alone does not determine if DTT is required. PG&E further argues that in lieu of Proposal 18b, Proposal 18e (which we adopt above) would reduce the number of DTTs needed.

We find the cost and time needed to develop Proposal 18b is not reasonable in the long run. We agree that increased penetration of solar with paired storage interconnection will reduce the value of Proposal 18b, given its anticipated costs and timeline. We further find that adoption of Proposal 18e, which decreases the need for DTT, makes Proposal 18b unnecessary. Accordingly, we should not adopt Proposal 18b.

Proposal 18f recommends the development of an interconnection guidebook on anti-islanding options. In reviewing the description of this proposal, its purpose is to provide guidance to developers to understand the

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<sup>101</sup> Report at 25.

<sup>102</sup> PG&E Opening Comments, December 18, 2020 at 8.

circumstances that would warrant DTT, and the steps necessary to avoid DTT. PG&E, supporting the proposal, explains the guide could be an informative annex to the distribution or transmission interconnection handbook, as appropriate.<sup>103</sup> As noted in the Report, developers should not have to guess what the potential requirements are.<sup>104</sup> Our objectives throughout this proceeding have been improving efficiency, transparency, certainty, and clarity.<sup>105</sup> We find this to be a reasonable proposal, as it could improve both transparency and clarity for developers in the PG&E service territory. However, we revise the proposal such that it is only applicable to PG&E because, unlike PG&E, neither SDG&E nor SCE perform anti-islanding screening based on Sandia studies.<sup>106</sup> Proposal 18f should be adopted with the modification that it is not applicable to SDG&E or SCE. No later than 90 days from the issuance of this decision, PG&E shall initiate discussion of this guide. One year from the issuance of this decision, PG&E shall submit a Tier 2 Advice Letter seeking approval of the guide, the request for approval shall describe stakeholder and Energy Division collaboration.

Proposal 18g recommends evaluation and adoption of least cost anti-islanding solutions. Proponents of this proposal contend that its purpose is to establish a policy to encourage utilities to continue to seek the lowest cost solutions to unintended islanding. According to the Report, the Governor's Tree Mortality Task Force reviewed seven separate BioMAT projects and found an

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<sup>103</sup> Report at 42.

<sup>104</sup> *Id.* at 40.

<sup>105</sup> D.20-09-035 at 2.

<sup>106</sup> Report at 41-42. See also SCE Opening Comments, December 18, 2020 at 12-13 and SDG&E Opening Comments, December 18, 2020 at 12-13.

average of \$1M in unnecessary or overly costly interconnection requirements, many related to anti-islanding measures. The Report contends this incident demonstrates it may be necessary for a secondary review to ensure only necessary costs are imposed on a project.<sup>107</sup> The Report asserts adoption of Proposal 18g “helps to underscore the need for continued diligence in providing least-cost solutions.”<sup>108</sup>

First, we find that SCE and SDG&E do not perform enhanced anti-islanding screening based on the Sandia studies or require DTT and therefore the proposal should not be applicable to them.<sup>109</sup>

With respect to the allegations that utilities do not provide least-cost solutions to developers, we highlight IREC’s statement that “there can be a considerable amount of nuance and disagreement when determining whether the least-cost solution is actually appropriate for the specific project location and grid characteristics.”<sup>110</sup> Safety concerns do not necessarily align with cost concerns; yet neither should be discounted. As noted by SDG&E in the Report, the current interconnection process provides ample opportunities for developers to discuss and, if necessary, dispute system study outcome recommendations.<sup>111</sup> We find the Rule 21, as revised in this decision, provides a platform where utilities’ safety concerns and developers’ cost concerns, with respect to anti-islanding mitigation, can be identified and brought closer to alignment. We find it unnecessary to adopt Proposal 18g.

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<sup>107</sup> Report at 42-43.

<sup>108</sup> *Ibid.*

<sup>109</sup> *Id.* at 43-44.

<sup>110</sup> *Id.* at 44-45.

<sup>111</sup> *Id.* at 44.

Proposal 18h would specify timelines for determining anti-islanding requirements. The Report contends certain projects have experienced a series of 5-day delays, which have led to significant time delays. The proposal initiator believes the timeline for Risk of Islanding and Interconnection studies should be shortened and delays allowed only when justified.<sup>112</sup> Several parties contend this proposal is unnecessary, as the problem is being addressed by other solutions. For example, IREC contends this issue is being addressed more comprehensively through adopted Issue 12 proposals.<sup>113</sup> Similarly, SCE points to Proposal 18d, previously adopted in this decision, which could lead to new timelines for studies.<sup>114</sup> We agree that the result Proposal 18h attempts to reach can be sought through other adopted proposals. Proposal 18h is unnecessary and should not be adopted.

Proposal 18i recommends the Commission and the California Energy Commission support the use of Electric Program Investment Charge (EPIC) for islanding prevention solution development. EPIC financially supports the development of new, emerging, and pre-commercialized clean energy technologies in California in three program areas: applied research and development, technology development and demonstration, and market facilitation. As explained by SCE, EPIC projects are reviewed, approved, and governed through a process external to this rulemaking.<sup>115</sup> The EPIC rulemaking (R.19-10-005) is currently considering ways the Commission should provide enhanced guidance on priorities within EPIC, and we decline to adopt detailed

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<sup>112</sup> *Id.* at 45.

<sup>113</sup> *Ibid.*

<sup>114</sup> *Id.* at 46.

<sup>115</sup> *Id.* at 47.

guidance on this specific issue separately here. We agree with SCE that it would be inappropriate to evaluate and prioritize projects, including anti-islanding projects, outside the established EPIC process.<sup>116</sup> Proposal 18i should not be adopted.

## **5.2. Issue 19: Streamlined Interconnection for Zero Net Energy Projects**

We revise the interconnection application process to allow applications based on street address rather than service account and to allow developers of multiple units the option to submit applications through one single application or through a batch process. These revisions will result in decreased overhead, improved efficiencies, and reduced timelines for zero net energy projects. Below, we provide a background of the anticipated increased interconnections of zero net energy projects in California, followed by a brief description of five proposals submitted by Working Group Four and a discussion of our determinations.

### **5.2.1. Issue 19: Background**

Issue 19 asks whether the Commission should adopt streamlined interconnection procedures to facilitate implementation of California zero net energy building codes and what those procedures would entail. A zero net energy building is defined as an energy-efficient building where the annual consumed energy is less than or equal to the renewable energy produced onsite.<sup>117</sup> The Report explains that the California Energy Commission's Title 24 requires solar energy systems on all new residential construction up to three stories, effective January 1, 2020.<sup>118</sup> Further, the 2008 California Long Term

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<sup>116</sup> *Ibid.*

<sup>117</sup> *Id.* at 49.

<sup>118</sup> *Id.* at 49 citing Title 24 webpage – <https://www.energy.ca.gov/programs-and-topics/programs/building-energy-efficiency-standards>.

Energy Efficiency Strategic Plan called for all new residential construction to be zero net energy by 2030, half of new major renovations of state buildings to be zero net energy by 2025, half of all commercial buildings to be retrofit to zero net energy by 2030, and all new commercial construction to be zero net energy starting in 2030.<sup>119</sup> The Report concludes that changes to Rule 21 should reflect these mandates. Hence, the proposals described below are intended to streamline the current procedures to facilitate implementation of Title 24 requirements. The Report points out that projects developed to meet zero net energy building codes are no different than any other interconnection projects with respect to the application process, engineering requirements, and evaluating potential grid impacts.

#### **5.2.2. Issue 19: Proposal 19a**

Proposal 19a, a consensus proposal, would enable residential home builders to submit an interconnection application based on a street address and without a meter number. It should be noted that SDG&E built their interconnection portal using account identification numbers but has also developed a reasonable way to get account numbers based on address; Proposal 19a would continue SDG&E's two-step process.

#### **5.2.3. Issue 19: Proposal 19b**

Proposal 19b would enable residential home development builders to submit applications for multiple units through a single submission or through a batch process. CALSSA initiated this proposal. Clean Coalition, Green Power Institute, SBUA, PG&E and SCE support this proposal. SDG&E opposes Proposal 19b.

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<sup>119</sup> *Id.* at 49 citing Commission webpage – <https://www.cpuc.ca.gov/General.aspx?id=4125>.

#### **5.2.4. Issue 19: Proposal 19c**

Proposal 19c, a consensus proposal, would require PG&E, SDG&E, and SCE to allow template single-line drawings for small solar and small solar paired storage in new zero net energy residential construction, as ordered in Rulemaking 19-09-009.

#### **5.2.5. Issue 19: Proposal 19d**

Proposal 19d would expand utility development of single-line diagrams, requiring PG&E, SDG&E, and SCE to publish standard proposed facility configuration designs and single line diagrams for use in new zero net energy residential construction interconnection applications. The proposal would require utilities to track zero net energy project applications. Following receipt of 50 applications within the previous year for a functionally equivalent zero net energy project, utilities would coordinate a stakeholder call to evaluate the need for a template single line diagram for the group of projects. If support is warranted, the utilities would develop the standard single line diagram template and publish within 120 days after the conclusion of stakeholder discussions. Proposal 19d was initiated by Clean Coalition and is supported by Green Power Institute and SBUA. PG&E, SDG&E and SCE oppose adoption of Proposal 19d.

#### **5.2.6. Issue 19: Proposal 19e**

Proposal 19e would require PG&E, SDG&E, and SCE to fully consider and provide responses on the degree to which residential and commercial zero net energy interconnection applications may enjoy the same or similar rapid processing benefits as net energy metering projects under 30 kW. Proposal 19e would also require the utilities to consider and provide responses on which of the expedited processing tools currently applicable to projects equal to or less than 30 kW could be extended to zero net energy projects over 30 kW. Green

Power Institute initiated this proposal. Proposal 19e is supported by Clean Coalition and SBUA but opposed by PG&E, SDG&E and SCE.

#### **5.2.7. Resolution of Issue 19**

Issue 19 asks whether the Commission should adopt streamlined interconnection procedures to facilitate implementation of California zero net energy building codes and what those procedures would entail. Participants proposed and discussed five proposals to address this issue. We consider each of the five Issue 19 proposals, individually, in terms of addressing the overall issue.

Proposal 19a would revise Rule 21 to allow customers building new homes to submit applications based on street address instead of service account or meter number. Proposal 19a proponents submit the proposal would establish more consistent and appropriate interconnection processing procedures for new zero net energy construction, by addressing aspects of the current interconnection process which do not make sense for new zero net energy interconnection projects. Proponents further contend a zero net energy homebuyer should not have to wait to submit an interconnection application until establishing a service account and highlights that houses under construction have neither meter numbers nor service account numbers.<sup>120</sup> We find that installing solar on new construction should be part of the overall construction schedule, which will improve efficiencies in interconnection – an objective of this proceeding.

PG&E supports development of Proposal 19a and has set aside funding for 2021 Information Technology work to enable customer ability to submit interconnection applications based on project address. SCE's interconnection

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<sup>120</sup> *Id.* at 50-51.



portal allows for submission of residential home builder's interconnection application based on a street address. SDG&E's interconnection portal is based on account numbers and/or meter numbers. However, SDG&E has developed a two-step procedure to eliminate the costly need to change its current portal. Hence, PG&E, SDG&E, and SCE have already taken steps to implement the change recommended in Proposal 19a.

We find that revising the Interconnection application such that the application can be based on street address will allow new zero net energy construction interconnection applications to move forward in a more expeditious fashion. Proposal 19a should be adopted with an implementation deadline of December 31, 2021, as proposed in the Report.<sup>121</sup>

Proposal 19b would enable customers or developers building new homes to submit applications for multiple units through one application or through a batch process. Proposal proponents contend this proposal will result in reduced administrative overhead, improved efficiencies, and improved information sharing for builders and utilities.<sup>122</sup> Proponents explain that, effective December 31, 2021, Title 24, Part 6 will require interconnection of multiple residential buildings in new subdivisions; thus, individual applications "hinder a utility's ability to plan for the entire community."<sup>123</sup> SCE and PG&E state they have or plan to implement processes for multiple application submissions and therefore, support this proposal.<sup>124</sup> However, SDG&E opposes the proposal and contends that the cost to modify its portal to allow for this revision would exceed

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<sup>121</sup> *Id.* at 51.

<sup>122</sup> *Id.* at 52-53.

<sup>123</sup> *Id.* at 53.

<sup>124</sup> *Id.* at 53-55.

the benefits. SDG&E explains that applications for new home construction projects made up two percent of total interconnection applications.<sup>125</sup> We find it valuable to adopt this proposal, given the anticipated increased impact of zero net energy policies on the home building industry. Further, enabling one single application or batched applications leads to improved efficiencies, one of the objectives in this proceeding. However, we also find it reasonable to exempt SDG&E at this time, given the minimal number of relevant applications it receives. SDG&E shall continue to monitor the number of home construction projects seeking interconnection and provide the data to Energy Division on an annual basis. If there is a significant increase, the Commission may revise this requirement to include SDG&E. Issue 19b should be adopted for PG&E and SCE only at this time, with an implementation deadline of December 31, 2021.

Proposal 19c would revise Rule 21 by allowing template single-line drawings for small solar and small solar-plus storage in new zero net energy residential construction. Rulemaking 19-09-009 considered and adopted the same proposal in D.20-06-007. In the Report, Tesla queries where, if any, incremental action is required by the Commission beyond the directives in D.20-06-007, implementing the same proposal as Proposal 19c.<sup>126</sup> We clarify that no further action is necessary as the resolution of Proposal 19c is moot.

Proposal 19d would build upon Proposal 19c, which does not address single line diagrams in a wide range of applications. D.20-06-017, which adopted a proposal akin to Proposal 19c, stated that single line diagrams for other projects would be addressed in subsequent tracks of the Microgrid proceeding.<sup>127</sup>

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<sup>125</sup> *Id.* at 54.

<sup>126</sup> *Id.* at 57.

<sup>127</sup> *Id.* at 58 citing D.20-06-017 at 24.

Proponents of Proposal 19d contend it is more comprehensive and more appropriate (*i.e.*, appropriately aligned with the technical requirements and assessment of customer interest across all zero net energy and related applications) to address the configurations and single line diagrams for zero net energy buildings in this proceeding. More specifically, Proposal 19d would create conditions where development of a single line diagram zero net energy standard template not covered by existing applicable templates would be triggered.

Utilities oppose Proposal 19d, contending it unnecessary for multiple reasons. First, SCE submits the requirement of D.20-06-017 to develop single line diagrams standard templates will address 80 percent or more of potential interconnection projects.<sup>128</sup> Clean Coalition notes this assertion could only be made if there is already awareness by the utilities of whether or not applications fit the defined categories. In addition, SCE states it supports development and publication of template single line diagrams but asserts the formal requirement may create increased work, in particular the proposal requirement to track the number of projects to get to 50.<sup>129</sup> Clean Coalition responds that the utilities most likely know whether an application represents a familiar configuration.<sup>130</sup> Further, maintaining there is no reason to create one template for zero net energy and another identical template for a non-zero net energy project, SDG&E contends a single line diagram for a zero net energy project is no different than any other similarly situated project.<sup>131</sup>

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<sup>128</sup> *Id.* at 62.

<sup>129</sup> *Ibid.*

<sup>130</sup> *Ibid.*

<sup>131</sup> *Ibid.*

We are not persuaded by the need, at this time, for Proposal 19d. We find that the single line diagrams required by D.20-06-017 should be the focus of efforts at this time, especially since these efforts would address nearly 80 percent of zero net energy projects. Furthermore, we agree with Tesla that efforts focused on zero net energy projects should not take priority over the broader effort to streamline the interconnection process. We conclude the Commission should not adopt Proposal 19d.

Proposal 19e recommends the utilities be required to consider expedited processing for zero net energy projects, similar to net energy metering projects under 30 kW. Proponents include what they consider to be the most promising near-term options of specific streamlining measures and explain how the options are applicable and specific to zero net energy project interconnection. Support for this proposal is mixed.

Green Power Institute argues the Commission included this issue to determine whether zero net energy-related mandates require additional interconnection streamlining to avoid interconnection becoming a major hurdle for those mandates.<sup>132</sup> SCE asserts that zero net energy projects are inherently no different electrically than other interconnection projects, noting that both types send electrical power to the grid and can create safety and reliability system concerns just like other generation projects.<sup>133</sup> We agree that zero net energy projects are no different from other interconnection projects. Green Power Institute further contends the purpose of this issue is to incentivize developers to

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<sup>132</sup> *Id.* at 73.

<sup>133</sup> *Id.* at 69.

ensure buildings become zero net energy.<sup>134</sup> We disagree that the purpose of Issue 19 is to incentivize zero net energy buildings.

The main objective of this proceeding is to streamline the interconnection application process. As Green Power Institute noted, we included in the scope of this proceeding the issue of whether the Commission should adopt streamlined interconnection procedures to facilitate implementation of California zero net energy building codes. The matter of increased incentives, which Green Power Institute contends is a purpose of this scoping issue, is neither discussed nor implied in the scoping memo. In fact, as pointed out by SCE, distinguishing zero net energy projects from other interconnection projects for expedited treatment would be inappropriate.

Issue 19 asks whether the Commission should adopt streamlined interconnection procedures to facilitate implementation of California zero net energy building codes and what those procedures would entail. We conclude the Commission should adopt such streamlined procedures and have previously concluded Proposals 19a and 19b should be adopted. However, we find that Proposal 19e raises differential treatment concerns given that zero net energy applies to new construction. Accordingly, we conclude the Commission should not adopt Proposal 19e.

### **5.3. Issue 29: Safety and Environmental Concerns**

Agreeing that safety and environmental concerns are generally already addressed, parties recommend a process to maintain a list of additional safety issues for this or another forum. As discussed below, we previously addressed the issue of an expanding scope of issues in this proceeding. In this decision, we

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<sup>134</sup> *Id.* at 73-74.

establish a biennial review process to consider future interconnection issues. A review initiated on a routine basis will provide the Commission time to observe and evaluate the effectiveness of the modifications and practices adopted in previous rulemaking. Below we present an overview of the working group's proposal for this issue followed by a discussion of our determinations.

### **5.3.1. Issue 29 – Proposal 29a**

Proposal 29a, a consensus proposal, recommends the Commission issue a ruling, six months after the issuance of this decision, soliciting input on safety and environmental risks related to interconnection of distributed energy resources for discussion in either a future Rule 21 Working Group or another forum. The proposal recommends Energy Division periodically solicit and maintain a public list of items proposed by parties to help judge whether a separate rulemaking forum is needed. Proposal 29a recommends that adoption of the proposal not foreclose the ability of stakeholders to file motions requesting expeditious consideration of emerging interconnection issues.

### **5.3.2. Issue 29 – Overview**

Issue 29 asks whether the Commission should establish a forum, either within this proceeding or externally, to develop interconnection safety standards to address safety and environmental risks as the interconnection of distributed energy resources devices grows. As indicated in the Report, working group participants agree a separate interconnection safety forum is unnecessary, as one of the objectives of Rule 21 is to ensure the safe interconnection of distributed energy resources.<sup>135</sup> The group also agrees other safety forums also exist.<sup>136</sup> The

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<sup>135</sup> *Id.* at 77.

<sup>136</sup> For example, Rule 21 Expedited Dispute Resolution process and Interconnection Discussion Forum.

Report states there are no remaining issues scheduled for discussion in Phase I of this proceeding, however, a second Phase to address ratesetting related elements is contemplated in the Amended Scoping Memo and discussed in D.20-09-035.

The participants of Working Group Four recommend allowing time to pass before establishing a new list of interconnection topics, including those related to application of existing interconnection rules and necessary actions to ensure safe and reliable interconnection of distributed energy resources.<sup>137</sup>

### **5.3.3. Resolution of Issue 29: Rejection of Proposal 29a and Process for Addressing Future Interconnection Issues**

Proposal 29a is listed as supported by CALSSA, CESA, Clean Coalition, IREC, SBUA, Tesla, PG&E, SCE, and SDG&E. However, parties note certain disclaimers. Both IREC and SDG&E further underscore that adoption of Proposal 29a is unnecessary as there are existing rules and standards to address safety and environmental risks.<sup>138</sup> SCE, Tesla, and CESA also repeat the existence of said rules and standards.<sup>139</sup>

Safety concerns are the bedrock of Rule 21. Further, we agree with parties that there are also other existing forums to address safety concerns. Together, these forums should be able to appropriately ensure the interconnection of distributed energy resources are conducted safely. We find it unnecessary to adopt Proposal 29a.

We remind parties that rejection of this proposal does not foreclose the ability of stakeholders to utilize acceptable regulatory procedures, *e.g.*, petitions

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<sup>137</sup> Report at 78.

<sup>138</sup> *Ibid.*

<sup>139</sup> SCE Opening Comments, December 18, 2020 at 13, Tesla Opening Comments, December 18, 2020 at 24, and CESA Opening Comments, December 18, 2020 at 7.

for modification. However, we concur that the issues in the first phase of this proceeding have been addressed, with the adoption of this decision.

In the Report, parties recommend that the Commission include the following disclaimer, as part of Proposal 29a: “Adoption of this proposal shall not foreclose the ability of stakeholders to submit motions to the Commission requesting more expeditious consideration of interconnection issues that may emerge and to have those motions considered outside of the schedule envisioned herein.”<sup>140</sup> The scope of this proceeding was finalized in the Amended Scoping Memo. The Amended Scoping Memo for this proceeding observed the potential for an ever expanding scope of issues in this proceeding, cautioning that continuous requests to add new issues to the scope of this proceeding could result in uncertainty and wasted resources. In the Amended Scoping Memo, parties were asked to weigh in how to address new issues both while this proceeding is open and after the proceeding is closed. Given the proposed disclaimer in Proposal 29a, we find it appropriate to resolve the question in this decision.

We first address the question of how to address new issues while the proceeding is open. As stated in the Amended Scoping Memo, we recognize that technology continues to change and aspects of interconnection are evolving but we are concerned about a changing scope wasting resources and creating uncertainty. In comments to the Amended Scoping Memo, parties generally recommended limiting the issues to those already in the scope. TURN contends this will allow stakeholders to operate with confidence that modified rules will

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<sup>140</sup> Report at 77.



be in place for a period of time before they are revisited.<sup>141</sup> PG&E, SDG&E, SBUA, and SDG&E concur.<sup>142</sup> All three utilities suggest issues could be discussed, but not determined, in the Interconnection Discussion Forum. CALSSA recommends re-evaluating the scope after each working group.<sup>143</sup> (We realize this cannot be done between Working Groups 3 and 4). Green Power Institute submits new issues should be dealt with on a case by case basis.<sup>144</sup>

Establishing the scope of a proceeding creates certainty for all stakeholders. While we previously allowed for additional issues in the proceeding, we did so cautiously. We agree with the majority of parties, introducing new issues later in a proceeding can create inefficiencies and uncertainty. We now turn to how to address new issues after the proceeding is closed.

In response to the questions asked in the Amended Scoping Memo, parties pointed to two possible venues for addressing future Interconnection issues.: Interconnection Discussion Forum or a cyclical formal review process. SCE and PG&E recommend that parties discuss and attempt to resolve emerging interconnection issues in the Interconnection Discussion Forum, contending the forum should not just be for dispute resolution and that the staff proposal creating the forum anticipated it could be used to explore a wide range of issues

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<sup>141</sup> TURN Opening Comments to Amended Scoping Memo, December 3, 2018 at 1.

<sup>142</sup> PG&E and SCE Opening Comments to Amended Scoping Memo, December 3, 2018 at 1-2, SBUA Opening Comments to Amended Scoping Memo, December 3, 2018 at 2, and SDG&E Opening Comments to Amended Scoping Memo, December 3, 2018 at 1-2.

<sup>143</sup> CALSSA Opening Comments to Amended Scoping Memo, December 3, 2018 at 1.

<sup>144</sup> Green Power Institute Opening Comments to Amended Scoping Memo, December 3, 2018 at 1.

related to interconnection practices and policies.<sup>145</sup> However, SBUA argues the Interconnection Discussion Forum has a limited scope and recommends a cyclical review process.<sup>146</sup> Tesla, CALSSA, Green Power Institute, and TURN support the use of cyclical review process.<sup>147</sup> TURN recommends the Commission take time to observe and evaluate the effectiveness of the modifications and practices adopted in this rulemaking, and establish a fixed interval of time to then consider new interconnection issues and review interconnection policies.<sup>148</sup>

Resolution ALJ-347, which adopted the Expedited Interconnection Dispute Resolution Process, identifies the Interconnection Discussion Forum's objective as fostering proactive communication about issues related to implementation of Rule 21, informally resolving and/or preventing disputes, and sharing information and best practices across utilities and developers.<sup>149</sup> We agree with CALSSA that the Interconnection Discussion Forum should be focused on disputes, as originally intended in Resolution ALJ-347. Further, CALSSA highlights that the staff proposal specifically states that development of recommendations for tariff provisions is not in scope for the forum.<sup>150</sup> Relatedly,

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<sup>145</sup> SCE and PG&E Reply Comments to Amended Scoping Memo, December 10, 2018 at 3-4 and citing Administrative Law Judge-347 at Exhibit A, Attachment A.

<sup>146</sup> SBUA Opening Comments to Amended Scoping Memo, December 3, 2018 at 4.

<sup>147</sup> Tesla Opening Comments to Amended Scoping Memo, December 3, 2018 at 5, Green Power Institute Opening Comments to Amended Scoping Memo, December 3, 2018 at 4, CALSSA Opening Comments to Amended Scoping Memo, December 3, 2018 at 2 and TURN Opening Comments to Amended Scoping Memo, December 3, 2018 at 1-2.

<sup>148</sup> TURN Opening Comments to Amended Scoping Memo, December 3, 2018 at 1-2.

<sup>149</sup> ALJ-347, Appendix A, Attachment A at second page.

<sup>150</sup> CALSSA Opening Comments to Amended Scoping Memo, December 3, 2018 at 2 citing ALJ-347, Appendix A, Attachment A. “

TURN cautions against addressing issues in the forum, as using this process may be unfavorable to stakeholders that do not have resources to maintain consistent representation at the Interconnection Discussion Forum.<sup>151</sup>

We find a formal rulemaking is the more prudent regulatory process to consider future interconnection issues. Several parties expressed concern that a longer time between reviews of interconnection issues could cause a potential gap in addressing issues and perpetuate uncertainty.<sup>152</sup> We address this concern of uncertainty by revising the previously proposed triennial review and establishing a biennial review process in order to allow the Commission time to observe and evaluate the effectiveness of the modifications and practices adopted in this rulemaking. One year after the closure of this interconnection proceeding, Energy Division will entertain informal comments from the service list on new interconnection issues and revisions to interconnection policies. If Energy Division determines there are a sufficient number of issues to be addressed, the comments will be used to draft the preliminary scope in an Order Instituting Rulemaking for the successor rulemaking, which should be issued no later than two years following the closure of R.17-07-007.

#### **5.4. Issue F: Accounting for the Ability of DERMS and Aggregator Commands to Address Flexibility Need**

Recognizing that the future of Interconnection will involve communications with Distributed Energy Resources Management Systems

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<sup>151</sup> TURN Opening Comments to Amended Scoping Memo, December 3, 2018 at 2.

<sup>152</sup> See CALSSA Opening Comments on Proposed Decision, April 27, 2021 at 1-2, CESA Opening Comments on Proposed Decision, April 27, 2021 at 7-9, Tesla Opening Comments on Proposed Decision, April 27, 2021 at 8-9, and Green Power Institute Reply Comments on Proposed Decision, May 3, 2021 at 3, and Clean Coalition Reply Comments on Proposed Decision, May 3, 2021 at 2-3.

(DERMS) tools, this decision addresses operational flexibility constraints through a pilot to test operational alternatives and directs parties to develop and finalize a template Aggregator Agreement. This decision also recognizes this need for a Smart Inverter Operationalization Working Group but declines to establish it in this proceeding. Below we present a background on Issue F, and the relationship with DERMS, and provide a discussion of our determinations.

#### **5.4.1. Issue F: Background**

Issue F, which asks what interconnection rules the Commission should adopt to account for the ability of DERMS and aggregator commands to address flexibility need. The Report states that all smart inverter functionality (except Phase 3 functions 4 and 7) have been adopted by the Commission and capability is required by all new distributed energy resources installed beginning with applications received after June 22, 2020. Hence, according to the Report, new distributed energy resources integration management tools will be deployed at the same time and location as new distributed energy resources with smarter inverters that have Phase 3 functional capabilities.<sup>153</sup>

The Report describes the relationship between Issue F and the Interconnection Capacity Analysis. First, the Report explains Interconnection Capacity Analysis is based on five constraints: thermal limits, steady state voltage, voltage fluctuation, protection, and operational flexibility. Utilities need operational flexibility to reconfigure circuits during maintenance or unplanned outages. During these times, customer distributed energy resources could be switched to other circuits. Hence, the impacts of distributed energy resources on

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<sup>153</sup> Report at 80-81.

circuits they might get connected to must be studied during the Interconnection application process.<sup>154</sup>

When a distributed energy resource or project is studied, engineers look at: 1) the likelihood of being connected to an adjacent circuit; 2) the availability of other switching options; and 3) the extent of any risk should the distributed energy resources be connected to the circuit in question. The main question is how to study this accurately across the grid. The Interconnection Capacity Analysis Working Group concluded a possible solution is a utility may use communication to send commands directly to distributed energy resources or send communications through a third-party aggregator to the distributed energy resource, in order to mitigate issues related to operational flexibility.<sup>155</sup>

Over the course of initial discussions, the position arose that it is difficult to develop rules for Issue F without discussion of deployment timelines for DERMS technology. Public Advocates Office submits that to fully operationalize smart inverters you need deployment of distributed energy resources and aggregator equipment, deployment of utility equipment and adoption of rules governing interconnection and use of smart inverters. Parties agree that to operationalize means to be used by grid operators to help manage the grid.

#### **5.4.2. Issue F: Proposal F-1**

Proposal F-1, a consensus proposal, would require the distribution provider to determine whether a distributed energy resources operational alternative would be a sufficient mitigation for operations flexibility constraints, if the output of a generating facility being interconnected is larger than the

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<sup>154</sup> *Id.* at 80-82.

<sup>155</sup> *Id.* at 82.

Interconnection Capacity Analysis values for that location with operational flexibility constraints taken into account but smaller than the Interconnection Capacity Analysis values without operational constraints taken into account. Proposal F-1 only applies after a decision on operationalizing Interconnection Capacity Analysis values within Rule 21, pursuant to proposals on Issues 8 and 9. CALSSA initiated this proposal and Clean Coalition, Public Advocates Office, SBUA, PG&E, SCE and SDG&E support it.

#### **5.4.3. Issue F: Proposal F-2**

Proposal F-2, also a consensus proposal, recommends the Commission invite utilities and non-utility parties to submit a consensus template Aggregator Agreement or different proposals for a template Aggregator Agreement, no later than four months following the issuance of this decision. CALSSA initiated this proposal and Clean Coalition, Public Advocates Office, SBUA, PG&E, SCE and SDG&E support it.

#### **5.4.4. Issue F: Proposal F-3**

Proposal F-3, another consensus proposal, recommends the Commission establish a Smart Inverter Operationalization Working Group to develop technical, regulatory, and operational guidelines for high priority use cases, including operational flexibility need. The proposal recommends the proposed work could also be added to the scope of the Smart Inverter Working Group, as further discussed in Proposal F-4. Proposal F-3 recommends that smart inverter operationalization be defined as smart inverters are actually in-use by grid operators to manage the distribution grid, with all required deployments, rules, and tariffs completed and operational for a given use case. Proposal F-3 would include the following tasks: 1) compile a comprehensive list of smart inverter use cases and establish priorities; 2) establish guidelines for all elements required

to operationalize each specific high-priority use case; and 3) integrate the guidelines for high-priority use cases into functional requirements for utility and third-party smart inverter operationalization equipment. Public Advocates Office initiated Proposal F-3; the following parties support the proposal: CALSSA, Clean Coalition, SBUA, PG&E, SCE, and SDG&E.

**5.4.5. Issue F: Proposal F-4**

Proposal F-4 recommends the Commission establish the Smart Inverter Operationalization Working Group in 2020, within the Distribution Resources Planning proceeding as a high priority to support work in multiple related proceedings. Public Advocates Office initiated Proposal F-4. CALSSA, Clean Coalition and SBUA support the proposal and PG&E, SDG&E, and SCE oppose Proposal F-4.

**5.4.6. Issue F: Proposal F-5**

Proposal F-5 would require the Smart Inverter Operationalization Working Group to address the question posed by Issue F. Further, this proposal recommends the Commission include smart inverter operationalization as an element of grid modernization and establish the Distribution Resources Planning proceeding as having overarching authority on smart inverter operationalization. Proposal F-5 recommends the working group should develop a smart inverter operationalization plan, which would address the merits of: 1) operational flexibility compared to impacts of distributed energy resources deployment and 2) inclusion of distributed energy resources management systems and smart inverter operationalization roadmaps within utility Grid Modernization Plans. Public Advocates Office initiated this proposal, which is supported by CALSSA, Clean Coalition, and SBUA. PG&E, SCE, and SDG&E oppose Proposal F-5.

#### **5.4.7. Resolution of Issue F**

We discuss our determination of each of the five Issue F proposals, in numerical order.

According to the Report, Proposal F-1 (a consensus proposal) would address the problem of Interconnection Capacity Analysis operational flexibility constraints limiting distributed energy resources interconnection at many locations, even if circuit reconfiguration at that location is rare. The Report contends that without Proposal F-1, underutilization of existing hosting capacity would continue. With adoption of Proposal F-1, more distributed energy resource capacity could potentially be added to a circuit while still remaining within hosting capacity limits.<sup>156</sup>

SCE supports Proposal F-1, finding it balances the needs of evolving system capabilities.<sup>157</sup> While PG&E and SDG&E support the proposal, both consider their support as contingent upon other factors. First, PG&E does not support any binding limit on the frequency or duration of curtailments. Further, PG&E cautions that additional utility investments are needed to translate abnormal switching conditions into disconnect or curtailment commands and operational alternatives may evolve over time.<sup>158</sup> SDG&E agrees there should be no binding limitations on distributed energy resource curtailment due to the unknown and unpredictable nature of unplanned outages.<sup>159</sup>

In comments to questions posed in the November 19, 2020 Ruling, both PG&E and SDG&E note that additional time is needed before the capabilities

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<sup>156</sup> *Id.* at 86.

<sup>157</sup> *Id.* at 87.

<sup>158</sup> *Id.* at 88.

<sup>159</sup> *Ibid.*



envisioned by this proposal are ready.<sup>160</sup> Further, both allude to the possibility that testing or validation pilots may be necessary.<sup>161</sup>

We find Proposal F-1 has the potential to increase distributed energy resource use without compromising safety by leveraging the capabilities of DERMS; this will increase alongside the increase of smart inverter requirements and capabilities.<sup>162</sup> However, we are concerned with statements from PG&E and SDG&E that neither have a system in place at this time to accommodate the operational alternatives anticipated in this proposal. Further, we agree that the evolution of operational alternatives may require re-evaluation, testing, or pilots. Accordingly, we adopt Proposal F-1, but find it prudent to initially pilot it. Further, we delay such piloting until utilities have implemented necessary equipment allowing the proposal capabilities.

We direct PG&E, SDG&E, and SCE to develop a proposal for how a pilot version of Proposal F-1 would work and include implementation timelines, along with the objectives of the pilot and how to measure success or failure to determine whether the proposal warrants continuation or not. The pilot proposal shall be submitted via a Tier 3 Advice Letter within six months after PG&E, SDG&E, and SCE have all implemented IEEE 2030.5 CSIP compliant production servers, but no later than June 1, 2022.

In comments to the proposed decision, SCE and SDG&E question the timing of the required pilot proposal submittal. SCE contends the necessary

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<sup>160</sup> Those capabilities include limiting or eliminating exported energy, modifying advanced inverter functions, monitoring and reporting, or other functionality that supports grid operations. (See Report at 87.)

<sup>161</sup> PG&E Opening Comments, December 18, 2020 at 20-21 and SDG&E Opening Comments, December 18, 2020 at 21.

<sup>162</sup> Report at 86-87.

equipment allowing the proposal capabilities is broader than IEEE 2030.5 CSIP compliant production servers implementation.<sup>163</sup> SDG&E states that it does not have an IEEE 2030.5 CSIP compliant server and its ability to comply with this requirement is contingent upon the approval of relevant funding as part of a general rate case application and approval process.<sup>164</sup> PG&E notes, however, that the advice letter submittal is for a proposal. We maintain the current deadline for submitting this advice letter.

Proposal F-2, also a consensus proposal, would result in supporting fairness and transparency in contractual agreements between distributed energy resources aggregators and their customers.<sup>165</sup> Parties acknowledge work remains on the proposed template Aggregator Agreement. A continuation of a Working Group Two Issue, the Report notes that information has previously been collected on this subject through a prior ruling in this proceeding, which is available as input on further work on the template aggregator agreement. Accordingly, we direct parties to continue work on the template. PG&E, SDG&E, and SCE are directed to submit a Tier 2 Advice Letter, on behalf of all stakeholders requesting approval of the consensus template, no later than one year from the issuance of this decision. The additional time will allow for further discussion of cybersecurity requirements, as recommended by CALSSA.<sup>166</sup> If consensus is not reached, the utilities shall file a Tier 3 Advice Letter and include all stakeholder recommendations and positions.

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<sup>163</sup> SCE Opening Comments on Proposed Decision, April 27, 2021 at 9.

<sup>164</sup> SDG&E Opening Comments on Proposed Decision, April 27, 2021 at 5-6.

<sup>165</sup> Report at 89.

<sup>166</sup> CALSSA Opening Comments, December 18, 2020 at 6.

We find value in Proposal F-3, which would establish a Smart Inverter Operationalization Working Group. While we recognize the need for the working group, we find it inappropriate to establish the working group in this proceeding given its implications on other open proceedings; for example, the Distribution Resources Plans proceeding (R.14-08-013) or its successor. Accordingly, we deny Proposal F-3.

For the same reason, we deny F-4, which would establish a forum and timing for the Smart Inverter Operationalization Working Group. Lastly, we deny approval of Proposal F-5, which would include smart inverter operationalization as an element of grid modernization; grid modernization is not in the scope of this proceeding.

## **6. Comments on Proposed Decision**

The proposed decision of Commissioner Martha Guzman Aceves in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission's Rules of Practice and Procedure. Comments were filed by CALSSA, CESA, Green Power Institute, PG&E, SDG&E, SCE, and Tesla on April 27, 2021. Reply comments were filed on May 3, 2021, by CESA, CALSSA, Clean Coalition, Green Power Institute, SBUA, SCE, and Tesla. In response to the comments, corrections and clarifications have been made throughout the Decision.

## **7. Assignment of Proceeding**

Martha Guzman Aceves is the assigned Commissioner and Kelly A. Hymes is the assigned Administrative Law Judge in this proceeding.

## **Findings of Fact**

1. COVID-19 and annual wildfires are current and continuing circumstances that warrant the Commission adoption of a notification-only approach.

2. The multiple elements of the Tesla Proposal working together should ensure developers demonstrate ability to deploy conforming systems.
3. Safety concerns, including the unknown aggregate impact of interconnecting small, non-export systems, exist in the Tesla Proposal.
4. It is premature to waive or reduce fees during a pilot stage.
5. The eight eligibility requirements in the Notification-Only Approach pilot should appropriately address the safety concerns in the original Tesla Proposal.
6. Multi-tariff projects complicate the utilization of power control systems and may result in such systems not functioning as intended.
7. Restricting the notification-only approach pilot to only be used once per site ensures circuits are not overloaded.
8. Limiting each developer to 10 non-export projects for each distribution circuit addresses the concern of overloaded circuits.
9. UL 1741 and UL Power Control Systems certification is not sufficient for passing Screen B.
10. Requiring the use of a UL-certified Power Control System with an Open Loop response time of two seconds or less adequately addresses the concern that projects will not pass Screen B.
11. Limiting eligible projects to 120 V or 240 V that use self-contained meter ensures compliance with Rule 21, section Hh.1.d.
12. A one quarter mile buffer from any networked secondary portion of a utility's grid is a reasonable safety precaution to ensure that projects are not inadvertently connected to a customer that is served from the networked secondary portion of a utility's grid.
13. Requiring PG&E, SDG&E, and SCE to provide information indicating the location of the networked secondary portions of each utility's grid will address

the concern that customers do not know if projects would be connected to the networked secondary portions.

14. Requiring eligible projects to operate in a manner that does not increase a customer's peak load resolves the concern that additional loading could create the need for additional study in the current Interconnection application approach.

15. Requiring eligible projects to use inverters that are pre-approved by the utility will ensure that non-certified inverters do not connect to the grid and create a safety concern.

16. Requiring eligible projects connected to a single phase transformer with 120/240 secondary voltage to be installed such that the aggregated gross output is as balanced as practicable will otherwise ensure passed of Screen E by such a project.

17. The combination of a developer attestation and the required amount of developer experience in the adopted notification-only approach protects against safety gaps.

18. If a developer has successfully deployed 20 projects meeting the pilot eligibility requirements, that developer has demonstrated an understanding of the laws, regulations, rules, and processes necessary to safely deploy a system.

19. Requiring application of the 20 project requirement to commence upon issuance of the decision would unnecessarily delay use of the pilot.

20. Submission of the documents in the notification package appropriately addresses safety concerns.

21. Increasing the allowable audits from five to 20 percent of projects during the trial period will indicate to the utilities and the Commission whether the

engineering study that occurs during the current Interconnection application process is necessary for this explicit subset of projects.

22. Additional data is needed on what, if any, the aggregate impacts are of small, non-export systems on the grid.

23. An inequity may exist in the current cost-sharing approach where individual projects shoulder the costs of distribution upgrades even when subsequent projects benefit from the upgrades.

24. There is value in continuing to explore the concept of distribution upgrade cost sharing.

25. There is an allegation that cost shifts from net energy metering customers to non-net energy metering customers have occurred as a result of the distribution upgrade exemption adopted in D.02-03-057.

26. D.02-03-057 concluded that Public Utilities Code Section 2827(d) exempts generators eligible for net energy metering from paying for costs associated with interconnection studies, distribution system modifications, or application review fees but recognized that this could result in a real (but undetermined) cost to ratepayers.

27. Both Commission and FERC-jurisdictional projects interconnect to the distribution system.

28. SDG&E does not utilize, nor does it propose to develop an anti-islanding screen.

29. SCE does not require Direct Transfer Trip.

30. SDG&E and SCE assess and manage the potential risks of unintentional islanding differently from PG&E due to differences in transmission and distribution systems.

31. Because of the differences in transmission and distribution systems, Proposals 18a, 18c, and 18e do not apply to SDG&E or SCE.

32. Consensus reached in Proposals 18a, 18c, and 18e does not include SDG&E or SCE.

33. Rotating machines are not required to have UL 1741 active anti-islanding protections.

34. Proposal 18a would require machine generators to be responsible for mitigation costs at interconnection.

35. Proposal 18a would protect UL 1741 tested inverter-based generation from bearing costs of anti-islanding risks created by rotating machines.

36. Increased interconnection of Rule 21 certified distributed energy resources will reduce the need for protective equipment on future installations.

37. Proposal 18a will have minimal ratepayer cost impacts.

38. Proposal 18c would provide a streamlined third-party option when anti-islanding mitigation is required.

39. Proposal 18c could result in savings of both time and expenses for the customer and provide assurance to PG&E with respect to islanding and anti-islanding protections.

40. Considering unintentional islanding a distribution system issue could allow for mitigation solutions beyond individual projects and pockets.

41. Proposal 18d is a forward-looking solution to addressing islanding concerns.

42. Proposal 18e is a reasonable step forward to ensure grid safety and reliability, consistent with other proposals to address unintentional islanding, especially as distributed energy resource penetration increases.

43. While the adoption of Proposal 18d – establishing an Unintentional Islanding Working Group – is a step in the right direction, the working group could take years to determine a screening process.

44. Adoption of Proposal 18e is a prudent step to ensure unintentional islanding is not an issue while further research is being performed.

45. The cost and time needed to develop Proposal 18b is not reasonable in the long run.

46. Increased penetration of solar paired with storage interconnection will reduce the value of Proposal 18b, given its anticipated costs and timeline.

47. Adoption of Proposal 18e, which decreases the need for Direct Transfer Trip equipment, makes Proposal 18b unnecessary.

48. Proposal 18f could improve both transparency and clarity for developers in the PG&E service territory.

49. Neither SDG&E nor SCE perform anti-islanding screening based on Sandia studies.

50. Proposals 18f and 18g are not applicable to SDG&E or SCE.

51. Safety concerns do not necessarily align with cost concerns but neither should be discounted.

52. The current interconnection process provides ample opportunities for developers to discuss and, if necessary, dispute system study outcome recommendations.

53. The current Rule 21 provides a platform where utilities' safety concerns and developers' cost concerns, with respect to anti-islanding mitigation, can be identified and brought closer to alignment.

54. It is not necessary to adopt Proposal 18g.



55. The result Proposal 18h is attempting to reach can be sought through other adopted proposals.

56. It is not necessary to adopt Proposal 18h.

57. EPIC projects are reviewed, approved, and governed through a process external to this rulemaking.

58. It would be inappropriate to evaluate and prioritize projects, including the anti-islanding projects, outside the established EPIC process.

59. Installing solar on new construction should be part of the overall construction schedule to improve efficiencies in interconnection.

60. PG&E, SDG&E, and SCE have taken steps to implement the change recommended in Proposal 19a.

61. Revising the Interconnection application such that the application can be based on street address will allow new zero net energy construction interconnection applications to move forward in a more expeditious fashion.

62. We find it valuable to adopt Proposal 19b, given the anticipated increased impact of zero net energy policies on the home building industry.

63. Allowing one single application or batched applications should lead to improved efficiencies, one of the objectives in this proceeding.

64. SDG&E receives a minimal number of applications for new home construction projects.

65. Rulemaking 19-09-009 considered and adopted the same proposal as Proposal 19c in D.20-06-007.

66. No further action with respect to Proposal 19c is necessary.

67. Proposal 19c is moot.

68. The single line diagrams required by D.20-06-017 should be the focus of efforts at this time since these efforts would address nearly 80 percent of zero net energy projects.

69. Efforts focused on zero net energy projects should not take priority over the broader effort to streamline the interconnection process.

70. Zero net energy projects are no different than other interconnection projects; both types send electrical power to the grid just like other generation projects and can create safety and reliability system concerns just like other generation projects.

71. The main objective of this proceeding is to streamline the interconnection application process.

72. Issue 19 asks whether the Commission should adopt streamlined interconnection procedures to facilitate implementation of California zero net energy building codes.

73. Neither the Scoping Memo nor the Amended Scoping Memo of this proceeding discuss nor imply that increasing incentives for buildings to become zero net energy is the purpose for including Issue 19 in this proceeding.

74. Distinguishing zero net energy projects from other interconnection projects for expedited treatment would be inappropriate.

75. Proposal 19e raises differential treatment concerns, given that zero net energy applies to new construction only.

76. Safety concerns are the bedrock of Rule 21.

77. There are other existing forums to address safety concerns.

78. The existing safety forums in combination with Rule 21 appropriately ensure the interconnection of distributed energy resources is safely conducted.

79. Adoption of Proposal 29a is not necessary.

80. The Amended Scoping Memo for this proceeding observed the potential for an ever expanding scope of issues in this proceeding and cautioned that continuous requests to add new issues to the scope could result in uncertainty and wasted resources.

81. It is appropriate to resolve the question of how to consider new issues while this proceeding is open and after the proceeding is closed.

82. Resolution ALJ-347 identifies the Interconnection Discussion Forum's objective as fostering proactive communication about issues related to implementation of Rule 21, informally resolving and/or preventing disputes, and sharing information and best practices across utilities and developers.

83. The Interconnection Discussion Forum should be focused on disputes, as originally intended in Resolution ALJ-347.

84. Development of recommendations for tariff provisions is not in scope for the Interconnection Discussion Forum.

85. A formal rulemaking is the more prudent regulatory process to consider future interconnection issues.

86. Proposal F-1 has the potential to increase distributed energy resources use, without compromising safety, by leveraging the capabilities of DERMS.

87. Neither PG&E nor SDG&E have a system in place to accommodate the operational alternatives anticipated in Proposal F-1.

88. Evolution of operational alternatives may require re-evaluation, testing, or pilots.

89. It is prudent to develop a pilot of Proposal F-1 to allow for re-evaluation and testing.

90. Proposal F-2 would result in supporting fairness and transparency in contractual agreements between distributed energy resources aggregators and their customers.

91. Work remains on the proposed template Aggregator Agreement.

92. Information previously collected is available as input on further work on the template Aggregator Agreement.

93. An additional eight months to develop the template Aggregator Agreement will allow for further discussion of cybersecurity requirements.

94. There is value in Proposal F-3, which would establish a Smart Inverter Operationalization Working Group.

95. It is inappropriate to establish a Smart Inverter Operationalization Working Group in this proceeding, given its implications on other open proceedings.

96. Proposal F-4, which would establish a forum and timing for the Smart Inverter Operationalization Working Group, should not be adopted because we should not establish the working group in this proceeding.

97. Proposal F-5 would include smart inverter operationalization as an element of grid modernization.

98. Grid modernization is not in the scope of this proceeding.

### **Conclusions of Law**

1. The Tesla Proposal should be modified to account for the existence of safety concerns.

2. A Notification-Only Approach to the current Interconnection Application Process should be adopted on a trial basis for a period of two years.

3. The Commission should collect data to determine the impacts of the notification-only approach.

4. The application fee for the notification-only approach should be studied during the evaluation of the Notification-Only Approach pilot.
5. Distribution upgrades cost sharing methods should be further investigated.
6. PG&E, SDG&E, and SCE should study and report on data collected regarding the impact on non-net energy metering customers of the cost shift of upgrades related to net energy metering projects that triggered the upgrades, which have not benefited other interconnection customers or ratepayers.
7. The Interconnection Discussion Forum should discuss the potential impact of distribution upgrades cost sharing approaches on FERC-jurisdictional projects.
8. The Commission should consider distribution upgrades cost sharing proposals after it addresses cost shifts and impacts to FERC-jurisdictional projects.
9. Proposal 18a should be adopted.
10. PG&E should record the costs for implementing Proposal 18a and report on them every three years.
11. Proposal 18c and the contents of Annex 2 should be adopted.
12. Proposal 18d should be adopted.
13. Proposal 18e should be adopted.
14. The Commission should not adopt Proposal 18b.
15. Proposal 18f should be modified and adopted.
16. The Commission should not adopt Proposal 18g.
17. The Commission should not adopt Proposal 18h.
18. The Commission should not adopt Proposal 18i.
19. Proposal 19a should be adopted.
20. SDG&E should be exempt from implementing Proposal 19b.

21. Proposal 19b should be adopted for PG&E and SCE.
22. The Commission should not adopt Proposal 19d.
23. The Commission should not adopt Proposal 19e.
24. The Commission should not adopt Proposal 29a.
25. The Commission should allow for development of a pilot of Proposal F-1.
26. Proposal F-2 should be adopted, with modification.
27. The Commission should not establish a Smart Inverter Operationalization Working Group in this proceeding.
28. The Commission should not adopt Proposal F-4.
29. The Commission should not adopt Proposal F-5.

## **O R D E R**

### **IT IS ORDERED** that:

1. A notification-only interconnection application approach, based on the proposal from Tesla, attached as Appendix A, is adopted as modified herein:
  - (a) A two-year pilot of the approach shall be conducted, beginning 45 days from the issuance of this decision;
  - (b) Eligible projects: shall total less than or equal to an aggregate of 30 kilovolt-amperes (kVA) and may consist of one of the following options: i) one new non-export energy storage system, ii) one new non-export system with energy storage system and solar, or iii) one new energy storage system plus any existing generation systems where the combined system is non-export; shall be limited to 10 non-export projects for each developer at any one circuit; shall use a Underwriter Laboratories (UL)-certified Power Control System with an Open Loop response time of two seconds or less and set to a non-export mode; shall be limited to 120 Volt or 240 Volt services that use a self-contained meter; shall not be located on or within a quarter mile distance from any networked secondary portion of the utility's grid; shall be

operated in a manner that does not increase a customer's peak load; shall use inverters pre-approved by the utility; shall be installed such that when connected to a single phase-transformer with 120/240 Volts secondary voltage the aggregated gross output is balanced as practicable between the two phases of the 240 Volt service; and shall only be installed by eligible developers, as described below.

- (c) Eligible developers must have successfully deployed at least 20 non-export projects that meet the eligibility criteria for the notification-only process using the current interconnection application process; must file an attestation with the utility stating: i) they understand where the networked secondary portion of the utility's grid is located and ii) the developer will not use the notification-only process for projects deployed on the networked secondary portions of the utility's grid or located within a quarter mile distance from any networked secondary portion of the utility's grid.
- (d) Developers and customers shall submit the following documentation as part of the Notification Package to the utility no later than 15 business days after the project system passes final permit inspection: i) Interconnection Application Form; ii) Certificate of Insurance from the customer; iii) Authority Having Jurisdiction Electrical Release; iv) Developer Attestation that a system deployed on a 240 volt service is deployed across the entire 240 volt service; v) Developer Attestation that if the system is found to be noncompliant, developer will work with the utility and customer to bring system into compliance and will pursue reinstatement of Permission To Operate through the standard Interconnection Application process; vi) Developer and Customer Attestations that the system meets each of the eligibility criteria described above; and vii) Developer and Customer Attestations they each recognize and understand the auditing element described below.

- (e) Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company (Utilities) shall issue documentation of Permissions To Operate to qualifying projects upon receipt of the Notification Package. Utilities shall review the Notification Package for completeness and accuracy and identify projects that inadvertently did not follow the requirements of the Notification-Only Approach pilot or are ineligible for the Notification-Only Approach pilot within 15 business days of receipt of the Notification Package at which point Utilities shall notify developers of any missing requirements. Developers will work with Utilities within five business days after notification to fix any issues. Utilities may suspend Permission To Operate if developer does not cure outstanding issues within the five business days or if there are safety and reliability issues identified.
- (f) The Audit element described in the attached Tesla Proposal is adopted but revised such that up to 20 percent of projects in the notification approach may be audited at the utility's discretion. Audits are restricted to review of generating facility equipment, control modes, and equipment settings for compliance with the eligibility requirements. Developers shall respond to an audit request within 20 business days. A violation of the established criteria will cause removal of the developer's name from the eligibility list until the developer: i) has successfully deployed an incremental 40 projects that meet the eligibility criteria using the standard interconnection application process and ii) explained to the utility how the developer intends to prevent future violations. A utility may audit any other projects deployed through the notification-only process by a developer found in violation. Any projects found noncompliant will automatically have the Permission To Operate revoked and the developer will be required to request a new Permission To Operate through the current Interconnection application process.



- (g) No later than 30 days from the issuance of this decision, Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company shall each file a Tier 1 Advice Letter explaining how they implemented the Notification-only approach, as required in Decision 19-03-013.

2. No later than 15 days following the issuance of this decision, Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company (Utilities) shall each file a Tier 1 Advice Letter indicating where on the utility's website interested developers will find instructions regarding how to request eligibility for participating in the Notification-Only Approach pilot. The eligibility request contents are limited to the following: i) the developer's name and contact information; ii) a list of no less than 20 non-export projects in the utility's service territory that received a Permission To Operate and how each project meets each of the eligibility criteria for the Notification-Only Approach pilot adopted in Ordering Paragraph 1; and iii) the two attestations regarding the networked secondary portion of the grid, as described in this decision. Utilities shall respond to a developer request no later than 10 business days after receiving the request.

3. No later than 30 days from the issuance of the decision, Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company shall submit a Tier 2 Advice Letter proposing details on the audits allowed as part of the Notification-Only Approach pilot adopted in Ordering Paragraph 1.

4. No later than 30 days from the issuance of this decision, Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company (Utilities) shall host a public workshop to garner stakeholder recommendations on the data to be collected to measure the impacts from the

Notification-only Approach pilot. No later than 90 days from the issuance of this decision, Utilities shall submit, with guidance from the Commission's Energy Division, a Tier 1 Advice Letter indicating the data they will collect to study the impacts of the Notification-Only Approach pilot.

5. No later than 20 months from the implementation of the Notification-Only Approach Pilot adopted in Ordering Paragraph 1, Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall submit a Tier 3 Advice Letter providing the data from the first 18 months of the Notification-Only Approach pilot and, based on the data, a request to continue the notification approach on a permanent basis as adopted herein, continue the pilot with modifications, or discontinue the notification approach. This advice letter shall contain a proposal for the notification-only approach application fee to cover the costs of administering the approach post-pilot phase.

6. Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company shall host a workshop no later than 30 days prior to submitting the Tier 3 Advice Letter required in Ordering Paragraph 5. Utilities shall provide and discuss a draft of the required Tier 3 Advice Letter.

7. Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company (Utilities) shall analyze the data collected pursuant to Decision 02-03-057, with respect to costs associated with all interconnections, and report on the impacts on non-net energy metering customers of the cost shift of upgrades related to net energy metering projects that were paid by applicants that triggered the upgrades but have not benefitted other interconnection customers or ratepayers. Utilities shall also analyze the costs of grid upgrades borne by ratepayers that benefit subsequent generation

customers. The results of the study shall be filed with the information required in Ordering Paragraph 8, with respect to distribution upgrades cost sharing for projects under the jurisdiction of the Federal Energy Regulatory Commission. Utilities shall host a workshop to discuss the results of the study with other parties; the workshop shall be held no later than 30 days after the filing of the report.

8. No later than 120 days from the issuance of this decision, the members of the Interconnection Discussion Forum are directed to discuss the potential impact of distribution upgrades cost sharing to projects that are under the jurisdiction of the Federal Energy Regulatory Commission. Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company shall provide a report on the discussion and file and serve the report in this proceeding, no later than 30 days after the discussion occurs.

9. Proposal 18a is adopted and only applies to the interconnection of distributed energy resources with utilities that perform enhanced anti-islanding screening based on the Sandia studies. Machine generators larger than 40 kilowatts requesting interconnection to the distribution system shall install a recloser or other protective equipment of similar function and cost: i) if the utility determines that risk of unintentional islanding is a present concern, in which case, the protective equipment and its interconnection will be at the expense of the interconnection customer; or ii) if it is reasonably anticipated that risk of unintentional islanding is likely to be a concern in the near future, in which case the protective equipment and its interconnection will be at the expense of the utility. If Supplemental Review for a proposed inverter-based generator determines that the proposed generator fails the anti-islanding screen due to existing machine generation, the utility will

initiate installation of the required recloser, and the protective equipment will be at the expense of the utility.

10. Proposal 18c is adopted, along with Annex 2 of the Working Group 4 Report: *Risk of Islanding Study Assessment Procedure* (Appendix C of this decision) and only applies to the interconnection of distributed energy resources with utilities that perform enhanced anti-islanding screening based on the Sandia studies. If the utility determines that anti-islanding mitigation is required, the interconnection customers shall be provided the option to hire an independent analyst, approved by the utility, to perform a risk of islanding study. The study shall follow the Risk of Islanding Study Assessment Procedure and be completed within 40 business days. An extension of the 40 business day timeline, upon mutual agreement between the utility and customers, is permitted. Mitigations required by the System Impact Study shall be used if the independent evaluator's study is not able to meet the deadline and an extension cannot be agreed upon.

11. Proposal 18d is adopted. The Unintentional Islanding Working Group is hereby established to review, discuss, evaluate, and recommend distribution system level solutions to island formation arising from increased distributed energy resources penetration. The Commission Energy Division is authorized to commence and facilitate the working group no later than 180 days from the issuance of this decision. Representatives from Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company shall participate in the monthly working group meetings, along with parties and interested stakeholders. The working group is instructed to discuss and develop solutions to the list of questions contained in the Working Group Four Report; a copy of the list is attached to this decision, as Appendix B. The

working group shall file a final report, no later than two years from the commencement date of the working group.

12. No later than 30 days from the issuance of this decision, Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company are directed to initiate contact with the National Renewable Energy Laboratory, Electric Power Research Institute, and Sandia National Labs to encourage and invite participation of appropriate experts in the Unintentional Islanding Working Group.

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

14. Proposal 18f is adopted and only applies to utilities that perform enhanced anti-islanding screening based on Sandia studies. Required utilities shall work with developers and the Commission's Energy Division to develop a guide that provides anti-islanding options, clearly identifies the cost of each option, and sets out the circumstances when it will be required. No later than 90 days from the issuance of this decision, Pacific Gas and Electric Company (PG&E) shall initiate

discussion of this guide. Not later than one year from the issuance of this decision, PG&E shall submit a Tier 2 Advice Letter seeking approval of the guide. The request for approval shall describe stakeholder and Energy Division collaboration.

15. Proposal 19a is adopted and shall be implemented by December 31, 2021. The Interconnection Application process, Rule 21, shall be revised to enable residential home builders to submit Interconnection applications in their name based on a street address. A meter number or account number shall no longer be required for an Interconnection application for new construction. San Diego Gas & Electric Company is authorized to continue to use its two-step process whereby it can obtain account identification numbers based on a street address.

16. Proposal 19b is adopted and shall be implemented by December 31, 2021. The Interconnection Application process, Rule 21, shall be revised to enable residential home builders with multiple units to submit one Interconnection application for all units combined or multiple applications via a batch application process. San Diego Gas & Electric Company is exempt from this requirement, at this time, but shall continue to monitor the number of home construction projects seeking interconnection and submit the data to the Commission's Energy Division on an annual basis, with the first data set due no later than one year from the issuance of this decision.

17. 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.

18. Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company (Utilities) shall develop a proposal for a pilot of Proposal F-1, which would determine whether a distributed energy resource operational alternative would be a sufficient mitigation for operational flexibility constraints. Six months after Utilities have implemented IEEE 2030.5 CSIP compliant production servers but not later than June 1, 2022, Utilities shall submit a Tier 3 Advice Letter seeking approval of the Proposal F-1 pilot; the Advice Letter shall include implementation timelines.

19. Proposal F-2 is adopted. Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company (Utilities) shall work with stakeholders to finalize the template Aggregator Agreement. No later than one year from the issuance of this decision, Utilities shall submit a Tier 2 Advice Letter requesting approval of the template. If consensus is not reached, Utilities shall file a Tier 3 Advice Letter and include all stakeholder recommendations and positions.

20. No later than 30 days from the issuance of this decision, Pacific Gas and Electric Company, San Diego Gas & Electric Company and Southern California Edison Company shall each submit a Tier 2 Advice Letter modifying their Rule 21 tariffs consistent with this decision.

21. Rulemaking 17-07-007 remains open to address issues in subsequent phases of the proceeding.

This order is effective today.

Dated June 3, 2021, at San Francisco, California.

MARYBEL BATJER

President

MARTHA GUZMAN ACEVES

CLIFFORD RECHTSCHAFFEN

GENEVIEVE SHIROMA

DARCIE HOUCK

Commissioners



# **Appendix A**

## **Tesla Proposal**

### **Tesla Notification-Only Proposal**

The following is an excerpt from the *Opening Comments of Tesla, Inc. On the Proposed Decision Adopting Short Term Actions To Accelerate Microgrid Deployment And Related Resiliency Solutions*. The excerpt, containing pages 5-8 of the comments, provides a description of the proposed notification-only approach for a specified subset of project types. Footnotes have been replaced with parenthetical references.

In comments responding to the January 21, 2020 ruling issued in this proceeding, Tesla recommended consideration of a notification-only approach in lieu of requiring all projects to submit an interconnection application request in order to interconnect. (Comments of Tesla, Inc. on the Staff and Utility Proposals to Accelerate the Deployment of Microgrids and Related Resiliency Solutions, January 30, 2020, p. 6.) Tesla believes this approach merits serious consideration given the urgent need to facilitate rapid deployment of back-up solutions. Given the COVID crisis, the rationale for implementing a notification-only process only grows stronger, given that many may be reluctant to rely on community facilities during Public Safety Power Shutoffs if they are worried about contracting the corona virus and will therefore look to ways to provide back-power to their homes. Under a notification-only approach, customers deploying systems would be required to notify the utility that they are installing a system, but would not be required to wait for utility approval or review in order to proceed with interconnection. Needless to say, such an approach would dramatically reduce the complexity and timelines associated with deploying back-up solutions, and in our view would be a gamechanger in terms of facilitating widespread adoption. Such a process would be especially beneficial in terms of enabling the hundreds of thousands of customers with existing solar systems to retrofit those

systems with energy storage as a means of providing resiliency. Tesla's proposal is grounded in the fact that provided a project meets certain configuration and operational requirements, it will not have any grid impacts and thus the need for study is effectively eliminated. The specific parameters that Tesla suggests to limit the types of projects that would be eligible for a notification-only approach consist of the following:

- The project must not be located on a networked secondary part of the utilities' grid;
- The project must use certified equipment (equipment would have to be certified to UL 1741 SA, CSIP IEEE 2030.5 and UL 1741 PCS) set to non-export mode; either Import-Only or No-Exchange mode ("Import-Only" and "No-Exchange" are modes contained within UL 1741 PCS.); and
- The project's capacity must be less than or equal to 30 kVA.

Provided a project meets these criteria, it would pass all relevant screens under Rule 21 and proceed to interconnection approval in all circumstances. In the table below, we provide an overview of the relevant screens to which a project meeting these parameters would be subject and how those screens would apply given the project characteristics meet the criteria above.

Screen	Applicability/Outcome
Screen A - Is the PCC on a networked secondary system?	N/A - the notification-only process will not be available to projects deployed on the secondary Network
Screen B - Is certified equipment used?	Pass - pursuant to notification-only eligibility criteria, equipment will be certified to UL 1741 SA, CSIP IEEE 2030.5 and UL 1741 PCS.
Screen C - Is the starting voltage drop within acceptable limits?	N/A - Not applicable to Inverter-Based Generation
Screen D - Is the transformer or secondary conductor rating exceeded?	Pass - Transformer sizing not relevant for non-exporting systems
Screen E - Does the Single-Phase Generator cause unacceptable imbalance?	N/A - Not applicable to Inverter-Based Generation

Screen F - Is the Short Circuit Current Contribution Ratio within acceptable limits?	Pass - Bypassed for systems less than 11 kVA, with expectation that this will increase to 30 kVA consistent with Rule 21 WG 2 consensus proposal. (Working Group Two Report at 51)
Screen G - Is the Short Circuit Interrupting Capability Exceeded?	Pass - Bypassed for systems less than 11 kVA, with expectation that this will increase to 30 kVA consistent with Rule 21 WG consensus proposal.
Screen H - Is the line configuration compatible with the Interconnection type?	Pass - Bypassed for systems less than 11 kVA, with expectation that this will increase to 30 kVA consistent with Rule 21 WG consensus proposal.
Screen I - Will power be exported across the PCC?	Pass - Inadvertent Export will be controlled within 2 seconds
Screen J - Is the Gross Rating of the Generating Facility 11 kVA or less?	Pass - Bypassed for systems less than 11 kVA, with expectation that this will increase to 30 kVA consistent with Rule 21 WG consensus proposal.

We fully expect that some may argue that even if one accepts the technical argument that a project meeting the eligibility criteria identified above would not have any material grid impacts, an important part of the interconnection process is ensuring that the system that is ultimately deployed and interconnected is, in fact, the same as the system that was described in the application.

Tesla understands this concern and believes it can be fully addressed by implementing an approved installer process and auditing regime. Under this framework, a developer would need to submit an attestation to the utility it operates in indicating that they understand where the utility's secondary network is located and will not use the notification-only process for projects deployed on those parts of the utility's grid. Only after this attestation is submitted would the developer be allowed to utilize the notification-only process. Developers would also need to have successfully deployed 20 non-export projects pursuant to the current interconnection process that meet the criteria above before being authorized to shift to a notification-only approach. After this, projects deployed pursuant to the notification-only process would be subject to an audit regime whereby, 5% of the projects may be audited at the

utility's discretion. If, over the course of these audits, any of the projects are found to violate the approved criteria, then that developer would be foreclosed from using the notification-only process for three months. Any projects that violate the criteria would have to cease operation and reapply through the standard interconnection process. In order to be allowed to use the notification-only process after this period, a developer would need to explain how they intend to prevent any future violations if they intend to use the notification-only process going forward as well as successfully deploy an incremental 40 projects using the standard interconnection process that meet the eligibility criteria.

For all of the reasons discussed above and consistent with the framework we put forward, Tesla encourages the Commission to adopt a notification-only approach as part of this order. If, however the Commission does not wish to approve such an approach at this time, we ask that the Commission establish a clearly defined process by which this proposal can be further considered for potential future adoption. In establishing that process, Tesla asks that the Commission identify the key questions or concerns that it believes would need to be addressed and a clear timeline for reconsideration.

**(END OF APPENDIX A)**

## **Appendix B**

### **Questions for Unintentional Islanding Working Group**

### Questions for Unintentional Islanding Working Group

- What types of technical evaluations/studies need to be conducted to determine the system conditions that would drive the need for additional mitigation?
- What information would be necessary from DERs (such as anti-islanding algorithms) in order to perform technical evaluation?
- What mitigations would be available for resolving the identified issues?
- What should the anti-islanding evaluation process entail?
- At high levels of penetration, are the power quality issues driven by anti-islanding algorithms in need of mitigation?
- What reclosing and system-level unintentional island mitigation solutions exist or are feasible today (e.g. reclose blocking, extending anti-islanding response time, grounding switches)?
  - What are typical costs associated with those solutions?
  - Do power quality concerns within an unintentional island need to be addressed if the system-level approach is used?
- What system-level anti-islanding enabling solutions exist or are feasible today (e.g. grounding switches, power line carrier heartbeat, communications)?
  - What are typical costs associated with those solutions?
  - Do power quality concerns within an unintentional island need to be addressed if the system-level approach is used?
- What system-level intentional island enabling solutions exist or are feasible today (e.g. communications, power line carrier heartbeat)? *Note that scoping related to intentional islanding is subject to alignment with final scoping of the proposed Microgrid Working Group as outlined within the Track Two Staff Proposal as recommended within the Microgrid OIR.*
  - What are typical costs associated with those solutions?
  - Do power quality concerns within an intentional island need to be addressed if the system-level approach is used?
- What potential unintentional island mitigation solutions that do not yet exist need further evaluation and/or testing?
- What unintentional island mitigation solutions are ripe for pilot projects and/or additional testing to ensure feasibility?
- What coordination and cost allocation issues need to be surmounted in order to deploy the most effective/feasible/least cost unintentional island mitigation solutions?

**(END OF APPENDIX B)**



## **Appendix C**

### **Working Group 4 Final Report Annex 2: Risk of Islanding Study Assessment Procedure**

## **Annex 2. Risk of Islanding Study Assessment Procedure**

1. Feeder/Station Modeling
  - a. Develop feeder model in MATLAB/Simulink using data provided by utility. (Cyme or similar)
2. Modeling Details In order to reduce model complexity and speed simulation time, several aggregation steps can be performed on the models.
  - a. Any nodes with identical conductors, no branches, and no equipment connected (i.e., circuit segments that are in series and have the same impedance per unit length) were combined into a single circuit segment with conductor length equal to the sum of the individual segment lengths. This step simplifies the model yet has no impact on model accuracy.
  - b. The important equipment of all single-phase nodes, such as loads, capacitors, and transformers, were aggregated to the three-phase trunk. To account for real and reactive losses in the series circuit elements in these aggregated single- and two-phase sections, the aggregated loads were adjusted to draw an additional 2% real power and 5% reactive power. This aggregation step causes a minor loss of fidelity, but the 2% and 5% adjustments just mentioned compensate for this loss of fidelity so that it should be negligible for purposes of this study.
  - c. After the model is built, any connected impedance nodes representing overhead lines with no branches and no equipment were aggregated into a single node with the same impedance. This step is similar to step #1 except that it also aggregates circuit

segments with dissimilar conductors, as long as they are purely in series.

- d. Load shall be constant Z load as a default, constant power loads (ie Motor loads), may be required depending on the location.

#### Model Validation

Circuit impedances should be validated against expectations by comparing the calculated fault currents expected against those predicted by the MATLAB/Simulink feeder model. This is performed by applying LLL, LLG, LL and LG faults and comparing against the Utility model, they shall match within 10%.

#### 3. PV Machine Plant Modeling:

- a. PV Modeling shall use manufacturer-specific proprietary anti-islanding controls.
- b. Machine modeling shall use Matlab's built in sixth order machine model.
- c. PV and Machine generation shall have the applicable voltage and frequency trip settings installed. If they are not known PV inverter settings will utilize Rule Table HH ride through settings. Machine settings will be obtained by the utility.

#### 4. Risk of Islanding Study Procedure:

- a. Select a breaker, switch or other device that can form an island that includes the DG under study, loads, and a VAR source. If inactive VAR source(s) are present on the line segment and not being utilized, they should be removed or otherwise deactivated and excluded from the scope of the Risk of Islanding study.

- b. Define the balance point is found at which the output of all real and reactive power sources in the island matches the demand of the loads in the island.
- c. Once that point is located, a batch-mode coarse-resolution sweep is run over the expected range of loading fractions\* (LF) and power factors (PF). For all LF and PF pairs in the batch, a simulation is run in which an island is formed without a fault by opening a breaker of interest, and the resulting run-on time (ROT) of the DG plant, defined as the time from switch opening to plant shutdown, is recorded. The coarse resolution allows the batch to be run in a reasonable length of time, and facilitates the location of the edges of any nondetection zone (NDZ) that may exist. Finer-resolution batches can be run to obtain better resolution if needed. The NDZ is defined as the range of loads over which the ROTs of the PV plant are longer than the IEEE 1547 limit of 2 sec. for the entire islanded section.
- d. Once the NDZ location or lack of an NDZ has been determined with suitable confidence and the maximum ROTs are known, NPPT and utility engineers confer to decide whether the NDZ is such that the risk of islanding is negligible, or whether it represents a realistic loading scenario and additional mitigation is needed.
- e. This process is repeated for each breaker, switch or interrupter that can form an island including the DG under study.

*\*For these simulations, LF is given as a percentage of the total connected load. The PF values given are the uncompensated PF values. What this means is that the PF values are the values of the R-L loads, but without the utility capacitors included. Thus, the PF that*

*is being swept in these simulations is that of the load and feeder only, excluding the capacitors.*

5. Study Results: The end result of the Risk of Islanding study should contain a detailed assessment as to the reasonable feasibility of an extended ROT exceeding 2 seconds. The conclusion should contain language that addresses this question specifically as well as any potential solutions that could be implemented in lieu of conventional means of managing Risk of Islanding on both the distribution and transmission levels. The intent is to allow islanding mitigation methods to evolve with state of the art technology and stakeholder understanding of conditions that may result in islanding.

These solutions include but are not limited to:

- a) Setting changes using smart inverter technology that destabilize the island
- b) Utilizing inverters with different method(s) of anti-islanding that perform better in the given grid conditions
- c) Setting changes to synchronous generator protection schemes or operating parameters
- d) Installing IOU approved relays or site controllers that provide the required response time at the Point of Interconnection
- e) Utilization of localized Distributed Energy Resource Management Systems (DERMS)

Approval and implementation of any mitigation method shall be at the sole discretion of the IOU Engineer.

**(End of Appendix C)**

# **Appendix D**

## **Proposed PG&E Screens**

***Proposed PG&E Screens***

The new UL1741/1741SA anti-Islanding screening proposal is illustrated by the flow chart in Figure 1 and contains the following elements.

1. Is aggregated DG greater than 50% of minimum load?
  - a. If no, no further review is required.
  - b. If yes, continue to Screen 2.
2. Is the ratio of unprotected<sup>167</sup> aggregate machines and/or uncertified DG to total DG greater than 40%?
  - a. If no, then no further review is required. Note: As more certified inverters are added to the system, it will become more likely that projects will pass this screen and therefore not be required to install mitigations for islanding.
  - b. If yes, continue to Screen 3.
3. Are the unprotected machines and/or uncertified DG (e.g., wind) operated in fixed power-factor mode AND are the voltage and frequency elements set per Rule 21 Table H<sup>168</sup>?
  - a. If yes to both, skip Screen 4 and continue directly to Screen 5.
  - b. If no, proceed to Screen 4.
4. Can the DG be placed in fixed power-factor mode AND the voltage and frequency elements be set per Rule 21 Table H?
  - a. If yes to both, then continue to Screen 5.

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<sup>167</sup> Unprotected – if an existing machine/uncertified DG already has DTT or a recloser installed for this islanding condition the DG would not count towards the ratio limit.

<sup>168</sup> Rule 21 Table H settings are specified in PG&E Electric Rule No. 21 Sheets 173, and 176.

- b. If no, then a Risk of Islanding Study must be performed to determine whether mitigation is required. If the Risk of Islanding Study determines there is a risk of an island forming after more than two seconds then mitigation will be required. If the applicant does not want to proceed to a Risk of Islanding Study, then mitigation will be required or the application must be withdrawn.
- 5. Are more than 50% of the inverters using a type 1 or 2A<sup>169</sup> anti-islanding method AND is the ratio of unprotected aggregate machines and/or uncertified DG to total DG less than 70%?
  - a. If yes to both, then no further review is required.
  - b. If no to either or both, then a Risk of Islanding Study must be performed to determine whether mitigation is required. If the Risk of Islanding Study determines there is a risk of an island forming after more than two seconds then mitigation will be required. If the applicant does not want to proceed to a Risk of Islanding Study, then mitigation will be required or the application must be withdrawn.

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<sup>169</sup> Inverter Group 1/2A is referenced to SANDIA defined Active Islanding methods. Group 1 is defined as a method that uses positive feedback error on a frequency or phase pulse creating instability when an island forms up to the frequency trip limits. The output perturbation may be continuous or pulsed. Group 2A is similar to Group-1 with the exception that the signal is not continuous and may be stepped or discontinuous.



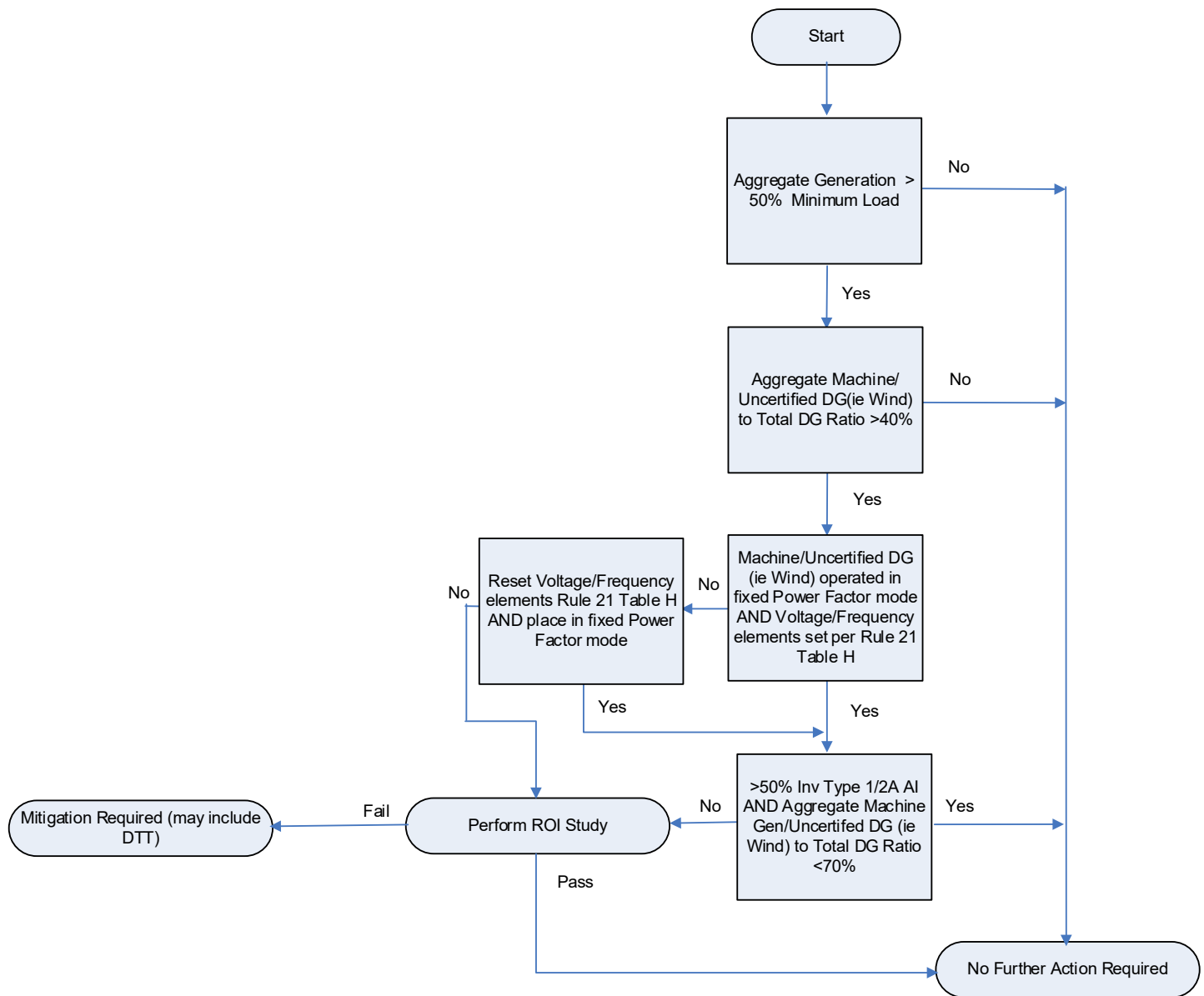


Figure-1 Certified Inverter Screen

Referring to Figure 1, the first screen is to check for minimum loading, this check is intended to screen out interconnections requiring mitigation based on the load to generation ratio. The load data is based upon the minimum load for the calendar year.

The new machine uncertified anti-Islanding screening proposal is illustrated by the flow chart in Figure 2 and contains the following elements.

1. Is aggregated Machine DG greater than 50% of the 24hr minimum load?
  - a. If no, no further review is required.
  - b. If yes, continue to Screen 2.
2. Are more than 50% of the inverters using a type 1 or 2A<sup>170</sup> anti-islanding method AND is the ratio of unprotected aggregate machines and/or uncertified DG to total DG less than 70%?
  - c. If yes to both, then no further review is required.
  - d. If no to either or both, then a Risk of Islanding Study must be performed to determine whether mitigation is required. If the Risk of Islanding Study determines there is a risk of an island forming after more than 2 seconds then mitigation will be required. If the applicant does not want to proceed to a Risk of Islanding Study, then mitigation will be required or the application must be withdrawn.

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<sup>170</sup> Inverter Group 1/2A is referenced to SANDIA defined Active Islanding methods. Group 1 is defined as a method that uses positive feedback error on a frequency or phase pulse creating instability when an island forms up to the frequency trip limits. The output perturbation may be continuous or pulsed. Group 2A is similar to Group-1 with the exception that the signal is not continuous and may be stepped or discontinuous.

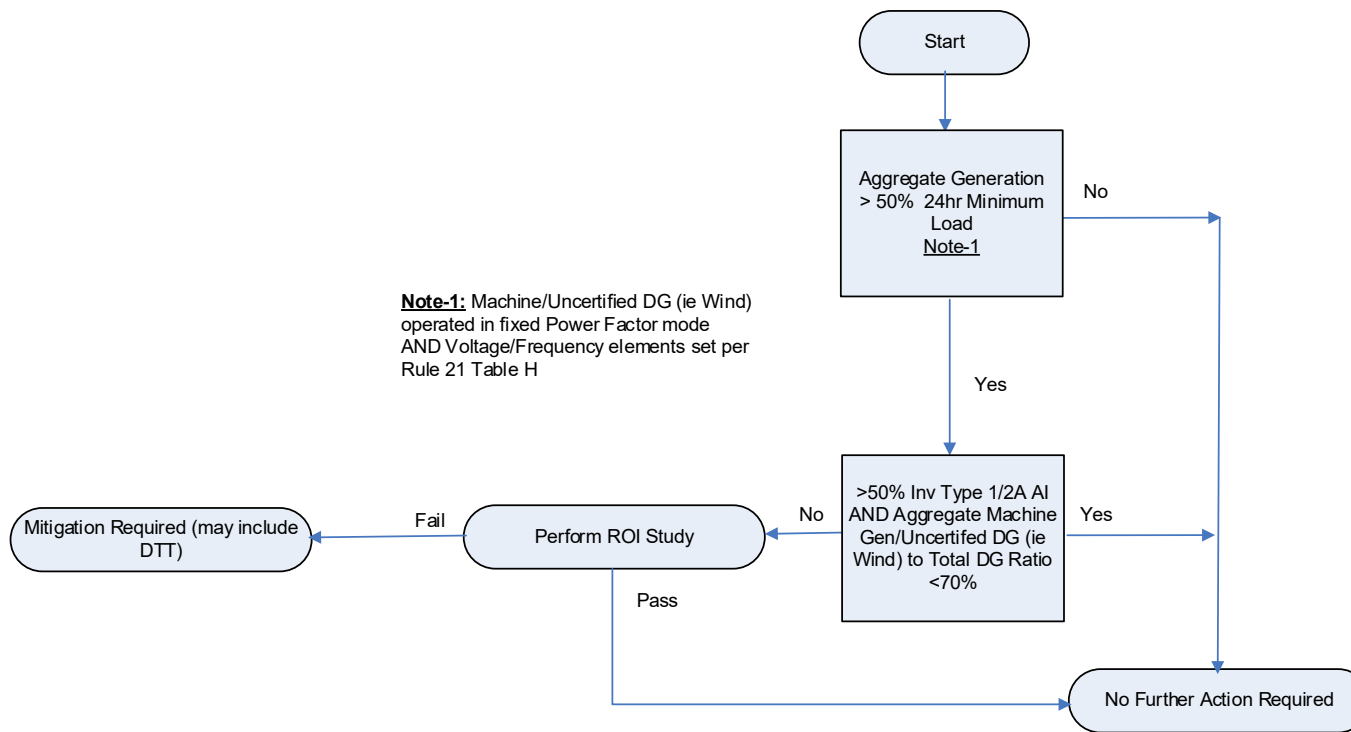


Figure-2 Machine Generator Screen

Referring to Figure 2, the first screen is to check for minimum loading, this check is intended to screen out interconnections requiring mitigation based on the load to generation ratio. The load data is based upon the 24-hour minimum load for the calendar year.

**(End of Appendix D)**