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

Pacific Gas & Electric Company
ELC (Corp ID 39)
Status of Advice Letter 6287E
As of August 30, 2021

Subject: Modifications to Electric Rule 21 Pursuant to Decision 20-09-035 Addressing Remaining Ordering Paragraph Issues in Working Group 2 and 3

Division Assigned: Energy

Date Filed: 08-06-2021

Date to Calendar: 08-11-2021

Authorizing Documents: D2009035

Disposition:	**Withdrawn**
Effective Date:	**None**

Resolution Required: No

Resolution Number: None

Commission Meeting Date: None

CPUC Contact Information:

edtariffunit@cpuc.ca.gov

AL Certificate Contact Information:

Kimberly Loo
415-973-4587
PGETariffs@pge.com

STATE OF CALIFORNIA **GAVIN NEWSOM,** *Governor*

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

To: Energy Company Filing Advice Letter

From: Energy Division PAL Coordinator

Subject: Your Advice Letter Filing

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

The AL status certificate indicates:

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Disposition of Filing (Accepted, Rejected, Withdrawn, etc.)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

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

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

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

Pacific Gas and Electric Company

Sidney Bob Dietz II
Director
Regulatory Relations

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

Fax : 415-973-3582

August 6, 2021

Advice 6287-E
(Pacific Gas and Electric Company ID U 39 E)

Public Utilities Commission of the State of California

Subject: **Modifications to Electric Rule 21 Pursuant to Decision 20-09-035 Addressing Remaining Ordering Paragraph Issues in Working Group 2 and 3**

Purpose

Pacific Gas and Electric Company (PG&E) hereby submits this Tier 2 Advice Letter ("AL") to update Electric Rule 21 - *Generating Facility Interconnections* - in compliance with the California Public Utilities Commission ("CPUC", "Commission") Decision ("D.") D.20-09-035[1] ("WG 2 & 3 Decision") addressing the unresolved ordering paragraphs (OPs) in the following advice letters:

(1) **AL 5988-E-A** - the "**30 day"** supplemental submitted May 19, 2021 did not resolve OPs 7, 49 and 50 (OP 7, 49 and 50, will be addressed in a separate Tier 1 advice letter (AL 6286-E) submitted concurrently with this advice letter to be able to implement for the 2021 wildfire season, per Energy Division's guidance);
(2) **AL 6014-E-A** - the "**60 day"** supplemental submitted June 25, 2021 did not resolve OPs 2,12, and 23;
(3) **AL 5915-E** - the "**120 days"** supplemental was not submitted but this advice letter addresses additional change to OPs 5, 6, 8 and 11.

Based on Energy Division's guidance, this advice letter addresses the remaining issues in the above advice letters.

Background

Rulemaking 17-07-007
On July 13, 2017, The Commission adopted Order Instituting Rulemaking (R.) 17-07-007 to consider refinements to Electric Tariff Rule 21 of Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E), and Southern California Edison

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

Company (SCE) (jointly, Utilities) regarding the interconnection of distributed energy resources.[2]

ACR Scoping Memo

On October 2, 2017, the Commission issued Scoping Memo of Assigned Commissioner and Administrative Law Judge (Scoping Memo) set forth the scope and schedule of the proceeding. It established the working group process, whereby resolution of the technical issues of the proceeding would be proposed by Working Groups One through Six. In addition, four issues were assigned to the Smart Inverter Working Group, including issues 5 and 6.[3]

Working Group 1 and D. 19-03-013

Working Group One led to various advice letters being submitted[4] that were protested and were ultimately resolved by Resolution E-5035.

Working Group 2

On February 14, 2018, a Ruling directed that Working Group Two would begin on March 15, 2018 and required that it subsequently file its recommendations report on September 15, 2018. The Ruling also reassigned Issue 6 to Working Group Two.

On August 15, 2018, the Administrative Law Judge issued a Ruling allowing additional time for Working Group Two to resolve issues, including sub-issues encountered, and delaying the filing of the recommendations report to October 31, 2018.

On October 31, 2018, the Working Group 2 final report was issued.[5]

On November 7, 2018, the Administrative Law Judge facilitated a workshop to discuss the recommendations provided in the Working Group 2 Final Report.

---

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

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

[4] AL 5553-E *Modification to Rule 21 Pursuant to the Working Group 1 D. 19-03-013*. The Rule 21 changes in AL 5553-E is still pending approval. Two other Advice letters (AL 5583-E, and AL 5584-E) were also submitted for Working Group 1 but they did not impact Rule 21. E-5035 resolved issues with the aforementioned advice letters, and required the submission of AL 6154-E, 6154-E-A, AL 6155-E and AL 6155-E-A.

[5] Working Group Two Final Report filed jointly by the Utilities.

On December 7, 2018, in response to the November 7, 2018, workshop on the Working Group Two Report, and parties were directed to respond to questions on the report.

On February 1, 2019, responses to the questions, along with comments on the Working Group Report, were filed by the various parties

On February 22, 2019, replies were filed by the various parties.

Amended Scoping Memo and Working Group 3

On November 16, 2018, a Scoping Memo and Ruling (Amended Scoping Memo) delayed the start of Working Group Three until December 1, 2018 and required Working Group Three to file its recommendations report on June 14, 2019. The Amended Scoping Memo also decreased the number of working groups and redistributed issues across two working groups and the Interconnection Discussion Forum[6] such that Working Group Three was assigned issues 12, 15, 16, 20, 22, 23, 24, 27 28, and New Issues A and B.

On June 13, 2019, the Working Group Three Final Report[7] was issued followed by a workshop.

A November 27, 2019 Ruling directed parties to respond to questions on the Working Group Three Report.

On January 13, 2020, the various parties filed responses to the questions contained in the November 27, 2019, ruling, along with comments to the Working Group Three Report.

On January 27, 2020, various parties filed replies to the responses and Working Group Three Report comments

Decision 20-09-035

On August 20, 2020, a proposed decision was issued on Working Groups Two and Three. On September 9, 2020 comments were received. On September 22, 2020, replies were received.

On September 24, 2020, the Commission voted out D.20-09-035. D.20-09-035 addressed the recommendations of Working Groups Two and Three and the Vehicle-to-Grid Alternating Current Interconnection Subgroup (V2G AC Subgroup).

---

[6] In Resolution Administrative Law Judge-347, the Commission established the Interconnection Discussion Forum (formerly known as the Rule 21 Working Group) as a venue to encourage discussion and collaboration between the Utilities and developers. [as explained in footnote 3 in D. 20-09-035]

[7] Working Group Three Final Report filed by SDG&E

Decision 21-01-027

On January 21, 2021, the CPUC issued D. 21-01-027[8] *Correcting Errors in Decision 20-09-035.* It noted for the purposes of this advice letter that references to various ordering paragraph numbers noted in the table below should corrected.

AL 5988-E and AL 5988-E-A

On October 30th, PG&E submitted Tier 1 AL 5988-E[9] 30 days after the issuance of D. 20-09-035, as ordered by that decision. That advice letter was protested and has been suspended. Supplemental AL 5988-E-A[10] was submitted May 19, 2021 addressing OPs 13, 14, 46, but OPs 7, 49 and 50 were not addressed there.

AL 6014-E and AL 6014-E-A

On November 30th, PG&E submitted Tier 2 AL 6014-E[11] 60 days after the issuance of D. 20-09-035, as ordered by that decision. That advice letter was protested. Supplemental AL 6014-E-A[12] was submitted June 25, 2021, addressing OPs 1, 3, 4, 17 and 18, but OPs 2, 12, and 23 were not addressed there.

AL 5915-E

On January 28, 2021, PG&E submitted the original advice letter AL5915-E. 120 days after the issuance of D. 20-09-035, as ordered by that decision. That advice letter was protested.

AL 6058-E

Concurrent with AL 5915-E, pursuant to D. 20-09-025 OP 15 and 16 (pertaining to the use of a Limited Generation Profile for interconnection) PG&E submitted Tier 3 AL 6058-E.

---

8 See D. 20-09-035 OP1 Table labeled *Decision 20-09-035 Ordering Paragraph Corrections,* last line under OP 55.

9 AL 5988-E *Advice Letter Modifying Electric Rule 21 Pursuant to Decision 20-09-035 for Working Group 2 and 3*

10 AL 5988-E-A - *Supplemental: Advice Letter Modifying Electric Rule 21 Pursuant to Decision 20-09-035 for Working Group 2 and 3*

11 AL 6014-E *Advice Letter Modifying Electric Rule 21 Pursuant to Decision 20-09-035 for Working Group 2 and 3* (due 60 Days from Issuance)

12 AL 6014-E-A - *Supplemental: Advice Letter Modifying Electric Rule 21 Pursuant to Decision 20-09-035 for Working Group 2 and 3 (due 60 Days from Issuance)*

Overview

D. 20-09-035 OP 55 (as corrected by D. 21-01-027[13]) requires:

> *"55. Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall update their respective Electric Rule 21 Tariff and, where necessary, Rules 2, 15, and 16 Tariffs, in compliance with the Ordering Paragraphs of this decision by submitting three advice letters pursuant to the table below The table provides the list of the ordering Paragraphs (OP) in this decision requiring changes to Rule 21. The table also indicates whether the advice letter associated with each ordering paragraph is required to be Tier 1 or Tier 2 and provides the deadline for submitting the Advice Letter."*

Distilling down the referenced table at the end referred to in OP 55 (as corrected) to only include the items germane to this Advice Letter, the following Ordering Paragraphs will be addressed. However, the table appears to have incorrect references[14] based on the context of discussion as noted in the red text.

AL Section	OP From earlier AL	OP	Description
1		various	New Integration Capacity Analysis Definitions
2	AL 6014-E-A	2	Initial Review to Use ICA and Share Results (Proposal 8b)
3	AL 5915-E	5	Proposal 8f1 Creating Screen F1 for Short Circuit Contribution>1.2/unit (adds new ICA definitions)
4	AL 5915-E	6	Screens F, G, H & J for < 30 kVA Projects
6	AL 5915-E	8[15]	Modify Screen L to Include Transmission Overvoltage and Anti-islanding Tests
6	AL 5915-E	11	Add 10% Buffer on ICA-SG & ICA OF Profiles
7	AL 5915-E	various	Rule 21 Flow Chart Update based on OP Changes Above
8	AL 6014-E-A	12	Screen N Thermal Overload (Proposal 8n)
9	AL 6014-E-A	23	Standard Design & Construction 60 / 60 BD Timeline (Issue 23, Proposal 12c)

Therefore, based on the above identified Ordering Paragraphs, PG&E proposes the tariff revision addressed below.

---

[13] D. 21-01-027 - *Order Correcting Errors In Decision 20-09-035* – issued January 21, 2021.
[14] As corrected in D. 21-01-07.
[15] This ordering paragraph applies to PG&E only.

Tariff Changes

1. ICA Definitions

IREC proposed the following language:

> **Generation Profile:** The active power output of a Generating Facility over a period of time. The Generation Profile may be less than the Gross Nameplate Capacity at certain times, for example when using a typical PV Generation Profile or a Limited Generation Profile.
>
> **Integration Capacity Analysis – Operational Flexibility (ICA-OF) Values:** The minimum ICA value at a given Point of Interconnection from the set of the thermal, voltage, power quality, protection, and operational flexibility ICA Values.
>
> **Integration Capacity Analysis – Operational Flexibility (ICA-OF) 576 Profile:** Annual Profile composed of 576 hours where each hour is represented by its ICA-OF Value.

To support other change below, and based on utility discussions with IREC, PG&E, in alignment with the other utilities, proposes the following definitions related to the Integration Capacity Analysis (ICA) be added to Rule 21:

Term Defined	Basis for Revision
Generation Profile	IREC proposed this definition in 120-day advice letter protest
Integration Capacity Analysis (ICA) Values:	IREC proposed PG&E's definition in 60-day advice letter protest, but the utilities add/maintain inclusion of the word "safety." Subsequently, it was agreed the word "safety" could be included in parentheses instead of "operational flexibility"
Integration Capacity Analysis – Static Grid (ICA-SG) Values	IREC proposed SDG&E's definition in 60-day advice letter protest.
Integration Capacity Analysis – Operational Flexibility (ICA-OF) Values	IREC proposed this definition in 120-day advice letter protest.
Integration Capacity Analysis – Operational Flexibility 576 (ICA-OF 576) Profile	IREC proposed this definition in 120-day advice letter protest.
Integration Capacity Analysis – Static Grid 576 (ICA-SG 576) Profile	IREC proposed SCE's definition in 60-day advice letter protest.

Based on this, the following definitions are proposed for including in Rule 21 Section C - *Definitions*

Generation Profile: The active power output of a Generating Facility over a period of time. The Generation Profile may be less than the Gross Nameplate Capacity at certain times, for example when using a typical PV Generation Profile or a Limited Generation Profile.

...

Integration Capacity Analysis (ICA) Values: Values which represent the maximum capacity that can be interconnected at a given Point of Interconnection without exceeding Distribution Provider equipment thermal limits or any of the Distribution System voltage, power quality, protection, and operational flexibility (safety) limits, each of which is independently calculated.

Integration Capacity Analysis – Static Grid (ICA-SG) Values: The minimum ICA value at a given Point of Interconnection from the set of the thermal, voltage, power quality, and protection ICA Values.

Integration Capacity Analysis – Operational Flexibility (ICA-OF) Values: The minimum ICA value at a given Point of Interconnection from the set of the thermal, voltage, power quality, protection, and operational flexibility ICA Values.

Integration Capacity Analysis – Operational Flexibility 576 (ICA-OF 576) Profile: Annual Profile composed of 576 hours where each hour is represented by its ICA-OF Value.

Integration Capacity Analysis – Static Grid 576 (ICA-SG 576) Profile: Annual Profile composed of 576 hours where each hour is represented by its ICA-SG Value.

2. Ordering Paragraph 2 - Initial Review to Use ICA and Share Results (Proposal 8b)

Ordering Paragraph 2 requires:

2. Proposal 8b is adopted.

Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company (Utilities) shall ***use the Initial Review process to determine if Integration Capacity Analysis values*** *at the proposed Point of Interconnection need to be updated using the Integration Capacity Analysis tool on the specific electrical node into the Initial Review*

process or running the Integration Capacity Analysis on all the electrical nodes in the circuit.

Utilities shall not perform additional Integration Capacity analyses as part of the interconnection process of projects with less than 30 kilovolt amperes nameplate capacity.

Utilities shall ***share the results of any Integration Capacity Analysis updates with the interconnecting generator*** *and provide an explanation of changes to grid conditions or the interconnection queue.*

Utilities shall comply with confidentiality provisions and data reduction policies.

[Formatting and emphasis added]

Tied with the above OP, OP 11 involves applying a buffer on the Integration Capacity Analysis-Static Grid. OP 54 (as corrected) lists OP 11 as being addressed in a Tier 2 AL due 120 day after the issuance of the decision. As OP 11 was addressed in a subsequent advice letter submitted after the original of this AL, until that advice letter is made effective, it limits how much of these ICA changes can be implemented in this advice letter.

11. Option B of Proposal 8m is adopted with modification.

Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company (Utilities) shall apply a 10 percent buffer to the Integration Capacity Analysis-Static Grid profile and to the Integration Capacity Analysis Operational Advice 6014-E-A - 11 - June 25, 2021 Flexibility profile during review of Screen M of the Rule 21 Interconnection Application Process.

The need for the 10 percent buffer to the Integration Capacity Analysis-Operational Flexibility profile will be revisited by the Commission.

Utilities shall collect data on the effectiveness of the 10 percent Integration Capacity Analysis-Operational Flexibility buffer (after consulting with the Commission's Energy Division) and provide the data and a recommendation on whether to retain the buffer or adjust it, in the Advice Letter on buffers for Issue 9, as required by Ordering Paragraph 15.

[Formatting and emphasis added]

Based on the above, PG&E proposes to make the following addition to Section F.2.a: (original sheet 78)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS

a. Initial Review

Upon receipt of a complete and valid Interconnection Request, Distribution Provider shall perform Initial Review using the process in Section G.1. The Initial Review determines if (i) the Generating Facility qualifies for Fast Track Interconnection through Initial Review, or (ii) the Generating Facility requires a Supplemental Review. Absent extraordinary circumstances, Distribution Provider shall notify Applicant in writing of the results of Initial Review within fifteen (15) Business Days following validation of an Interconnection Request.

As part of the evaluation of Screen M, when Integration Capacity Analysis Values are available at the requested Point of Interconnection, Distribution Provider will determine if Integration Capacity Analysis Values at the proposed Point of Interconnection need to be updated. If Distribution Provider determines that the Integration Capacity Analysis Values at the proposed Point Interconnection need to be updated, the Distribution Provider will update the values for the proposed Point of Interconnection using the Integration Capacity Analysis tool on the specific electrical node or by running the Integration Capacity Analysis on all the electrical nodes in the circuit. Distribution Provider shall not perform additional Integration Capacity Analysis as part of the interconnection process of projects with less than 30 kilovolt amperes nameplate capacity. Distribution Provider shall share the results of any Integration Capacity Analysis updates with the Applicant and provide an explanation of changes to grid conditions or the interconnection queue which led to the need to obtain updated Integration Capacity Analysis Values. Distribution Provider shall comply with confidentiality provisions and data redaction policies.

For all Interconnection Requests that pass Initial Review and do not require Interconnection Facilities or Distribution Upgrades, Distribution Provider shall provide Applicant with a Generator Interconnection Agreement within fifteen (15) Business Days of providing notice of Initial Review results...

3. Ordering Paragraph 5 – Proposal 8f1[16] Creating Screen F1 for Short Circuit Contribution>1.2 per unit

Ordering Paragraph 5 requires:

> ***Proposal 8f1*** *is adopted.*
>
> *Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company* ***shall include a new Screen in the Interconnection Rule 21 process, to be named Screen F1****, which will determine whether a generating system's short circuit contribution exceeds 1.2 per unit.*
>
> [Emphasis and formatting added]

IREC's protest asked that Screen F1 reference the protection Integration Capacity Analysis (ICA) Value and have the same language across the IOUs**.** The IOUs agreed that the Screen F1 language should reference the Protection ICA value

[16] D. 20-09-035, Section 4.2.6. Issue 8: Proposal 8f1 Proposal 8f1 would add Screen F1 to determine whether the generating system's short circuit contribution exceeds 1.2 per unit. This is a consensus proposal. The Working Group Two Report explains that generating systems with 1.2 per unit short circuit contribution can reference the Integration Capacity Analysis value for meeting the reduction of reach Integration Capacity Analysis Protection Screen. For generating facilities exceeding the 1.2 per unit short circuit contribution, a utility would use the protection Integration Capacity Analysis value at the point of interconnection and the project specific per unit short circuit contribution to determine whether the facility passes Screen F1.

The Working Group Two Report points out that synchronous or induction generators cannot use the Integration Capacity Analysis to determine a specific value. Instead, the Integration Capacity Analysis automatically assigns a value of 1.2 per unit short circuit contribution for inverter-based technology. Thus, to evaluate an inverter-based project's short circuit duty contribution, Screen F1 is proposed. If the project's short circuit duty contribution is less than 1.2, the project passes Screen F1. If the project's contribution is greater than 1.2, the project would fail Screen F1. The Working Group Two Report underscores that if the projects' nameplate value multiplied by its per unit contribution is less than or equal to the Integration Capacity Analysis value multiplied by 1.2 per unit, the project will still pass Screen F1. Simply put, projects would fail Screen F1 because the project's nameplate capacity is greater than the Project Specific Protection Integration Capacity Analysis value. Projects failing Screen F1 would be evaluated under Supplemental Review for impacts to reduction in reach.

31 Reduction of Reach occurs when distribution relays are rendered less able to sense a faulted condition as a consequence of increased generation on a distribution line. (See Padullaparti, H.V. et al. (2016).) Analytical Approach to Estimate Feeder Accommodation Limits Based on Protection Criteria. IEEE Access. 4. 1-1. 10.1109/ACCESS.2016.2589545. [p22-23]

instead of the ICA Static Grid (IGA SG) value as outlined in the original AL 5915-E.

PG&E proposes to update Section G.1.f and the Interconnection Technical Framework Overview flow chart in Section G (see section 7 of this advice letter also) to:

· incorporate Screen F1

· rephrase "Fast Track Eligibility MW Limit" to "Fast Track Request"

· add "Protection ICA" in the Initial Review Screens A-H box

· modify Screen J

For Screen F1, PG&E proposes to modify Rule 21 Section G.1.f language as shown: (Sheet 151)

G. ENGINEERING REVIEW DETAILS (Cont'd.)
1. INITIAL REVIEW SCREENS (Cont'd.)

f. Screens F and F1: Is the Short Circuit Current Contribution Ratio within acceptable limits?

Screen F: Is the Short Circuit Current Contribution Ratio within acceptable limits?
- If Yes (pass), continue to Screen F1 ~~G~~.
- If No (fail), continue to Screen F1 ~~G~~ pursuant to Section G.1.

When measured at primary side (high side) of the Dedicated Distribution Transformer serving a Generating Facility, the sum of the Short Circuit Contribution Ratios of all Generating Facilities connected to Distribution Provider's Distribution System circuit that serves the Generating Facility must be less than or equal to 0.1.

Significance: If the Generating Facility passes this screen, it can be expected that it will have no significant impact on the Distribution System's short circuit duty, fault detection sensitivity, relay coordination, or fuse-saving schemes

Screen F1: Is the per unit short circuit current contribution under allowable levels?

Is the short circuit current contribution less than or equal to 1.2 per unit or is the Generating Facility Gross Nameplate Rating multiplied by its per unit

contribution less than the Protection Integrated Capacity Analysis (ICA) Value[1] multiplied by 1.2 per unit?

- If Yes to either (pass), continue to Screen G.
- If No to both (fail), continue to Screen G pursuant to Section G.1.

Significance: Generating systems with a per unit short circuit contribution of 1.2 or less can bypass this screen and directly use the ICA because ICA calculations assume that Generating Facilities have a per unit short circuit contribution of 1.2. For Generating Facilities with a per unit short circuit contribution greater than 1.2, the Distribution Provider will use the Protection ICA Value at the point of interconnection in conjunction with the Generating Facility's per unit short circuit contribution to determine whether the facility passes Screen F1.

_____

[1]Protection ICA Value is one of the component values of the ICA Value that pertains to sensing faults on the grid.

g. Screen G: Is the Short Circuit Interrupting Capability Exceeded?

...

The Technical Framework Overview Flow Chart is updated in Section 7 of this advice letter.

4. Ordering Paragraph 6 – Screens F, G, H & J for < 30 kVA Projects

Ordering Paragraph 6 requires:

> *6. Modification 1 of Proposals 8f, 8g, 8h, and 8j is adopted.*
>
> *Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall* ***modify Interconnection Rule 21 to allow interconnection projects less than 30 kilowatt volt amperes to bypass Screens F, G, H, and J.***
>
> [emphasis and formatting added]

Note that, within the Working Group Two Report, these proposals contemplated changing the tariff language to state that these screens do not apply to Generating Facilities with a Gross Rating of "30 kVA **or less**."[17]

[17] Working Group Two Report at p. 52.

OP 6, however, provides that the Utilities are to modify Rule 21 to allow interconnection projects "***less than** 30 kilowatt volt amperes" to bypass Screens F, G, H, and J. The Decision references both approaches*.[18]

Within the Working Group Two Report these proposals contemplated changing the tariff language to state that these screens do not apply to Generating Facilities with a Gross Rating of "30 kVA or less."[19] OP 6, however, provides that the Utilities are to modify Rule 21 to allow interconnection projects "less than 30 kilowatt volt amperes" to bypass these screens. The Decision references both approaches.[20]

In IREC's protest to AL 5915-E, it asserted that the IOUs should adhere to the Working Group Two consensus agreement and exempt small generators with capacities of 30 kVA or less from screens F, G, H, and J. The IOUs agreed to adopt IREC language, and the Energy Division confirmed that we should proceed with 30 kVA "or less" instead of the OP language.

To comply with OP 6, PG&E proposes to change the tariff to allow projects 30 kVA **or less** to bypass these screens.

For the changes to Screens F, G, H and J, PG&E proposes the following changes to sheets 6 and 151-157 in section G.1.f, g, h, and j.

PG&E also proposes to modify the following language to Section G.1.j as shown in fourth window below.

PG&E also updates the Technical Framework in section 7 of this advice letter to reflect all of these changes.

TABLE OF CONTENTS (Cont'd.)

ENGINEERING REVIEW DETAILS (Cont'd.)

INITIAL REVIEW SCREENS (Cont'd.)

…

Screen J: Is the Gross Rating of the Generating Facility 30~~11~~ kVA or less?

[18] Compare Decision at p. 22 (describing Modification 1 as allowing "projects less than 30 kVA" to bypass Screens F, G, H, and J) to Decision at pp. 43-44 (referencing "raising the threshold" to 30 kVA).

[19] Working Group Two Report at p. 52.

[20] Compare Decision at p. 22 (describing Modification 1 as allowing "projects less than 30 kVA" to bypass Screens F, G, H, and J) to Decision at pp. 43-44 (referencing "raising the threshold" to 30 kVA).

…

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

f. Screens F and F1: Is the Short Circuit Current Contribution Ratio within acceptable limits?

- If Yes (pass), continue to Screen G.
- If No (fail), continue to Screen G pursuant to Section G.1.

Note: This Screen does not apply to Generating Facilities with a Gross Rating of ~~11~~30 kVA or less.

When measured at primary side (high side) of the Dedicated Distribution Transformer serving a Generating Facility, the sum of the Short Circuit Contribution Ratios of all Generating Facilities connected to Distribution Provider's Distribution System circuit that serves the Generating Facility must be less than or equal to 0.1.

Significance: If the Generating Facility passes this Screen, it can be expected that it will have no significant impact on Distribution Provider's Distribution System's short circuit duty, fault detection sensitivity, relay coordination or fuse-saving schemes.

...

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

g. Screen G: Is the Short Circuit Interrupting Capability Exceeded?

Does the proposed Generating Facility, in aggregate with other Generating Facilities on the distribution circuit, cause any distribution protective devices and equipment (including, but not limited to, substation breakers, fuse cutouts, and line reclosers), or Interconnection Request equipment on the system to exceed 87.5 % of the short circuit interrupting

capability; or is the Interconnection proposed for a circuit that already exceeds 87.5 % of the short circuit interrupting capability?

- If Yes (fail) continue to Screen H pursuant to Section G.1.
- If No (pass), continue to Screen H

Note: This Screen does not apply to Generating Facilities with a Gross Rating of ~~11~~30 kVA or less.

Significance: If the Generating Facility passes this screen, it can be expected that it will not cause any of Distribution Provider's equipment to be overstressed.

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

h. Screen H: Is the line configuration compatible with the Interconnection type?
- If Yes (pass), continue to Screen I.
- If No (fail), continue to Screen I pursuant to Section G.1.

Note: This Screen does not apply to Generating Facilities with a Gross Rating of ~~11~~30kVA or less.

Line Configuration Screen: Identify primary distribution line configuration that will serve the Generating Facility. Based on the type of Interconnection to be used for the Generating Facility, determine from Table G.1 if the proposed Generating Facility passes the Screen.

Table G-1 Type of Interconnection

Primary Distribution Line Type Configuration	Type of Interconnection to be made to Primary Distribution Line	Result/Criteria
Three-phase, three-wire	Any type	Pass Screen
Three-phase, four-wire	Single-phase, line-to-neutral	Pass Screen
Three-phase, four-wire		To pass, aggregate

(For any line that has such a section OR mixed three-wire & four-wire)	All others	Generating Facility nameplate rating must be less than or equal to 10% of Line Section peak load

Significance: If the primary distribution line serving the Generating Facility is of a "three-wire" configuration, or if the Generating Facility's distribution transformer is single-phase and connected in a line-to neutral configuration, then there is no concern about overvoltages to Distribution Provider's, or other Customer's equipment caused by loss of system neutral grounding during the operating time of the NonIslanding Protective Function.

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

Screen J: Is the Gross Rating of the Generating Facility ~~11~~30 kVA or less?

- If Yes (pass), skip Screens K, L and M; Initial Review is complete.
- If No (fail), continue to Screen K.[i]

Significance: The Generating Facility will have a minimal impact on fault current levels and any potential line overvoltages from loss of Distribution Provider's Distribution System neutral grounding.

5. Ordering Paragraph 8 – Modify Screen L to Include Transmission Overvoltage and Anti-islanding Tests (PG&E only)

Ordering Paragraph 8 requires:

*8. **Option C** of **Proposal 8k** is adopted on an interim basis until resolution of Issue 18 in Working Group Four.* [21]

[21] Working Group 4 Report

Pacific Gas and Electric Company *shall:*

> ***modify Screen L*** *in Interconnection Rule 21* ***to include the transmission overvoltage and transmission anti-islanding tests currently in Screen M*****.**

[emphasis and footnote15 added]

For proposal 8k, "*Screen L determines whether the Interconnection Request is made in an area where there are known transient stability limitations, or the proposed generating facility has interdependencies known to the utility with transmission system Interconnection Requests already in the queue…. Screen M evaluates whether there is a risk that aggregate generation could exceed 15 percent of peak load and, if so, identifies which projects require Supplemental Review.*" [22, 23, 24]

Option C is adopted by D. 20-09-025 and "*modifies the Screen to temporarily allow application of antiislanding tests until Issue 18 can be resolved in Working Group Four*."[25]

"*Option C, proposed by IREC, would allow* ***PG&E to utilize the current screening practices that look at whether a project has failed 50 percent of minimum load and where 40 percent or more of the generation on the substation comes from rotating machines*** *and allow SCE and SDG&E to screen for antiislanding but on a temporary basis until Issue 18 is resolved. IREC explains that Option C would require a* ***guidance document to be published identifying the specific screening approach SCE and SDG&E would use, similar to that of PG&E.*** *The subtle but important difference in*

Issue 18 is *Should the Commission adopt changes to anti-islanding screen parameters to reflect research on islanding risks when using UL 1741-certified inverters in order to avoid unnecessary mitigations? If yes, what should those changes entail?* (p 6)

[22] D.20-09-035 p. 26

[23] From Footnote 44, D 20-09-035 p.26 "*Transmission overvoltage is considered possible when a transmission breaker opens on a substation that has an ungrounded high side and aggregate generation is greater than 50 percent of minimum load. 15 percent of peak load is used as the initial screen or filter to conduct additional screening on projects that exceed 15 percent of peak load."*

[24] From Footnote 45 D. 20-09-035 p26: " *Islanding is considered possible when the ratio of machine-based synchronous generation to inverter-based generation is more than 40 percent and aggregate generation is greater than 50 percent of minimum load. Again, 15 percent of peak load is used as the initial screen or filter to conduct additional screening on projects that exceed 15 percent of peak load."*

[25] D.20-09-035 p. 26

Option C is that the customer will identify the specific screening approach that will apply to them…."[26]
[Emphasis and formatting added]

In IREC's protest they note that the Advice Letters do not adopt the language proposed in Option C to proposal 8k as the Commission required. They ask the language be revised to:

> *"Is the Interconnection Request for an area where:*
> *(i) there are known, or posted, transient/dynamic stability limitations,*
> *(ii) the proposed Generating Facility has interdependencies, known to Distribution Provider, with earlier queued Transmission System Interconnection Requests,*
> *(iii) islanding conditions are possible based on [PG&E, SDG&E or SCE's] currently adopted and published screening policies with respect to antiislanding screening, or*
> *(iv) transmission ground fault overvoltage is possible based on [PG&E, SDG&E or SCE's] currently adopted and published screening policies with respect to overvoltage screening.*
>
> *Where (i), (ii), (iii) or (iv) above are met, the impacts of this Interconnection Request to the Transmission System may require further study.*
>
> • *If Yes (fail), Supplemental Review is required.*
> • *If No (pass), continue to Screen M."*
>
> [formatting added]

PG&E agrees to these changes. Accordingly, for Screen L, PG&E proposes modifications to Rule 21 (original sheet 158) as follows:

> I. Screen L: Transmission Dependency, ~~and Transmission~~ Stability, ~~Ground Fault~~ Overvoltage, and ~~/ Anti-~~Islanding Tests
>
> Is the Interconnection Request for an area where:
>
> (i) there are known, or posted, transient/dynamic stability limitations, or
>
> (ii) the proposed Generating Facility has interdependencies, known to Distribution Provider, with earlier-queued Transmission System interconnection requests, or

[26] D.20-09-035 p. 28

(iii) islanding conditions are possible based on PG&E's currently adopted and published screening policies with respect to antiislanding screening, or

(iv) transmission ground fault overvoltage is possible based on PG&E's currently adopted and published screening policies with respect to overvoltage screening.

Where (i) or (ii) or (iii) or (iv) above are met, the impacts of this Interconnection Request to the Transmission System may require further ~~Detailed~~ Study.

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

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

PG&E will temporarily apply anti-islanding tests until the resolution of **Issue 18*** R. 17.-07-007 Working Group Four in made effective in PG&E's tariffs.

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

6. Ordering Paragraph 11 – Add 10% Buffer on ICA-SG & ICA OF Profiles

Ordering Paragraph 11 requires:

11. Option B of Proposal 8m is adopted with modification.

Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company (Utilities) ***shall apply a 10 percent buffer to the Integration Capacity Analysis-Static Grid profile and to the Integration Capacity Analysis Operational Flexibility profile during review of Screen M*** *of the Rule 21 Interconnection Application Process.*

> *The need for the 10 percent buffer to the Integration Capacity Analysis-Operational Flexibility profile will be revisited by the Commission.*
>
> ***Utilities shall collect data*** *on the effectiveness of the 10 percent Integration Capacity Analysis-Operational Flexibility buffer (after consulting with the Commission's Energy Division) and provide the data and a recommendation on whether to retain the buffer or adjust it, in the Advice Letter on buffers for Issue 9, as required by Ordering Paragraph 15.*

[formatting and emphasis added]

IREC's protest states that Screen M should use defined terms and its questions should be phrased consistently.

- Tariff language should use defined terms when suitable.
- Rule 21 should define the term "Generation Profile" to distinguish between screens that evaluate the impact of a Generating Facility exporting its entire Gross Nameplate Rating versus a more limited amount.
- Screen M's questions and answers should be phrased consistently.

IREC also contends that Screen M should be modified in each of the Rule 21 tariffs to read as follows:

> Screen M: Does the Generating Facility pass the ICA or is aggregate generation less than 15% of line section peak load?
>
> When ICA Values are available at the requested Point of Interconnection, the Distribution Provider shall compare the ICA Values to the Gross Nameplate Rating or typical PV Generation Profile.
>
> For Interconnection Requests based on Gross Nameplate Rating:
>
> a. Is the Generating Facility aggregate Gross Nameplate Rating less than or equal to 90% of the lowest value in the ICA-SG 576 Profile?
>
> or
>
> b. Is the Generating Facility aggregate Gross Nameplate Rating less than or equal to 90% of the lowest value in the ICA-OF 576 Profile?
>
> - If Yes to both (pass), Initial Review is complete.
> - If No to either (fail), Supplemental Review is required.

For Interconnection Requests based on typical PV Generation Profile:

a. Is the Generating Facility's Generation Profile based on PV Watts or equivalent less than or equal to 90% of the ICA-SG 576 Profile in any hour?

b. Is the Generating Facility's Generation Profile based on PV Watts or equivalent less than or equal to 90% of the ICA-OF 576 Profile in any hour?

- If Yes to both (pass), Initial Review is complete.
- If No to either (fail), Supplemental Review is required.

When ICA Values are not available at the requested Point of Interconnection, Screen M should be evaluated as follows:

Is the aggregate Generating Facility capacity on the Line Section less than 15% of Line Section peak load for all line sections bounded by automatic sectionalizing devices?

- If Yes (pass), Initial Review is complete.
- If No (fail), Supplemental Review is required.

After discussion with IREC and the other utilities, PG&E proposes to add the following defined terms to language to the beginning of Section G.1.m (original sheets 158-159):

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

Screen M: When ICA information is available at the requested Point of Interconnection, Screen M should be evaluated in accordance with the Gross Nameplate Rating or typical PV output profile.

For Interconnection Requests based on Gross Nameplate Rating

a. Is the Generating Facility aggregate Gross Nameplate Rating greater than 90% of the lower value in the ICA-SG 576 Profile?

or

b. Is the Generating Facility aggregate Gross Nameplate Rating greater than 90% of the lower value in the ICA-OF 576 Profile?

If the response is "yes" to either a) or b), the Interconnection Request fails Screen M and must be evaluated under the Supplemental Review or Detailed Study to determine mitigation requirements.

For Interconnection Requests based on typical PV output profile

a. Is the Generating Facility real power production based on PV Watts or equivalent greater than 90% of the ICA-SG 576 value in any hour?

or

b. Is the Generating Facility real power production based on PV Watts or equivalent greater than 90% of the ICA-OF 576 value in any hour?

If the response is "yes" to either a) or b), the Interconnection Request fails Screen M and must be evaluated under the Supplemental Review or Detailed Study to determine mitigation requirements.

When ICA information is not available at the requested Point of Interconnection, Screen M should be evaluated as follows:

Screen M: Is the aggregate Generating Facility capacity on the Line Section less than 15% of Line Section peak load for all line sections bounded by automatic sectionalizing devices? [ii]

• If Yes (pass), Initial Review is complete.

• If No (fail), Supplemental Review is required.

Significance:

1. Low penetration of Generating Facility capacity will have a minimal impact on the operation and load restoration efforts of Distribution Provider's Distribution System,

2. The operating requirements for a high penetration of Generating Facility capacity may be different since the impact on Distribution Provider's Distribution System will no longer be minimal, therefore requiring additional study or controls.

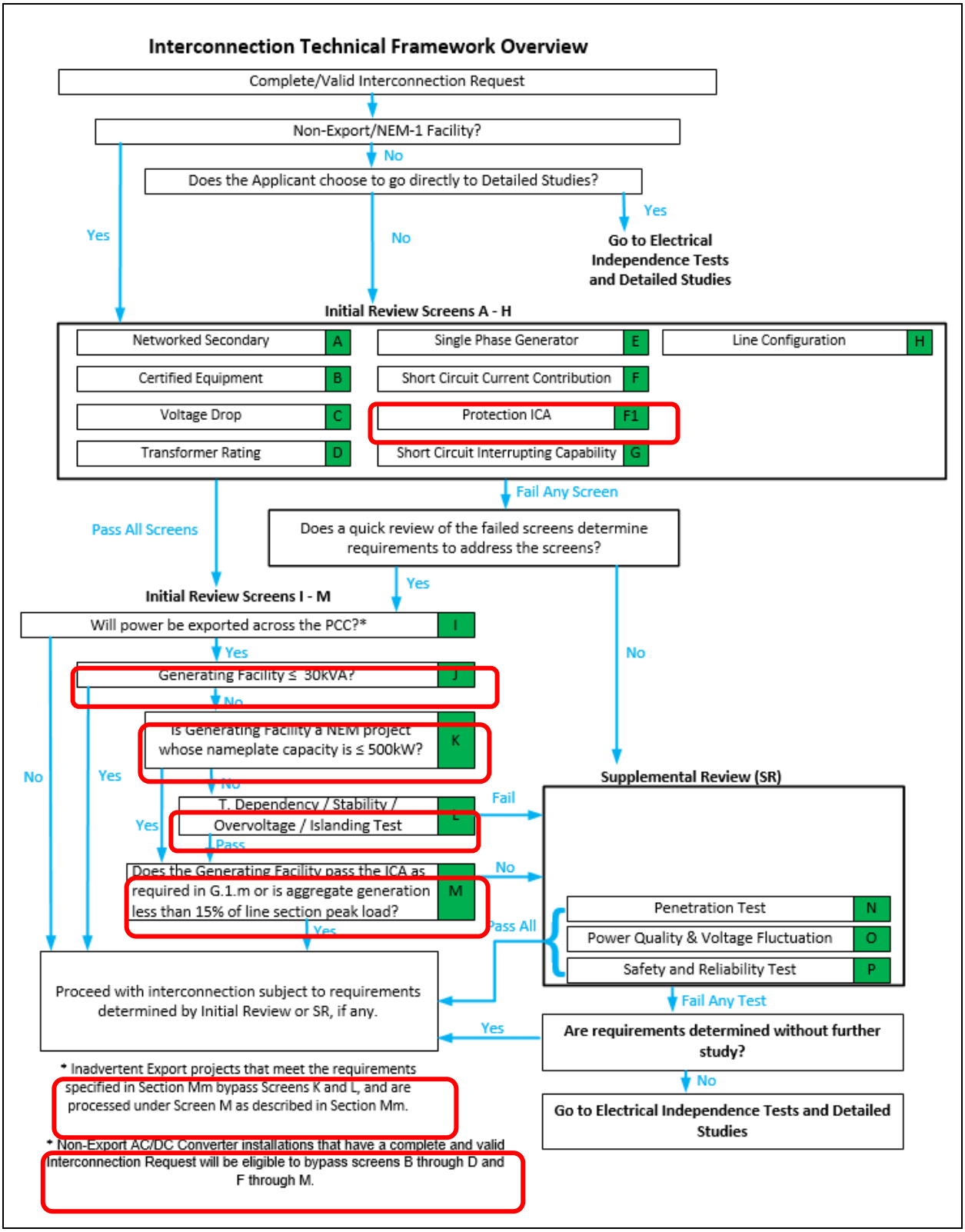
The purpose of this Screen is solely to identify if the Generating Facility needs additional study and is not intended as justification for limiting the penetration of generation on a line section.

———————

[ii] Inadvertent Export systems that meet the requirements specified in Section Mm are processed under Screen M as described in Section Mm.

7. Rule 21 Technical Framework Flow Chart Update based on OP Changes Above

PG&E updates the Engineering Review Details flow chart (original sheet 145) consistent with the OP changes above. Additions circled in Red.


Interconnection Technical Framework Overview
Complete/Valid Interconnection Request
Non-Export/NEM-1 Facility?
No
Does the Applicant choose to go directly to Detailed Studies?
Yes
No
Yes
Go to Electrical Independence Tests and Detailed Studies
Initial Review Screens A - H
Networked Secondary A
Certified Equipment B
Voltage Drop C
Transformer Rating D
Single Phase Generator E
Short Circuit Current Contribution F
Protection ICA F1
Short Circuit Interrupting Capability G
Line Configuration H
Fail Any Screen
Pass All Screens
Does a quick review of the failed screens determine requirements to address the screens?
Yes
No
Initial Review Screens I - M
Will power be exported across the PCC?* I
Yes
Generating Facility ≤ 30kVA? J
No
Is Generating Facility a NEM project whose nameplate capacity is ≤ 500kW? K
No
Yes
No
Yes
T. Dependency / Stability / Overvoltage / Islanding Test L
Fail
Pass
Does the Generating Facility pass the ICA as required in G.1.m or is aggregate generation less than 15% of line section peak load? M
No
Yes
Pass All
Supplemental Review (SR)
Penetration Test N
Power Quality & Voltage Fluctuation O
Safety and Reliability Test P
Fail Any Test
Are requirements determined without further study?
Yes
No
Go to Electrical Independence Tests and Detailed Studies
Proceed with interconnection subject to requirements determined by Initial Review or SR, if any.
* Inadvertent Export projects that meet the requirements specified in Section Mm bypass Screens K and L, and are processed under Screen M as described in Section Mm.
* Non-Export AC/DC Converter installations that have a complete and valid Interconnection Request will be eligible to bypass screens B through D and F through M.

8. Ordering Paragraph 12 - Screen N Thermal Overload (Proposal 8n)

Ordering Paragraph 12 requires:

12. Proposal 8n is adopted.

Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall update Screen N of the Rule 21 Interconnection Application Process to account for thermal overload, while adjusting for the following three scenarios:

i) when the Interconnection Request is below the updated Integration Capacity Analysis value and passes Screen F1;

ii) when the Interconnection Request is above the updated Integration Capacity Analysis value or fails Screen F1; and

iii) when Integration Capacity Analysis information is not available.

[Formatting and emphasis added]

PG&E proposes to add the following language to Section G.2.a (original sheet 160). In order to make the Energy Division Staff deadline of August 6 for this Advice Letter, PG&E is summitting it with the language below. The language is still being discussed with stakeholders, and may need to be resolved in a subsequent supplement, based on Energy Division guidance.

G. ENGINEERING REVIEW DETAILS (Cont'd.)

2. SUPPLEMENTAL REVIEW SCREENS (Cont'd.)

a. Screen N: Penetration Test

If Integration Capacity Analysis Values are available at the requested Point of Interconnection, evaluate Screen N as follows:

i) Penetration Level:

For Interconnection Requests based on nameplate capacity: Is the Interconnection Request Gross Nameplate Rating equal to or below 90% of the minimum annual ICA-SG Value (i.e. minimum value) in the ICA-SG 576 Profile?

For Interconnection Requests based on typical PV output profile: Is the Interconnection Request real power production, based on PV Watts or equivalent, equal to or below 90% the ICA-SG value at each hour in the ICA-SG 576 Profile?

ii) Screen F1: Did the Interconnection Request pass Screen F1?

Did the Interconnection Request pass Screen F1?

If yes to both of the above (pass), continue to Screen O.

If “no” to either or both of the above(fail), a quick review of the failure within Supplemental Review may determine the requirements to address the failure; otherwise Electrical Independence Tests or Detailed Studies are required.

- If the failure(s) that cannot be addressed in Supplemental Review, the Distribution Provider will conduct a review to identify the reasons why further studies are required
- If the failure(s) cannot be addressed in Supplemental Review, the distribution provider must identify a reason why a specific technical constraint is not captured by the ICA and the why the project must proceed to Electrical Independence Tests and Detailed Studies.
- If voltage is a prevailing constraint, then the smart inverter default volt/var function will be used in power flow analysis for the evaluation of the proposed project. This will reveal if the proposed project causes any voltage impacts of concern. If concerns related to steady state voltage, thermal, or protection exist and the Distribution Provider can identify simple upgrades through power flow analysis (e.g., installation of voltage regulator devices or protection devices to mitigate reduction of reach), then the Distribution Provider will determine the mitigation requirements within Screen N. When larger upgrades or complex protection evaluation is required, Screen N will fail, and the technical evaluation will be conducted under the Detailed Study process.
- If no reason for further study is identified, or if requirements to address the failure can be identified in screen N, proceed to Screen O.
- Note: If Electrical Independence tests and Detailed Studies are required, Applicants will continue to the Electrical Independence Tests and Detailed Studies after review of the remaining Supplemental Review Screens if Applicant elects to proceed.

If Integration Capacity Analysis Values are not available, evaluate Screen N as follows:

Where 12 months of line section minimum load data is available, can be calculated, can be estimated from existing data, or determined from a power flow model, is the aggregate Generating Facility capacity on the Line

Section less than 100% of the minimum load for all line sections bounded by automatic sectionalizing devices upstream of the Generating Facility?

...

9. Ordering Paragraph 23 - Standard Design & Construction 60 / 60 Business Day Timeline (Issue 23, Proposal 12c)

Ordering Paragraph 23 requires:

23. Proposal 12c is adopted, establishing a standard timeline for design and construction of interconnection-related distribution upgrades as follows:
i) 60 business days for design and 60 business days for construction, or
ii) design and construction timelines as agreed with the customer.

The 60-day clock commences upon payment and after the customer has done everything necessary on their end to prepare for construction.

[Formatting and emphasis added]

The Working Group handbook

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)
7. COST ENVELOPE OPTION (Cont'd.)
...
g. Tender of the Generator Interconnection Agreement Under the Cost Envelope Option
Negotiation and execution of the Generator Interconnection Agreement shall be in accordance with Section F.2.e for Interconnection Requests evaluated under the Fast Track Process, and in accordance with Section F.3.e.ii for Interconnection Requests evaluated under the Independent Study Process.

8. STANDARD DESIGN AND CONSTRUCTION TIMELINE

Subject to emergencies, delays from other agencies, and other reasons,[1] the standard timeline for design and construction of interconnection-related distribution upgrades is as follows:
i) 60 business days for design and 60 business days for construction, or
ii) design and construction timelines as agreed to between Applicant and Distribution Provider.

The 60-day clock commences upon payment and after Applicant has done everything necessary on its end to prepare for construction.

[1] "Other reasons" include: long lead times for procurement of materials; licensing, rights acquisition, and/or permitting; higher-voltage distribution (generally greater than 50 kilovolts); modifications to equipment (to remove and/or replace) inside substations; civil work performed by Distribution Provider (that is typically performed by Applicant); line extension or reconductoring greater than 500 feet in length.

Protests

*****Due to the COVID-19 pandemic, PG&E is currently unable to receive protests or comments to this advice letter via U.S. mail or fax. Please submit protests or comments to this advice letter to EDTariffUnit@cpuc.ca.gov and PGETariffs@pge.com*****

Any party wishing to protest this submittal may do so by letter sent via U.S. mail, facsimile or E-mail, no later than August 26, 2021, which is 20 days after the date of this submittal. Protests must be submitted to:

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

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

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

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

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

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

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

Effective Date

Pursuant to Decision 20-09-035 Ordering Paragraph 55 (as corrected), this advice letter is submitted with a Tier 2 designation. PG&E requests that this advice submittal become effective 180 to 240 days after it is approved, to allow to time to implement the Screen M ICA changes and related screen L changes, train staff and notify applicants of the changes.

Notice

In accordance with General Order 96-B, Section IV, a copy of this advice letter is being sent electronically and via U.S. mail to parties shown on the attached list and the parties on the service list for R.17-07-007 (Rule .21), R. 14-07-002 (NEM Successor) and R.19-09-009 (Microgrid). Address changes to the General Order 96-B service list should be directed to PG&E at email address PGETariffs@pge.com. For changes to any other service list, please contact the Commission's Process Office at (415) 703-2021 or at Process_Office@cpuc.ca.gov. Send all electronic approvals to PGETariffs@pge.com. Advice letter submittals can also be accessed electronically at: http://www.pge.com/tariffs/.

/S/
Sidney Bob Dietz II
Director, Regulatory Relations

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

Attachments:
Attachment 1 –Clean version of updated Tariff
Attachment 2 – Redline Tariff Revisions

California Public Utilities Commission

ADVICE LETTER SUMMARY

ENERGY UTILITY

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

Company name/CPUC Utility No.: Pacific Gas and Electric Company (ID U39E)

Utility type:
☑ ELC ☐ GAS ☐ WATER
☐ PLC ☐ HEAT

Contact Person: Kimberly Loo
Phone #: (415)973-4587
E-mail: PGETariffs@pge.com
E-mail Disposition Notice to: KELM@pge.com

EXPLANATION OF UTILITY TYPE
ELC = Electric GAS = Gas WATER = Water
PLC = Pipeline HEAT = Heat

(Date Submitted / Received Stamp by CPUC)

Advice Letter (AL) #: 6287-E

Tier Designation: 2

Subject of AL: Modifications to Electric Rule 21 Pursuant to Decision 20-09-035 Addressing Remaining Ordering Paragraph Issues in Working Group 2 and 3

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

AL Type: ☐ Monthly ☐ Quarterly ☐ Annual ☑ One-Time ☐ Other:

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

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL: No

Summarize differences between the AL and the prior withdrawn or rejected AL:

Confidential treatment requested? ☐ Yes ☑ No

If yes, specification of confidential information:
Confidential information will be made available to appropriate parties who execute a nondisclosure agreement. Name and contact information to request nondisclosure agreement/ access to confidential information:

Resolution required? ☐ Yes ☑ No

Requested effective date:

No. of tariff sheets: 223

Estimated system annual revenue effect (%): N/A

Estimated system average rate effect (%): N/A

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected: See Attachment 1

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

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

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

Clear Form

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

CPUC, Energy Division
Attention: Tariff Unit
505 Van Ness Avenue
San Francisco, CA 94102
Email: EDTariffUnit@cpuc.ca.gov

Name: Sidney Bob Dietz II, c/o Megan Lawson
Title: Director, Regulatory Relations
Utility Name: Pacific Gas and Electric Company
Address: 77 Beale Street, Mail Code B13U
City: San Francisco, CA 94177
State: California Zip: 94177
Telephone (xxx) xxx-xxxx: (415)973-2093
Facsimile (xxx) xxx-xxxx: (415)973-3582
Email: PGETariffs@pge.com

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

Clear Form

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
50947-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 4	50320-E
50948-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 5	50321-E
50949-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 6	50812-E
50950-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 7	50813-E
50951-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 8	50814-E
50952-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 9	50815-E
50953-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 10	50816-E
50954-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 11	50817-E
50955-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 12	50818-E
50956-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 13	50819-E
50957-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 14	50820-E
50958-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 23	42320-E
50959-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 24	50821-E
50960-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 25	42322-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
50961-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 26	50332-E
50962-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 27	50333-E
50963-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 28	42325-E
50964-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 78	50348-E
50965-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 79	
50966-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 80	50349-E
50967-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 81	50350-E
50968-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 82	50351-E
50969-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 83	50352-E
50970-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 84	50353-E
50971-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 85	50354-E
50972-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 86	50355-E
50973-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 87	50356-E
50974-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 88	50357-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
50975-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 89	50358-E
50976-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 90	50359-E
50977-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 91	50360-E
50978-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 92	50361-E
50979-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 93	50362-E
50980-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 94	50363-E
50981-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 95	50364-E
50982-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 96	50365-E
50983-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 97	50366-E
50984-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 98	50367-E
50985-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 99	50368-E
50986-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 100	50369-E
50987-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 101	50370-E
50988-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 102	50371-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
50989-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 103	50372-E
50990-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 104	50373-E
50991-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 105	50374-E
50992-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 106	50375-E
50993-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 107	50376-E
50994-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 108	50377-E
50995-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 109	50378-E
50996-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 110	50379-E
50997-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 111	50380-E
50998-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 112	50381-E
50999-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 113	50382-E
51000-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 114	50383-E
51001-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 115	50384-E
51002-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 116	50385-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
51003-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 117	50386-E
51004-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 118	50387-E
51005-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 119	50388-E
51006-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 120	50389-E
51007-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 121	50390-E
51008-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 122	50391-E
51009-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 123	50392-E
51010-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 124	50393-E
51011-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 125	50394-E
51012-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 126	50395-E
51013-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 127	50396-E
51014-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 128	50397-E
51015-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 129	50398-E
51016-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 130	50399-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
51017-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 131	50400-E
51018-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 132	50401-E
51019-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 133	50402-E
51020-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 134	50403-E
51021-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 135	50404-E
51022-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 136	50405-E
51023-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 137	50406-E
51024-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 138	50407-E
51025-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 139	50408-E
51026-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 140	50409-E
51027-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 141	50410-E
51028-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 142	50411-E
51029-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 143	50412-E
51030-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 144	50413-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
51031-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 145	50414-E
51032-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 146	50415-E
51033-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 147	50416-E
51034-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 148	50417-E
51035-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 149	50418-E
51036-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 150	50419-E
51037-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 151	50420-E
51038-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 152	50421-E
51039-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 153	50422-E
51040-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 154	50423-E
51041-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 155	50822-E
51042-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 156	50425-E
51043-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 157	50823-E
51044-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 158	50824-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
51045-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 159	50825-E
51046-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 160	50826-E
51047-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 161	
51048-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 162	50827-E
51049-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 163	
51050-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 164	
51051-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 165	50828-E
51052-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 166	50829-E
51053-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 167	50830-E
51054-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 168	50831-E
51055-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 169	50832-E
51056-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 170	50833-E
51057-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 171	50834-E
51058-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 172	50835-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
51059-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 173	50836-E
51060-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 174	50837-E
51061-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 175	50838-E
51062-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 176	50839-E
51063-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 177	50840-E
51064-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 178	50841-E
51065-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 179	50842-E
51066-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 180	50843-E
51067-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 181	50844-E
51068-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 182	50845-E
51069-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 183	50846-E
51070-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 184	50847-E
51071-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 185	50848-E
51072-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 186	50849-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
51073-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 187	50850-E
51074-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 188	50851-E
51075-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 189	50852-E
51076-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 190	50853-E
51077-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 191	50854-E
51078-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 192	50855-E
51079-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 193	50856-E
51080-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 194	50857-E
51081-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 195	50858-E
51082-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 196	50859-E
51083-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 197	50860-E
51084-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 198	50861-E
51085-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 199	50862-E
51086-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 200	50863-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
51087-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 201	50864-E
51088-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 202	50865-E
51089-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 203	50866-E
51090-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 204	50867-E
51091-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 205	50868-E
51092-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 206	50869-E
51093-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 207	50870-E
51094-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 208	50871-E
51095-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 209	50872-E
51096-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 210	50873-E
51097-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 211	50874-E
51098-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 212	50875-E
51099-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 213	50876-E
51100-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 214	50877-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
51101-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 215	50878-E
51102-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 216	50879-E
51103-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 217	50880-E
51104-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 218	50881-E
51105-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 219	50882-E
51106-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 220	50883-E
51107-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 221	50884-E
51108-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 222	50885-E
51109-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 223	50886-E
51110-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 224	50887-E
51111-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 225	50888-E
51112-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 226	50889-E
51113-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 227	50890-E
51114-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 228	50891-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
51115-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 229	50892-E
51116-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 230	50893-E
51117-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 231	50894-E
51118-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 232	50895-E
51119-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 233	50896-E
51120-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 234	50897-E
51121-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 235	50898-E
51122-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 236	50899-E
51123-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 237	50900-E
51124-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 238	50901-E
51125-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 239	50902-E
51126-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 240	50903-E
51127-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 241	50904-E
51128-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 242	50905-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
51129-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 243	50906-E
51130-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 244	50907-E
51131-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 245	50908-E
51132-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 246	50909-E
51133-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 247	50910-E
51134-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 248	50911-E
51135-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 249	50912-E
51136-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 250	50913-E
51137-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 251	50914-E
51138-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 252	50915-E
51139-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 253	50916-E
51140-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 254	50917-E
51141-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 255	50918-E
51142-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 256	50919-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
51143-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 257	50920-E
51144-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 258	50921-E
51145-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 259	50922-E
51146-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 260	50923-E
51147-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 261	50924-E
51148-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 262	50925-E
51149-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 263	50926-E
51150-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 264	50927-E
51151-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 265	50928-E
51152-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 266	50929-E
51153-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 267	50930-E
51154-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 268	50931-E
51155-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 269	50932-E
51156-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 270	50933-E

Cal P.U.C. Sheet No.	Title of Sheet	Cancelling Cal P.U.C. Sheet No.
51157-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 271	50934-E
51158-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 272	50935-E
51159-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 273	50936-E
51160-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 274	50937-E
51161-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 275	50938-E
51162-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 276	50939-E
51163-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 277	50940-E
51164-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 278	50941-E
51165-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 279	50942-E
51166-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 280	50943-E
51167-E	ELECTRIC RULE NO. 21 GENERATING FACILITY INTERCONNECTIONS Sheet 281	50944-E
51168-E	ELECTRIC TABLE OF CONTENTS Sheet 1	50945-E
51169-E	ELECTRIC TABLE OF CONTENTS Sheet 20	50946-E

TABLE OF CONTENTS (Cont'd.)

F.		REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)		
	2.	FAST TRACK INTERCONNECTION REVIEW PROCESS	78	
		a. Initial Review	78	
		b. Optional Initial Review Results Meeting	82	(T)
		c. Supplemental Review	83	
		d. Optional Supplemental Review Results Meeting	87	
		e. Execution of the Generator Interconnection Agreement	87	
	3.	DETAILED STUDY INTERCONNECTION REVIEW PROCESS	91	
		a. Detailed Study Track Selection Process	91	
		b. Independent Study Process	93	
		c. Distribution Group Study Process	102	
		d. WDT Transmission Cluster Study Process	116	
		e. Generator Interconnection Agreement	118	
		f. Engineering & Procurement (E&P) Agreement	121	
	4.	INTERCONNECTION FINANCIAL SECURITY	121	
		a. Types of Interconnection Financial Security	121	
		b. Initial Posting of Interconnection Financial Security	122	
		c. Second Posting of Interconnection Financial Security	124	
		d. Third Posting of Interconnection Financial Security	125	
		e. General Effect of Withdrawal of Interconnection Request or Termination of the Generator Interconnection Agreement on Interconnection Financial Security for Interconnection Requests Studied Under the Independent Study Process	126	(T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

F.		REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)		
	5.	COMMISSIONING TESTING AND PARALLEL OPERATION	134	(T)
	a.	Commissioning Testing	134	
	b.	Parallel Operation or Momentary Parallel Operation	134	
	6.	WITHDRAWAL	135	
	7.	Cost Envelope Option	136	
	a.	Eligibility for Cost Envelope Option	136	
	b.	Cost Responsibility for Facilities Subject to Cost Envelope	138	
	c.	Timing of Applicant's Selection of Cost Envelope and Payment of Deposit	139	
	d.	Distribution Provider's Preparation of the Cost Envelope Estimate	141	
	e.	Cost Elements Not Subject to Cost Envelope	142	
	f.	Modifications	144	
	g.	Tender of the Generator Interconnection Agreement Under the Cost Envelope Option	145	
G.		ENGINEERING REVIEW DETAILS	146	
	1.	INITIAL REVIEW SCREENS	148	
	a.	Screen A: Is the PCC on a Networked Secondary System?	148	
	b.	Screen B: Is Certified Equipment used?	149	
	c.	Screen C: Is the Starting Voltage Drop within acceptable limits?	150	(T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

d. Screen D: Is the transformer or secondary conductor rating exceeded? 151 (T)

e. Screen E: Does the Single-Phase Generator cause unacceptable imbalance? 151

f. Screens F and F1: Is the Short Circuit Current Contribution Ratio within acceptable limits? 152

g. Screen G: Is the Short Circuit Interrupting Capability Exceeded? 153

h. Screen H: Is the line configuration compatible with the Interconnection type? 154

i. Screen I: Will power be exported across the PCC? 155

j. Screen J: Is the Gross Rating of the Generating Facility 30 kVA or less? 159

k. Screen K: Is the Generating Facility a Net Energy Metering (NEM) Generating Facility with nameplate capacity less than or equal to 500kW? 159

l. Screen L: Transmission Dependency and Transmission Stability Test 160

m. Screen M: When ICA information is available at the requested Point of Interconnection, Screen M should be evaluated in accordance with the Gross Nameplate Rating or typical PV output profile; Is the aggregate Generating Facility capacity on the Line Section less than 15% of Line Section peak load for all line sections bounded by automatic sectionalizing devices? 161 (T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

G.			ENGINEERING REVIEW DETAILS (Cont'd.)		
	2.		SUPPLEMENTAL REVIEW SCREENS	163	(T)
		a.	Screen N: Penetration Test	163	
		b.	Screen O: Power Quality and Voltage Tests	166	
		c.	Screen P: Safety and Reliability Tests	167	
	3.		DETAILED STUDY SCREENS	169	
		a.	Screen Q: Is the Interconnection Request electrically Independent of the Transmission System?	170	
		b.	Screen R: Is the Interconnection Request independent of other earlier-queued and yet to be studied interconnection requests interconnecting to the Distribution System?	171	
		c.	Independent Study Process and Distribution Group Study Process Interconnection Studies	172	
H.			GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS	175	
	1.		GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS	172	
		a.	Protective Functions Required	176	
		b.	Momentary Paralleling Generating Facilities	177	
		c.	Suitable Equipment Required	177	
		d.	Visible Disconnect Required	178	
		e.	Drawings Required	179	
		f.	Generating Facility Conditions Not Identified	180	(T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

H.		GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.)		
	2.	PREVENTION OF INTERFERENCE	180	(T)
		a. Voltage Regulation	180	
		b. Voltage Trip Setting	181	
		c. Paralleling	184	
		d. Flicker	184	
		e. Integration with Distribution Provider's Distribution System Grounding	185	
		f. Frequency	185	
		g. Harmonics	187	
		h. Direct Current Injection	188	
		i. Power Factor	188	
	3.	TECHNOLOGY SPECIFIC REQUIREMENTS	189	
		a. Technology Specific Requirements	189	
		b. Induction Generators	189	
		c. Inverters	190	
		d. Limitations on Inverters Not Classified as Smart Inverters	190	
		e. Non-Export AC/DC Converters	190	(T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

H.		GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.)		
	4.	SUPPLEMENTAL GENERATING FACILITY REQUIREMENTS	191	(T)
		a. Fault Detection	191	
		b. Transfer Trip	191	
		c. Reclose Blocking	191	
Hh.		SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS	191	
	1.	GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS	193	
		a. Protective Functions Required	193	
		b. Momentary Paralleling Generating Facilities	194	
		c. Suitable Equipment Required	195	
		d. Visible Disconnect Required	195	
		e. Drawings Required	198	
		f. Generating Facility Conditions Not Identified	198	
	2.	PREVENTION OF INTERFERENCE	198	
		a. Voltage Regulation	199	
		b. Voltage Trip and Ride-Through Settings	199	
		c. Paralleling	201	
		d. Flicker	201	
		e. Integration with Distribution Provider's Distribution System Grounding	201	(T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

Hh.		SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.)		
	2.	PREVENTION OF INTERFERENCE (Cont'd.)		
		f. Frequency	202	(T)
		g. Harmonics	203	
		h. Direct Current Injection	204	
		i. Fixed Power Factor	204	
		j. Dynamic Volt/VAR Operations	204	
		k. Ramp Rate Requirements	205	
		l. Recommended Frequency-Watt Settings	207	
		m. Smart Inverters	209	
		n. Default Activation States for Phase 1 Functions	211	
		o. Load Shedding or Transfer	211	
		p. Default Activation States for Phase 1 Functions	211	
		q. Phase 3 Function	212	
		r. Load Shedding or Transfer	213	
	3.	TECHNOLOGY SPECIFIC REQUIREMENTS	213	
	4.	SUPPLEMENTAL SMART INVERTER REQUIREMENTS	214	
		a. Fault Detection	214	
		b. Transfer Trip	214	
		c. Reclose Blocking	214	
	5.	COMMUNICATION REQUIREMENTS	215	
		a. Generating Facilities utilizing inverter-based technologies must adhere to all of the following communication protocol requirements:	215	(T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

Hh.		SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.)		
	5.	COMMUNICATION REQUIREMENTS (Cont'd.)		
		b. Additional communication protocol requirements shall also apply to Generating Facilities utilizing inverter-based technologies as provided in the following documents	216	(T)
		c. Additional communication protocol requirements shall also apply to Generating Facilities utilizing inverter-based technologies as provided in the following documents:	217	
	6.	SCHEDULING CAPABILITY REQUIREMENTS	218	
	7.	MONITORING AND TELEMETRY REQUIREMENTS	220	
	8.	CONTROL THROUGH COMMUNICATION CAPABILITIES	223	
I.		THIRD-PARTY INSTALLATIONS, RESERVATION OF UNUSED FACILITIES, AND REFUND OF SALVAGE VALUE	224	
	1.	INTERCONNECTION FACILITIES AND DISTRIBUTION UPGRADES	224	
	2.	THIRD-PARTY INSTALLATIONS	224	
	3.	RESERVATION OF UNUSED FACILITIES	225	
	4.	REFUND OF SALVAGE VALUE	225	
J.		METERING, MONITORING AND TELEMETERING	225	
	1.	GENERAL REQUIREMENTS	225	
	2.	METERING BY NON-DISTRIBUTION PROVIDER PARTIES	225	
	3.	NET GENERATION OUTPUT METERING	226	
	4.	POINT OF COMMON COUPLING (PCC) METERING	227	
	5.	TELEMETERING	228	
	6.	LOCATION	229	
	7.	COSTS OF METERING	229	
	8.	MULTIPLE TARIFF METERING	229	(T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

K.		DISPUTE RESOLUTION PROCESS	230	(T)
	1.	SCOPE	230	
	2.	PROCEDURES	230	
	3.	PERFORMANCE DURING DISPUTE	232	
L.		CERTIFICATION AND TESTING CRITERIA	232	
	1.	INTRODUCTION	232	
	2.	CERTIFIED AND NON-CERTIFIED INTERCONNECTION EQUIPMENT	234	
	a.	Certified Equipment	234	
	b.	Non-Certified Equipment	235	
	3.	TYPE TESTING	236	
	a.	Type Tests and Criteria for Interconnection Equipment Certification	236	
	b.	Anti-Islanding Test	238	
	c.	Non-Export Test	238	
	d.	In-rush Current Test	239	
	e.	Surge Withstand Capability Test	239	
	f.	Synchronization Test	240	
	g.	Paralleling Device Withstand Test	241	
	h.	Backfeed Test	241	(T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

L.		CERTIFICATION AND TESTING CRITERIA (Cont'd.)		
	4.	PRODUCTION TESTING	241	(T)
	5.	COMMISSIONING TESTING	242	
		a. Commissioning Testing	242	
		b. Review, Study, and Additional Commissioning Test Verification Costs	243	
		c. Other Checks and Tests	244	
		d. Certified Equipment	244	
		e. Non-Certified Equipment	245	
		f. Verification of Settings	245	
		g. Trip Tests	246	
		h. In-service Tests	246	
	6.	PERIODIC TESTING	246	
	7.	TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS	246	
		a. Non-Exporting Test Procedures	246	
		b. In-rush Current Test Procedures	258	(T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

M.		INADVERTENT EXPORT	259	(T)
Mm.		INADVERTENT EXPORT FOR INTERCONNECTION REQUESTS UTILIZING UL-1741 CERTIFIED OR SA LISTED GRID SUPPORT (NONISLANDING) INVERTERS	261	|
Mm1.		OPTION 8: Non-Export Utilizing Certified Power Control Systems	265	|
Mm2.		OPTION 9: Limited Export Utilizing Certified Power Control Systems	267	|
Mm3.		OPTION 10: Non-Export with Inadvertent Export Utilizing Certified Power Control Systems	269	|
Mm4.		OPTION 11: Limited Export with Inadvertent Export Utilizing Certified Power Control Systems	271	|
N.		EXPEDITED INTERCONNECTION PROCESS FOR NON-EXPORT ENERGY STORAGE GENERATING FACILITIES	273	|
	1.	ELIGIBILITY REQUIREMENTS	273	|
	2.	GENERATING FACILITY ELIGIBILITY CRITERIA	274	|
O.		AC/DC CONVERTER ELIGIBILITY CRITERIA	275	|
Appendix A		Forms Associated with Rule 2 Generating Facility Interconnections	276	|
Appendix B		Unit Cost Guide	281	(T)

(Continued)

C. DEFINITIONS (Cont'd.)

Field Testing: Testing performed in the field to determine whether equipment meets Distribution Provider's requirements for safe and reliable Interconnection.

Function: Some combination of hardware and software designed to provide specific features or capabilities. Its use, as in Protective Function, is intended to encompass a range of implementations from a single-purpose device to a section of software and specific pieces of hardware within a larger piece of equipment to a collection of devices and software.

Generating Facility: All Generators, electrical wires, equipment, and other facilities, excluding Interconnection Facilities, owned or provided by Producer for the purpose of producing electric power, including storage.

Generating Facility Capacity: The net capacity of the Generating Facility and the aggregate net capacity of the Generating Facility where it includes multiple Generators.

Generation Profile: The active power output of a Generating Facility over a period of time. The Generation Profile may be less than the Gross Nameplate Capacity at certain times, for example when using a typical PV Generation Profile or a Limited Generation Profile. (N)

Generator: A device converting mechanical, chemical, or solar energy into electrical energy, including all of its protective and control functions and structural appurtenances. One or more Generators comprise a Generating Facility.

Generator Interconnection Agreement: An agreement between Distribution Provider and Producer providing for the Interconnection of a Generating Facility that gives certain rights and obligations to effect or end Interconnection. For the purpose of this Rule, Net Energy Metering or power purchase agreements authorized by the Commission are also defined as Generator Interconnection Agreements.

(Continued)

C. DEFINITIONS (Cont'd.)

Good Utility Practice: Any of the practices, methods and acts engaged in or approved by a significant portion of the electric utility industry during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

Governmental Authority: Any federal, state, local or other governmental regulatory or administrative agency, court, commission, department, board, or other governmental subdivision, legislature, rulemaking board, tribunal, or other governmental authority having jurisdiction over the Parties, their respective facilities, or the respective services they provide, and exercising or entitled to exercise any administrative, executive, police, or taxing authority or power; provided, however, that such term does not include Interconnection Customer, Distribution Provider, or any Affiliate thereof.

Gross Rating; Gross Nameplate Rating; Gross Capacity or Gross Nameplate Capacity: The total gross generating capacity of a Generator or Generating Facility as designated by the manufacturer(s) of the Generator(s).

Host Load: The electrical power, less the Generator auxiliary load, consumed by the Customer, to which the Generating Facility is connected.

Inadvertent Export: The unscheduled and uncompensated export of real power from a Generating Facility (GF) for a limited duration as specified in Sections M, Mm and Mm3. (P)

Independent Study Process: The interconnection study process set forth in Section F.3.d.

Initial Review: See Section F.2.a.

In-rush Current: The current determined by the In-rush Current Test. (L)

In-Service Date: The estimated date upon which Applicant reasonably expects it will be ready to begin use of Distribution Provider's Interconnection Facilities. (L)

(Continued)

C. DEFINITIONS (Cont'd.)

(L)

Integration Capacity Analysis (ICA) Values: Values which represent the maximum capacity that can be interconnected at a given Point of Interconnection without exceeding Distribution Provider equipment thermal limits or any of the Distribution System voltage, power quality, protection, and operational flexibility (safety) limits, each of which is independently calculated. (N)

Integration Capacity Analysis – Static Grid (ICA-SG) Values: The minimum ICA value at a given Point of Interconnection from the set of the thermal, voltage, power quality, and protection ICA Values.

Integration Capacity Analysis – Operational Flexibility (ICA-OF) Values: The minimum ICA value at a given Point of Interconnection from the set of the thermal, voltage, power quality, protection, and operational flexibility ICA Values.

Integration Capacity Analysis – Operational Flexibility 576 (ICA-OF 576) Profile: Annual Profile composed of 576 hours where each hour is represented by its ICA-OF Value.

Integration Capacity Analysis – Static Grid 576 (ICA-SG 576) Profile: Annual Profile composed of 576 hours where each hour is represented by its ICA-SG Value. (N)

Interconnection; Interconnected: The physical connection of a Generating Facility in accordance with the requirements of this Rule so that Parallel Operation with Distribution Provider's Distribution or Transmission System can occur (has occurred).

Interconnection Agreement: See Generator Interconnection Agreement.

Interconnection Customer: See Applicant.

Interconnection Facilities: The electrical wires, switches and related equipment that are required in addition to the facilities required to provide electric Distribution Service to a Customer to allow Interconnection. Interconnection Facilities may be located on either side of the Point of Common Coupling as appropriate to their purpose and design. Interconnection Facilities may be integral to a Generating Facility or provided separately. Interconnection Facilities may be owned by either Producer or Distribution Provider.

(L)
(L)

(Continued)

C. DEFINITIONS (Cont'd.)

Interconnection Facilities Study: A study conducted by Distribution Provider for an Interconnection Customer under the Independent Study Process to determine a list of facilities (including Distribution Provider's Interconnection Facilities, Distribution Upgrades, and Network Upgrades as identified in the Interconnection System Impact Study), the cost of those facilities, and the time required to interconnect the Generating Facility with Distribution Provider's Distribution or Transmission System. The scope of the study is defined in Section G.3.c. (L)

Interconnection Financial Security: Any of the financial instruments listed in Section F.4.a. (L)

Interconnection Request: An Applicant's request to interconnect a new Generating Facility, or to increase the capacity of, or make a Material Modification to the operating characteristics of, an existing Generating Facility that is interconnected with Distribution Provider's Distribution or Transmission System.

Interconnection Study: A study to establish the requirements for Interconnection of a Generating Facility with Distribution Provider's Distribution System or Transmission System, pursuant to this Rule.

Interconnection System Impact Study: An engineering study conducted by Distribution Provider for an Interconnection Customer under the Independent Study Process that evaluates the impact of the proposed interconnection on the safety and reliability of Distribution Provider's Distribution and/or Transmission System and, if applicable, an Affected System. The scope of the study is defined in Section G.3.c.i.

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

Large Generating Facility: A Generating Facility having a Generating Facility Capacity of more than 20 MW.

Like for like: For inverters, like-for-like means certified, same nameplate or smaller, same fault current or smaller. For solar panels, like-for-like means certified, same CEC-AC rating of the system or smaller. For batteries, like-for-like means same or less kWh & kW rating and same operating profile. For transformers, like-for-like means same connection type, same or smaller impedance and capacity. (L)

(Continued)

C. DEFINITIONS (Cont'd.)

Line Section: That portion of Distribution Provider's Distribution or Transmission System connected to a Customer bounded by automatic sectionalizing devices or the end of the distribution line. (L)

Local Furnishing Bond: Tax-exempt bonds utilized to finance facilities for the local furnishing of electric energy, as described in Internal Revenue Code, 26 U.S.C. § 142(f).

Local Furnishing Distribution Provider: Any Distribution Provider that owns facilities financed by Local Furnishing Bonds. (L)

Mandatory Operation: The Smart Inverter operates at maximum available current without tripping during Distribution Provider's Transmission or Distribution System excursions outside the region of continuous operation. Any functions that protect the Smart Inverter from damage may operate as needed.

Material Modification: Those modifications that have a material impact on cost or timing of any Interconnection Request with a later queue priority date or a change in Point of Interconnection. A Material Modification does not include a change in ownership of a Generating Facility, (ii) a modification described in Table F.1, nor (iii) a modification described in Tables Ee.1, 2 or 3 that does not require a new interconnection request.

Metering: The measurement of electrical power in kilowatts (kW) and/or energy in kilowatt-hours (kWh), and if necessary, reactive power in kVAR at a point, and its display to Distribution Provider, as required by this Rule.

Metering Equipment: All equipment, hardware, software including meter cabinets, conduit, etc., that are necessary for Metering.

Momentary Cessation: The Smart Inverter momentarily reduces current output to the Distribution Provider's Transmission or Distribution System to below 10% of the maximum continuous output current rating. The Smart Inverter is allowed to increase current output to the Distribution Provider's Transmission or Distribution System without any intentional reconnection delay once voltage exits the Momentary Cessation region and enters a Permissive Operation region or Continuous Operation region.

(L)
(L)

(Continued)

C. DEFINITIONS (Cont'd.) (L)

Momentary Parallel Operation: The Interconnection of a Generating Facility to the Distribution and Transmission System for one second (60 cycles) or less.

Nationally Recognized Testing Laboratory (NRTL): A laboratory accredited to perform the Certification Testing requirements under this Rule.

Net Energy Metering (NEM): Metering for the receipt and delivery of electricity between Producer and Distribution Provider pursuant to California Public Utilities Code (PUC) sections 2827, 2827.1 (as currently implemented by Commission Decision (D.)16-01-044), 2827.8, or 2827.10.

NEM-1: Refers to Interconnection Requests for service pursuant to Schedules NEM, NEMV, and NEMVMASH.

NEM-2: Refers to Interconnection Requests for service pursuant to Schedules NEM2, NEM2V, NEM2VMSH, and NEM2VSOM. (L)

Net Rating or Net Nameplate Rating: The Gross Rating minus the consumption of electrical power of the auxiliary load.

Network Upgrades: Delivery Network Upgrades and Reliability Network Upgrades.

Networked Secondary System: An AC distribution system where the secondaries of the distribution transformers are connected to a common bus for supplying electricity directly to consumers. There are two types of secondary networks: grid networks (also referred to as area networks or street networks) and Spot Networks. Synonyms: Secondary Network. Refer to IEEE 1547.6 for additional detail.

Non-Emergency: Conditions or situations that are not Emergencies, including but not limited to meter reading, inspection, testing, routine repairs, replacement, and maintenance.

Nominal: Standard frequency and voltage.

Non-Export; Non-Exporting: When the Generating Facility is sized and designed such that the Generator output is used for Host Load only and is designed to prevent the transfer of electrical energy from the Generating Facility to Distribution Provider's Distribution or Transmission System.

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS

a. Initial Review

Upon receipt of a complete and valid Interconnection Request, Distribution Provider shall perform Initial Review using the process in Section G.1. The Initial Review determines if (i) the Generating Facility qualifies for Fast Track Interconnection through Initial Review, or (ii) the Generating Facility requires a Supplemental Review. Absent extraordinary circumstances, Distribution Provider shall notify Applicant in writing of the results of Initial Review within fifteen (15) Business Days following validation of an Interconnection Request.

As part of the evaluation of Screen M, when Integration Capacity Analysis Values are available at the requested Point of Interconnection, Distribution Provider will determine if Integration Capacity Analysis Values at the proposed Point of Interconnection need to be updated. If Distribution Provider determines that the Integration Capacity Analysis Values at the proposed Point Interconnection need to be updated, the Distribution Provider will update the values for the proposed Point of Interconnection using the Integration Capacity Analysis tool on the specific electrical node or by running the Integration Capacity Analysis on all the electrical nodes in the circuit. Distribution Provider shall not perform additional Integration Capacity Analysis as part of the interconnection process of projects with less than 30 kilovolt amperes nameplate capacity. Distribution Provider shall share the results of any Integration Capacity Analysis updates with the Applicant and provide an explanation of changes to grid conditions or the interconnection queue which led to the need to obtain updated Integration Capacity Analysis Values. Distribution Provider shall comply with confidentiality provisions and data redaction policies. (N)

(L)

(L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd)

a. Initial Review (Cont'd)

For all Interconnection Requests that pass Initial Review and do not require Interconnection Facilities or Distribution Upgrades, Distribution Provider shall provide Applicant with a Generator Interconnection Agreement within fifteen (15) Business Days of providing notice of Initial Review results. For Interconnection Requests that pass Initial Review but do require Interconnection Facilities or Distribution Upgrades, within fifteen (15) Business Days of providing notice of Initial Review results, Distribution Provider shall provide Applicant with a non-binding cost estimate of the Interconnection Facilities or Distribution Upgrades. For those Interconnection Requests where Applicant has selected the Cost Envelope Option, within ten (10) Business Days of providing Applicant the non-binding cost estimate for the required Interconnection Facilities and/or Distribution Upgrades, Applicant shall provide the Distribution Provider the Cost Envelope Option deposit, in accordance with Section F.7.a.i.3. If Applicant fails to provide the Cost Envelope Option deposit in accordance with Section F.7.a.i.3, Applicant's request for the Cost Envelope Option shall be deemed withdrawn and the Interconnection Request shall not be eligible for the Cost Envelope Option.

For all Interconnection Requests that pass Initial Review, refer to Section F.2.e for cost responsibility and time frames for completing the Generator Interconnection Agreement. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS

a. Initial Review (Cont'd.)

For Interconnection Requests that fail Initial Review, Distribution Provider shall provide the technical reason, data and analysis supporting the Initial Review results in writing and provide Applicant the option to either attend an Initial Review results meeting or proceed directly to Supplemental Review. NEM-1 and ≤1 MW NEM-2 (L)
Applicants covered under Section D.13.a, and Applicants that pre-pay (P)/(L)
for the Supplemental Review (such as concurrently with the
Interconnection Request Fee), shall proceed directly to Supplemental (P)(L)
Review without an Initial Review results meeting. Applicant shall (L)
notify Distribution Provider within ten (10) Business Days following such notification whether to (i) proceed to an Initial Review results meeting, (ii) proceed to Supplemental Review, or (iii) withdraw the Interconnection Request. Applicant may request one extension of no more than ten (10) Business Days to respond. If Applicant fails to notify Distribution Provider within ten (10) Business Days of such notification, or at the end of the extension, if one was requested, the Interconnection Request shall be deemed withdrawn.

No changes may be made to the planned Point of Interconnection or (L)
Generating Facility size included in the Interconnection Request during the Fast Track Process, except as provided in Table F.1 below, or unless such changes are agreed to by Distribution Provider. Where agreement has not been reached, Applicants choosing to change the Point of Interconnection or Generating Facility size, except as provided for in Table F.1, must reapply and submit a new Interconnection Request. (L)

Applicants that elect to proceed to Supplemental Review, unless the (P)/(L)
Applicant has pre-paid, shall provide a nonrefundable Supplemental (P)/(L)
Review fee set forth in Section E.2.c with their response. The (L)
Supplemental Review fee shall be waived for Interconnection Requests requesting Interconnection of NEM-1 or ≤1 MW NEM-2 Generating Facilities and for solar-powered non-NEM ≤1 MW Generating Facilities that do not sell power to Distribution Provider, per Commission D.01-07-027. (L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 81
GENERATING FACILITY INTERCONNECTIONS

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (N)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS

a. Initial Review (Cont'd.)

TABLE F.1 – MODIFICATION TO PENDING APPLICATIONS (D. 19-03-013 Type I Changes)

Modifications to Interconnection Applications Under the Fast Track Modifications to Interconnection Applications Under the Fast Track

1. The number of modification requests per Interconnection Request is limited to one.
2. D.19-03-013 gives Distribution Provider the discretion to allow additional modification requests. Distribution Provider is encouraged to exercise this discretion in instances when Distribution Provider has caused the need for an additional modification request.
3. From the date of the proposed modification request is received, the Distribution Provider shall process the request within:
   (i) ten (10) Business Days if no re-study is required
   (ii)twenty (20) Business Days if a re-study is required
4. Except as allowed in Section E.4 for NEM customers, if a project downsizes, the revised shall not affect the cost responsibility or timing of interconnection of other projects.
5. Additional changes outside of the modification types identified herein will not be accepted under the Fast Track process.

Description of Modification	Application Modifications Allowed?	Fee
"Like-for-like"[1] equipment replacements meeting the following criteria: • Does not increase facility size[2]; • No size decrease exceeding 20%; and • No identified upgrades or mitigations.	Yes	n/a
Size reductions meeting the following criteria: 1. No size reduction exceeding 20%; and 2. Identified upgrades or mitigations are paid for by the customer	Yes	n/a
Size reductions to avoid upgrades meeting the following criteria: 1. The re-study determines that the modification affects no other distributed energy resource	Yes	$300[3]
Other types of modifications outside of those listed in this table will not be accepted without a new application.	No	

[1] Like-for-like is defined in Section C
[2] System size pursuant to D.19-03-013, footnote 43 on p.22 is defined as the follows:

For solar systems	For energy storage systems	For all other generation types
the lesser of inverter nameplate capacity (kW) or maximum solar output (CEC-AC rating)	both the inverter nameplate capacity (kW) and the capacity of the storage device (kWh) are considered in the definition of size.	the gross nameplate rating of the generator

[3] Pursuant to D.19-03-013, p.22 (N)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Optional Initial Review Results Meeting

Within five (5) Business Days of Applicant's request for an Initial Review results meeting, Distribution Provider shall contact Applicant and offer to convene a meeting at a mutually acceptable time to review the Initial Review screen analysis and related results to determine what modifications, if any, may permit the Generating Facility to be connected safely and reliably without Supplemental Review. (L)

In the event the Applicant has pre-paid the Supplemental Review fee (such as concurrently with the Interconnection Request Fee), the Distribution Provider will proceed, if necessary, with Supplemental Review upon completion of Initial Review and shall not be required to offer an Initial Review results meeting. (P) (P)

If modifications that obviate the need for Supplemental Review are identified, and Applicant and Distribution Provider agree to such modifications, Distribution Provider shall provide Applicant with a Generator Interconnection Agreement within fifteen (15) Business Days of the Initial Review results meeting if no Interconnection Facilities or Distribution Upgrades are required. If Interconnection Facilities or Distribution Upgrades are required, Distribution Provider shall provide Applicant with a non-binding cost estimate of any Interconnection Facilities or Distribution Upgrades within fifteen (15) Business Days of the Initial Review results meeting. For those Interconnection Requests where Applicant has selected the Cost Envelope Option, within ten (10) Business Days of providing Applicant the non-binding cost estimate for the required Interconnection Facilities and/or Distribution Upgrades, Applicant shall provide the Distribution Provider the Cost Envelope Option deposit, in accordance with Section F.7.a.i.3. If Applicant fails to provide the Cost Envelope Option deposit in accordance with Section F.7.a.i.3, Applicant's request for the Cost Envelope Option shall be deemed withdrawn and the Interconnection Request shall not be eligible for the Cost Envelope Option. (L)

For all Interconnection Requests that pass Initial Review, refer to Section F.2.e for cost responsibility and time frames for completing the Generator Interconnection Agreement. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Optional Initial Review Results Meeting (Cont'd.)

If Applicant and Distribution Provider are unable to identify or agree to modifications that enable Applicant to pass Initial Review, Applicant shall notify Distribution Provider within ten (10) Business Days of the Initial Review results meeting whether it would like to proceed with Supplemental Review or withdraw its Interconnection Request. Applicant may request one extension of no more than ten (10) Business Days to respond. If Applicant fails to notify Distribution Provider within ten (10) Business Days of the Initial Review results meeting, or at the end of the extension, if one was requested, the Interconnection Request shall be deemed withdrawn.

c. Supplemental Review

i) If Applicant requests Supplemental Review and submits a nonrefundable Supplemental Review fee, if required, Distribution Provider shall complete Supplemental Review within twenty (20) Business Days, absent extraordinary circumstances, following authorization and receipt of the fee. Supplemental Review determines if (i) the Generating Facility qualifies for Fast Track Interconnection, or (ii) the Generating Facility requires Detailed Study. (L)

ii) If the Applicant pre-paid the Supplemental Review fee (such as concurrently with the Interconnection Request Fee), Distribution Provider will complete the Supplemental Review, if required, within twenty (20) Business Days from the completion of the Initial Review. (P) (P)

iii) If the Applicant chooses to move to Supplemental Review or has pre-paid the non-refundable Supplemental Review fee, they have the option to elect that the Distribution Provider provide a fault current study as part of the Supplemental Review. This fault current study would extend the Supplemental Review time by up to ten (10) Business Days, and would require an additional nonrefundable fee of $1,000. (P)/(L) (P)/(L) (L)

This fault current study will determine if the Generating Facility can detect phase and ground faults on the Distribution Provider's Distribution System or the distribution feeder breaker where the Applicant proposes to connect the Generating Facility. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Supplemental Review (Cont'd.)

iii) The result of the fault current study will determine if direct transfer trip (DTT) will be required from the Distribution System to the Generating Facility site. Note that for Applicants proposing to interconnect to the Distribution System where there is expected to be power backfeed to the Transmission System, DTT from the transmission may still be required and a Detailed Interconnection Study will be required to make this determination (Cont'd). (P)/(L)

Should the Applicant request a Supplemental Review results meeting, as described in Section F.2d, the optional fault current study analysis and related results shall, at the Applicant's request, be reviewed to determine what modifications, if any, may permit the Generating Facility to be connected safely and reliably. (L)

(P)
(P)

The Applicant must provide the following data to Distribution Provider when requesting Supplemental Review in order to select this option: (L)

Generator:
- MVA Rating
- kV Rating
- Base MVA
- Base kV
- Xd" (direct axis subtransient reactance)
- Xd' (direct axis transient reactance)
- Xd (Synchronous reactance)
- X2 (Negative Sequence reactance)
- X0 (Zero Sequence reactance)

XFMR Data:
- Winding configuration (delta-Wye grd or Wye grd-Delta)
- MVA Rating
- KV Rating
- Base MVA
- Base KV
- Z1 HV-LV
- Z0 HV-LV (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Supplemental Review (Cont'd.) (L)

iii) Line Data: (P)/(L)
Impedance data for line from XFMR to POI (if applicable) (L)
Z1 (L)
Z0

POI Location (P)/(L)

iv) For Interconnection Requests that pass Supplemental Review and do not require Interconnection Facilities or Distribution Upgrades, Distribution Provider shall provide Applicant with a Generator Interconnection Agreement within fifteen (15) Business Days of providing notice of Supplemental Review results. For Interconnection Requests that pass Supplemental Review and do require Interconnection Facilities or Distribution Upgrades, within fifteen (15) Business Days of providing notice of Supplemental Review results, Distribution Provider shall provide Applicant with a non-binding cost estimate of any Interconnection Facilities or Distribution Upgrades. For those Interconnection Requests where Applicant has selected the Cost Envelope Option, within ten (10) Business Days of providing Applicant the non-binding cost estimate for the required Interconnection Facilities and/or Distribution Upgrades, Applicant shall provide the Distribution Provider the Cost Envelope Option deposit, in accordance with Section F.7.a.i.3. If Applicant fails to provide the Cost Envelope Option deposit in accordance with Section F.7.a.i.3, Applicant's request for the Cost Envelope Option shall be deemed withdrawn and the Interconnection Request shall not be eligible for the Cost Envelope Option. (P)/(L) (L)

For all Interconnection Requests that pass Supplemental Review, refer to Section F.2.e for cost responsibility and time frames for completing the Generator Interconnection Agreement. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Supplemental Review (Cont'd.) (L)

v) For Interconnection Requests that fail Supplemental Review, Distribution Provider shall provide the technical reason, data and analysis supporting the Supplemental Review results in writing, including, if Distribution Provider can make the determination, which Detailed Study track Applicant qualifies for, and provide Applicant the option to attend a Supplemental Review results meeting or proceed directly to Detailed Study. Applicant shall notify Distribution Provider within fifteen (15) Business Days following such notification whether to (i) proceed to a Supplemental Review results meeting, (ii) proceed to Detailed Study, or (iii) withdraw the Interconnection Request. Applicant may request one extension of no more than fifteen (15) Business Days to respond. If Applicant fails to notify Distribution Provider within fifteen (15) Business Days of such notification, or at the end of the extension, if one was requested, the Interconnection Request shall be deemed withdrawn. (P)/(L) (L)

Applicants that elect to proceed to Detailed Study shall provide the applicable study deposit set forth in Section E.3.a with their response. Detailed Study fees for solar Generating Facilities up to 1 MW interconnecting to the Distribution System that do not sell power to Distribution Provider will be waived up to the amount of $5,000. Except as provided for in Section F.3.d, NEM-1 and ≤1 MW NEM-2 Generating Facilities are exempt from any costs associated with Detailed Studies. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

d. Optional Supplemental Review Results Meeting

Within five (5) Business Days of Applicant's request for a Supplemental Review results meeting, Distribution Provider shall contact Applicant and offer to convene a meeting at a mutually acceptable time to review the Supplemental Review screen analysis and related results to determine what modifications, if any, may permit the Generating Facility to be connected safely and reliably without Detailed Study.

If modifications that obviate the need for Detailed Study are identified and Applicant and Distribution Provider agree to such modifications, Distribution Provider shall provide Applicant with a Generator Interconnection Agreement within fifteen (15) Business Days of the Supplemental Review results meeting if no Interconnection Facilities or Distribution Upgrades are required. If Interconnection Facilities or Distribution Upgrades are required, Distribution Provider shall provide Applicant with a non-binding cost estimate of any Interconnection Facilities or Distribution Upgrades within fifteen (15) Business Days of the Supplemental Review results meeting. For those Interconnection Requests where Applicant has selected the Cost Envelope Option, within ten (10) Business Days of providing Applicant the non-binding cost estimate for the required Interconnection Facilities and/or Distribution Upgrades, Applicant shall provide the Distribution Provider the Cost Envelope Option deposit, in accordance with Section F.7.a.i.3. If Applicant fails to provide the Cost Envelope Option deposit in accordance with Section F.7.a.i.3, Applicant's request for the Cost Envelope Option shall be deemed withdrawn and the Interconnection Request shall not be eligible for the Cost Envelope Option.

For all Interconnection Requests that pass Supplemental Review, refer to Section F.2.e for cost responsibility and time frames for completing the Generator Interconnection Agreement. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

d. Optional Supplemental Review Results Meeting (Cont'd.)

If Applicant and Distribution Provider are unable to identify or agree to modifications, Applicant shall notify Distribution Provider within twenty (20) Business Days of the Supplemental Review Results Meeting whether it would like to proceed with Detailed Study or withdraw its Interconnection Request. Applicant may request one extension of no more than twenty (20) Business Days to respond. If Applicant fails to notify Distribution Provider within twenty (20) Business Days of the Supplemental Review results meeting, or at the end of the extension, if one was requested, the Interconnection Request shall be deemed withdrawn. Applicants that elect to proceed to Detailed Study shall provide the applicable study deposit set forth in Section E.3.a.

e. Execution of the Generator Interconnection Agreement

For Interconnection Requests where Applicant has not selected the Cost Envelope Option, Following the receipt of a cost estimate for any Distribution Upgrades and/or Interconnection Facilities that have been identified, Applicant shall notify Distribution Provider within fifteen (15) Business Days whether Applicant: (i) requests a Generator Interconnection Agreement, or (ii) withdraws its Interconnection Request. Applicant may request one extension of no more than fifteen (15) Business Days to respond. If Applicant fails to notify Distribution Provider within fifteen (15) Business Days, or at the end of the extension, if one was requested, the Interconnection Request shall be deemed withdrawn. If Applicant elects to proceed to a Generator Interconnection Agreement, Distribution Provider shall provide Applicant with a Generator Interconnection Agreement for Applicant's signature within fifteen (15) Business Days of Applicant's request. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

e. Execution of the Generator Interconnection Agreement (Cont'd.)

For those Interconnection Requests where Applicant has selected the Cost Envelope Option and has provided the Cost Envelope Option deposit in accordance with Section F.7.a.i.3, Distribution Provider shall complete and issue to Applicant the Cost Envelope Estimate within twenty (20) Business Days following Distribution Provider's receipt of the Cost Envelope Option deposit in accordance with F.7.d. Once the Cost Envelope Estimate is issued, Applicant shall notify Distribution Provider within fifteen (15) Business Days of notification whether Applicant: (i) requests a Generator Interconnection Agreement, or (ii) withdraws its Interconnection Request. Applicant may request one extension of no more than fifteen (15) Business Days to respond. If Applicant fails to notify Distribution Provider within fifteen (15) Business Days, or at the end of the extension, if one was requested, the Interconnection Request shall be deemed withdrawn. If Applicant elects to proceed to a Generator Interconnection Agreement, Distribution Provider shall provide Applicant with a Generator Interconnection Agreement for Applicant's signature within fifteen (15) Business Days of Applicant's request.

Upon receipt of a draft Generator Interconnection Agreement, Applicant has ninety (90) Calendar Days to sign and return the Generator Interconnection Agreement. Applicant shall provide written comments, or notification of no comments, to the draft Generator Interconnection Agreement and appendices within thirty (30) Calendar Days. At the request of Applicant, Distribution Provider shall begin negotiations with Applicant at any time after Distribution Provider provides Applicant with the draft Generator Interconnection Agreement, which contains in its appendices the cost estimate for any Distribution Upgrades and/or Interconnection Facilities that have been identified by Distribution Provider. Distribution Provider and Applicant (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

e. Execution of the Generator Interconnection Agreement (Cont'd.)

shall negotiate concerning the cost estimate, or any disputed provisions of the appendices to a draft Generator Interconnection Agreement, for not more than ninety (90) Calendar Days after Distribution Provider provides Applicant with the Generator Interconnection Agreement. If Applicant determines that negotiations are at an impasse, it may request termination of the negotiations and initiate Dispute Resolution procedures pursuant to Section K. If Applicant fails to sign the Generator Interconnection Agreement or initiate Dispute Resolution within ninety (90) Calendar Days, the Interconnection Request shall be deemed withdrawn.

After Applicant, or a Producer where those are different entities, has executed the Generator Interconnection Agreement, Distribution Provider will commence design, procurement, construction and installation of Distribution Provider's Distribution Upgrades and/or Interconnection Facilities that have been identified in the Generator Interconnection Agreement. Distribution Provider and Producer will use good faith efforts to meet schedules in accordance with the requirements of the Generator Interconnection Agreement and estimated costs as appropriate. Producer is responsible for all applicable costs associated with Parallel Operation to support the safe and reliable operation of the Distribution System and Transmission System as set forth in Section E.4.

Distribution Provider and Producer shall negotiate in good faith concerning a schedule for the construction of Distribution Provider's Interconnection Facilities and Distribution Upgrades. (L)

Unless agreed to otherwise between Applicant and Distribution Provider, Distribution Provider shall schedule a mitigation work scoping meeting no later than 10 business days after receiving the payment for the engineering advance. (P)

Distribution Provider shall provide quarterly updates on substation upgrades to Producers whose projects are dependent on a substation upgrade. (P)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS

a. Detailed Study Track Selection Process

For all Detailed Study Applicants, as well as Applicants that have failed Fast Track initial review and/or supplemental review, the specific Detailed Study track for which Applicant is eligible will be determined by the application of Screens Q and R. For Applicants that require application of Screens Q and R, absent extraordinary circumstances, within twenty (20) Business Days following validation of an Interconnection Request and receipt of the appropriate study deposit set forth in Section E.3.a, Distribution Provider will apply Screen Q, and if applicable, Screen R and provide Applicant with the screen results as set forth below.

If Applicant fails Screen Q, Distribution Provider shall provide the data and analysis supporting Screen Q results in writing. The Interconnection Request will be processed in accordance with Section F.3.d below. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

a. Detailed Study Track Selection Process (Cont'd.)

If Applicant passes Screen Q, but fails Screen R, Distribution Provider shall provide data and analysis supporting the Screen R results in writing. Applicant shall notify Distribution Provider within twenty (20) Business Days following such notification whether it would like to (i) proceed to the Distribution Group Study Process or (ii) withdraw the Interconnection Request. Applicant may request one extension of no more than twenty (20) Business Days to respond. However, Applicant's decision must be received prior to the close of a given Distribution Group Study window, to participate in that Distribution Study Group. If the decision is received after the close of a particular Distribution Group Study window, then Applicant's Interconnection Request will be included in the next available Distribution Group Study window.

If Applicant fails to notify Distribution Provider within twenty (20) Business Days of receiving Screen R results, or at the end of the extension, if one was requested, the Interconnection Request shall be deemed withdrawn.

If Applicant elects to proceed to the Distribution Group Study Process, the Interconnection Request will be processed in accordance with Section F.3.c below.

A Distribution Study Group will be comprised of all Interconnection Requests that are determined to be electrically interdependent based on results of Screen R. A Distribution Study Group may contain only one Interconnection Request.

Applicant(s) that opt to proceed to the Distribution Group Study Process will be re-evaluated under Screen Q. If the Distribution Study Group fails Screen Q, the Applicants will be required to withdraw and move to the WDT Transmission Cluster Process.

If Applicant passes Screens Q and R, the Interconnection Request will be processed in accordance with Section F.3.b below.

If Applicant elects to proceed to the WDT Transmission Cluster Study Process, Interconnection Request will be processed in accordance with Section F.3.d. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.) (L)

b. Independent Study Process

i) Scoping Meeting

Within five (5) Business Days after Distribution Provider notifies Applicant that the Interconnection Request has passed Screens Q and R and is thus eligible for the Independent Study Process, Distribution Provider shall contact Applicant to establish a date agreeable to Applicant and Distribution Provider for a scoping meeting. Distribution Provider shall inform Applicant of the Detailed Study start date. (L) (P)/(L) (P)/(L)

The purpose of the scoping meeting shall be: (i) to discuss reasonable Commercial Operation Dates and alternative interconnection options; (ii) to exchange information, including any transmission data that would reasonably be expected to impact Applicant's interconnection options; (iii) to analyze such information; and (iv) to determine feasible Points of Interconnection and eliminate alternatives given resources and available information. (L)

Distribution Provider will bring to the scoping meeting, as reasonably necessary to accomplish its purpose, such already available technical data, including, but not limited to; (i) general facility loadings, (ii) general instability issues, (iii) general short circuit issues, (iv) general voltage issues, and (v) general reliability issues.

Applicant will bring to the scoping meeting, in addition to the technical data in Attachment A of the Rule 21 Exporting Generating Facility Interconnection Request form, any system studies previously performed. Distribution Provider, the CAISO, if applicable, and Applicant will also bring to the meeting personnel and other resources as may be reasonably required to accomplish the purpose of the meeting in the time allocated for the meeting. On the basis of the meeting, Applicant shall designate its Point of Interconnection. The duration of the meeting shall be only what is sufficient to accomplish its purpose. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Independent Study Process (Cont'd.)

i) Scoping Meeting (Cont'd.)

Within fifteen (15) Business Days after the scoping meeting, Distribution Provider shall provide Applicant with a Detailed Study Agreement, which shall contain an outline of the scope of the Interconnection System Impact Study and Interconnection Facilities Study, contain a non-binding good faith estimate of the cost to perform such studies, and shall specify that Applicant is responsible for the actual cost of the Interconnection Studies, including reasonable administrative costs. Applicant shall execute and deliver to Distribution Provider the Detailed Study Agreement no later than thirty (30) Business Days after the scoping meeting, or the Interconnection Request shall be deemed withdrawn.

ii) Timing of the Interconnection System Impact Study Results

Absent extraordinary circumstances, Distribution Provider shall complete and issue a final Interconnection System Impact Study report within sixty (60) Business Days after the execution of a Detailed Study Agreement. If the System Impact Study indicates a need for Network Upgrades on the Transmission System, Distribution Provider will share applicable study results with the CAISO for review and comment and will incorporate comments into the final Interconnection System Impact Study report.

At any time Distribution Provider determines that it will not meet the required time frame for completing the Interconnection System Impact Study, Distribution Provider shall notify Applicant in writing as to the status of the Interconnection System Impact Study and provide an estimated completion date with an explanation of the reasons why additional time is required. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Independent Study Process (Cont'd.)

ii) Timing of the Interconnection System Impact Study Results (Cont'd.)

Upon request, Distribution Provider shall provide Applicant all relevant supporting documentation, workpapers and pre-Interconnection Request and post-Interconnection Request power flow, short circuit and stability databases, and currently planned Distribution Upgrades relevant to the Interconnection Request for the Interconnection System Impact Study. Applicant may be required to sign a non-disclosure agreement with terms consistent with Section D.7 regarding Confidentiality.

iii) Interconnection System Impact Study Results Meeting

Applicant shall request a results meeting within ten (10) Business Days of the issuance of the final Interconnection System Impact Study report. This results meeting, if requested, shall be held among Distribution Provider, the CAISO, if applicable, and Applicant to discuss the results of the Interconnection System Impact Study, including assigned cost responsibility. Within five (5) Business Days of the request, Distribution Provider shall contact Applicant to establish a date agreeable to Applicant, Distribution Provider and the CAISO, if applicable, for the results meeting.

If Applicant does not request a results meeting within the specified time above, the results meeting will be deemed waived. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Independent Study Process (Cont'd.)

iv) Initial Posting of Interconnection Financial Security

Applicant shall make its initial posting of Interconnection Financial Security in accordance with the requirements of Section F.4.b, within sixty (60) Calendar Days after issuance of the final Interconnection System Impact Study report, or its Interconnection Request shall be deemed withdrawn. The initial posting of Interconnection Financial Security will be based on the cost responsibility for Network Upgrades, Distribution Upgrades, and Distribution Provider's Interconnection Facilities set forth in the final Interconnection System Impact Study report.

v) Modifications

At any time during the course of the Interconnection Studies, Applicant, Distribution Provider, or the CAISO, as applicable, may identify changes to the planned Interconnection that may improve the costs and benefits (including reliability) of the Interconnection, and the ability of the proposed change to accommodate the Interconnection Request. To the extent the identified changes are acceptable to Distribution Provider, the CAISO, as applicable, and Applicant, such acceptance not to be unreasonably withheld, Distribution Provider shall modify the Point of Interconnection and/or configuration in accordance with such changes without altering the Interconnection Request's eligibility for participating in Interconnection Studies. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Independent Study Process (Cont'd.)

v) Modifications (Cont'd.)

At the Interconnection System Impact Study results meeting, Applicant should be prepared to discuss any desired modifications to the Interconnection Request. After the issuance of the final Interconnection System Impact Study report, but no later than five (5) Business Days following the Interconnection System Impact Study results meeting, Applicant shall submit to Distribution Provider, in writing, (i) modifications to any information provided in the Interconnection Request, including that information required for the Cost Envelope Option, if applicable, or (ii) confirmations of no modifications. Distribution Provider will forward Applicant's request for modification to the CAISO, if applicable, within two (2) Business Days of receipt. If no Interconnection System Impact Study results meeting is held, Applicant shall submit to Distribution Provider any requested modifications within twenty-five (25) Business Days of the receipt of the final Interconnection System Impact Study report.

Modifications permitted under this Section F.3.b.v shall include specifically: (a) a decrease in the electrical output (MW) of the proposed Generating Facility; (b) modifying the technical parameters associated with the Generating Facility technology or the Generating Facility step-up transformer impedance characteristics; and (c) modifying the interconnection configuration. For any modifications other than those permitted above, Distribution Provider, in coordination with CAISO, if applicable, will evaluate whether the proposed modification to the Interconnection Request constitutes a Material Modification. Distribution Provider will inform Applicant in writing whether the modifications would constitute a Material Modification (i) for Interconnection Requests that have not elected the Cost Envelope Option, within ten (10) Business Days of receipt of the proposed request for modification, and (ii) for Interconnection Requests that have elected the Cost Envelope Option, within twenty (20) Business Days of receipt of the proposed request of modification. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Independent Study Process (Cont'd.)

v) Modifications (Cont'd.)

Any change to the Point of Interconnection, except for that specified by Distribution Provider in an Interconnection Study or otherwise allowed under this Section F.3.d.v, shall constitute a Material Modification.

If the proposed modification is determined to be a Material Modification, Applicant may either withdraw the proposed modification or proceed with a new Interconnection Request for such modification. Applicant shall make such determination within ten (10) Business Days after being provided the Material Modification determination results.

Proposed modifications determined not to be Material Modifications may still necessitate the need to re-evaluate the System Impact Study to determine modifications to the Interconnection Facilities and Distribution Upgrades, or to update the Cost Envelope Estimate, if applicable, in accordance with Section F.7. Distribution Provider will provide Applicant an estimate of time to complete the re-evaluation and the associated incremental cost required to complete the re-evaluation. Applicant may either accept the additional time and cost to complete the reevaluation, withdraw the proposed modification request, or proceed with a new Interconnection Request for such modification. Applicant shall make such determination within ten (10) Business Days after being provided the Material Modification results. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Independent Study Process (Cont'd.)

vi) Scope and Purpose of the Interconnection Facilities Study and Study Deposit

Within ten (10) Business Days of Applicant's confirmation of no modifications or Distribution Provider's determination that the Interconnection System Impact Study does not require reevaluation, Applicant shall submit to Distribution Provider the data required by Distribution Provider, including the completed form of Attachment B to the Detailed Study Agreement, if applicable. For Generating Facilities 5 MW or less, Applicant shall also submit the Interconnection Facilities Study deposit, as set out in Section E.3.a, unless the Interconnection Facilities Study will be waived in accordance with Section F.3.b.vii.

For NEM Generating Facilities and Solar ≤1 MW Generating Facilities that have elected the Cost Envelope Option, Applicant must (i) submit to Distribution Provider the Cost Envelope Option deposit within ten (10) Business Days of Applicant's confirmation of no modifications or Distribution Provider's determination that the Interconnection System Impact Study does not require reevaluation, or (ii) provide Distribution Provider written notice that it elects to withdraw its request for the Cost Envelope Option, in accordance with Section F.7. Should Applicant fail to provide the required Cost Envelope Option deposit or provide written notice within such timeframe, Applicant's request for the Cost Envelope Option shall be deemed withdrawn, and the Interconnection Request shall continue to be processed in accordance with the Independent Study Process. (L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 100
GENERATING FACILITY INTERCONNECTIONS

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Independent Study Process (Cont'd.)

vii) Waiver of the Interconnection Facilities Study

The Interconnection Facilities Study may be waived if Distribution Provider and Applicant mutually agree to such waiver within either (i) five (5) Business Days following the Interconnection System Impact Study results meeting, or (ii) within twenty-five (25) Business Days of the issuance of the final Interconnection System Impact Study report if no Interconnection System Impact Study results meeting is held. If Distribution Provider and Applicant agree to waive the Interconnection Facilities Study for an Interconnection Request where Applicant has selected the Cost Envelope Option, the Interconnection Request shall not be eligible for the Cost Envelope Option and Applicant's request for the Cost Envelope Option shall be deemed withdrawn. The Interconnection Facilities Study may not be waived for Interconnection Requests that have selected the Cost Envelope Option and for which the Applicant elects to proceed with Distribution Provider's preparation of the Cost Envelope Estimate.

Within thirty (30) Calendar Days after Distribution Provider and Applicant mutually agree to waive the Interconnection Facilities Study, Distribution Provider shall tender a draft Generator Interconnection Agreement, together with draft appendices, to Applicant. If Applicant chooses to forgo the Interconnection Facilities Study and move directly to a Generator Interconnection Agreement, Applicant must agree in writing to be responsible for all actual costs of all required facilities deemed necessary by Distribution Provider. Applicant is responsible for all applicable costs associated with Parallel Operation to support the safe and reliable operation of the Distribution and Transmission System as set forth in Section E.4. Refer to Section F.3.e for cost responsibility and time frames for completing the Generator Interconnection Agreement. (L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 101
GENERATING FACILITY INTERCONNECTIONS

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Independent Study Process (Cont'd.)

viii) Timing of the Interconnection Facilities Study

The Interconnection Facilities Study shall be completed and provided to Applicant within sixty (60) Business Days after Applicant posts the initial Interconnection Financial Security in accordance with Section F.4.b where Distribution Upgrades or Network Upgrades are identified and, for Generating Facilities with a Gross Nameplate Rating of 5 MW or less, Applicant submits the Interconnection Facilities Study deposit in accordance with Section E.3.a and F.3.b.vi. In cases where no Distribution Upgrades and/or Network Upgrades are identified and the required facilities are limited to Distribution Provider's Interconnection Facilities only, the Interconnection Facilities Study shall be completed within forty-five (45) Business Days after Applicant posts the initial Interconnection Financial Security and, for Generating Facilities with a Gross Nameplate Rating of 5 MW or less, Applicant submits the Interconnection Facilities Study deposit.

If applicable, Distribution Provider will share the study results with the CAISO for review and comment, and will incorporate CAISO comments, if any, into the study report prior to issuing a final Interconnection Facilities Study report to Applicant.

Within thirty (30) Calendar Days after Distribution Provider issues the final Interconnection Facilities Study report to Applicant, or within thirty (30) Calendar Days of an Interconnection Facilities Study results meeting, if requested, Distribution Provider shall tender a draft Generator Interconnection Agreement, together with draft appendices. Refer to Section F.3.e for cost responsibility and time frames for completing the Generator Interconnection Agreement.

At any time Distribution Provider determines that it will not meet the required time frame for completing the Interconnection Facilities Study, Distribution Provider shall notify Applicant in writing as to the status of the Interconnection Facilities Study and provide an estimated completion date with an explanation of the reasons why additional time is required. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Independent Study Process (Cont'd.)

ix) Interconnection Facilities Study Results Meeting

If requested by Applicant, a results meeting shall be held among Distribution Provider, the CAISO, if applicable, and Applicant to discuss the results of the Interconnection Facilities Study, including assigned cost responsibility. Within five (5) Business Days of the request, Distribution Provider shall contact Applicant to establish a date agreeable to Applicant, Distribution Provider and the CAISO, if applicable, for the results meeting.

Within thirty (30) Calendar Days after the Interconnection Facilities Study results meeting, Distribution Provider shall tender a draft Generator Interconnection Agreement, together with draft appendices, to Applicant.

x) Second and Third Postings of Interconnection Financial Security

Applicant will post its second and third postings of Interconnection Financial Security as set forth in Sections F.4.c and F.4.d based on the cost responsibility for Network Upgrades, Distribution Upgrades, and Distribution Provider's Interconnection Facilities set forth in the final Interconnection Facilities Study, or the final Interconnection System Impact Study if the Interconnection Facilities Study is waived in accordance with Section F.3.b.vii.

c. Distribution Group Study Process

i) Initiation of Distribution Study Process

Applicants that apply for the Independent Study Process that pass Screen Q but fail Screen R will be eligible for inclusion in a Distribution Study Group. Applicant must submit all materials required to complete their Interconnection Request no later than ten (10) Business Days after the close of the relevant Distribution Group Study window. This includes notification from Applicant that they want to proceed with the Distribution Group Study Process, if applicable, in accordance with Section F.3.a. Distribution Provider shall inform Applicant of the Detailed Study start date. (L) (P)/(L) (P)/(L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

i) Initiation of Distribution Study Process (Cont'd.)

Distribution Provider shall perform a Screen Q analysis for the Distribution Study Group within thirty (30) Business Days of the close of the window, using best available information about projects that have entered the Distribution Group Study Process under Rule 21 and the WDT.

If the Distribution Study Group fails Screen Q, the Distribution Provider will deem the projects withdrawn from Rule 21 and notify Applicants. Applicants may elect to proceed with the WDT Transmission Cluster Study Process pursuant to Section F.3.d.

In order to be eligible to participate in the DGS Phase I Interconnection Study, the scoping meeting must be complete and the Applicant must execute the Detailed Study Agreement prior to the start date of the DGS Phase I Interconnection Study.

ii) Scoping Meeting

Within five (5) Business Days after Distribution Provider performs the Electrical Independence Test, it will contact the Applicant(s) to notify them that the Interconnection Request has passed Screen Q and failed Screen R and is thus eligible for the Distribution Group Study Process, and establish a date agreeable to Applicant and Distribution Provider for a scoping meeting.

The Distribution Provider, in coordination with the CAISO, if applicable, shall determine whether the Interconnection Request is at or near the boundary of an Affected System(s) so as to potentially impact such Affected System(s). If a determination of potential impact is made, the Distribution Provider shall invite the Affected System Operator(s) to the scoping meeting by informing them of the time and place of the scheduled scoping meeting as soon as practicable. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

ii) Scoping Meeting (Cont'd.)

The purpose of the scoping meeting shall be: (i) to discuss reasonable Commercial Operation Dates and alternative interconnection options; (ii) to exchange information, including any transmission data that would reasonably be expected to impact Applicant's interconnection options; (iii) to analyze such information; (iv) to determine feasible Points of Interconnection and eliminate alternatives given resources and available information; and (v) to advise Applicant of the expected start date of the DGS Phase I Interconnection Study.

Distribution Provider will bring to the scoping meeting, as reasonably necessary to accomplish its purpose, such already available technical data, including, but not limited to: (i) general facility loadings, (ii) general instability issues, (iii) general short circuit issues, (iv) general voltage issues, and (v) general reliability issues.

Applicant will bring to the scoping meeting, in addition to the technical data in Attachment A of the Rule 21 Exporting Generating Facility Interconnection Request form, any system studies previously performed. Distribution Provider, the CAISO, if applicable, and Applicant will also bring to the meeting personnel and other resources as may be reasonably required to accomplish the purpose of the meeting in the time allocated for the meeting.

During the meeting, Applicant shall confirm its Point of Interconnection. The duration of the meeting shall be only what is sufficient to accomplish its purpose. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

ii) Scoping Meeting (Cont'd.)

Within fifteen (15) Business Days after the scoping meeting, Distribution Provider shall provide Applicant with a Detailed Study Agreement, which shall contain an outline of the scope of the DGS Phase I Interconnection Study and DGS Phase II Interconnection Study, contain a non-binding good faith estimate of the cost to perform such studies, and shall specify that Applicant is responsible for the actual cost of the Interconnection Studies, including reasonable administrative costs. Applicant shall execute and deliver to Distribution Provider the Detailed Study Agreement no later than thirty (30) Business Days after the scoping meeting or the start date of the DGS Phase I Interconnection Study, whichever is earlier, or the Interconnection Request shall be deemed withdrawn.

iii) Grouping of Interconnection Requests for a Distribution Group Study

The results of Screen R will determine the Interconnection Requests to be grouped together for each Distribution Group Study. An Interconnection Request that failed Screen R will be grouped with other projects that are determined to be electrically interdependent through the application of Screen R. No later than the date a DGS Phase I Interconnection Study begins, Distribution Provider may send to each Applicant in a Distribution Study Group a list of the Interconnection Requests in its Distribution Study Group.

At the Distribution Provider's option, an Interconnection Request received during a particular Distribution Group Study Application window may be studied individually (Independent Study Process) or in a Distribution Group Study for the purpose of conducting one or more of the analyses forming the Interconnection Studies. For each Interconnection Study received within the same Distribution Group Study Application window, the Distribution Provider may develop one or more Distribution Study Groups. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

iv) Timing of the DGS Phase I Interconnection Study

Absent extraordinary circumstances, Distribution Provider shall complete and issue a final DGS Phase I Interconnection Study report within sixty (60) Business Days from the start of the study. If the DGS Phase I Interconnection Study indicates a need for Network Upgrades, Distribution Provider will share applicable study results with the CAISO for review and comment and will incorporate comments into the final DGS Phase I Interconnection Study report.

At any time Distribution Provider determines that it will not meet the required time frame for completing the DGS Phase I Interconnection Study, Distribution Provider shall notify all Applicants in the Distribution Study Group as to the status of the DGS Phase I Interconnection Study and provide an estimated completion date with an explanation of the reasons why additional time is required.

Upon request, Distribution Provider shall provide any Applicant in the Distribution Study Group all relevant supporting documentation, workpapers and pre-Interconnection Request and post-Interconnection Request power flow, short circuit and dynamic/stability databases, and currently planned Distribution Upgrades relevant to the Interconnection Request for the DGS Phase I Interconnection Study. Applicant may be required to sign a non-disclosure agreement with terms consistent with Section D.7 regarding Confidentiality.

If applicable, Distribution Provider will share the applicable study results with the CAISO for review and comment, and will incorporate CAISO comments, if any, into the study report prior to issuing a final DGS Phase I Interconnection Study report to Applicants in the Distribution Study Group. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

v) DGS Phase I Interconnection Study Results Meeting

If requested by an Applicant in a Distribution Study Group or Distribution Provider, a results meeting shall be held among Distribution Provider, the CAISO, if applicable, and the Applicant to discuss the results of the DGS Phase I Interconnection Study, including assigned cost responsibility. Within five (5) Business Days of such request, Distribution Provider shall contact Applicant to establish a date agreeable to Applicant, Distribution Provider and the CAISO, if applicable, for the results meeting. If the Applicant or Distribution Provider has requested a results meeting, it must be completed within thirty (30) Calendar Days after issuance of the final DGS Phase I Interconnection Study report, unless otherwise agreed upon by the Distribution Provider and Applicant.

At the Phase I Interconnection Study results meeting, the Applicant shall provide a schedule outlining key milestones including environmental survey start date, expected environmental permitting submittal date, expected procurement date of project equipment, back-feed date for project construction, and expected project construction date. This will assist the parties in determining if proposed Commercial Operation Dates are reasonable. If large-scale Distribution Provider's Interconnection Facilities or Distribution Upgrades for the Generating Facility have been identified in the DGS Phase I Interconnection Study, such as telecommunications equipment, distribution feeders to support back feed, a new substation, and/or expanded substation work, permitting and material procurement lead times may result in the need to alter the proposed Commercial Operation Date, the Applicant and Distribution Provider may agree to a new Commercial Operation Date. In addition, where an Applicant intends to establish Commercial Operation separately for different Electric Generating Units or project phases at its Generating Facility, it may only do so in accordance with an implementation plan agreed to in advance by the Distribution Provider and the CAISO, if applicable, which agreement shall not be unreasonably withheld. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

v) DGS Phase I Interconnection Study Results Meeting (Cont'd.)

Where the parties cannot agree to a revised Commercial Operation Date, the Commercial Operation Date determined reasonable by the Distribution Provider will be used for the DGS Phase II Interconnection Study, or the Generator Interconnection Agreement (in accordance with Section F.3.e.iii) if the DGS Phase II Interconnection Study is waived in accordance with Section F.3.c.ix, where the revised Commercial Operation Date is needed to accommodate the anticipated completion, assuming Reasonable Efforts by the Distribution Provider of necessary Distribution Upgrades and/or Distribution Provider's Interconnection Facilities, pending the outcome of any relief sought by the Applicant under Sections F.1.d or K. The Applicant must notify the Distribution Provider within five (5) Business Days following the Results Meeting if it is initiating dispute procedures under Sections F.1.d or K.

Within five (5) Business Days following the DGS Phase I Interconnection Study results meeting, the Applicant shall submit to the Distribution Provider all requested information. If no DGS Phase I Interconnection Study results meeting is held, Applicant shall submit to Distribution Provider any requested information within thirty (30) Calendar Days of the receipt of the final DGS Phase I Interconnection Study report.

vi) Initial Posting of Interconnection Financial Security

Each Applicant in a Distribution Study Group shall make its initial posting of Interconnection Financial Security in accordance with the requirements of Section F.4.b, within sixty (60) Calendar Days after being provided with the final DGS Phase I Interconnection Study report, or its Interconnection Request shall be deemed withdrawn. The initial posting of Interconnection Financial Security will be based on the cost responsibility for Network Upgrades, Distribution Upgrades, and Distribution Provider's Interconnection Facilities set forth in the final DGS Phase I Interconnection Study report. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

vii) Modifications

At any time during the course of the Interconnection Studies, Applicant, Distribution Provider, or the CAISO, as applicable, may identify changes to the planned Interconnection that may improve the costs and benefits (including reliability) of the Interconnection, and the ability of the proposed change to accommodate the Interconnection Request. To the extent the identified changes are acceptable to Distribution Provider, the CAISO, as applicable, and Applicant, such acceptance not to be unreasonably withheld, Distribution Provider shall modify the Point of Interconnection and/or configuration in accordance with such changes without altering the Interconnection Request's eligibility for participating in Interconnection Studies.

At the DGS Phase I Interconnection Study results meeting, if elected by Applicant or Distribution Provider, Applicant should be prepared to discuss any desired modifications to the Interconnection Request. After the publication of the final DGS Phase I Interconnection Study report, but no later than five (5) Business Days following the DGS Phase I Interconnection Study results meeting, Applicant shall submit to Distribution Provider, in writing, modifications to any information provided in the Interconnection Request. Distribution Provider will forward Applicant's request for modification to the CAISO, if applicable, within two (2) Business Days of receipt.

If no DGS Phase I Interconnection Study results meeting is held, Applicant shall submit to Distribution Provider any requested modifications within thirty (30) Calendar Days of the receipt of the final Phase I Interconnection Study report. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

vii) Modifications (Cont'd.)

Modifications permitted under this Section F.3.c.vii shall include specifically: (a) a decrease in the electrical output (MW) of the proposed Generating Facility; (b) modifying the technical parameters associated with the Generating Facility technology or the Generating Facility step-up transformer impedance characteristics; and (c) modifying the interconnection configuration. For any modifications other than those permitted above, Distribution Provider, in coordination with CAISO, if applicable, will evaluate whether the proposed modification to the Interconnection Request constitutes a Material Modification. Distribution Provider will inform Applicant in writing whether the modifications would constitute a Material Modification within ten (10) Business Days of receipt of the proposed request for modification. Any change to the Point of Interconnection, except for that specified by Distribution Provider in an Interconnection Study or otherwise allowed under this Section F.3.c.vii, shall constitute a Material Modification.

If the proposed modification is determined to be a Material Modification, Applicant may either withdraw the proposed modification or proceed with a new Interconnection Request for such modification. Applicant shall make such determination within ten (10) Business Days after being provided the Material Modification determination results.

Proposed modifications determined not to be Material Modifications may still necessitate the need to re-evaluate the DGS Phase I Interconnection Study to determine modifications to the Interconnection Facilities and Distribution Upgrades. Such re-evaluation will occur during the DGS Phase II Interconnection Study. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

viii) Scope and Purpose of the DGS Phase II Interconnection Study and Study Deposit

Within either (i) five (5) Business Days following the DGS Phase I Interconnection Study results meeting, or (ii) within thirty (30) Calendar Days of the receipt of the final DGS Phase I Interconnection Study report if no DGS Phase I Interconnection Study results meeting is held, Applicant shall submit to Distribution Provider the data required by Distribution Provider. Within thirty (30) Business Days of the issuance of the final DGS Phase I Interconnection Study report, for Generating Facilities 5 MW or less, Applicant shall submit the DGS Phase II Interconnection Study deposit, as set out in Section E.3.a, unless the DGS Phase II Interconnection Study is waived in accordance with Section F.3.

ix) Waiver of the DGS Phase II Interconnection Study

The DGS Phase II Interconnection Study may be waived if Distribution Provider and all Applicants included in the DGS Phase I Interconnection Study mutually agree to such waiver within thirty (30) Calendar Days of the issuance of the DGS Phase I Interconnection Study report. Within thirty (30) Calendar Days after Distribution Provider and Applicants agree to waive the DGS Phase II Interconnection Study, Distribution Provider shall tender a draft Generator Interconnection Agreement, together with draft appendices, to Applicant. Applicant is responsible for all costs associated with Parallel Operation to support the safe and reliable operation of the Distribution and Transmission System as set forth in Section E.4. Refer to Section F.3.e for cost responsibility and time frames for completing the Generator Interconnection Agreement. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

x) DGS Phase II Interconnection Study Procedures

Distribution Provider shall utilize existing studies to the extent practicable in conducting the DGS Phase II Interconnection Study. The Distribution Provider shall commence the DGS Phase II Interconnection Study within sixty (60) Calendar Days of the issuance of the final DGS Phase I Interconnection Study report.

Distribution Provider shall complete and distribute to Applicants the DGS Phase II Interconnection Study reports within sixty (60) Business Days after the commencement of each DGS Phase II Interconnection Study. The Distribution Provider will issue a final DGS Phase II Interconnection Study report to Applicant.

At the request of Applicant or at any time Distribution Provider determines that it will not meet the required time frame for completing the DGS Phase II Interconnection Study, Distribution Provider shall notify Applicant as to the schedule status of the DGS Phase II Interconnection Study and provide an estimated completion date. If the Distribution Provider is unable to complete the DGS Phase II Interconnection Study in the time specified, such notice shall provide an explanation of the reasons why additional time is required.

Upon request of the Applicant, Distribution Provider shall provide Applicant all supporting documentation, work papers, and relevant pre-Interconnection Request and post-Interconnection Request power, short circuit and stability databases for the DGS Phase II Interconnection Study, subject to confidentiality arrangements consistent with Section D.7. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

x) DGS Phase II Interconnection Study Procedures (Cont'd.)

The Distribution Provider will conduct a DGS Phase II Interconnection Study that will incorporate eligible Interconnection Requests from the previous DGS Phase I Interconnection Study. The DGS Phase II Interconnection Study shall (i) update, as necessary, analyses performed in the DGS Phase I Interconnection Study to account for the withdrawal of Interconnection Requests or other projects in the Interconnection Study Process, (ii) identify Distribution Upgrades needed to physically interconnect the Generating Facility, (iii) assign cost responsibility for the Distribution Upgrades, (iv) identify for each Interconnection Request a final Point of Interconnection and Distribution Provider's Interconnection Facilities, (v) provide an estimate for each Interconnection Request of the Distribution Provider's Interconnection Facilities, and (vi) optimize in-service timing requirements based on operational studies in order to maximize achievement of the Commercial Operation Dates of the Generating Facilities, as applicable.

xi) DGS Phase II Interconnection Study Results Meeting

If requested by an Applicant in a Distribution Study Group, a results meeting shall be held among Distribution Provider, the CAISO, if applicable, and the Applicant to discuss the results of the DGS Phase II Interconnection Study, including selection of the final Commercial Operation Date and assigned cost responsibility. Within five (5) Business Days of such request, Distribution Provider shall contact Applicant to establish a date agreeable to Applicant, Distribution Provider and the CAISO, if applicable, for the results meeting. If Applicant wants to have a meeting, it must be completed within thirty (30) Calendar Days after issuance of the final DGS Phase II Interconnection Study report, unless mutually agreed upon by the Distribution Provider and Applicant. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

xi) DGS Phase II Interconnection Study Results Meeting (Cont'd.)

Distribution Provider shall tender a draft Generator Interconnection Agreement pursuant to F.3.e.i. Refer to Section F.3.e for cost responsibility and time frames for completing the Generator Interconnection Agreement.

xii) Timing of the DGS Phase II Interconnection Study

At any time Distribution Provider determines that it will not meet the required time frame for completing the DGS Phase II Interconnection Study, Distribution Provider shall notify each Applicant in the Distribution Study Group in writing as to the status of the DGS Phase II Interconnection Study and provide an estimated completion date with an explanation of the reasons why additional time is required.

xiii) Second and Third Postings of Interconnection Financial Security

Each Applicant in a Distribution Study Group will post its second and third posting of Interconnection Financial Security as set forth in Sections F.4.c and F.4.d based on the cost responsibility for Network Upgrades, Distribution Upgrades, and Distribution Provider's Interconnection Facilities set forth in the final DGS Phase II Interconnection Study, or the final DGS Phase I Interconnection Study if the DGS Phase II Interconnection Study is waived in accordance with Section F.3.c.ix. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

xiv) Withdrawal and Reallocation of Cost to Interconnection Requests in a Distribution Study Group

If at any time, an Interconnection Request is withdrawn or a Generator Interconnection Agreement is terminated, the upgrades identified in the Interconnection Studies will be revaluated to determine if they are still needed. If the Distribution Provider determines that a restudy is needed, it will be conducted pursuant to Section F.3.c.xv. Any costs, identified in the Distribution Group Study not already funded by Interconnection Financial Security that has been posted by the withdrawing Applicant, will be the responsibility of remaining Applicants in the Distribution Group and will be reallocated in accordance with E.4.e.

xv) Restudy

If a restudy is required following the issuance of the final DGS Phase II Interconnection Study, or the final DGS Phase I Interconnection Study if the DGS Phase II Interconnection Study is waived, due to a project withdrawal, Distribution Provider shall notify the remaining Applicant(s) in writing.

The restudy report shall be completed and provided to each Applicant remaining in the Distribution Group within sixty (60) Business Days of the withdrawal of the Interconnection Request that caused the restudy. The Applicants remaining in the Distribution Group will be responsible for the cost of the restudy. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

xvi) Automatic Timing Extension

If during any six month period, the number of Interconnection Requests exceeds by fifty (50) percent the number of active Interconnection Request in the preceding six month period, the study timelines for Distribution Group Studies begun during the next twelve (12) months will automatically increase as follows. The time to complete the DGS Phase I Interconnection Study pursuant to Section F.3.c.iv will increase from sixty (60) Business Days to one hundred twenty (120) Business Days. The time to complete the DGS Phase II Interconnection Study pursuant to Section F.3.c.x will increase from sixty (60) Business Days to one hundred twenty (120) Business Days. The time to tender a draft Generator Interconnection Agreement pursuant to F.3.e.i will increase from thirty (30) Calendar Days to forty-five (45) Calendar Days. Distribution Provider will notify Applicants in the Distribution Study Group in writing after commencement of DGS Phase I Interconnection Study of the extension.

d. WDT Transmission Cluster Study Process (L)

If Applicant's Interconnection Request fails Screen Q or elects to be studied under the WDT Transmission Cluster Study Process, Applicant shall have the option of applying for Interconnection under the WDT Transmission Cluster Study Process of the Wholesale Distribution Tariff in accordance with its provisions. If Applicant fails Screen Q, Applicant's Interconnection Request shall be deemed withdrawn under this Rule regardless of whether Applicant applies for Interconnection under the WDT. Distribution Provider shall inform Applicant of the Detailed Study start date. (L) (P)/(L) (P)/(L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

d. WDT Transmission Cluster Study Process (Cont'd.)

An Applicant that chooses to apply under the WDT Transmission Cluster Study Process must file a valid Interconnection Request and post the applicable study deposit as set out in Distribution Provider's WDT. If Applicant chooses to apply under the WDT, then Applicant's Interconnection Request will be subject to the terms of Distribution Provider's WDT applicable to the WDT Transmission Cluster Study Process, including those provisions establishing cost responsibility. Upon completion of the WDT Transmission Cluster Study Process under the WDT, Applicants that are eligible for a State-jurisdictional Interconnection can, in accordance with the WDT, either execute the applicable Commission-approved Rule 21 Generator Interconnection Agreement for Exporting Generating Facilities or the WDT Generator Interconnection Agreement. Such Commission-approved Generator Interconnection Agreement for Exporting Generating Facilities will include the cost responsibility established in the WDT Transmission Cluster Study.

If and when an Applicant submits a new interconnection request under the WDT, Applicant is under the jurisdiction of FERC. On the date the applicable Commission-approved Rule 21 Generator Interconnection Agreement for Exporting Generating Facilities is executed by Applicant, or Producer where those are different entities, and Distribution Provider, jurisdiction over the Interconnection reverts back to the Commission. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

e. Generator Interconnection Agreement

i) Tender

The Distribution Provider shall tender a draft Generator Interconnection Agreement, together with draft appendices, within thirty (30) Calendar Days of the following:

1) Agreement by the Distribution Provider and Applicant to waive the Interconnection Facilities Study in accordance with Section F.3.b.vii,

2) Issuance of the final Interconnection Facilities Study report (or results meeting, if held) to Applicant,

3) Agreement by the Distribution Provider and all Applicants included in a DGS Phase I Interconnection Study to waive the DGS Phase II Interconnection Study in accordance with Section F.3.c.ix,

4) Issuance of the final DGS Phase II Interconnection Study report to each Applicant in the Distribution Study Group (or results meeting, if held).

Applicant(s) shall provide written comments, or notification of no comments, to the draft appendices within thirty (30) Calendar Days.

ii) Negotiation

Notwithstanding Section F.3.e.i, at the request of Applicant, Distribution Provider shall begin negotiations with Applicant concerning the appendices to the Generator Interconnection Agreement at any time after Distribution Provider provides Applicant with the final Interconnection Facilities Study report (or (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

e. Generator Interconnection Agreement (Cont'd.)

ii) Negotiation (Cont'd.)

final Interconnection System Impact Study report if the Interconnection Facilities Study is waived) or final DGS Phase II Interconnection Study report (or the final DGS Phase I Interconnection Study report if the DGS Phase II Interconnection Study is waived) in the case of the Distribution Group Study Process. Distribution Provider and Applicant shall negotiate concerning any disputed provisions of the appendices to the draft Generator Interconnection Agreement for not more than ninety (90) Calendar Days after Distribution Provider provides Applicant with the final DGS Phase II Interconnection Study report (or the final DGS Phase I Interconnection Study report if the DGS Phase II Interconnection Study is waived) in the case of the Distribution Group Study Process or the final Interconnection Facilities Study report (or final Interconnection System Impact Study report if the Interconnection Facilities Study is waived) in the case of the Independent Study Process. Producers whose Interconnection Requests were studied in a Distribution Group Study Process will be required to fund upgrades triggered by more than one Interconnection Request in accordance with a payment schedule that allows such upgrades to be completed in time for the earliest Commercial Operation Date of such Interconnection requests. Producer is responsible for all costs associated with Parallel Operation to support the safe and reliable operation of the Distribution System and Transmission System as set forth in Section E.4.

If Applicant determines that negotiations are at an impasse, it may request termination of the negotiations at any time after tender of the draft Generator Interconnection Agreement pursuant to Section F.3.e.i and initiate Dispute Resolution procedures pursuant to Section K. Unless otherwise agreed by the Parties, if Applicant or Producer, where those are different entities, has not executed the Generator Interconnection Agreement, or initiated Dispute Resolution procedures pursuant to Section K, within ninety (90) Calendar Days after issuance of the final (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

e. Generator Interconnection Agreement (Cont'd.)

ii) Negotiation (Cont'd.)

DGS Phase II Interconnection Facilities Study report (or the final DGS Phase I Interconnection Study report if the DGS Phase II Interconnection Study is waived) in the case of the Distribution Group Study Process or Interconnection Facilities Study report (or final Interconnection System Impact Study report if the Interconnection Facilities Study is waived) in the case of the Independent Study Process, it shall be deemed to have withdrawn its Interconnection Request. (L)

Unless agreed to otherwise between Applicant and Distribution Provider, Distribution Provider will send an invoice to Applicant within five business days of execution of the Interconnection Agreement. (P)

Unless agreed to otherwise between Applicant and Distribution Provider, Distribution Provider shall schedule a mitigation work scoping meeting no later than 10 business days after receiving the payment for the engineering advance. (P)

iii) Extensions of Commercial Operation Date (L)

Extensions of the Commercial Operation Date will be agreed upon in the executed Generator Interconnection Agreement. Reasonable Commercial Operation Dates will be discussed at the DGS Phase II Interconnection Study results meeting, or the DGS Phase I Interconnection Study results meeting if the DGS Phase II Interconnection Study results meeting is waived, in the case of the Distribution Group Study Process, the Interconnection Facilities Study results meeting, or the Interconnection System Impact Study results meeting if the Interconnection Facilities Study is waived in the case of the Independent Study Process. A request for an extension of the Commercial Operation Date after the Generator Interconnection Agreement is executed will be agreed to provided that, the Producer is still responsible for funding any Distribution Upgrades and Network Upgrades as specified in the Generator Interconnection Agreement and under the same payment schedule agreed upon in the Generator Interconnection Agreement. This provision has no impact on any power purchase agreement terms. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

f. Engineering & Procurement (E&P) Agreement

Prior to executing a Generator Interconnection Agreement, in order to advance the implementation of its interconnection, an Applicant may request, and Distribution Provider shall offer, an E&P Agreement that authorizes Distribution Provider to begin engineering and procurement of long lead-time items necessary for the establishment of the interconnection. However, Distribution Provider shall not be obligated to offer an E&P Agreement if Applicant is in Dispute Resolution as a result of an allegation that Applicant has failed to meet any milestones or comply with any prerequisites specified in other parts of this Rule. The E&P Agreement is an optional procedure. The E&P Agreement shall provide for Applicant to pay the cost of all activities authorized by Applicant and to make advance payments or provide other satisfactory security for such costs.

Applicant shall pay the cost of such authorized activities and any cancellation costs for equipment that is already ordered for its interconnection, which cannot be mitigated as hereafter described, whether or not such items or equipment later become unnecessary. If Applicant withdraws its Interconnection Request, or either Applicant or Distribution Provider terminates the E&P Agreement, to the extent the equipment ordered can be canceled under reasonable terms, Applicant shall be obligated to pay the associated cancellation costs. To the extent that the equipment cannot be reasonably canceled, Distribution Provider may elect: (i) to take title to the equipment, in which event Distribution Provider shall refund Applicant any amounts paid by Applicant for such equipment and shall pay the cost of delivery of such equipment, or (ii) to transfer title to and deliver such equipment to Applicant, in which event Applicant shall pay any unpaid balance and cost of delivery of such equipment.

4. INTERCONNECTION FINANCIAL SECURITY

a. Types of Interconnection Financial Security

The Interconnection Financial Security posted by an Applicant may be any combination of the following types of Interconnection Financial Security provided in favor of Distribution Provider: (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

4. INTERCONNECTION FINANCIAL SECURITY (Cont'd.)

a. Types of Interconnection Financial Security (Cont'd.)

i) an irrevocable and unconditional letter of credit issued by a bank or financial institution that has a credit rating of A or better by Standard and Poor's or A2 or better by Moody's;

ii) an unconditional and irrevocable guaranty issued by a company has a credit rating of A or better by Standard and Poor's or A2 or better by Moody's;

iii) a cash deposit standing to the credit of Distribution Provider and in an interest-bearing escrow account maintained at a bank or financial institution that is reasonably acceptable to Distribution Provider;

Interconnection Financial Security instruments as listed above shall be in such form as Distribution Provider may reasonably require from time to time by notice to Applicants, or in such other form as has been evaluated and approved as reasonably acceptable by Distribution Provider.

Distribution Provider shall require the use of standardized forms of Interconnection Financial Security to the greatest extent possible. If at any time the guarantor of the Interconnection Financial Security fails to maintain the credit rating required by this Section F.4.a, Applicant shall provide to Distribution Provider replacement Interconnection Financial Security meeting the requirements of this Section F.4.a within five (5) Business Days of the change in credit rating.

Interest on a cash deposit standing to the credit of Distribution Provider in an interest-bearing escrow account under subpart (iii) of this Section F.4.a will accrue to Applicant's benefit.

b. Initial Posting of Interconnection Financial Security

On or before sixty (60) Calendar Days after publication of either the final Interconnection System Impact Study report, or the final DGS Phase I Interconnection Study report, Applicant must post, with notice to Distribution Provider, two separate Interconnection Financial Security instruments. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

4. INTERCONNECTION FINANCIAL SECURITY (Cont'd.)

b. Initial Posting of Interconnection Financial Security (Cont'd.)

First, Applicant proposing to interconnect a Large Generating Facility shall post an Interconnection Financial Security instrument in an amount equal to the lesser of (i) fifteen percent (15%) of the total cost responsibility assigned to Applicant in the final Interconnection System Impact Study or final DGS Phase I Interconnection Study in the case of the Distribution Group Study Process for Network Upgrades, (ii) $20,000 per MW of electrical output of the Large Generating Facility or the amount of megawatt increase in the generating capacity of each existing Generating Facility as listed by Applicant in its Interconnection Request, including any requested modifications thereto, or (iii) $7,500,000.

Applicant proposing to interconnect a Small Generating Facility shall post an Interconnection Financial Security instrument in an amount equal to the lesser of (i) fifteen percent (15%) of the total cost responsibility assigned to Applicant in the final Interconnection System Impact Study or final DGS Phase I Interconnection Study in the case of the Distribution Group Study Process for Network Upgrades, or (ii) $20,000 per MW of electrical output of the Small Generating Facility or the amount of megawatt increase in the generating capacity of each existing Generating Facility as listed by Applicant in its Interconnection Request.

Second, Applicant shall also post an Interconnection Financial Security instrument in the amount of twenty percent (20%) of the total estimated cost responsibility assigned to Applicant in the final Interconnection System Impact Study or final DGS Phase I Interconnection Study in the case of the Distribution Group Study Process for Distribution Provider's Interconnection Facilities and Distribution Upgrades.

The failure by an Applicant to timely post the Interconnection Financial Security required by this Section F.4.b shall result in the Interconnection Request being deemed withdrawn subject to Section F.6.

If required by Distribution Provider, Applicant shall provide Distribution Provider with written notice that it has posted the required Interconnection Financial Security no later than the applicable final day for posting. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

4. INTERCONNECTION FINANCIAL SECURITY (Cont'd.)

c. Second Posting of Interconnection Financial Security

On or before one hundred twenty (120) Calendar Days after issuance of the final DGS Phase II Interconnection Study report (or final DGS Phase I Interconnection Study report if the DGS Phase II Interconnection Study is waived) or final Interconnection Facilities Study report (or final Interconnection System Impact Study report if the Interconnection Facilities Study is waived in the case of the Independent Study Process), Applicant shall post two separate Interconnection Financial Security instruments.

First, Applicant proposing to interconnect a Large Generating Facility shall post an Interconnection Financial Security instrument such that the total Interconnection Financial Security posted by Applicant for Network Upgrades equals the lesser of (i) $15 million, or (ii) thirty percent (30%) of the total cost responsibility assigned to Applicant for Network Upgrades in either the final Interconnection System Impact Study (final DGS Phase I Interconnection Study in the case on the Distribution Group Study Process) or final Interconnection Facilities Study (final DGS Phase II Interconnection Study in the case of the Distribution Group Study Process), whichever is lower.

Applicant proposing to interconnect a Small Generating Facility shall post an Interconnection Financial Security instrument such that the total Interconnection Financial Security posted by Applicant for Network Upgrades equals the lesser of (i) $1 million, or (ii) thirty percent (30%) of the total cost responsibility assigned to Applicant for Network Upgrades in either the final Interconnection System Impact Study or final Interconnection Facilities Study (final DGS Phase I or final DGS Phase II Interconnection Studies, respectively, for the Distribution Group Study Process), whichever is lower.

Second, Applicant shall also post an Interconnection Financial Security instrument such that the total Interconnection Financial Security posted by Applicant for Distribution Provider's Interconnection Facilities and Distribution Upgrades equals thirty percent (30%) of the total cost responsibility assigned to Applicant in the final DGS Phase II Interconnection Facilities Study (or final DGS Phase I Interconnection Study if the DGS Phase II Interconnection study is waived) in the case (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

4. INTERCONNECTION FINANCIAL SECURITY (Cont'd.)

c. Second Posting of Interconnection Financial Security (Cont'd.)

of the Distribution Group Study Process, or final Interconnection Facilities Study (or final Interconnection System Impact Study if the Interconnection Facilities Study is waived) in the case of the Independent Study Process, for Distribution Provider's Interconnection Facilities and Distribution Upgrades.

If the start date for Construction Activities of Network Upgrades, Distribution Provider's Interconnection Facilities and Distribution Upgrades on behalf of Applicant is prior to one hundred twenty (120) Calendar Days after issuance of the final DGS Phase II Interconnection Facilities Study report (or final DGS Phase I Interconnection Study report if the DGS Phase II Interconnection Study is waived), in the case of the Distribution Group Study Process or final Interconnection Facilities Study report (or final Interconnection System Impact Study report if the Interconnection Facilities Study is waived) in the case of the Independent Study Process, that start date must be set forth in Applicant's Generator Interconnection Agreement and Applicant shall make its second posting of Interconnection Financial Security pursuant to Section F.4.d rather than Section F.4.c.

The failure by an Applicant to timely post the Interconnection Financial Security required by this Section F.4.c shall result in the Interconnection Request being deemed withdrawn and subject to Section F.6 or, if applicable, shall constitute grounds for termination of the Generator Interconnection Agreement.

d. Third Posting of Interconnection Financial Security.

On or before the start of Construction Activities for Network Upgrades or Distribution Provider's Interconnection Facilities or Distribution Upgrades on behalf of Applicant, whichever is earlier, Applicant shall modify the two separate Interconnection Financial Security instruments posted as follows.

With respect to the Interconnection Financial Security instrument for Network Upgrades, Applicant shall modify this instrument so that it equals one hundred percent (100%) of the total cost responsibility (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

4. INTERCONNECTION FINANCIAL SECURITY (Cont'd.)

d. Third Posting of Interconnection Financial Security. (Cont'd.)

assigned to Applicant for Network Upgrades in the final DGS Phase II Interconnection Study (or the final DGS Phase I Interconnection Study if the DGS Phase II Interconnection Study is waived) in the case of the Distribution Group Study Process or final Interconnection Facilities Study (or the final Interconnection System Impact Study if the Interconnection Facilities Study is waived) in the case of the Independent Study Process.

With respect to the Interconnection Financial Security instrument for Distribution Provider's Interconnection Facilities or Distribution Upgrades, Applicant shall modify this instrument so that it equals one hundred percent (100%) of the total cost responsibility assigned to Applicant for Distribution Provider's Interconnection Facilities and Distribution Upgrades in the final DGS Phase II Interconnection Study (or the final DGS Phase I Interconnection Study if the DGS Phase II Interconnection Study is waived) in the case of the Distribution Group Study Process or final Interconnection Facilities Study (or the final Interconnection System Impact Study if the Interconnection Facilities Study is waived) in the case of the Independent Study Process.

The failure by an Applicant to timely post the Interconnection Financial Security required by this Section F.4.d shall constitute grounds for termination of the Generator Interconnection Agreement.

e. General Effect of Withdrawal of Interconnection Request or Termination of the Generator Interconnection Agreement on Interconnection Financial Security for Interconnection Requests Studied Under the Independent Study Process.

Except as set forth in Section F.4.e.i, withdrawal of an Interconnection Request or termination of a Generator Interconnection Agreement shall allow Distribution Provider to liquidate the Interconnection Financial Security, or balance thereof, posted by Applicant for Network Upgrades at the time of withdrawal. To the extent the amount of the liquidated Interconnection Financial Security plus capital, if any, separately provided by Applicant to satisfy its obligation to finance Network Upgrades in accordance with Section E.4 exceeds the total (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

4. INTERCONNECTION FINANCIAL SECURITY (Cont'd.)

e. General Effect of Withdrawal of Interconnection Request or Termination of the Generator Interconnection Agreement on Interconnection Financial Security for Interconnection Requests Studied Under the Independent Study Process. (Cont'd.)

cost responsibility for Network Upgrades assigned to Applicant by the final Interconnection Facilities Study, or the final Interconnection System Impact Study if the Interconnection Facilities Study is waived, Distribution Provider shall remit to Applicant the excess amount.

Withdrawal of an Interconnection Request or termination of a Generator Interconnection Agreement shall result in the release to Applicant of any Interconnection Financial Security posted by Applicant for Distribution Provider's Interconnection Facilities and Distribution Upgrades, except with respect to any amounts necessary to pay for costs incurred or irrevocably committed by Distribution Provider on behalf of Applicant for Distribution Provider's Interconnection Facilities and Distribution Upgrades and for which Distribution Provider has not been reimbursed.

i) Conditions for Partial Recovery of Interconnection Financial Security Upon Withdrawal of Interconnection Request or Termination of Generator Interconnection Agreement.

A portion of the Interconnection Financial Security shall be released to Applicant, consistent with Section F.4.e.ii, if the withdrawal of the Interconnection Request or termination of the Generator Interconnection Agreement occurs for any of the following reasons:

(1) Failure to Secure a Power Purchase Agreement.

At the time of withdrawal of the Interconnection Request or termination of the Generator Interconnection Agreement, Applicant demonstrates to Distribution Provider that it has failed to secure an acceptable power purchase agreement for the energy or capacity of the Generating Facility after a good faith effort to do so. A good faith effort can be established by demonstrating participation in a competitive solicitation (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

4. INTERCONNECTION FINANCIAL SECURITY (Cont'd.)

e. General Effect of Withdrawal of Interconnection Request or Termination of the Generator Interconnection Agreement on Interconnection Financial Security for Interconnection Requests Studied Under the Independent Study Process. (Cont'd.)

i) Conditions for Partial Recovery of Interconnection Financial Security Upon Withdrawal of Interconnection Request or Termination of Generator Interconnection Agreement. (Cont'd.)

(1) Failure to Secure a Power Purchase Agreement. (Cont'd.)

process or bilateral negotiations with an entity other than an Affiliate that progressed, at minimum, to the mutual exchange by all counter-parties of proposed term sheets.

(2) Failure to Secure a Necessary Permit.

At the time of withdrawal of the Interconnection Request or termination of the Generator Interconnection Agreement, Applicant demonstrates to Distribution Provider that it has received a final denial from the primary issuing Governmental Authority of any permit or other authorization necessary for the construction or operation of the Generating Facility.

(3) Increase in the Cost of Distribution Provider's Interconnection Facilities or Distribution Upgrades.

Applicant withdraws the Interconnection Request or terminates the Generator Interconnection Agreement based on an increase of: (i) more than 30% or $300,000, whichever is greater, in the estimated cost of Distribution Provider's Interconnection Facilities; or (ii) more than 30% or $300,000, whichever is greater, in the estimated cost of Distribution Upgrades allocated to Applicant from the Interconnection System Impact Study to the Interconnection Facilities Study. This Section F.4.e.i.(3) shall not apply if the cause of the cost increase under (i) or (ii) above is the result of a change requested by Applicant pursuant to Section F.3.b.v. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

4. INTERCONNECTION FINANCIAL SECURITY (Cont'd.)

e. General Effect of Withdrawal of Interconnection Request or Termination of the Generator Interconnection Agreement on Interconnection Financial Security for Interconnection Requests Studied Under the Independent Study Process. (Cont'd.)

i) Conditions for Partial Recovery of Interconnection Financial Security Upon Withdrawal of Interconnection Request or Termination of Generator Interconnection Agreement. (Cont'd.)

(4) Material Change in Applicant's Interconnection Facilities Created by Distribution Provider's Change in the Point of Interconnection.

Applicant withdraws the Interconnection Request or terminates the Generator Interconnection Agreement based on a material change from the Interconnection System Impact Study in the Point of Interconnection for the Generating Facility mandated by Distribution Provider and included in the final Interconnection Facilities Study. A material change in the Point of Interconnection shall be where the Point of Interconnection has moved to (i) a different substation, (ii) a different line on a different right of way, or (iii) a materially different location than previously identified on the same line.

ii) Schedule for Determining Non-Refundable Portion of the Interconnection Financial Security for Network Upgrades.

(1) Up to One Hundred Twenty (120) Calendar Days After the Final Interconnection Facilities Study Report (or Final Interconnection System Impact Study Report if the Interconnection Facilities Study is Waived).

If, at any time after the initial posting of the Interconnection Financial Security for Network Upgrades under Section F.4.b and on or before one hundred twenty (120) Calendar Days (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

4. INTERCONNECTION FINANCIAL SECURITY (Cont'd.)

e. General Effect of Withdrawal of Interconnection Request or Termination of the Generator Interconnection Agreement on Interconnection Financial Security for Interconnection Requests Studied Under the Independent Study Process. (Cont'd.)

ii) Schedule for Determining Non-Refundable Portion of the Interconnection Financial Security for Network Upgrades (Cont'd.)

(1) Up to One Hundred Twenty (120) Calendar Days After the Final Interconnection Facilities Study Report (or Final Interconnection System Impact Study Report if the Interconnection Facilities Study is Waived). (Cont'd.)

after the date of issuance of the final Interconnection Facilities Study report (or final Interconnection System Impact Study report if the Interconnection Facilities Study is waived), Applicant withdraws the Interconnection Request or terminates the Generator Interconnection Agreement, as applicable, in accordance with Section F.4.e.i, Distribution Provider shall liquidate the Interconnection Financial Security for Network Upgrades under Section F.4.b and reimburse Applicant in an amount of (i) any posted amount less fifty percent (50%) of the value of the posted Interconnection Financial Security for Network Upgrades (with a maximum of $10,000 per requested and approved MW value of the Generating Facility Capacity at the time of withdrawal being retained by Distribution Provider), or (ii) if the Interconnection Financial Security has been drawn down to finance Pre-Construction Activities for Network Upgrades on behalf of Applicant, the lesser of the remaining balance of the Interconnection Financial Security or the amount calculated under (i) above. If Applicant has separately provided capital apart from the Interconnection Financial Security to finance Pre-Construction Activities for Network Upgrades, Distribution Provider will credit the capital provided as if drawn from the Interconnection Financial Security and apply (ii) above. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

4. INTERCONNECTION FINANCIAL SECURITY (Cont'd.)

e. General Effect of Withdrawal of Interconnection Request or Termination of the Generator Interconnection Agreement on Interconnection Financial Security for Interconnection Requests Studied Under the Independent Study Process. (Cont'd.)

ii) Schedule for Determining Non-Refundable Portion of the Interconnection Financial Security for Network Upgrades. (Cont'd.)

(2) Between One Hundred Twenty-One (121) Calendar Days and After Final Interconnection Facilities Study Report and the Commencement of Construction Activities.

If, at any time between one hundred twenty-one (121) Calendar Days and after the date of issuance of the final Interconnection Facilities Study report (or final Interconnection System Impact Study report if the Interconnection Facilities Study is waived), and the commencement of Construction Activities for either Network Upgrades or Distribution Provider's Interconnection Facilities or Distribution Upgrades, Applicant withdraws the Interconnection Request or terminates the Generator Interconnection Agreement, as applicable, in accordance with Section F.4.e.i, Distribution Provider shall liquidate the Interconnection Financial Security for Network Upgrades under Section F.4.c and reimburse Applicant in an amount of (i) any posted amounts less fifty percent (50%) of the value of the posted Interconnection Financial Security for Network Upgrades (with a maximum of $20,000 per requested and approved MW value of the Generating Facility Capacity at the time of withdrawal being retained by Distribution Provider), or, (ii) if the Interconnection Financial Security has been drawn down to finance Pre-Construction Activities for Network Upgrades on behalf of Applicant, the lesser of the remaining balance of the Interconnection Financial Security or the amount calculated under (i) above. If Applicant has separately provided capital apart from the Interconnection Financial Security to finance Pre-Construction Activities for Network Upgrades, Distribution Provider will credit the capital provided as if drawn from the Interconnection Financial Security and apply (ii) above. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

4. INTERCONNECTION FINANCIAL SECURITY (Cont'd.)

e. General Effect of Withdrawal of Interconnection Request or Termination of the Generator Interconnection Agreement on Interconnection Financial Security for Interconnection Requests Studied Under the Independent Study Process. (Cont'd.)

ii) Schedule for Determining Non-Refundable Portion of the Interconnection Financial Security for Network Upgrades. (Cont'd.)

(3) After Commencement of Construction Activities.

Once Construction Activities on Network Upgrades on behalf of Applicant commence, any withdrawal of the Interconnection Request or termination of the Generator Interconnection Agreement by Applicant will be treated in accordance with this Section F.4.e.

(4) Notification and Accounting by Distribution Provider.

Distribution Provider will notify Applicant within three (3) Business Days of liquidating any Interconnection Financial Security. Within seventy-five (75) Calendar Days of any liquidating event, Distribution Provider will provide Applicant with an accounting of the disposition of the proceeds of the liquidated Interconnection Financial Security and all proceeds not otherwise reimbursed to Applicant or applied to costs incurred or irrevocably committed by Distribution Provider on behalf of Applicant in accordance with this Section F.4.e shall be applied as directed by the Commission. Where an Applicant with remaining proceeds from Interconnection Financial Security cannot be located, such remaining proceeds shall escheat to the State pursuant to the Unclaimed Property Law commencing with the California Code of Civil Procedure § 1500. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

4. INTERCONNECTION FINANCIAL SECURITY (Cont'd.)

f. General Effect of Withdrawal of Interconnection Request or Termination of the Generator Interconnection Agreement on Interconnection Financial Security for Interconnection Requests Studied Under the Distribution Group Study Process.

Withdrawal of an Interconnection Request or termination of a Generator Interconnection Agreement shall allow Distribution Provider to liquidate the Interconnection Financial Security, or balance thereof, posted by Applicant for Network Upgrades or Distribution Upgrades at the time of withdrawal. To the extent the amount of the liquidated Interconnection Financial Security plus capital, if any, separately provided by Applicant to satisfy its obligation to finance Network Upgrades or Distribution Upgrades in accordance with Section E.4 exceeds the total cost responsibility for Network Upgrades or Distribution Upgrades assigned to Applicant by the final DGS Phase II Interconnection study (or final DGS Phase I Interconnection Study if the DGS Phase II Interconnection Study is waived), Distribution Provider shall remit to Applicant the excess amount.

Withdrawal of an Interconnection Request or termination of a Generator Interconnection Agreement shall result in the release to Applicant of any Interconnection Financial Security posted by Applicant for Distribution Provider's Interconnection Facilities, except with respect to any amounts necessary to pay for costs incurred or irrevocably committed by Distribution Provider on behalf of Applicant for Distribution Provider's Interconnection Facilities and for which Distribution Provider has not been reimbursed.

i) Notification and Accounting by Distribution Provider.

Distribution Provider will notify Applicant within three (3) Business Days of liquidating any Interconnection Financial Security. Within seventy-five (75) Calendar Days of any liquidating event, Distribution Provider will provide Applicant with an accounting of the disposition of the proceeds of the liquidated Interconnection Financial Security and all proceeds not otherwise reimbursed to Applicant or applied to costs incurred or irrevocably committed by Distribution Provider on behalf of Applicant in accordance with this Section F.4.f. Where an Applicant with remaining proceeds from Interconnection Financial Security cannot be located, such remaining proceeds shall escheat to the State pursuant to the Unclaimed Property Law commencing with the California Code of Civil Procedure § 1500. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

5. COMMISSIONING TESTING AND PARALLEL OPERATION

a. Commissioning Testing

Producer Arranges for and Completes Commissioning Testing of Generating Facility and Producer's Interconnection Facilities: Producer is responsible for testing new Generating Facilities and associated Interconnection Facilities according to Section L.5 to ensure compliance with the safety and reliability provisions of this Rule prior to being operated in parallel with Distribution Provider's Distribution or Transmission System. For non-Certified Equipment, Producer shall develop a written testing plan to be submitted to Distribution Provider for its review and acceptance. Alternatively, Producer and Distribution Provider may agree to have Distribution Provider conduct the required testing at Producer's expense. Where applicable, the test plan shall include the installation test procedures published by the manufacturer of the Generating Facility or Interconnection Facilities. Facility testing shall be conducted at a mutually agreeable time, and depending on who conducts the test, Distribution Provider or Producer shall be given the opportunity to witness the tests.

b. Parallel Operation or Momentary Parallel Operation

Producer shall not commence Parallel Operation of its Generating Facility with Distribution Provider's system unless it has received Distribution Provider's express written permission to do so. Distribution Provider shall authorize Producer's Generating Facility for Parallel Operation or Momentary Parallel Operation with Distribution Provider's Distribution or Transmission System, in writing, within five (5) Business Days of satisfactory compliance with the terms of all applicable agreements. Compliance may include, but not be limited to, provision of any required documentation and satisfactorily completing any required inspections or tests as described herein or in the agreements formed between Producer and Distribution Provider. (L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 135
GENERATING FACILITY INTERCONNECTIONS

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

6. WITHDRAWAL

Applicant may withdraw its Interconnection Request at any time by written notice of such withdrawal to Distribution Provider. In addition, after receipt of the Interconnection Request, if Applicant fails to adhere to the requirements and timelines of this tariff, except as provided in Section K (Disputes), Distribution Provider shall deem the Interconnection Request to be withdrawn and shall provide written notice to Applicant of the deemed withdrawal within five (5) Business Days and an explanation of the reasons for such deemed withdrawal. Upon receipt of such written notice, Applicant shall have five (5) Business Days in which to either respond with information or action that either cures the deficiency or supports its position that the deemed withdrawal was erroneous and notifies Distribution Provider of its intent to pursue Dispute Resolution. If Applicant cures the deficiency or supports its position that the deemed withdrawal was erroneous, Applicant shall not lose its Queue Position established pursuant to Section E.5.

Withdrawal shall result in the removal of the Interconnection Request from the Interconnection Study process. If Applicant disputes the withdrawal and removal from the Interconnection Study process and has elected to pursue Dispute Resolution as set forth in Section K, Applicant's Interconnection Request is not required to be considered in any ongoing Interconnection Study during the Dispute Resolution process.

In the event of such withdrawal, Distribution Provider, subject to the provisions in Section D.7 and Sections E.3.a, as applicable, shall provide, at Applicant's request, all information that Distribution Provider developed for any completed study conducted up to the date of withdrawal of the Interconnection Request. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

7. COST ENVELOPE OPTION

Interconnection Requests for Generating Facilities evaluated under the Fast Track Process or Independent Study Process may qualify for the Cost Envelope Option described in this Section F.7 provided the requirements set forth in subsection (a) below are met. As further described below, under the Cost Envelope Option, Distribution Provider will prepare a Cost Envelope Estimate. The Cost Envelope Estimate will be based on the Applicant's estimated costs to interconnect a Generating Faciliy and will identify which elements of the estimated costs are subject to the Cost Envelope, and which are excluded from the Cost Envelope. Should an Applicant decide to proceed to a Generator Interconnection Agreement following receipt of the Cost Envelope Estimate in accordance with Section F.2.e for the Fast Track Process, or Section F.3.e.i for the Independent Study Process, the Generator Interconnection Agreement shall include cost responsibility for required upgrades based upon the Cost Envelope Estimate.

a. Eligibility for Cost Envelope Option

i) Eligibility of Interconnection Requests Under the Fast Track Process

Interconnection Requests processed under the Fast Track Process are eligible for the Cost Envelope Option if all of the following criteria are met:

(1) Applicant selects the Cost Envelope Option in its Interconnection Request, or during any applicable results meeting if mutually agreed upon by Distribution Provider and Applicant, and provides the additional required information specified therein for the Cost Envelope Option; and,

(2) The Interconnection Request passes the Fast Track Process evaluation pursuant to Section F.2.; and, (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

7. COST ENVELOPE OPTION (Cont'd.)

a. Eligibility for Cost Envelope Option (Cont'd.)

i) Eligibility of Interconnection Requests Under the Fast Track Process (Cont'd.)

(3) Applicant provides Distribution Provider the Cost Envelope Option deposit of $2,500 within ten (10) Business Days following receipt of the Distribution Provider's non-binding cost estimate provided in accordance with Sections F.2.a, F.2.b, F.2.c.iii, or F.2.d, as applicable. The Cost Envelope Option deposit of $2,500 is subject to adjustment upon mutual agreement of the Distribution Provider and Applicant.

In the event it is determined under the Initial Review or Supplemental Review that i) there are no Distribution Provider Interconnection Facilities and/or Distribution Upgrades required for interconnection of the Generating Facility, or ii) there are no Distribution Provider's Interconnection Facilities and/or Distribution Upgrades required for interconnection of the Generating Facility for which Applicant bears cost responsibility, Applicant's election of the Cost Envelope Option shall be considered not applicable and shall be deemed withdrawn. In such event, the Interconnection Request shall continue to be processed in accordance with the Fast Track Process.

ii) Eligibility of Interconnection Requests Under The Independent Study Process

(1) Applicant selects the Cost Envelope Option in its Interconnection Request and provides the additional required information specified therein for the Cost Envelope Option; and,

(2) The Interconnection Request qualifies for evaluation under the Independent Study Process pursuant to Section F.3.a; and, (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

7. COST ENVELOPE OPTION (Cont'd.)

a. Eligibility for Cost Envelope Option (Cont'd.)

ii) Eligibility of Interconnection Requests Under The Independent Study Process (Cont'd.)

(3) An Interconnection System Impact Study and Interconnection Facilities Study are completed for the Interconnection Request pursuant to Sections F.3.b.ii and F.3.b.viii, respectively; and,

(4) In the case of a NEM Generating Facility or Solar ≤1 MW Generating Facility, Applicant provides Distribution Provider the Cost Envelope Option deposit of $2,500 within the timeframe set forth in Section F.3.b.vi. The Cost Envelope Option deposit of $2,500 is subject to adjustment upon mutual agreement of the Distribution Provider and Applicant.

b. Cost Responsibility under the Cost Envelope Option

i) Cost Responsibility for Facilities Subject to Cost Envelope

Applicant shall be responsible for the actual cost of the portion of interconnection facilities and/or distribution upgrades subject to the cost envelope within the range of plus or minus twenty-five (25) percent of the estimated cost of such facilities identified in the cost envelope estimate. Applicant's cost responsibility for that portion of the interconnection facilities and/or distribution upgrades subject to the cost envelope shall be capped at twentyfive (25) percent above the estimated cost, and applicant shall not be responsible for the portion of the actual cost of such interconnection facilities and/or distribution upgrades that exceeds twenty-five (25) percent of the estimate. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

7. COST ENVELOPE OPTION (Cont'd.)

b. Cost Responsibility under the Cost Envelope Option (Cont'd.)

i) Cost Responsibility for Facilities Subject to Cost Envelope (Cont'd.)

Correspondingly, applicant's cost responsibility for the portion of the interconnection facilities and/or distribution upgrades subject to the cost envelope shall not be less than the amount determined as twenty-five (25) percent below the estimated cost, and any portion of the actual cost of such interconnection facilities and/or distribution upgrades that is below twenty-five (25) percent of the estimate shall not be refundable to applicant.

ii) Cost Responsibility for Facilities Not Subject to Cost Envelope

Applicant shall be responsible for the actual cost of the portion of Interconnection Facilities and/or Distribution Upgrades that are not subject to the Cost Envelope and the actual cost of Network Upgrades in accordance with Section F.7.e.

c. Timing of Applicant's Selection of Cost Envelope Option and Payment of Deposit

i) For Interconnection Requests under the Fast Track Process, Applicant must select the Cost Envelope Option in its Interconnection Request to be eligible for the Cost Envelope Option, in accordance with Section F.7.a.i. In addition, for Interconnection Requests that pass the Fast Track Process, Applicant must provide the Distribution Provider a $2,500 Cost Envelope Option deposit within ten (10) Business Days of receipt of the Distribution Provider's non-binding cost estimate for the (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

7. COST ENVELOPE OPTION (Cont'd.)

c. Timing of Applicant's Selection of Cost Envelope Option and Payment of Deposit (Cont'd.)

i) Interconnection Facilities and/or Distribution Upgrades required for interconnection. If Applicant fails to provide the Cost Envelope Option deposit within ten (10) Business Days of receipt of the Distribution Provider's non-binding cost estimate for the Interconnection Facilities and/or Distribution Upgrades required for interconnection, Applicant's request for the Cost Envelope Option shall be deemed withdrawn and the Interconnection Request shall not be eligible for the Cost Envelope Option. However, if the Applicant fails to provide the Cost Envelope Option deposit within the required timeframe, a Generator Interconnection Agreement may be requested by Applicant in accordance with Section F.2.e, and such Generator Interconnection Agreement will reflect the non-binding cost estimate for the Distribution Provider's required Interconnection Facilities and/or Distribution Upgrades provided during the Initial or Supplemental Review, and Applicant shall be responsible for the actual cost of such upgrades.

ii) For Interconnection Requests under the Independent Study Process, Applicant must select the Cost Envelope Option in its Interconnection Request to be eligible for the Cost Envelope Option, in accordance with Section F.7.a.ii. In the case of a NEM Generating Facility or Solar ≤1 MW Generating Facility, Applicant must also provide Distribution Provider the Cost Envelope Option deposit of $2,500 following completion of the Interconnection System Impact Study within the timeframe set forth in Section F.3.b.vi. The Cost Envelope Option deposit of $2,500 is subject to adjustment upon mutual agreement of the Distribution Provider and Applicant. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

7. COST ENVELOPE OPTION (Cont'd.)

c. Timing of Applicant's Selection of Cost Envelope Option and Payment of Deposit (Cont'd.)

ii) An Applicant must withdraw its request for the Cost Envelope Option following the Distribution Provider's completion of the Interconnection System Impact Study in the event the Distribution Provider and Applicant agree to waive the Interconnection Facilities Study in accordance with Section F.3.b.vii, by so indicating on Attachment B of the Detailed Study Agreement, or for NEM Generating Facilities by providing Distribution Provider written notice of such withdrawal prior to commencement of the Interconnection Facilities Study in accordance with Section F.3.b.vi.

d. Distribution Provider's Preparation of the Cost Envelope Estimate

For Interconnection Requests evaluated under the Fast Track Process, Distribution Provider shall complete and issue to Applicant the Cost Envelope Estimate within twenty (20) Business Days following Distribution Provider's receipt of the Cost Envelope Option deposit required pursuant to Section F.7.a.i.3. For Interconnection Requests evaluated under the Independent Study Process, the Cost Envelope Estimate will be developed as part of the Interconnection Facilities Study and will be included in the Interconnection Facilities Study report in accordance with Section F.3.b.viii.

Applicant shall be responsible for the actual cost of development of the Cost Envelope Estimate. (L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 142
GENERATING FACILITY INTERCONNECTIONS

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

7. COST ENVELOPE OPTION (Cont'd.)

d. Distribution Provider's Preparation of the Cost Envelope Estimate (Cont'd.)

If full payment for the required Interconnection Facilities and/or Distribution Upgrades identified in the Cost Envelope Estimate has not been paid by Applicant to the Distribution Provider within two hundred ten (210) Calendar Days from the date Distribution Provider provides the Cost Envelope Estimate to Applicant, the Cost Envelope Estimate shall be subject to re-evaluation and adjustment by the Distribution Provider at Applicant's expense.

e. Cost Elements Not Subject to Cost Envelope

Any and all costs of required environmental studies, environmental mitigation, permits, and/or easements related to the construction and installation of Distribution Provider's Interconnection Facilities and/or Distribution Upgrades shall not be subject to the Cost Envelope. Such costs shall be the responsibility of Applicant based on the actual cost incurred by the Distribution Provider.

Any and all costs of required Network Upgrades shall not be subject to the Cost Envelope. Such costs shall be the responsibility of Applicant based on the actual cost incurred by the Distribution Provider. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

7. COST ENVELOPE OPTION (Cont'd.)

e. Cost Elements Not Subject to Cost Envelope (Cont'd.)

The cost of any Distribution Provider's Interconnection Facilities and/or Distribution Upgrades triggered by one or more earlier queued Interconnection Requests that are also required for interconnection of a later-queued Generating Facility under the Cost Envelope Option shall not be subject to the Cost Envelope. In the event one or more of the earlier-queued projects withdraws (or is delayed to the extent the upgrade will not be completed in time to meet the later-queued Generating Facility's requested In-Service Date), all, or a portion, of Distribution Provider's Interconnection Facilities and/or Distribution Upgrades may become the responsibility of the later-queued Generating Facility. Upon such an occurrence, the Generator Interconnection Agreement shall be amended to reflect the Applicant's responsibility for such Distribution Provider's Interconnection Facilities and/or Distribution Upgrades based on actual costs unless Applicant requests in writing, within ten (10) Business Days of Applicant's receipt of Distribution Provider's nonbinding estimated cost of such required facilities, that it elects to include such facilities in the Cost Envelope. Within ten (10) Business Days of Applicant's request, Distribution Provider shall provide to Applicant an estimate of the cost required to update the Cost Envelope Estimate. Applicant shall notify Distribution Provider in writing within ten (10) Business Days of Applicant's receipt of Distribution Provider's estimate whether (i) Applicant elects to proceed with the update to the Cost Envelope Estimate at Applicant's expense, or (ii) that Applicant withdraws its request to include the additional facilities in the Cost Envelope. If Applicant elects to proceed with the update to the Cost Envelope Estimate, Distribution Provider shall complete the update within the sum of the time allowed for each step utilized by the Distribution Provider in preparation of the initial Cost Envelope Estimate pursuant to Section F.2 for Interconnection Requests evaluated under the Fast Track Process, or Section F.3.b for Interconnection Requests evaluated under the Independent Study Process, from receipt of payment of the estimated cost of the update. Should Applicant fail to so notify Distribution Provider within the ten (10) Business Day period, Applicant's request to include such additional facilities in the Cost Envelope shall be deemed withdrawn and such additional facilities shall be the responsibility of Applicant based on actual cost. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

7. COST ENVELOPE OPTION (Cont'd.)

f. Modifications

Under the Fast Track Process, modifications are not permitted to the Generating Facility, related equipment, Point of Interconnection or other interconnection parameters that would require a re-evaluation of the Initial Review or Supplemental Review. However, notwithstanding these restrictions, an Applicant may identify and suggest minor changes to the Interconnection Facilities (e.g., minor adjustments to physical location of switchgear or other equipment, adjustments to routing of conductor from the Point of Common Coupling to the Point of Interconnection, etc.) upon or near completion of Applicant's final design of its Interconnection Facilities. If an Applicant identifies such changes, Applicant shall notify Distribution Provider of the requested changes and if, in the reasonable judgement of Distribution Provider, a re-evaluation of the costs under the Cost Envelope Option is required, Distribution Provider will provide Applicant within ten (10) Business Days of receipt of Applicant's notice an estimate of the time required to re-evaluate the costs under the Cost Envelope Option and the estimated cost of such re-evaluation. Applicant may either (i) accept the additional time and cost to complete the re-evaluation, (ii) withdraw the proposed changes, or (iii) proceed with a new Interconnection Request for such changes. Applicant shall provide Distribution Provider written notice of its election within ten (10) Business Days following Applicant's receipt of Distribution Provider's estimated additional time and cost required for the re-evaluation. If Applicant elects to proceed with the re-evaluation of the costs under the Cost Envelope Option, Distribution Provider shall complete the reevaluation within twenty (20) Business Days from receipt of all required technical data related to the proposed changes and payment of the estimated cost of the reevaluation. Should Applicant fail to so notify Distribution Provider within such ten (10) Business Day period, Applicant's request to make the proposed changes shall be deemed withdrawn. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

7. COST ENVELOPE OPTION (Cont'd.)

f. Modifications

Under the Independent Study Process, any requested modifications, including required updates to costs under the Cost Envelope Option, shall be made in accordance with Section F.3.b.v. If Applicant elects to proceed with re-evaluation of the costs under the Cost Envelope Option pursuant to Section F.3.b.v, Distribution Provider shall complete the re-evaluation within the sum of the time allowed for each step utilized by the Distribution Provider for preparation of the initial Cost Envelope Estimate pursuant Section F.3.b from receipt of all required technical data related to the proposed changes and payment of the estimated cost of the re-evaluation.

g. Tender of the Generator Interconnection Agreement Under the Cost Envelope Option

Negotiation and execution of the Generator Interconnection Agreement shall be in accordance with Section F.2.e for Interconnection Requests evaluated under the Fast Track Process, and in accordance with Section F.3.e.ii for Interconnection Requests evaluated under the Independent Study Process. (L)

8. STANDARD DESIGN AND CONSTRUCTION TIMELINE (N)

Subject to emergencies, delays from other agencies, and other reasons,[1] the standard timeline for design and construction of interconnection-related distribution upgrades is as follows:

i) 60 business days for design and 60 business days for construction, or

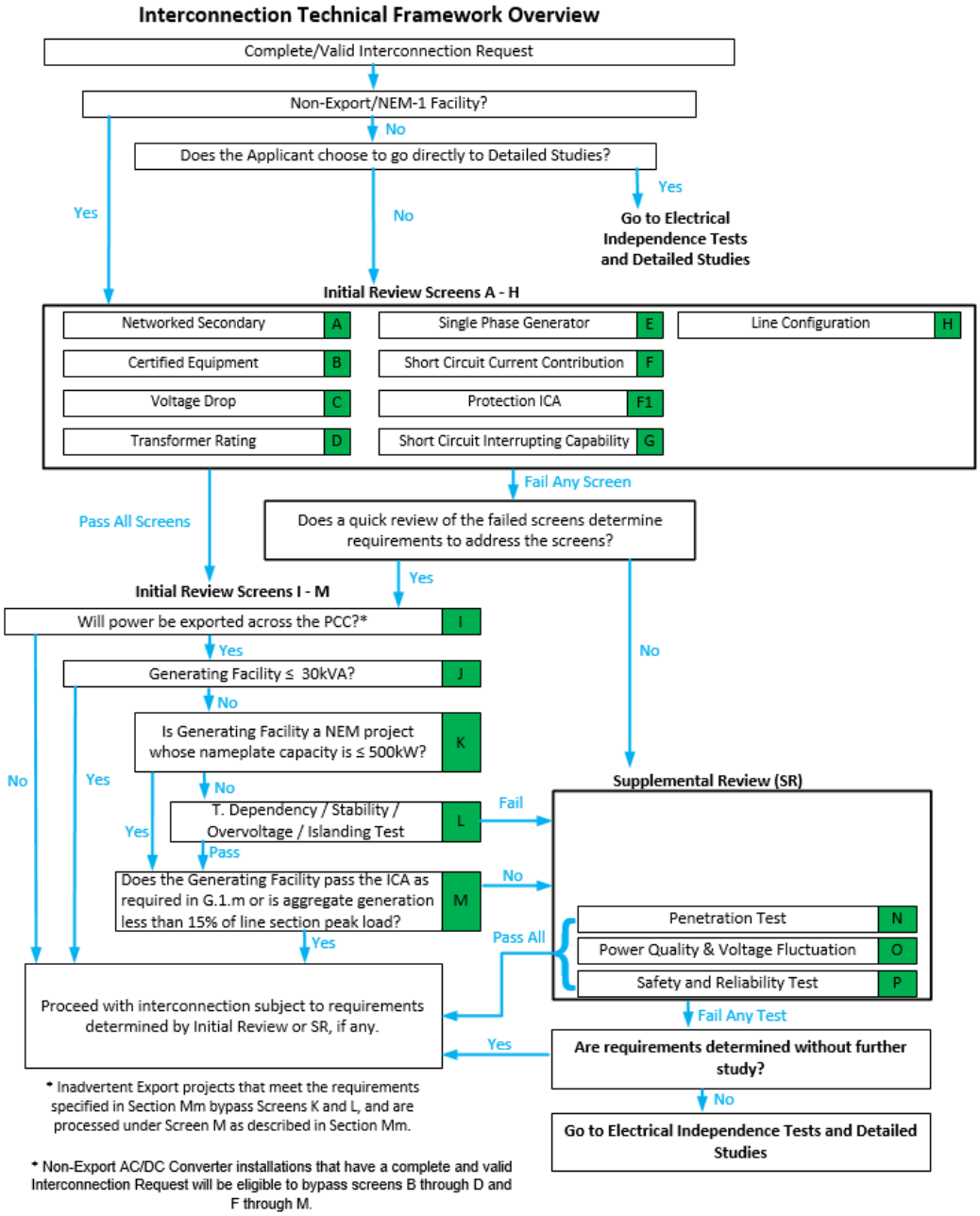
ii) Design and construct timelines as agreed to between Applicant and Distribution Provider.

The 60-day clock commences upon payment and after Applicant has done everything necessary on its end to prepare for construction.

[1] "Other reasons" include: long lead times for procurement of materials; licensing, rights acquisition, and/or permitting; higher-voltage distribution (generally greater than 50 kilovolts); modifications to equipment (to remove and/or replace) inside substations; civil work performed by Distribution Provider (that is typically performed by Applicant); line extension or reconductoring greater than 500 feet in length. (N)

(Continued)

G. ENGINEERING REVIEW DETAILS (T)



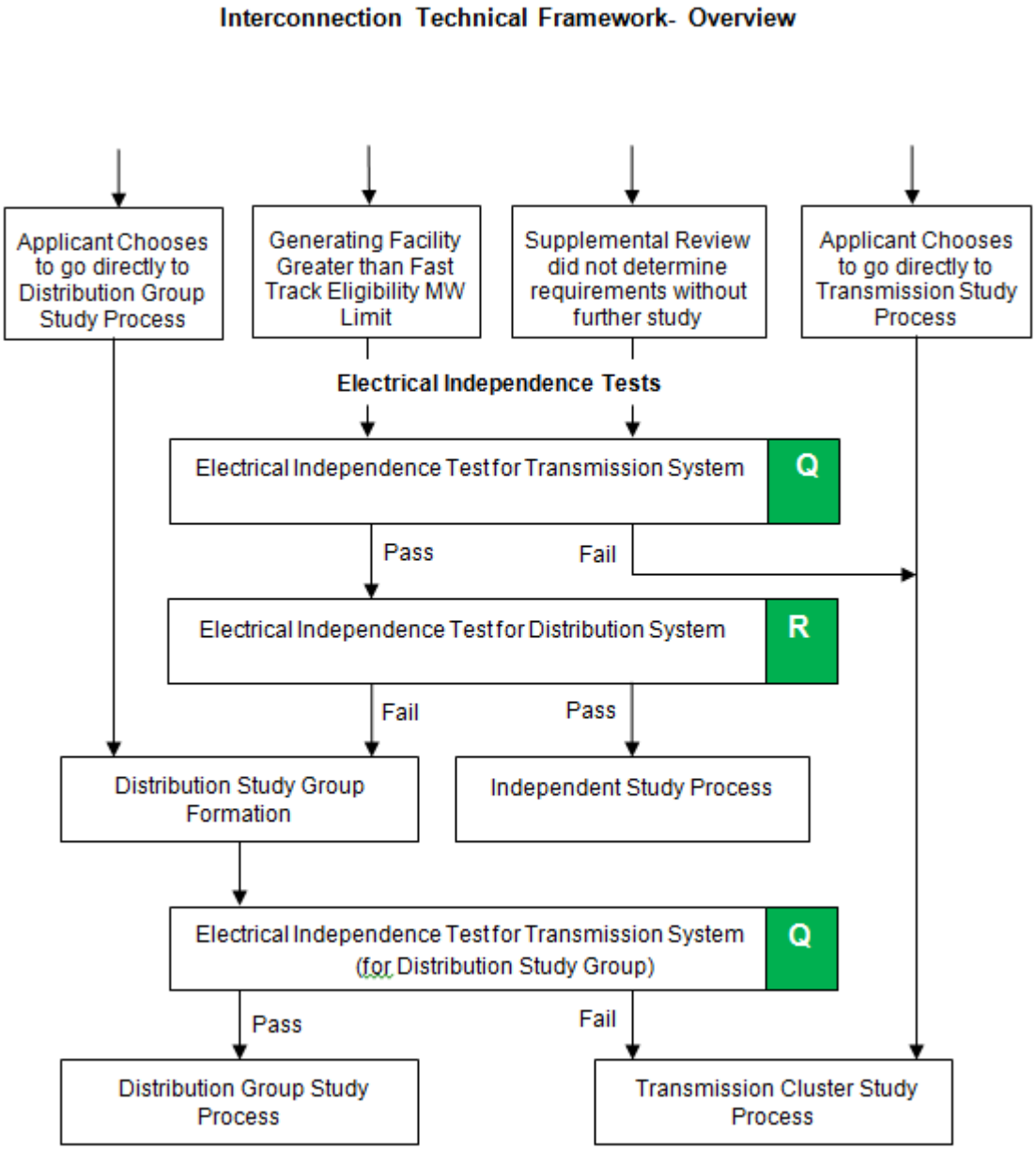
(T)

* Non-Export AC/DC Converter installations that have a complete and valid Interconnection Request will be eligible to bypass screens B through D and F through M. If the Generating Facility meets the conditions in Screen I below (Section G.1.i), skip Screens K, L, and M. (P)/(L)
(P)/(L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 147
GENERATING FACILITY INTERCONNECTIONS

G. ENGINEERING REVIEW DETAILS (Cont'd.)



(L)
(L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

1. INITIAL REVIEW SCREENS

The Initial Review consists of Screens A through M. If any of the Screens A through H are not passed, a quick review of the failed Screen(s) may determine the requirements to address the failure(s). Otherwise, Supplemental Review is required.

Some examples of solutions that may be available to mitigate the impact of a failed Screen A through H are:

1. Replace an overloaded distribution transformer with a larger transformer.

2. Replace overloaded secondary conductors with larger conductor.

3. Determine if phase balancing on the transformer is possible with minimal review.

4. If possible without further study check if the Generating Facility will actually overstress equipment.

a. Screen A: Is the PCC on a Networked Secondary System?

- If Yes (fail), must go to Supplemental Review except if the Generating Facility is on a Spot Network and meets the following criteria. If the Generating Facility meets the following criteria, continue to Screen B pursuant to Section G.1.

  The proposed Generating Facility must utilize an inverter-based equipment package and, together with the aggregated other inverter-based generation, shall not exceed the smaller of 5 % of a Spot Network's maximum load or 50 kW. Under no condition shall the interconnection of a Generating Facility result in a backfeed of a Spot Network or cause unnecessary operation of any Spot Network protectors. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

1. INITIAL REVIEW SCREENS (Cont'd.)

a. Screen A: Is the PCC on a Networked Secondary System? (Cont'd.)

- If No (pass), continue to Screen B.

Significance: Special considerations must be given to Generating Facilities proposed to be installed on Networked Secondary Systems because of the design and operational aspects of network protectors. There are no such considerations for radial distribution systems.

b. Screen B: Is Certified Equipment used?

Does the Interconnection Request propose to use Certified Equipment as set out in Section L or does the equipment have interim Distribution Provider approval?

- If Yes (pass), continue to Screen C.
- If No (fail) continue to Screen C pursuant to Section G.1.

Interim approval allows Distribution Provider to treat equipment that has not completed this Rule's Certification requirements as having met the intent of this screen. Interim approval is granted at Distribution Provider's discretion on case by case bases, and approval for one Generating Facility does not guarantee approval for any other Generating Facility.

Significance: If the Generating and/or Interconnection Facility has been Certified or previously approved by Distribution Provider, Distribution Provider does not need to repeat its full review and/or test of the Generating and/or Interconnection Facility's Protective Functions. Site Commissioning Testing may still be required to ensure that the Protective Functions are working properly.

Certification indicates that the criteria in Section L, as appropriate, have been tested and verified. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

1. INITIAL REVIEW SCREENS (Cont'd.)

c. Screen C: Is the Starting Voltage Drop within acceptable limits?

- If Yes (pass), continue to Screen D.
- If No (fail), continue to Screen D pursuant to Section G.1.

Note: This Screen only applies to Generating Facilities that start by motoring the Generator(s).

Distribution Provider has two options in determining whether Starting Voltage Drop is acceptable. The option to be used is at Distribution Provider's discretion.

Option 1: Distribution Provider may determine that the Generating Facility's starting In-rush Current is equal to or less than the continuous ampere rating of the Customer's service equipment.

Option 2: Distribution Provider may determine the impedances of the service distribution transformer (if present) and the secondary conductors to Customer's service equipment and perform a voltage drop calculation. Alternatively, Distribution Provider may use tables or nomographs to determine the voltage drop. Voltage drops caused by starting a Generator must be less than 2.5% for primary Interconnections and 5% for secondary Interconnections.

Significance:

1. This Screen addresses potential voltage fluctuation problems that may be caused by Generators that start by motoring.

2. When starting, Generating Facilities should have minimal impact on the service voltage to other Distribution Provider Customers.

3. Passing this Screen does not relieve Producer from ensuring that its Generating Facility complies with the flicker requirements of this Rule, Section H.2.d. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

1. INITIAL REVIEW SCREENS (Cont'd.)

d. Screen D: Is the transformer or secondary conductor rating exceeded?

Do the maximum aggregated Gross Ratings for all the Generating Facilities connected to a secondary distribution transformer exceed the transformer or secondary conductor rating, modified per established Distribution Provider practice, absent any Generating Facilities?

- If Yes (fail), continue to Screen E pursuant to Section G.1.
- If No (pass), continue to screen E.

Significance: This screen addresses potential secondary transformer or secondary conductor overloads. When Distribution Provider's analysis determines a transformer or conductor change is required, Distribution Provider will furnish Applicant with an explanation of why the change is needed.

e. Screen E: Does the Single-Phase Generator cause unacceptable imbalance?

If the proposed Generating Facility is single-phase and is to be interconnected on a center tap neutral of a 240 volt service, does it cause unacceptable imbalance between the two phases of the 240 volt service?

- If Yes (fail), continue to Screen F pursuant to Section G.1.
- If No (pass), continue to screen F. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

1. INITIAL REVIEW SCREENS (Cont'd.)

e. Screen E: Does the Single-Phase Generator cause unacceptable imbalance? (Cont'd.)

Significance: Generating Facilities connected to a single-phase transformer with 120/240 V secondary voltage must be installed such that the aggregated gross output is as balanced as practicable between the two phases of the 240 volt service. When Distribution Provider's analysis determines a transformer change is required. Distribution Provider will furnish the customer with an explanation of why the change is needed. (L)

f. Screens F and F1: Is the Short Circuit Current Contribution Ratio within acceptable limits? (T)

Screen F: Is the Short Circuit Current Contribution Ratio within acceptable limits? (N) (N)

- If Yes (pass), continue to Screen F1. (T)/(L)
- If No (fail), continue to Screen F1 pursuant to Section G.1. (T)/(L)

Note: This Screen does not apply to Generating Facilities with a Gross Rating of 30 kVA or less. (L) (T)/(L)

When measured at primary side (high side) of the Dedicated Distribution Transformer serving a Generating Facility, the sum of the Short Circuit Contribution Ratios of all Generating Facilities connected to Distribution Provider's Distribution System circuit that serves the Generating Facility must be less than or equal to 0.1. (L) (L)

Significance: If the Generating Facility passes this screen, it can be expected that it will have no significant impact on Distribution Provider's Distribution System's short circuit duty, fault detection sensitivity, relay coordination or fuse-saving schemes. (T)/(L) (L) (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

f. Screen F1: Is the per unit short circuit current contribution under allowable levels? (N)

Is the short circuit current contribution less than or equal to 1.2 per unit or is the Generating Facility Gross Nameplate Rating multiplied by its per unit contribution less than the Protection Integrated Capacity Analysis (ICA) Value1 multiplied by 1.2 per unit?

• If Yes to either (pass), continue to Screen G.

• If No to both (fail), continue to Screen G pursuant to Section G.1.

Significance: Generating systems with a per unit short circuit contribution of 1.2 or less can bypass this screen and directly use the ICA because ICA calculations assume that Generating Facilities have a per unit short circuit contribution of 1.2. For Generating Facilities with a per unit short circuit contribution greater than 1.2, the Distribution Provider will use the Protection ICA Value at the point of interconnection in conjunction with the Generating Facility's per unit short circuit contribution to determine whether the facility passes Screen F1. (N)

g. Screen G: Is the Short Circuit Interrupting Capability Exceeded? (L)

Does the proposed Generating Facility, in aggregate with other Generating Facilities on the distribution circuit, cause any distribution protective devices and equipment (including, but not limited to, substation breakers, fuse cutouts, and line reclosers), or Interconnection Request equipment on the system to exceed 87.5 % of the short circuit interrupting capability; or is the Interconnection proposed for a circuit that already exceeds 87.5 % of the short circuit interrupting capability?

- If Yes (fail) continue to Screen H pursuant to Section G.1.
- If No (pass), continue to Screen H

Note: This Screen does not apply to Generating Facilities with a Gross Rating of 30 kVA or less. (L)
(T)/(L)
(N)

[1]Protection ICA Value is one of the component values of the ICA Value that pertains to sensing faults on the grid. (N)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

1. INITIAL REVIEW SCREENS (Cont'd.)

g. Screen G: Is the Short Circuit Interrupting Capability Exceeded? (Cont'd)

Significance: If the Generating Facility passes this screen, it can be expected that it will not cause any of Distribution Provider's equipment to be overstressed.

h. Screen H: Is the line configuration compatible with the Interconnection type?

- If Yes (pass), continue to Screen I.
- If No (fail), continue to Screen I pursuant to Section G.1.

Note: This Screen does not apply to Generating Facilities with a Gross Rating of 30 kVA or less (L)
(T)/(L)

Line Configuration Screen: Identify primary distribution line configuration that will serve the Generating Facility. Based on the type of Interconnection to be used for the Generating Facility, determine from Table G.1 if the proposed Generating Facility passes the Screen. (L)

Table G-1
Type of Interconnection

Primary Distribution Line Type Configuration	Type of Interconnection to be made to Primary Distribution Line	Result/Criteria
Three-phase, three-wire	Any type	Pass Screen
Three-phase, four-wire	Single-phase, line-to-neutral	Pass Screen
Three-phase, four-wire (For any line that has such a section OR mixed three-wire & four-wire)	All others	To pass, aggregate Generating Facility nameplate rating must be less than or equal to 10% of Line Section peak load

(L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

1. INITIAL REVIEW SCREENS (Cont'd.)

h. Screen H: Is the line configuration compatible with the Interconnection type? (Cont'd.)

Significance: If the primary distribution line serving the Generating Facility is of a "three-wire" configuration, or if the Generating Facility's distribution transformer is single-phase and connected in a line-to-neutral configuration, then there is no concern about overvoltages to Distribution Provider's, or other Customer's equipment caused by loss of system neutral grounding during the operating time of the Non-Islanding Protective Function.

i. Screen I: Will power be exported across the PCC? (L)

- If Yes, Continue to Screen J. This includes Options 5, 6, 9, 10, and 11 below. (P)/(L)

- If No, then to ensure that the Generating Facility does not export across the PCC, the Generating Facility must incorporate Options 1, 2, 3, 4, 7, or 8 below. Following that selection, Screen J, K, L, and M are skipped and Initial Review is complete. If Option 8 is used, see section Mm2 to determine screen application. (P)/(L)

Option 1 ("Reverse Power Protection"): To ensure power is never exported across the PCC, a reverse power Protective Function may be provided. The default setting for this Protective Function shall be 0.1% (export) of the service transformer's rating, with a maximum 2.0 second time delay. For multiple tariff interconnections refer to Section J.8. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

1. INITIAL REVIEW SCREENS (Cont'd.)

i. Screen I: Will power be exported across the PCC? (Cont'd.)

Option 2 ("Minimum Power Protection"): To ensure at least a minimum amount of power is imported across the PCC at all times (and, therefore, that power is not exported), an under-power Protective Function may be provided. The default setting for this Protective Function shall be 5% (import) of Generating Facility's total Gross Rating, with a maximum 2.0 second time delay.

Option 3 (Certified Non-Islanding Protection): To ensure the incidental export of power is limited to acceptable levels, this option requires that all of the following conditions be met: a) the total Gross Capacity of the Generating Facility must be no more than 25% of the nominal ampere rating of Producer's service equipment; b) the total Gross Capacity of the Generating Facility must be no more than 50% of Producer's service transformer capacity rating (this capacity requirement does not apply to Customers taking primary service without an intervening transformer); and c) the Generating Facility must be Certified as Non-Islanding.

The ampere rating of the Customer's service equipment to be used in this evaluation will be that rating for which the customer's utility service was originally sized or for which an upgrade has been approved. It is not the intent of this provision to allow increased export simply by increasing the size of the customer's service panel, without separate approval for the resize. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

i. Screen I: Will power be exported across the PCC? (Cont'd.) (L)

Option 4 (Relative Generating Facility Rating): This option, when used, requires the Net Rating of the Generating Facility to be so small in comparison to its host facility's minimum load, that the use of additional Protective Functions is not required to ensure that power will not be exported to Distribution Provider's Distribution or Transmission System. This option requires the Generating Facility capacity to be no greater than 50% of Producer's verifiable minimum Host Load over the past 12 months.

Option 5: Inadvertent Export as described in Section M. (L)

Option 6: Inadvertent Export utilizing UL-1741 or UL-1741 SA/SB listed grid support (Non-Islanding) inverters as described in Section Mm. (P)/(L)

Option 7: Non-Export utilizing Non-Export AC/DC Converter as described in Section O. (P)/(L)

Option 8: Non-Export utilizing Certified Power Control Systems with an open loop response time no more than two seconds as described in Section Mm1.

Option 9: Limited Export utilizing Certified Power Control Systems with an open loop response time no more than two seconds as described in Section Mm2.

Option 10: Non-Export with Inadvertent Export utilizing Certified Power Control Systems with an open loop response time greater than two seconds and no more than ten seconds as described in Section Mm3.

Option 11: Limited Export with Inadvertent Export utilizing Certified Power Control Systems with an open loop response time greater than two seconds and no more than ten seconds as described in Section Mm4. (P)/(L)

(P)

(P)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

1. INITIAL REVIEW SCREENS (Cont'd.)

i. Screen I: Will power be exported across the PCC? (Cont'd.)

Significance:

1. If it can be assured that the Generating Facility will not export power, Distribution Provider's Distribution or Transmission System does not need to be studied for load-carrying capability or Generating Facility power flow effects on Distribution Provider voltage regulators.

2. This Screen permits the use of reverse-power or minimum-power relaying as a Non-Islanding Protective Function (Option 1, 2, and 3).

3. This Screen allows, under certain defined conditions, for Generating Facilities that incorporate Certified Non-Islanding protection to qualify for interconnection through the Fast Track process without implementing reverse power or minimum power Protective Functions (Option 3). (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

1. INITIAL REVIEW SCREENS (Cont'd.) (L)

j. Screen J: Is the Gross Rating of the Generating Facility 30 kVA or less? (T)/(L)

- If Yes (pass), skip Screens K, L and M; Initial Review is complete. (L)
- If No (fail), continue to Screen K.[i]

Significance: The Generating Facility will have a minimal impact on fault current levels and any potential line overvoltages from loss of Distribution Provider's Distribution System neutral grounding.

k. Screen K: Is the Generating Facility a Net Energy Metering (NEM) Generating Facility with nameplate capacity less than or equal to 500 kW?

- If Yes (pass), skip screen L and continue to screen M.
- If No (fail), continue to screen L.

Significance: The purpose of this Screen is solely to facilitate interconnection of NEM facilities below this size threshold by allowing such facilities to bypass Screen M. The use of nameplate capacity expedites the Initial Review analysis. In Supplemental Review, the net export will be analyzed.

[i] Inadvertent Export systems that meet the requirements specified in Section Mm bypass Screens K and L, and are processed under Screen M as described in Section Mm. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

1. INITIAL REVIEW SCREENS (Cont'd.) (L)

l. Screen L: Transmission Dependency, Stability, Overvoltage, and Islanding Tests (T)/(L)
(T)/(L)

Is the Interconnection Request for an area where: (i) there are known, or posted, transient/dynamic stability limitations, or (ii) the proposed Generating Facility has interdependencies, known to Distribution Provider, with earlier-queued Transmission System interconnection requests, or (iii) islanding conditions are possible based on PG&E's currently adopted and published screening policies with respect to antiislanding screening, or (iv) transmission ground fault overvoltage is possible based on PG&E's currently adopted and published screening policies with respect to overvoltage screening. Where (i) or (ii) above are met, the impacts of this Interconnection Request to the Transmission System may require Detailed Study. (L) (T)

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

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

PG&E will temporarily apply anti-islanding tests until the resolution of Issue 18* R. 17.-07-007 Working Group Four in made effective in PG&E's tariffs. (N) (N)

(L)
(L)

---

* Issue 18 is "Should the Commission adopt changes to anti-islanding screen parameters to reflect research on islanding risks when using UL 1741-certified inverters in order to avoid unnecessary mitigations? If yes, what should those changes entail?" (N) (N)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (N)

1. INITIAL REVIEW SCREENS (Cont'd.)

m. Screen M: When ICA information is available at the requested Point of Interconnection, Screen M should be evaluated in accordance with the Gross Nameplate Rating or typical PV output profile.

For Interconnection Requests based on Gross Nameplate Rating

a. Is the Generating Facility aggregate Gross Nameplate Rating greater than 90% of the lower value in the ICA-SG 576 Profile? or

b. Is the Generating Facility aggregate Gross Nameplate Rating greater than 90% of the lower value in the ICA-OF 576 Profile?

If the response is "yes" to either a) or b), the Interconnection Request fails Screen M and must be evaluated under the Supplemental Review or Detailed Study to determine mitigation requirements.

For Interconnection Requests based on typical PV output profile

a. Is the Generating Facility real power production based on PV Watts or equivalent greater than 90% of the ICA-SG 576 value in any hour? or

b. Is the Generating Facility real power production based on PV Watts or equivalent greater than 90% of the ICA-OF 576 value in any hour?

If the response is "yes" to either a) or b), the Interconnection Request fails Screen M and must be evaluated under the Supplemental Review or Detailed Study to determine mitigation requirements.

When ICA information is not available at the requested Point of Interconnection, Screen M should be evaluated as follows:

(N)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

1. INITIAL REVIEW SCREENS (Cont'd.)

m. Screen M: Is the aggregate Generating Facility capacity on the Line Section less than 15% of Line Section peak load for all line sections bounded by automatic sectionalizing devices? (L) (T)/(L) (L)

- If Yes (pass), Initial Review is complete.
- If No (fail), Supplemental Review is required.

Significance:

1. Low penetration of Generating Facility capacity will have a minimal impact on the operation and load restoration efforts of Distribution Provider's Distribution System.

2. The operating requirements for a high penetration of Generating Facility capacity may be different since the impact on Distribution Provider's Distribution System will no longer be minimal, therefore requiring additional study or controls.

The purpose of this Screen is solely to identify if the Generating Facility needs additional study and is not intended as justification for limiting the penetration of generation on a line section.

2. SUPPLEMENTAL REVIEW SCREENS

The Supplemental Review consists of Screens N through P. If any of the Screens are not passed, a quick review of the failed Screen(s) will determine the requirements to address the failure(s) or that Detailed Studies are required. In certain instances, Distribution Provider may be able to identify the necessary solution and determine that Detailed Studies are unnecessary. Some examples of solutions that may be available to mitigate the impact of a failed Screen are:

1. Replacing a fixed capacitor bank with a switched capacitor bank.

2. Adjustment of line regulation settings.

3. Simple reconfiguration of the distribution circuit.

[ii] Inadvertent Export systems that meet the requirements specified in Section Mm are processed under Screen M as described in Section Mm. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

2. SUPPLEMENTAL REVIEW SCREENS (Cont'd.)

a. Screen N: Penetration Test (L)

If Integration Capacity Analysis Values are available at the requested Point of Interconnection, evaluate Screen N as follows: (N)

i) Penetration Level:

For Interconnection Requests based on nameplate capacity: Is the Interconnection Request Gross Nameplate Rating equal to or below 90% of the minimum annual ICA-SG Value (i.e. minimum value) in the ICA-SG 576 Profile?

For Interconnection Requests based on typical PV output profile: Is the Interconnection Request real power production, based on PV Watts or equivalent, equal to or below 90% the ICA-SG value at each hour in the ICA-SG 576 Profile?

ii) Screen F1: Did the Interconnection Request pass Screen F1?

Did the Interconnection Request pass Screen F1?

- If yes to both of the above (pass), continue to Screen O.
- If "no" to either or both of the above(fail), a quick review of the failure within Supplemental Review may determine the requirements to address the failure; otherwise Electrical Independence Tests or Detailed Studies are required. .

If the failure(s) that cannot be addressed in Supplemental Review, the Distribution Provider will conduct a review to identify the reasons why further studies are required.

(N)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (N)

2. SUPPLEMENTAL REVIEW SCREENS (Cont'd.)

a. Screen N: Penetration Test (Cont'd)

ii) Screen F1: Did the Interconnection Request pass Screen F1?

Did the Interconnection Request pass Screen F1?

- If the failure(s) cannot be addressed in Supplemental Review, the distribution provider must identify a reason why a specific technical constraint is not captured by the ICA and the why the project must proceed to Electrical Independence Tests and Detailed Studies.

- If voltage is a prevailing constraint, then the smart inverter default volt/var function will be used in power flow analysis for the evaluation of the proposed project. This will reveal if the proposed project causes any voltage impacts of concern. If concerns related to steady state voltage, thermal, or protection exist and the Distribution Provider can identify simple upgrades through power flow analysis (e.g., installation of voltage regulator devices or protection devices to mitigate reduction of reach), then the Distribution Provider will determine the mitigation requirements within Screen N. When larger upgrades or complex protection evaluation is required, Screen N will fail and the technical evaluation will be conducted under the Detailed Study process.

- If no reason for further study is identified, or if requirements to address the failure can be identified in screen N, proceed to Screen O.

- Note: If Electrical Independence tests and Detailed Studies are required, Applicants will continue to the Electrical Independence Tests and Detailed Studies after review of the remaining Supplemental Review Screens if Applicant elects to proceed. (N)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

2. SUPPLEMENTAL REVIEW SCREENS (Cont'd.)

a. Screen N: Penetration Test

Where 12 months of line section minimum load data is available, can be calculated, can be estimated from existing data, or determined from a power flow model, is the aggregate Generating Facility capacity on the Line Section less than 100% of the minimum load for all line sections bounded by automatic sectionalizing devices upstream of the Generating Facility?

- If yes (pass), continue to Screen O.
- If no (fail), a quick review of the failure may determine the requirements to address the failure; otherwise Electrical Independence Tests and Detailed Studies are required. Continue to Screen O. (Note: If Electrical Independence tests and Detailed Studies are required, Applicants will continue to the Electrical Independence Tests and Detailed Studies after review of the remaining Supplemental Review Screens, if Applicant elects to proceed.)

Note 1: If none of the above options are available, this screen defaults to Screen M.

Note 2: The type of Generating Facility technology will be taken into account when calculating, estimating, or determining circuit or Line Section minimum load relevant for the application of this screen. For solar Generating Facilities with no battery storage, daytime minimum load will be used (i.e., 10 am to 4 pm for fixed panel solar Generating Facilities and 8 am to 6 pm for solar Generating Facilities utilizing tracking systems), while absolute minimum load will be used for all other Generating Facility technologies.

Note 3: When this screen is being applied to a NEM Generating Facility, the net export in kW, if known, that may flow across the Point of Common Coupling into Distribution Provider's Distribution System will be considered as part of the aggregate generation. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

2. SUPPLEMENTAL REVIEW SCREENS (Cont'd.)

a. Screen N: Penetration Test (Cont'd.)

Note 4: Distribution Provider will not consider as part of the aggregate Generating Facility capacity for purposes of this screen Generating Facility capacity known to be already reflected in the minimum load data.

Note 5: NEM Generating Facilities with net export less than or equal to 500 kW that may flow across the Point of Common Coupling into Distribution Provider's Distribution or Transmission System will not be studied in the WDT Transmission Cluster Study Process, but may be studied under the Independent Study Process.

Significance: Penetration of Generating Facility capacity that does not result in power flow from the circuit back toward the substation will have a minimal impact on equipment loading, operation, and protection of the Distribution System.

b. Screen O: Power Quality and Voltage Tests

In aggregate with existing Generating Facility capacity on the Line Section, distribution circuit, and/or substation.

i) Can it be determined within the Supplemental Review that the voltage regulation on the line section can be maintained in compliance with Commission Rule 2 and/or Conservation Voltage Regulation voltage requirements under all system conditions?

ii) Can it be determined within the Supplemental Review that the voltage fluctuation is within acceptable limits as defined by IEEE 1453 or utility practice similar to IEEE1453? (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

2. SUPPLEMENTAL REVIEW SCREENS (Cont'd.)

b. Screen O: Power Quality and Voltage Tests (Cont'd.)

In aggregate with existing Generating Facility capacity on the Line Section, distribution circuit, and/or substation. (Cont'd.)

iii) Can it be determined within the Supplemental Review that the harmonic levels meet IEEE 519 limits at the Point of Common Coupling (PCC)? (L)

iv) Can it be determined within the Supplemental Review that the Generating Facility will not cause any voltage impacts considering the settings of the Volt-Var function and the characteristics of the circuit segment? (P)/(L) (P)/(L)

- If yes to all of the above (pass), continue to Screen P. (L)
- If no to any of the above (fail), a quick review of the failure may determine the requirements to address the failure; otherwise Electrical Independence Tests and Detailed Studies are required. Continue to Screen P. (Note: If Electrical Independence tests and Detailed Studies are required, Applicants will continue to the Electrical Independence Tests and Detailed Studies after review of the remaining Supplemental Review Screens.)

Significance: Adverse voltages and undesirable interference may be experienced by other Customers on Distribution Provider's Distribution System caused by operation of the Generating Facility(ies).

c. Screen P: Safety and Reliability Tests

Does the location of the proposed Generating Facility or the aggregate generation capacity on the Line Section create impacts to safety or reliability that cannot be adequately addressed without Detailed Study?

- If yes (fail), review of the failure may determine the requirements to address the failure; otherwise Electrical Independence Tests and Detailed Studies are required. Continue to Section G.3.
- If no (pass), Supplemental Review is complete. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

2. SUPPLEMENTAL REVIEW SCREENS (Cont'd.)

c. Screen P: Safety and Reliability Tests (Cont'd.)

Significance: In the safety and reliability test, there are several factors that may affect the nature and performance of an Interconnection. These include, but are not limited to:

1. Generating Facility energy source
2. Modes of synchronization
3. Unique system topology
4. Possible impacts to critical load customers
5. Possible safety impacts

The specific combination of these factors will determine if any system study requirements are needed. The following are some examples of the items that may be considered under this screen:

1. Does the Line Section have significant minimum loading levels dominated by a small number of customers (i.e. several large commercial customers)?
2. Is there an even or uneven distribution of loading along the feeder?
3. Is the proposed Generating Facility located in close proximity to the substation (i.e. <2.5 electrical line miles), and is the distribution line from the substation to the customer composed of large conductor/cable (i.e. 600A class cable)? (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

2. SUPPLEMENTAL REVIEW SCREENS (Cont'd.)

c. Screen P: Safety and Reliability Tests (Cont'd.)

4. Does the Generating Facility incorporate a time delay function to prevent reconnection of the generator to the system until system voltage and frequency are within normal limits for a prescribed time?

5. Is operational flexibility reduced by the proposed Generating Facility, such that transfer of the line section(s) of the Generating Facility to a neighboring distribution circuit/substation may trigger overloads or voltage issues?

6. Does the Generating Facility utilize Certified anti-islanding functions and equipment?

3. DETAILED STUDY SCREENS

a. Screen Q: Is the Interconnection Request electrically Independent of the Transmission System?

Distribution Provider, in consultation with the CAISO, will determine, based on knowledge of the interdependencies with earlier-queued interconnection requests under any tariff, whether the Interconnection Request to the Distribution System is of sufficient MW size and located at a point of interconnection such that it is reasonably anticipated to require or contribute to the need for Reliability Network Upgrades. In making this determination, the Distribution Provider will make a Determination of Electrical Independence for the CAISO Controlled Grid as set forth in the applicable CAISO Tariff in effect at the time the Electrical Independence Test begins.

If Distribution Provider determines that no interdependencies exist, or that interdependencies do exist but the proposed Generating Facility is not reasonably anticipated to require or contribute to the need for Reliability Network Upgrades, then the Interconnection Request will be deemed to have passed Distribution Provider's Determination of Electrical Independence for the CAISO Controlled Grid.

If Distribution Provider determines that interdependencies exist and that they are reasonably anticipated to require or contribute to the need for Reliability Network Upgrades, then Interconnection Request may be studied under the WDT Transmission Cluster Study Process as set forth in Section F.3.d. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

3. DETAILED STUDY SCREENS (Cont'd.)

a. Screen Q: Is the Interconnection Request electrically Independent of the Transmission System? (Cont'd.)

Distribution Provider will coordinate with the CAISO if necessary to conduct the Determination of Electrical Independence for the CAISO Controlled Grid as set forth in the applicable CAISO Tariff** in effect at the time the Electrical Independence Test (EIT) begins. The results of the incremental power flow, aggregate power flow, and short-circuit current contribution tests set out in the applicable CAISO Tariff in effect at the time the EIT begins will determine whether the Interconnection Request is electrically independent from the CAISO Controlled Grid.

- If Yes (pass), continue to Screen R.
- If No (fail), proceed to Section F.3.d.

Exemptions: All NEM Generating Facilities and all inverter-based Generating Facilities with a nameplate capacity less than or equal to 1 MVA will not be studied in the WDT Transmission Cluster Study Process, but may be studied under the Independent Study Process. For an Applicant that agrees to the installation, at Applicant's cost, of Distribution Provider-approved software/firmware controlled devices or equipment Nationally Recognized Testing Laboratory certified to limit the Generating Facility's net export so that it will never exceed the 1 MVA exemption limit, the Generating Facility's net export will be considered exempt from the WDT Transmission Cluster Study Process for purposes of this section.

Significance: Generating Facilities that are electrically interdependent with the Transmission System must be studied with other interconnection requests that have Transmission System interdependencies. It is possible to pass this Screen Q (i.e., be found to have no electrical interdependencies with earlier-queued Distribution System and/or Transmission System interconnection requests as set out above), be studied under the Independent Study Process, and still trigger a Reliability Network Upgrade.

** The currently effective CAISO Tariff can be accessed at the following CAISO website http://www.caiso.com/rules/Pages/Regulatory/Default.aspx (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

3. DETAILED STUDY SCREENS (Cont'd.)

b. Screen R: Is the Interconnection Request independent of other earlier-queued and yet to be studied interconnection requests interconnecting to the Distribution System?

For Interconnection Requests that are electrically independent from the CAISO Controlled Grid, Distribution Provider will evaluate each Interconnection Request for known or reasonably anticipated relationships between the Interconnection Request and any earlier-queued interconnection requests in the Distribution Group Study Process, the Independent Study Process, or interconnection requests studied under predecessor interconnection procedures that have yet to complete their respective interconnection studies. Distribution Provider may conduct incremental power flow, aggregate power flow, and/or short-circuit duty tests using existing interconnection studies, Base Case data, overall system knowledge, and engineering judgment to determine whether an Interconnection Request can be studied independently of earlier-queued interconnection requests. If the Interconnection Request being evaluated for electrical independence on the Distribution System may be electrically related to earlier-queued interconnection requests that have yet to complete interconnection studies, then it fails the evaluation of electrical independence for the Distribution System.

- If Yes (pass), continue to Independent Study Process
- If No (fail), continue to the Distribution Group Study Process

Significance: Interconnection Requests that are electrically related to earlier-queued interconnection requests that have not yet been studied do not qualify for independent study. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

3. DETAILED STUDY SCREENS (Cont'd.)

c. Independent Study Process and Distribution Group Study Process Interconnection Studies

The Interconnection Studies shall consist of an Interconnection System Impact Study and an Interconnection Facilities Study for the Independent Study Process or the DGS Phase I Interconnection Study and the DGS Phase II Interconnection Study for the Distribution Group Study Process. The Interconnection Studies will identify Interconnection Facilities, Distribution Upgrades and Reliability Network Upgrades necessary to mitigate thermal overloads and voltage violations, and address short circuit, dynamic/stability, and reliability issues associated with the requested Interconnection Service. If Distribution Provider anticipates that Reliability Network Upgrades will be required, or the Interconnection Studies identify the need for Reliability Network Upgrades, then Distribution Provider will coordinate with the CAISO during the study process as set forth in Sections F.3.b or F.3.c above.

The estimated costs of short circuit related upgrades and shared interconnection facilities, if any, identified through a Distribution Group Study shall be assigned as provided in E.4.e.

i) Interconnection System Impact and DGS Phase I Interconnection Study.

(1) Scope of the Interconnection System Impact and DGS Phase I Interconnection Study.

The Interconnection System Impact or DGS Phase I Interconnection Study in the case of the Distribution Group Study Process may consist of a localized short circuit analysis, a stability/dynamic analysis, a power flow analysis, and any other studies that are deemed necessary. The localized short circuit analysis will evaluate impacts to the Distribution and Transmission System only with any local short circuit-duty related Reliability Network Upgrades allocated to the Generating Facility or Generating Facilities that require(s) the upgrades. Short circuit duty impacts to the (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

3. DETAILED STUDY SCREENS (Cont'd.)

c. Independent Study Process and Distribution Group Study Process Interconnection Studies (Cont'd.)

i) Interconnection System Impact and DGS Phase I Interconnection Study. (Cont'd.)

(1) Scope of the Interconnection System Impact and DGS Phase I Interconnection Study. (Cont'd.)

CAISO Controlled Grid are appropriately evaluated only in the WDT Transmission Cluster Study Process as set forth in Section F.3.d. The short circuit duty contribution of any Interconnection Requests studied in the Independent Study Process or Distribution Group Study Process that are subsequently identified in the Cluster Study Process will be allocated its pro rata share of the short circuit duty-related Reliability Network Upgrades on the basis of the short circuit duty contribution of each Generating Facility.

The Interconnection System Impact Study or DGS Phase I Interconnection Study in the case of the Distribution Group Study Process, shall state the assumptions upon which it is based, state the results of the analyses, and provide the requirement or potential impediments to providing the requested Interconnection Service, including a preliminary indication of the cost and length of time that would be necessary to correct any problems identified in those analyses and implement the Interconnection.

The Interconnection System Impact or DGS Phase I Interconnection Study shall provide a list of Distribution Provider's Interconnection Facilities, Distribution Upgrades, and Reliability Network Upgrades that are required as a result of the Interconnection Request along with a non-binding good faith estimate of cost responsibility and the amount of construction time required.

If at any time the Distribution Provider determines that it will not meet the required time frame for completing the DGS Phase I Interconnection Study due to the large number of (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

3. DETAILED STUDY SCREENS (Cont'd.)

c. Independent Study Process and Distribution Group Study Process Interconnection Studies (Cont'd.)

i) Interconnection System Impact and DGS Phase I Interconnection Study. (Cont'd.)

(1) Scope of the Interconnection System Impact and DGS Phase I Interconnection Study. (Cont'd.)

Interconnection Requests in the Distribution Group Study Application window, study complexity, or unavailability of resources on a reasonable basis to perform the study in the required time frame, the Distribution Provider shall notify the Interconnection Customer(s) within the Distribution Group Study as to the schedule status of the DGS Phase I Interconnection Study and provide an estimated completion date with an explanation of the reasons why additional time is required.

Upon request, the Distribution Provider shall provide the Applicant(s) all supporting documentation, work papers and relevant pre-Interconnection Request and post-Interconnection Request power flow, short circuit and stability databases for the DGS Phase I Interconnection Study, subject to confidentiality arrangements as outlined in Section D.7.

ii) Interconnection Facilities Study and DGS Phase II Interconnection Study.

(1) Scope and Purpose of the Interconnection Facilities and DGS Phase II Interconnection Study.

The Interconnection Facilities Study or DGS Phase II Interconnection Study in the case of the Distribution Group Study Process shall specify and estimate the cost of the equipment, engineering, procurement, and construction work (including overheads) needed to implement the conclusions of the Interconnection System Impact Study or DGS Phase I Interconnection Study technical analyses in accordance with (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (L)

3. DETAILED STUDY SCREENS (Cont'd.)

c. Independent Study Process and Distribution Group Study Process Interconnection Studies (Cont'd.)

ii) Interconnection Facilities Study and DGS Phase II Interconnection Study. (Cont'd.)

(1) Scope and Purpose of the Interconnection Facilities and DGS Phase II Interconnection Study. (Cont'd.)

Good Utility Practice to physically and electrically connect the Generating Facility to the Distribution or Transmission System. The Interconnection Facilities Study or DGS Phase II Interconnection Study shall also identify (i) the electrical switching configuration of the connection equipment, including, without limitation: the transformer, switchgear, meters, and other station equipment; the nature and estimated cost of any Distribution Provider's Interconnection Facilities, Distribution Upgrades, and Network Upgrades necessary to accomplish the interconnection; and an estimate of the time required to complete the construction and installation of such facilities. The analyses in the Interconnection System Impact Study (or DGS Phase I Interconnection Study in the case of the Distribution Group Study Process) will be updated as necessary in the Interconnection Facilities Study (or DGS Phase II Interconnection Study), to account for withdrawal of interconnection requests in the interconnection queue.

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS

Section H shall be used for interconnection of non-inverter based technologies.

Section H shall also continue to be used for interconnection of inverter based technologies until September 8, 2017. Following such date, Section Hh shall apply for interconnection of inverter based technologies. Until such date, Section Hh may be used in all or in part, for inverter based technologies by mutual agreement of the Distribution Provider and the Applicant. (L)

(Continued)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

1. GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS

This section is consistent with the requirements of ANSI/IEEE 1547-2003 Standard for Interconnecting Distributed Resources with Electric Power Systems (IEEE 1547). Exceptions are taken to IEEE 1547 Clauses 4.1.4.2 Distribution Secondary Spot Networks and Clauses 4.1.8.1 or 5.1.3.1, which address Protection from Electromagnetic Interference. These are being studied for inclusion in a subsequent version of this Rule. Also, Rule 21 does not adopt the Generating Facility power limitation of 10 MW incorporated in IEEE 1547.

The Protective Functions and requirements of this Rule are designed to protect Distribution Provider's Distribution and Transmission System and not the Generating Facility. A Producer shall be solely responsible for providing adequate protection for its Generating Facility and Interconnection Facilities. Producer's Protective Functions shall not impact the operation of other Protective Functions on Distribution Provider's Distribution and Transmission System in a manner that would affect Distribution Provider's capability of providing reliable service to its customers.

a. Protective Functions Required

Generating Facilities operating in parallel with Distribution Provider's Distribution or Transmission System shall be equipped with the following Protective Functions to sense abnormal conditions on Distribution Provider's Distribution or Transmission System and cause the Generating Facility to be automatically disconnected from Distribution Provider's Distribution or Transmission System or to prevent the Generating Facility from being connected to Distribution Provider's Distribution or Transmission System inappropriately:

i) Over and under voltage trip functions and over and under frequency trip functions;

ii) A voltage and frequency sensing and time-delay function to prevent the Generating Facility from energizing a de-energized Distribution or Transmission System circuit and to prevent the Generating Facility from reconnecting with Distribution Provider's (L)

(Continued)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

1. GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS (Cont'd.)

a. Protective Functions Required (Cont'd.)

ii) Distribution or Transmission System unless Distribution Provider's Distribution System service voltage and frequency is within the ANSI C84.1-1995 Table 1 Range B voltage Range of 106 volts to 127 volts (on a 120 volt basis), inclusive, and a frequency range of 59.3 Hz to 60.5 Hz, inclusive, and are stable for at least 60 seconds; and

iii) A function to prevent the Generating Facility from contributing to the formation of an Unintended Island, and cease to energize Distribution Provider's Distribution System within two seconds of the formation of an Unintended Island.

The Generating Facility shall cease to energize Distribution Provider's Distribution System for faults on Distribution Provider's Distribution System circuit to which it is connected (IEEE 1547-4.2.1). The Generating Facility shall cease to energize Distribution Provider's Distribution circuit prior to re-closure by Distribution Provider's Distribution System equipment (IEEE 1547-4.2.2).

b. Momentary Paralleling Generating Facilities

With Distribution Provider's approval, the transfer switch or scheme used to transfer Producer's loads from Distribution Provider's Distribution or Transmission System to Producer's Generating Facility may be used in lieu of the Protective Functions required for Parallel Operation.

c. Suitable Equipment Required

Circuit breakers or other interrupting equipment located at the Point of Common Coupling (PCC) must be Certified or "Listed" (as defined in Article 100, the Definitions Section of the National Electrical Code) as suitable for their intended application. This includes being capable of (L)

(Continued)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

1. GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS (Cont'd.)

c. Suitable Equipment Required (Cont'd.)

interrupting the maximum available fault current expected at their location. Producer's Generating Facility and Interconnection Facilities shall be designed so that the failure of any single device or component shall not potentially compromise the safety and reliability of Distribution Provider's Distribution and Transmission System. The Generating Facility paralleling-device shall be capable of withstanding 220% of the Interconnection Facility rated voltage (IEEE 1547-4.1.8.3). The Interconnection Facility shall have the capability to withstand voltage and current surges in accordance with the environments defined in IEEE Std C62.41.2-2002 or IEEE Std C37.90.1-2002 as applicable and as described in L.3.e (IEEE 1547-4.1.8.2).

d. Visible Disconnect Required

When required by Distribution Provider's operating practices, Producer shall furnish and install a ganged, manually-operated isolating switch (or a comparable device mutually agreed upon by Distribution Provider and Producer) near the Point of Interconnection to isolate the Generating Facility from Distribution Provider's Distribution or Transmission System. The device does not have to be rated for load break nor provide over-current protection.

The device must:

i) allow visible verification that separation has been accomplished. (This requirement may be met by opening the enclosure to observe contact separation.)

ii) include markings or signage that clearly indicates open and closed positions.

iii) be capable of being reached:

a) for Emergency purposes quickly and conveniently 24 hours a day by Distribution Provider personnel for construction, (L)

(Continued)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

1. GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS (Cont'd.)

d. Visible Disconnect Required (Cont'd.)

iii) be capable of being reached: (Cont'd.)

a) operation, maintenance, inspection, testing or to isolate the Generating Facility from Distribution Provider's Distribution or Transmission System without obstacles or requiring those seeking access to obtain keys, special permission, or security clearances.

b) for Non-Emergency purposes during normal business hours. Distribution Provider, where possible, will provide notice to Customer for gaining access to Customer's premises.

iv) be capable of being locked in the open position,

v) be clearly marked on the submitted single line diagram and its type and location approved by Distribution Provider prior to installation. If the device is not adjacent to the PCC, permanent signage must be installed at a Distribution Provider approved location providing a clear description of the location of the device. If the switch is not accessible outside the locked premises, signage with contact information and a Distribution Provider approved locking device for the premises shall be installed.

Generating Facilities with Non-Islanding inverters totaling one (1) kilovolt-ampere (kVA) or less are exempt from this requirement.

e. Drawings Required

Prior to Parallel Operation or Momentary Parallel Operation of the Generating Facility, Distribution Provider shall approve Producer's Protective Function and control diagrams. Generating Facilities equipped with Protective Functions and a control scheme previously approved by Distribution Provider for system-wide application or only Certified Equipment may satisfy this requirement by reference to previously approved drawings and diagrams. (L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 180
GENERATING FACILITY INTERCONNECTIONS

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

1. GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS (Cont'd.)

f. Generating Facility Conditions Not Identified

In the event this Rule does not address the Interconnection conditions for a particular Generating Facility, Distribution Provider and Producer may agree upon other arrangements

2. PREVENTION OF INTERFERENCE

Producer shall not operate Generating or Interconnection Facilities that superimpose a voltage or current upon Distribution Provider's Distribution or Transmission System that interferes with Distribution Provider operations, service to Distribution Provider Customers, or communication facilities. If such interference occurs, Producer must diligently pursue and take corrective action at its own expense after being given notice and reasonable time to do so by Distribution Provider. If Producer does not take corrective action in a timely manner, or continues to operate the facilities causing interference without restriction or limit, Distribution Provider may, without liability, disconnect Producer's facilities from Distribution Provider's Distribution or Transmission System, in accordance with Section D.9 of this Rule. To eliminate undesirable interference caused by its operation, each Generating Facility shall meet the following criteria:

a. Voltage Regulation

The Generating Facility shall not actively regulate the voltage at the PCC while in parallel with Distribution Provider's Distribution System. The Generating Facility shall not cause the service voltage at other customers to go outside the requirements of ANSI C84.1-1995, Range A (IEEE 1547-4.1.1). (L)

(Continued)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

b. Voltage Trip Setting

The voltage ranges in Table H.1 define protective trip limits for the Protective Function and are not intended to define or imply a voltage regulation Function. Generating Facilities shall cease to energize Distribution Provider's Distribution System within the prescribed trip time whenever the voltage at the PCC deviates from the allowable voltage operating range. The Protection Function shall detect and respond to voltage on all phases to which the Generating Facility is connected.

i) Generating Facilities (30 kVA or less)

Generating Facilities with a Gross Rating of 30 kVA or less shall be capable of operating within the voltage range normally experienced on Distribution Provider's Distribution System from plus to minus 5% of the nominal voltage (e.g. 114 volts to 126 volts, on a 120 volt base), at the service panel or PCC. The trip settings at the generator terminals may be selected in a manner that minimizes nuisance tripping between 106 volts and 132 volts on a 120-volt base (88%-110% of nominal voltage) to compensate for voltage drop between the generator terminals and the PCC. Voltage may be detected at either the PCC or the Point of Interconnection. However, the voltage range at the PCC, with the generator on-line, shall stay within +/-5% of nominal. (L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 182
GENERATING FACILITY INTERCONNECTIONS

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

b. Voltage Trip Setting (Cont'd.)

ii) Generating Facilities (greater than 30 kVA)

Distribution Provider may have specific operating voltage ranges for Generating Facilities with Gross Ratings greater than 30 kVA, and may require adjustable operating voltage settings. In the absence of such requirements, the Generating Facility shall be capable of operating at a range between 88% and 110% of the applicable interconnection voltage. Voltage shall be detected at either the PCC or the Point of Interconnection, with settings compensated to account for the voltage at the PCC. However, the voltage range at the PCC, with the generator on-line, shall stay within +/-5% of nominal.

iii) Voltage Disturbances

Whenever Distribution Provider's Distribution System voltage at the PCC varies from and remains outside normal (Nominally 120 volts) for the predetermined parameters set forth in Table H-1, the Generating Facility's Protective Functions shall cause the Generator(s) to become isolated from Distribution Provider's Distribution System: (L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 183
GENERATING FACILITY INTERCONNECTIONS

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

b. Voltage Trip Setting (Cont'd.)

iii) Voltage Disturbances (Cont'd.)

Table H.1: Voltage Trip Settings for Generating Facilities*			
Voltage at Point of Common Coupling (the ranges below are used to trip the generator during abnormal distribution system conditions)		Maximum Trip Time**	
Assuming 120 Volt Base	% of Nominal Voltage	# of Cycles (Assuming 60 Hz Nominal)	Seconds
Less than 60 volts	Less than 50%	10 Cycles	0.16 Seconds
Greater than or equal to 60 volts but less than 106 volts	Greater than or equal to 50% but less than 88%	120 Cycles	2 Seconds
Greater than 132 volts but less than or equal to 144 volts	Greater than 110% but less than or equal to 120%	60 Cycles	1 Second
Greater than 144 volts	Greater than 120%	10 Cycles	0.16 Seconds
**For Generating Facilities with a Rating greater than 30 kVA, set points shall be field adjustable and different voltage set points and trip times from those in Table H.1 may be negotiated with Distribution Provider*			
*** "Maximum Trip Time" refers to the time between the onset of the abnormal condition and the Generating Facility ceasing to energize Distribution Provider's Distribution System. Protective Function equipment and circuits may remain connected to Distribution Provider's Distribution System to allow sensing of electrical conditions for use by the "reconnect" feature. The purpose of the allowed time delay is to allow for a Generating Facility to minimize tripping during short term system disturbances. Set points shall not be user adjustable for generating facilities less than 30 kW.*			

(L)

(Continued)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

c. Paralleling

The Generating Facility shall parallel with Distribution Provider's Distribution or Transmission System without causing a voltage fluctuation at the PCC greater than plus/minus 5% of the prevailing voltage level of Distribution Provider's Distribution or Transmission System at the PCC, and meet the flicker requirements of Section H.2.d. Section L, Certification and Testing Criteria, provides technology-specific tests for evaluating the paralleling Function. (IEEE 1547-4.1.3)

d. Flicker

The Generating Facility shall not create objectionable flicker for other customers on Distribution Provider's Distribution or Transmission System. To minimize the adverse voltage effects experienced by other customers (IEEE 1547-4.3.2), flicker at the PCC caused by the Generating Facility should not exceed the limits defined by the "Maximum Borderline of Irritation Curve" identified in IEEE 519-1992 (IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems, IEEE STD 519-1992). This requirement is necessary to minimize the adverse voltage affects experienced by other Customers on Distribution Provider's Distribution or Transmission System. Generators may be connected and brought up to synchronous speed (as an induction motor) provided these flicker limits are not exceeded. (L)

(Continued)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

e. Integration with Distribution Provider's Distribution System Grounding

The grounding scheme of the Generating Facility shall not cause over-voltages that exceed the rating of the equipment connected to Distribution Provider's Distribution System and shall not disrupt the coordination of the ground fault protection on Distribution Provider's Distribution System (IEEE 1547-4.1.2) (See Section G.1.i, line configuration).

f. Frequency

Distribution Provider controls system frequency, and the Generating Facility shall operate in synchronism with Distribution Provider's Distribution or Transmission System. Whenever Distribution Provider's Distribution or Transmission System frequency at the PCC varies from and remains outside normal (nominally 60 Hz) by the predetermined amounts set forth in Table H.2, the Generating Facility's Protective Functions shall cease to energize Distribution Provider's Distribution or Transmission System within the stated maximum trip time. (L)

(Continued)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

f. Frequency (Cont'd.)

Table H.2
Frequency Trip Settings

Generating Facility Rating	Frequency Range (Assuming 60Hz Nominal)	Maximum Trip Time *[1]* (Assuming 60 Cycles per Second)
Less or equal to 30kW	Less than 59.3 Hz	10 Cycles
	Greater than 60.5 Hz	10 Cycles
Greater than 30 kW	Less than 57.0 Hz	10 Cycles
	Less than an adjustable value between 59.8 Hz and 57 Hz but greater than 57 Hz. *[2]*	Adjustable between 10 and 18,000 Cycles. *[2, 3]*
	Greater than 60.5 Hz.	10 Cycles

[1] – "Maximum Trip time" refers to the time between the onset of the abnormal condition and the Generating Facility ceasing to energize Distribution Provider's Distribution or Transmission System. Protective Function sensing equipment and circuits may remain connected to Distribution Provider's Distribution or Transmission System to allow sensing of electrical conditions for use by the "reconnect" feature. The purpose of the allowed time delay is to allow a Generating Facility to "ride through" short-term disturbances to avoid nuisance tripping. Set points shall not be user adjustable (though they may be field adjustable by qualified personnel). For Generating Facilities with a Gross Rating greater than 30 kVA, set points shall be field adjustable and different voltage set points and trip times from those in Table H.2 may be negotiated with Distribution Provider.

[2] – Unless otherwise required by Distribution Provider, a trip frequency of 59.3 Hz and a maximum trip time of 10 cycles shall be used.

[3] – When a 10 cycle Maximum trip time is used, a second under frequency trip setting is not required. (L)

(Continued)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

g. Harmonics

When the Generating Facility is serving balanced linear loads, harmonic current injection into Distribution Provider's Distribution or Transmission System at the PCC shall not exceed the limits stated in Table H.3. The harmonic current injections shall be exclusive of any harmonic currents due to harmonic voltage distortion present in Distribution Provider's Distribution or Transmission System without the Generating Facility connected (IEEE 1547-4.3.3.). The harmonic distortion of a Generating Facility shall be evaluated using the same criteria as for the Host Loads.

Table H.3

Maximum harmonic current distortion in percent of current (I) [1,2]

Individual harmonic order, h (odd harmonics) [3]	h<11	11≤ h<17	17≤ h<23	23≤ h<35	35≤ h	Total demand distortion
Max Distortion (%)	4.0	2.0	1.5	0.6	0.3	5.0

[1] – IEEE1547-4.3.3

[2] – I = the greater of the maximum Host Load current average demand over 15 or 30 minutes without the GF, or the GF rated current capacity (transformed to the PCC when a transformer exists between the GF and the PCC).

[3] – Even harmonics are limited to 25% of the odd harmonic limits above. (L)

(Continued)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

h. Direct Current Injection

Generating Facilities should not inject direct current greater than 0.5% of rated output current into Distribution Provider's Distribution or Transmission System.

i. Power Factor

Producer shall provide adequate reactive power compensation on site to maintain the Generating Facility power factor near unity at rated output or a Distribution Provider specified power factor within a power factor range from 0.9 leading to 0.9 lagging, based on local system conditions. While not required, for generators that do not have inherent reactive power control capability Distribution Provider at its option may offer reactive power support in the form of power factor correction capacitors on its Distribution or Transmission System, under a Generator Interconnection Agreement or an Added Facilities or Special Facilities agreement, as described in Rule 2.H, as applicable. (L)

(Continued)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

3. TECHNOLOGY SPECIFIC REQUIREMENTS

a. Technology Specific Requirements

Three-Phase Synchronous Generators: For three phase Generators, the Generating Facility circuit breakers shall be three-phase devices with electronic or electromechanical control. Producer shall be responsible for properly synchronizing its Generating Facility with Distribution Provider's Distribution or Transmission System by means of either manual or automatic synchronous equipment. Automatic synchronizing is required for all synchronous Generators that have a Short Circuit Contribution Ratio (SCCR) exceeding 0.05. Loss of synchronism protection is not required except as may be necessary to meet Section H.2.d (Flicker) (IEEE1547-4.2.5). Unless otherwise agreed upon by Producer and Distribution Provider, synchronous Generators shall automatically regulate power factor, not voltage, while operating in parallel with Distribution Provider's Distribution System. A power system stabilization Function is specifically not required for Generating Facilities under 10 MW Net Rating.

b. Induction Generators

Induction Generators (except self-excited Induction Generators) do not require a synchronizing Function. Starting or rapid load fluctuations on induction Generators can adversely impact Distribution Provider's Distribution or Transmission System voltage. Corrective step-switched capacitors or other techniques may be necessary and may cause undesirable ferro-resonance. When these counter measures (e.g. additional capacitors) are installed on Producer's side of the PCC, Distribution Provider must review these measures. Additional equipment may be required as determined in a Supplemental Review or an Interconnection Study. (L)

(Continued)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

3. TECHNOLOGY SPECIFIC REQUIREMENTS (Cont'd.)

c. Inverters

Grid-interactive inverters do not require separate synchronizing equipment. Non-grid-interactive or "stand-alone" inverters shall not be used for Parallel Operation with Distribution Provider's Distribution or Transmission System.

d. Limitations on Inverters Not Classified as Smart Inverters

i) Inverter based systems may continue to be installed per Section H until September 8, 2017. Section Hh may be used in all or in part, for inverter based technologies by mutual agreement of the Distribution Provider and the Applicant.

ii) The replacement of an existing inverter to an inverter that is of equal or greater ability than the original is allowed per Section H. Section Hh may be used in all or in part, for replacement inverter-based technologies by mutual agreement of the Distribution Provider and the Applicant. If a developer replaces an existing inverter with an inverter of greater ability, the replacement inverter shall have all the required functionalities and be set according to current Commission practices as of the date the new smart inverter is installed, unless the interconnection applicant can demonstrate that safety or operational needs necessitate otherwise, per D.19-03-013 OP 12.

e. Non-Export AC/DC Converters

A Non-Export AC/DC Converter must satisfy the definition in Section C. (L)

(Continued)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

4. SUPPLEMENTAL GENERATING FACILITY REQUIREMENTS

a. Fault Detection

A Generating Facility with an SCCR exceeding 0.1 or one that does not cease to energize Distribution Provider's Distribution or Transmission System within two seconds of the formation of an Unintended Island shall be equipped with Protective Functions designed to detect Distribution or Transmission System faults, both line-to-line and line-to-ground, and cease to energize Distribution Provider's Distribution or Transmission System within two seconds of the initiation of a fault.

b. Transfer Trip

For a Generating Facility that cannot detect Distribution or Transmission System faults (both line-to-line and line-to-ground) or the formation of an Unintended Island, and cease to energize Distribution Provider's Distribution or Transmission System within two seconds, Distribution Provider may require a Transfer Trip system or an equivalent Protective Function.

c. Reclose Blocking

Where the aggregate Generating Facility capacity exceeds 15% of the peak load on any automatic reclosing device, Distribution Provider may require additional Protective Functions, including, but not limited to reclose-blocking on some of the automatic reclosing devices.

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS

Section H shall continue to be used for interconnection of inverter based technologies until September 8, 2017. Following such date, Section Hh shall apply for interconnection of inverter based technologies. Until such date, Section Hh may be used in all or in part, for inverter based technologies by mutual agreement of the Distribution Provider and the Applicant.

[1] "The Standard for Inverters, Converters, and Controllers for Use in Independent Power Systems". (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

The inverter requirements are intended to be consistent with UL 1741 - Supplement SA using Section Hh of Rule 21 as the source requirement document and ANSI/IEEE 1547-2003 and 1547a Standard for Interconnecting Distributed Resources with Electric Power Systems (IEEE 1547 including amendment 1547a), where possible. In the event of conflict between this Rule, and UL 1741 - Supplement SA, and/or IEEE 1547-2003 or IEEE 1547a, this Rule shall take precedence. Exceptions are taken to IEEE 1547 Clauses 4.1.4.2 Distribution Secondary Spot Networks and Clauses 4.1.8.1 or 5.1.3.1, which address Protection from Electromagnetic Interference. Rule 21 does not adopt the Generating Facility power limitation of 10 MW incorporated in IEEE 1547. (L)

The Smart Inverter default settings and default activation states may be modified upon mutual agreement between Applicant and Distribution Provider. (P)/(L) (P)/(L)

Process for changing default settings for new Interconnection Requests: (P)/(L)

Distribution Provider, in the study process for new Generating Facilities, may determine and provide the optimum Smart Inverter Settings for the reactive power settings, including changes to the reactive power default settings (Example: Deactivate Volt/Var and activate Fixed Power Factor at given power factor).

Distribution Provider, in the study process for new Generating Facilities, may determine and provide the optimum Smart Inverter Settings for the Ramp Rate settings depending on the Generating Facility technology (such as solar, storage).

Distribution Provider, in the study process for new Generating Facilities, may determine the optimum Smart Inverter Settings for the volt/watt settings including changes to the default settings (Example: Change the volt/watt set points). The Applicant may select to agree on the new settings or select to perform upgrades to operate using the existing default volt/watt settings.

Default settings for voltage ride-through, frequency ride-through requirements, and Frequency/Watt should not be modified on an individual project basis unless the Interconnection Studies have determined that the default settings may not meet grid reliability requirements. (P)/(L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (P)/(L)

Process for changing default settings for Generating Facilities with an executed Interconnection Agreement:

When grid changes or Generating Facility changes require that the Smart Inverter operating parameters be reevaluated, the Distribution Provider or Producer may request changes to the Smart Inverter operating parameters. The request must include the reason for and timing of the proposed changes. The requested changes must be within the Smart Inverter function adjustability limits, must be within the limits specified in this tariff, and must be mutually agreed upon. (P)/(L)

1. GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS (L)

The Protective Functions and requirements of this Rule are designed to protect Distribution Provider's Distribution and Transmission System and not the Generating Facility. A Producer shall be solely responsible for providing adequate protection for its Generating Facility and Interconnection Facilities. Producer's Protective Functions shall not impact the operation of other Protective Functions on Distribution Provider's Distribution and Transmission System in a manner that would affect Distribution Provider's capability of providing reliable service to its customers.

a. Protective Functions Required

Smart Inverters operating in parallel with Distribution Provider's Distribution or Transmission System shall be equipped with the following Protective Functions to sense abnormal conditions on Distribution Provider's Distribution or Transmission System and cause the Smart Inverter to be automatically disconnected from Distribution Provider's Distribution or Transmission System or to prevent the Smart Inverter from being connected to Distribution Provider's Distribution or Transmission System inappropriately:

(i) Over and under voltage trip functions and over and under frequency trip functions; (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

1. GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS (Cont'd.)

a. Protective Functions Required (Cont'd.)

(ii) A voltage and frequency sensing and time-delay function to prevent the Smart Inverter from energizing a de-energized Distribution or Transmission System circuit and to prevent the Smart Inverter from reconnecting with Distribution Provider's Distribution or Transmission System unless Distribution Provider's Distribution System service voltage and frequency is within the ANSI C84.1-1995 Table 1 Range B voltage Range of 106 volts to 127 volts (on a 120 volt basis), inclusive, and a frequency range of 58.5 Hz to 60.5 Hz, inclusive, and are stable for at least 15 seconds; and

(iii) A function to prevent the Smart Inverter from contributing to the formation of an Unintended Island, and cease to energize Distribution Provider's Distribution System within two seconds of the formation of an Unintended Island.

The Smart Inverter shall cease to energize Distribution Provider's Distribution System for faults on Distribution Provider's Distribution System circuit to which it is connected (IEEE 1547-4.2.1). The Smart Inverter shall cease to energize Distribution Provider's Distribution circuit prior to re-closure by Distribution Provider's Distribution System equipment (IEEE 1547-4.2.2).

b. Momentary Paralleling Generating Facilities

With Distribution Provider's approval, the transfer switch or scheme used to transfer Producer's loads from Distribution Provider's Distribution or Transmission System to Producer's Generating Facility may be used in lieu of the Protective Functions required for Parallel Operation. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

1. GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS (Cont'd.)

c. Suitable Equipment Required

Circuit breakers or other interrupting equipment located at the Point of Common Coupling (PCC) must be Certified or "Listed" (as defined in Article 100, the Definitions Section of the National Electrical Code) as suitable for their intended application. This includes being capable of interrupting the maximum available fault current expected at their location. Producer's Smart Inverter and Interconnection Facilities shall be designed so that the failure of any single device or component shall not potentially compromise the safety and reliability of Distribution Provider's Distribution and Transmission System. The Smart Inverter paralleling-device shall be capable of withstanding 220% of the Interconnection Facility rated voltage (IEEE 1547-4.1.8.3). The Interconnection Facility shall have the capability to withstand voltage and current surges in accordance with the environments defined in IEEE Std C62.41.2-2002 or IEEE Std C37.90.1-2002 as applicable and as described in L.3.e (IEEE 1547-4.1.8.2).

d. Visible Disconnect Required

When required by Distribution Provider's operating practices, Producer shall furnish and install a ganged, manually-operated isolating switch (or a comparable device mutually agreed upon by Distribution Provider and Producer) near the Point of Interconnection to isolate the Smart Inverter from Distribution Provider's Distribution or Transmission System. The device does not have to be rated for load break nor provide over-current protection.

The device must:

(i) allow visible verification that separation has been accomplished. (This requirement may be met by opening the enclosure to observe contact separation.) (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

1. GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS (Cont'd.)

d. Visible Disconnect Required (Cont'd.)

(ii) include markings or signage that clearly indicates open and closed positions.

(iii) be capable of being reached:

a) for Emergency purposes quickly and conveniently 24 hours a day by Distribution Provider personnel for construction, operation, maintenance, inspection, testing or to isolate the Smart Inverter from Distribution Provider's Distribution or Transmission System without obstacles or requiring those seeking access to obtain keys, special permission, or security clearances.

b) for Non-Emergency purposes during normal business hours. Distribution Provider, where possible, will provide notice to Customer for gaining access to Customer's premises.

(iv) be capable of being locked in the open position.

(v) be clearly marked on the submitted single line diagram and its type and location approved by Distribution Provider prior to installation. If the device is not adjacent to the PCC, permanent signage must be installed at a Distribution Provider approved location providing a clear description of the location of the device. If the switch is not accessible outside the locked premises, signage with contact information and a Distribution Provider approved locking device for the premises shall be installed.

Generating Facilities with Non-Islanding inverters totaling one (1) kilovolt-ampere (kVA) or less are exempt from this requirement. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

1. GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS (Cont'd.)

   e. Drawings Required

      Prior to Parallel Operation or Momentary Parallel Operation of the Smart Inverter, Distribution Provider shall approve Producer's Protective Function and control diagrams. Generating Facilities equipped with Protective Functions and a control scheme previously approved by Distribution Provider for system-wide application or only Certified Equipment may satisfy this requirement by reference to previously approved drawings and diagrams.

   f. Generating Facility Conditions Not Identified

      In the event this Rule does not address the Interconnection conditions for a particular Smart Inverter, Distribution Provider and Producer may agree upon other arrangements.

2. PREVENTION OF INTERFERENCE

   Producer shall not operate Smart Inverters that superimpose a voltage or current upon Distribution Provider's Distribution or Transmission System that interferes with Distribution Provider operations, service to Distribution Provider Customers, or communication facilities. If such interference occurs, Producer must diligently pursue and take corrective action at its own expense after being given notice and reasonable time to do so by Distribution Provider. If Producer does not take corrective action in a timely manner, or continues to operate the facilities causing interference without restriction or limit, Distribution Provider may, without liability, disconnect Producer's facilities from Distribution Provider's Distribution or Transmission System, in accordance with Section D.9 of this Rule. To eliminate undesirable interference caused by its operation, each Smart Inverter shall meet the following criteria: (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

a. Voltage Regulation

If approved by the Distribution Provider, the Smart Inverter may actively regulate the voltage at the PCC while in parallel with Distribution Provider's Distribution System. The Smart Inverter shall not cause the service voltage at other customers to go outside the requirements of ANSI C84.1-1995, Range A (IEEE 1547-4.1.1).

b. Voltage Trip and Ride-Through Settings

The voltage ranges in Table Hh-.1 define protective trip limits for the Protective Function and are not intended to define or imply a voltage regulation Function. Generating Facilities shall cease to energize Distribution Provider's Distribution System within the prescribed trip time whenever the voltage at the PCC deviates from the allowable voltage operating range. The Protection Function shall detect and respond to voltage on all phases to which the Generating Facility is connected.

(i) Smart Inverters

Smart Inverters shall be capable of operating within the voltage range normally experienced on Distribution Provider's Distribution System from plus to minus 5% of the nominal voltage (e.g. 114 volts to 126 volts, on a 120 volt base), at the service panel or PCC. The trip settings at the generator terminals may be selected in a manner that minimizes nuisance tripping in accordance with Table Hh-.1 to compensate for voltage drop between the generator terminals and the PCC. Voltage may be detected at either the PCC or the Point of Interconnection. However, the voltage range at the PCC, with the generator on-line, shall stay within +/-5% of nominal. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

b. Voltage Trip and Ride-Through Settings (Cont'd.)

(ii) Voltage Disturbances

Whenever Distribution Provider's Distribution System voltage at the PCC varies from and remains outside near Nominal voltage for the predetermined parameters set forth in Table Hh-.1, the Smart Inverter's Protective Functions shall cause the Smart Inverter(s) to become isolated from Distribution Provider's Distribution System:

1. The Smart Inverter shall stay connected to the Distribution Provider's Transmission or Distribution System while the grid remains within the "Ride-Through Until" voltage-time range and must stay connected in the corresponding "Operating Mode.

2. For voltage excursions beyond the near Nominal (NN) magnitude range and within the range of the HV1 or LV3 regions, the Smart Inverter shall momentarily cease to energize within 0.16 seconds.

3. In the HV1 region, the Smart Inverter is permitted to reduce power output as a function of voltage under mutual agreement between the Producer and the Distribution Provider.

4. If the distribution system voltage does not exit the ride-through region and recovers to normal system voltage, the Smart Inverter shall restore continuous operation within 2 seconds.

5. If the Distribution Provider's Transmission or Distribution System voltage does not exit the ride-through region and returns from the LV3 region to the LV2 or LV1 region, the Smart Inverter shall restore available current within 2 seconds.

6. Different voltage-time settings could be permitted by the Distribution Provider. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

b. Voltage Trip and Ride-Through Settings (Cont'd.)

(ii) Voltage Disturbances (Cont'd.)

Table Hh.1: Voltage Ride-Through Table

Region	Voltage at Point of Common Coupling (% Nominal Voltage)	Ride-Through Until	Operating Mode	Maximum Trip Time
High Voltage 2 (HV2)	V ≥120			0.16 seconds
High Voltage 1 (HV1)	110 < V < 120	12 seconds	Momentary Cessation	13 seconds
Near Nominal (NN)	88 ≤ V ≤ 110	Indefinite	Continuous Operation	Not Applicable
Low Voltage 1 (LV1)	70 ≤ V < 88	20 seconds	Mandatory Operation	21 seconds
Low Voltage 2 (LV2)	50 ≤ V < 70	10 seconds	Mandatory Operation	11 seconds
Low Voltage 3 (LV3)	V < 50	1 seconds	Momentary Cessation	1.5 seconds

(L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

c. Paralleling

The Generating Facility shall parallel with Distribution Provider's Distribution or Transmission System without causing a voltage fluctuation at the PCC greater than plus/minus 5% of the prevailing voltage level of Distribution Provider's Distribution or Transmission System at the PCC, and meet the flicker requirements of Section H.2.d. Section L, Certification and Testing Criteria, provides technology-specific tests for evaluating the paralleling Function. (IEEE 1547-4.1.3)

d. Flicker

The Generating Facility shall not create objectionable flicker for other customers on Distribution Provider's Distribution or Transmission System. To minimize the adverse voltage effects experienced by other customers (IEEE 1547-4.3.2), flicker at the PCC caused by the Generating Facility should not exceed the limits defined by the "Maximum Borderline of Irritation Curve" identified in IEEE 519-1992 (IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems, IEEE STD 519-1992). This requirement is necessary to minimize the adverse voltage affects experienced by other Customers on Distribution Provider's Distribution or Transmission System. Generators may be connected and brought up to synchronous speed (as an induction motor) provided these flicker limits are not exceeded.

e. Integration with Distribution Provider's Distribution System Grounding

The grounding scheme of the Generating Facility shall not cause over-voltages that exceed the rating of the equipment connected to Distribution Provider's Distribution System and shall not disrupt the coordination of the ground fault protection on Distribution Provider's Distribution System (IEEE 1547-4.1.2) (See Section G.1.i, line configuration). (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

f. Frequency

Distribution Provider controls system frequency, and the Generating Facility shall operate in synchronism with Distribution Provider's Distribution or Transmission System. Whenever Distribution Provider's Distribution or Transmission System frequency at the PCC varies from and remains outside normal (nominally 60 Hz) by the predetermined amounts set forth in Table H.2, the Generating Facility's Protective Functions shall cease to energize Distribution Provider's Distribution or Transmission System within the stated maximum trip time.

(i) Frequency Ride-Through Requirements

Smart Inverter based systems shall remain connected to the Distribution Provider's Distribution or Transmission System while the grid is within the frequency-time range indicated in Table Hh-.2, and shall disconnect from the electric grid during a high or low frequency event that is outside that frequency-time range.

The frequency values are shown in Table Hh.2. These values provide default interconnection system response to abnormal frequencies. The inverter shall disconnect by the default clearing times. In the high frequency range between 60.2 Hz and 61.5 Hz, or some other mutually agreed range, the Smart Inverter is permitted to reduce real power output until it ceases to export power by 61.5 Hz, or other frequency value mutually agreed between the generating facility operator and the Distribution Provider. Islands and microgrids may need different default frequency settings. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

f. Frequency (Cont'd.)

(i) Frequency Ride-Through Requirements(Cont'd.)

Table Hh.2: Frequency Ride-Through and Trip Settings Table

System Frequency Default Settings (Hz)	Minimum Range of Adjustability (Hz)	Ride-Through Until	Ride-Through Operational Mode	MaximumTrip Time
f > 62	62 - 64	No Ride Through	Not Applicable	0.16 seconds
60.5 < f ≤ 62	60.1 - 62	299 seconds	Mandatory Operation	300 seconds
58.5 ≤ f ≤ 60.5	Not Applicable	Indefinite	Continuous Operation	Not Applicable
57.0 ≤ f < 58.5	57 - 59.9	299 seconds	Mandatory Operation	300 seconds
f < 57.0	53 - 57	No Ride Through	Not Applicable	0.16 seconds

g. Harmonics

When the Smart Inverter is serving balanced linear loads, harmonic current injection into Distribution Provider's Distribution or Transmission System at the PCC shall not exceed the limits stated in Table Hh-.43. The harmonic current injections shall be exclusive of any harmonic currents due to harmonic voltage distortion present in Distribution Provider's Distribution or Transmission System without the Smart Inverter connected (IEEE 1547-4.3.3.). The harmonic distortion of a Smart Inverter shall be evaluated using the same criteria as for the Host Loads. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

g. Harmonics (Cont'd.)

Table Hh.3

Maximum harmonic current distortion in percent of current (I) [1,2]

Individual harmonic order, h (odd harmonics) [3]	h<11	11≤ h<17	17≤ h<23	23≤ h<35	35≤ h	Total demand distortion
Max Distortion (%)	4.0	2.0	1.5	0.6	0.3	5.0

[1] – IEEE1547-4.3.3

[2] – I = the greater of the maximum Host Load current average demand over 15 or 30 minutes without the GF, or the GF rated current capacity (transformed to the PCC when a transformer exists between the GF and the PCC).

[3] – Even harmonics are limited to 25% of the odd harmonic limits above.

h. Direct Current Injection

Smart Inverter should not inject direct current greater than 0.5% of rated output current into Distribution Provider's Distribution or Transmission System.

i. Fixed Power Factor

Producer shall provide adequate reactive power compensation on site to maintain the Smart Inverter power factor near unity at rated output or a Distribution Provider specified power factor in accordance with the following requirements:

(i) Default Power Factor setting: Absorbing reactive power at 0.95 lagging power factor.

(ii) Aggregate generating facility is greater than 15 kW: 1.0 +/- 0.15 (0.85 Lagging to 0.85 Leading) down to 20% rated power irrespective of Real Power Production. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

i. Fixed Power Factor (Cont'd.)

(iii) Aggregate generating facility is less than or equal to 15 kW: 1.0 +/- 0.10 (0.90 Lagging to 0.90 Leading) down to 20% rated power irrespective of Real Power Production.

j. Dynamic Volt/VAR Operations

The Smart Inverter shall be capable of operating dynamically within a power factor range of +/- 0.85 PF for larger (>15 kW) systems, down to 20% of rated active power, and +/- 0.9 PF for smaller systems (≤15 kW), down to 20% of rated active power, irrespective of Real Power Production. This dynamic Volt/VAR capability shall be able to be activated or deactivated in accordance with Distribution Provider requirements.

The Distribution Provider may permit or require the Smart Inverter systems to operate in larger power factor ranges, including in 4-quadrant operations for storage systems with the implementation of additional anti-islanding protection as determined by the Distribution Provider.

The Smart Inverter shall be capable of providing dynamic reactive power compensation (dynamic Volt/VAR operation) within the following constraints:

- The Smart Inverter shall be able to consume reactive power in response to an increase in line voltage, and produce reactive power in response to a decrease in line voltage.
- The reactive power provided shall be per the range irrespective of real power production, but the maximum reactive power provided to the system shall be as directed by the Distribution Provide
- Reduction of real power production is allowed to meet the required reactive power ranges. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

j. Dynamic Volt/VAR Operations (Cont'd.)

Dynamic Volt/Var Operations Default Settings

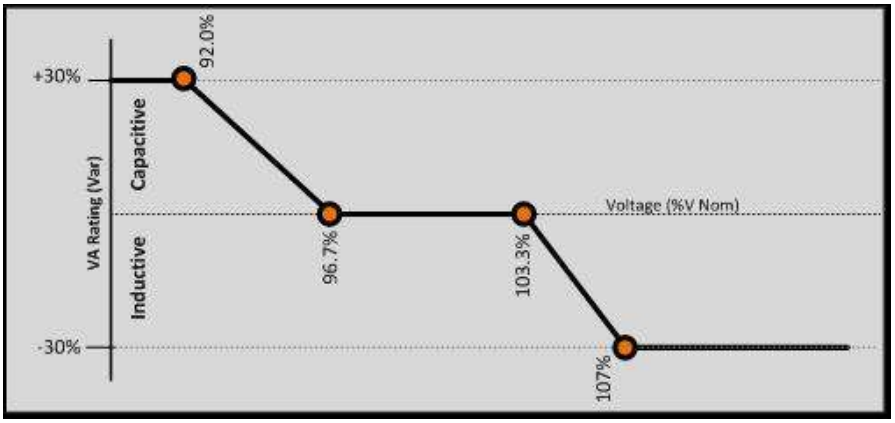
Table Hh-4 and Figure Hh-1 depict the default settings, which should be applied for all inverter sizes. Specific volt/var settings may be required for larger Generating Facilities (such as 100 kw or greater), or for specific areas with the Distribution Systems as determined by the Distribution Provider.

Default Open Loop Response Time for volt/var operation should be five (5) seconds.

Table Hh-4: Voltage and Reactive Default Settings

Voltage Setpoint	Voltage Value	Reactive Setpoint	Reactive Value	Operation
V1	92.0%	Q1	30%	Reactive Power Injection
V2	96.7%	Q2	0	Unity Power Factor
V3	103.3%	Q3	0	Unity Power Factor
V4	107.0%	Q4	30%	Reactive Power Absorption

Figure Hh-1: Voltage and Reactive Default Settings



(L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

k. Ramp Rate Requirements

The Smart Inverter is required to have the following ramp controls for at least the following four conditions. These functions can be established by multiple control functions or by one general ramp rate control function. Ramp rates are contingent upon sufficient energy available from the Smart Inverter.

- Normal ramp-up rate: For transitions between energy output levels over the normal course of operation. The default value is 100% of maximum current output per second with a range of adjustment between 1% to 100%, with specific settings as mutually agreed by the Distributor Provider and the Producer.

- Connect/Reconnect Ramp-up rate: Upon starting to inject power into the grid, following a period of inactivity or a disconnection, the inverter shall be able to control its rate of increase of power from 1 to 100% maximum current per second. The default value is 2% of maximum current output per second, with specific settings as mutually agreed upon by the Distribution Provider and the Producer.

l. Frequency-Watt Requirements

This requirement will become mandatory for Generating Facilities utilizing inverter-based technologies for which an Interconnection Request is submitted on or after February 22, 2019, nine (9) months following the approval of the SunSpec Alliance Communication Protocol Certification Test Standard.

The utilization of this function is permissible under mutual agreement between the utility and the generating facility before the effective date.

Smart Inverters shall reduce their real power production as a function of system frequency, in accordance with the following:

- When system frequency exceeds 60.036 Hz, the active power output produced by the Smart Inverter shall be reduced by 50% of real power nameplate rating per hertz (5% of real power nameplate rating reduction per 0.1 hertz) (L)

(Continued)

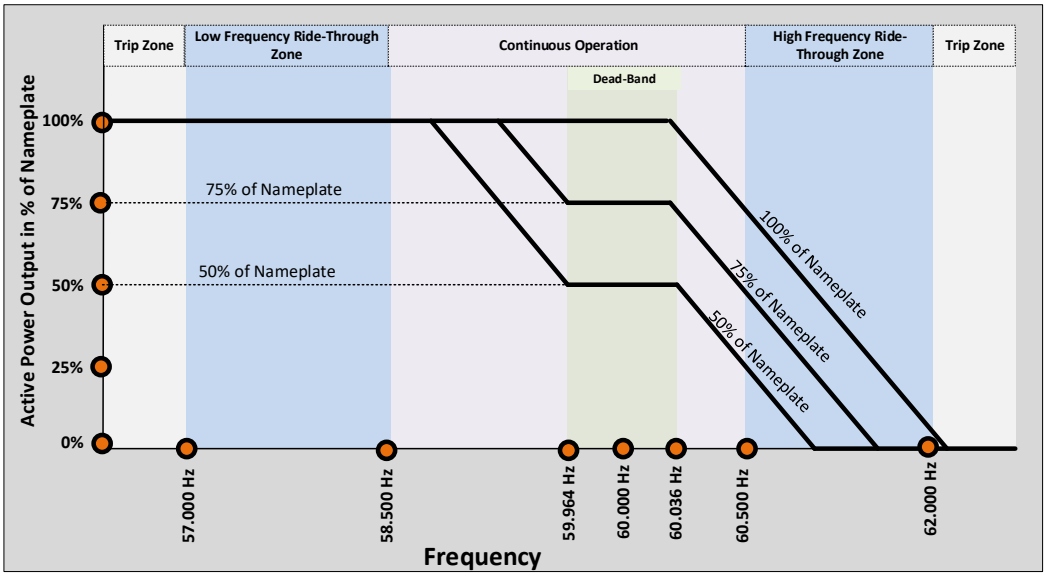
Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

l. Frequency-Watt Requirements (Cont'd.)

- When system frequency moves under 59.964 Hz, the active power output produced by the Smart Inverter shall be increased by 50% of real power nameplate rating per hertz (5% of real power nameplate rating increase per 0.1 hertz) when inverter is capable of increasing real power production.
- The default dead-band should be +/- 0.036 Hz from 60 Hertz (59.964 Hz to 60.036 Hz). When the system frequency is in range of 59.964 Hz and 60.036 Hz, the Smart Inverter is not required to decrease power as a function of system frequency.
- Open loop response time for Frequency –Watt shall be 5 seconds.
- Figure Hh-2 illustrated this requirement for three levels of output power. Figure Hh-2 is for illustration purposes only.

Figure Hh-2: Active Power as a Function of System Frequency



Note: the frequency markers on the horizontal axis are not drawn to scale. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

m. Voltage-Watt Default Settings Requirements

This requirement will become mandatory for Generating Facilities utilizing inverter-based technologies for which an Interconnection Request is submitted on or after February 22, 2019, nine (9) months following the approval of the SunSpec Alliance Communication Protocol Certification Test Standard.

The utilization of this function is permissible under mutual agreement between the utility and the generating facility before the effective date.

Smart Inverters shall reduce their real power production as a function of measured voltage at the inverter terminals or at the Generating Facility Point of Common Coupling (PCC) in accordance with the following:

- When the measured voltage is greater than 106% of nominal voltage (for example: 127.2 volts on a 120 volts nominal), the export of active power at the PCC or the production of active power by the Smart Inverter shall be reduced at a rate of 25% of active power nameplate rating per one percent of nominal voltage. Figure Hh-3 – Volt-Watt Requirements – illustrates the required rate of reduction. When export of active power is controlled, a certified inverter and control system shall be used. (L)

(Continued)

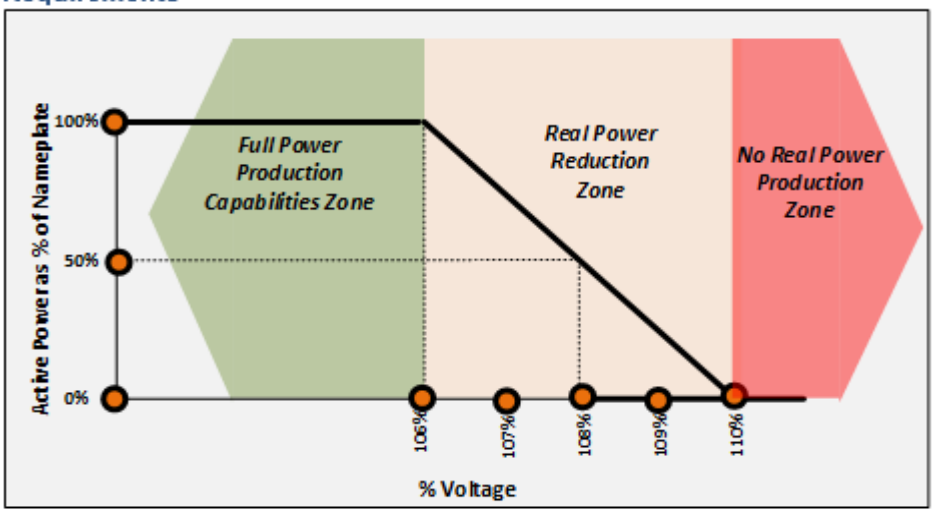
Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

m. (Cont'd.)

- When the measured voltage is greater than 110% of nominal voltage (Example: 132 volts on a 120 volts nominal), the export of active power output to the grid at the PCC or the production of active power by the Smart Inverter shall be reduced to 0 watts

Figure HH-3 – Volt-Watt Requirements



Percent (%) of nominal voltage (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

n. Dynamic Reactive Power Support Function

The capability for this requirement will become mandatory for Generating Facilities utilizing inverter-based technologies for which an Interconnection Request is submitted twelve (12) months after approval of a nationally recognized standard that includes the function.

The utilization of this function is allowed and optional upon the mutual agreement of the Distribution Provider and the Applicant, before the effective date.

o. Default Activation States

Unless otherwise provided by Distribution Provider, pursuant to Distribution Provider's Distribution Generation Interconnection Handbook, the default settings will be as follows:

	Function	**State**
1	Anti-islanding	activated
2	Low/High Voltage Ride-Through	activated
3	Low/High Frequency Ride-Through	activated
4	Dynamic Volt/VAR operations	activated
5	Ramp rates	activated
6	Fixed power factor	deactivated
7	Reconnect by "soft-start" methods	activated
8	Frequency-Watt*	activated
9	Volt/Watt*	activated
10	Set Active Power Function Mode (Optional)	activated under mutual agreement
11	Dynamic Reactive Power Support Mode (Optional)	activated under mutual agreement

These default activation states may be modified by mutual agreement between Distribution Provider and Producer.

* These functions must be activated for Interconnection Requests submitted on or after February 22, 2019. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

p. Phase 3 Functions

Table of Phase 3 Effective Dates Pursuant to Resolution E-4898 and Resolution E-5000 and CPUC Letter of March 20, 2020 responding to a request to extend the date for Functions 1, 2, 3 and 8:

Phase 3 Function #		
	Description	**Effective Date (note)**
1	Monitor Key DER Data	**June 22, 2020**
2	DER Disconnect and Reconnect Command (Cease to Energize and Return to Service)	**June 22, 2020**
3	Limit Maximum Active Power Mode	**June 22, 2020**
4	Set Active Power Mode	12 months after approval of a nationally recognized standard that includes the function.
5	Frequency Watt Mode	**February 22, 2019**, which is 9 months following SunSpec Alliance Communication Protocol Certification Test Standard.
6	Volt Watt Mode	**February 22, 2019**, which is 9 months following SunSpec Alliance Communication Protocol Certification Test Standard.
7	Dynamic Reactive Support	12 months after approval of a nationally recognized standard that includes the function.
8	Scheduling Power Values and Modes	**June 22, 2020**

Note: The utilization of any of these functions is permissible under mutual agreement between the utility and the generating facility before the effective date. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

2. PREVENTION OF INTERFERENCE (Cont'd.)

q. Load Shedding or Transfer

The voltage and frequency ride-through requirements of Hh.2.b.(ii) and Hh.2.f.(i) shall not apply if either: a) The real power across the Point of Common Coupling is continuously maintained at a value less than 10% of the aggregate rating of the Smart Inverters connected to the Generation Facility prior to any voltage disturbance, and the Generation Facility disconnects from the Distribution Provider's T&D system, along with Generation Facility load, such that the net change in real power flow from or to the Distribution Provider is less than 10% of the aggregate Smart Inverter capacity; or b) Generation Facility load real power demand equal to 90% to 120% of the pre-disturbance aggregate Smart Inverter real power output is shed within 0.1 seconds of Smart Inverter disconnection.

3. TECHNOLOGY SPECIFIC REQUIREMENTS

Grid-interactive inverters do not require separate synchronizing equipment. Non grid-interactive or "stand-alone" inverters shall not be used for Parallel Operation with Distribution Provider's Distribution or Transmission System. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

4. SUPPLEMENTAL SMART INVERTER REQUIREMENTS

a. Fault Detection

A Smart Inverter with an SCCR exceeding 0.1 or one that does not cease to energize Distribution Provider's Distribution or Transmission System within two seconds of the formation of an Unintended Island shall be equipped with Protective Functions designed to detect Distribution or Transmission System faults, both line-to-line and line-to-ground, and cease to energize Distribution Provider's Distribution or Transmission System within two seconds of the initiation of a fault.

b. Transfer Trip

For a Generating Facility that cannot detect Distribution or Transmission System faults (both line-to-line and line-to-ground) or the formation of an Unintended Island, and cease to energize Distribution Provider's Distribution or Transmission System within two seconds, Distribution Provider may require a Transfer Trip system or an equivalent Protective Function.

c. Reclose Blocking

Where the aggregate Generating Facility capacity exceeds 15% of the peak load on any automatic reclosing device, Distribution Provider may require additional Protective Functions, including, but not limited to reclose-blocking on some of the automatic reclosing devices. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

5. COMMUNICATION REQUIREMENTS

a. The communication protocol requirements included in this section Hh.5 shall become mandatory for Generating Facilities utilizing inverter-based technologies for which an Interconnection Request is submitted June 22, 2020. Until such date, this subsection may be used in all or in part by inverter-based technologies by mutual agreement of the Distribution Provider and the Applicant. The communications requirements herein shall be between:

(i) the Distribution Provider and the individual Generating Facility's inverter control or energy management system;

(ii) the Distribution Provider and communication to the Generating Facility through an aggregator not co-located or part of the Generating Facility; or

(iii) other communication options as are mutually agreed to are by Applicant and the Distribution Provider. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

5. COMMUNICATION REQUIREMENTS (Cont'd.)

b. Generating Facilities utilizing inverter-based technologies must adhere to all of the following communication protocol requirements for communications between Distribution Provider and communication option selected in section Hh. 5. This Rule does not specify the communication between the selected communication option and Smart Inverter but performance will be enforced by in compliance with this Rule:

(i) Shall be capable of communications;

(ii) Software shall be updateable via communications remotely;

(iii) The transport level protocol shall be TCP/IP; and,

(iv) The default application-level protocol shall be IEEE 2030.5 (i.e., Smart Energy Profile 2.0 (SEP 2)) as defined in the California IEEE 2030.5 Implementation Guide, but other application-level protocols may be used by mutual agreement of the parties including IEEE 1815/DNP3 for SCADA real-time monitoring and control and IEC 61850. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

5. COMMUNICATION REQUIREMENTS (Cont'd.)

c. Additional communication protocol requirements shall also apply to Generating Facilities utilizing inverter-based technologies as provided in the following documents:

(i) Distribution Provider Generation Interconnection Handbook, which shall include:

a) Details and guidelines for the implementation of communications with Generating Facilities utilizing inverter-based technologies;

b) Cybersecurity and privacy requirements (these may additionally or alternatively be included in the application-level protocol implementation guide); and,

c) Generic device communications registration management requirements, including how to register individual Generating Facilities, Generating Facilities with energy management systems, and aggregators (these requirements additionally or alternatively may be included in the application-level protocol implementation guide).

(ii) Application-Level Protocol Implementation Guide, which shall provide:

a) Communication requirements and implementation guidelines to ensure consistent interoperability of the Generating Facilities with all California investor-owned utilities under the Commission's jurisdiction. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

6. SCHEDULING CAPABILITY REQUIREMENTS

a. Generating Facilities which incorporate Smart Inverters shall incorporate scheduling capabilities with a minimum scheduling memory capability of at least 24 events. The capability for this requirement will be mandatory for Generating Facilities utilizing inverter-based technologies for which an Interconnection Request is submitted on or after June 22, 2020.

The utilization of this function is permissible under mutual agreement between the utility and the generating facility before the effective date.

Each event is composed of modifications to each, selected group of, or all of the following Smart Inverter function.

(i) Modifications to the voltage and reactive set-points of the Dynamic volt/var function.

(ii) Modifications to the reactive power set-points for the fixed power factor function.

(iii) Modifications to the voltage and watt-reduction level set-points for the volt/watt function. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

6. SCHEDULING CAPABILITY REQUIREMENTS (Cont'd.)

b. The Generating Facility's scheduling capability requirement herein shall be met by one or more of the following options.

(i) Scheduling capability requirements may be stored at the Generating Facility Energy Management System (GFEMS). The GFEMS shall communicate the necessary commands to the Smart Inverters within 10 minutes from when GFEMS received the scheduling information:

(ii) Scheduling capability requirements may be stored at the Smart Inverter Control Unit (SMCU) within the Generating Facility. The SMCU shall communicate necessary commands to the Smart Inverters within 10 minutes from when SCMU received the scheduling information.

(iii) Scheduling capability requirements may be stored at an aggregator not co-located within the Generating Facility. The aggregator shall communicate the necessary commands to the Smart Inverters within 15 minutes of the aggregator receiving the scheduling information.

(iv) Other options may be utilized by mutual agreement between the Applicant and Distribution Provider.

c. The selected scheduling control system shall store the schedules and shall send operational commands to the Smart Inverters as required by the schedule received from the Distribution Provider. The Smart Inverter shall respond by changing its mode of operation as commanded at the schedule start time with no unreasonable delay.

Each scheduled mode of operation shall include and start-time and duration. The Smart Inverter should return to its default settings at the end of the duration time or shall enter a new operational mode as directed by the scheduling control system. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

7. MONITORING AND TELEMETRY REQUIREMENTS

a. The capability for this requirement will be mandatory for Generating Facilities utilizing inverter-based technologies for which an Interconnection Request is submitted on or after June 22, 2020.

The utilization of this function is permissible under mutual agreement between the utility and the generating facility before the effective date.

Smart Inverter shall have the capability to communicate its performance information including:

(i) Smart Inverter production or consumption of active power (Watts).

(ii) Smart Inverter consumption or production of reactive power (VARs)

(iii) Phase measured at the AC terminals of the Smart Inverter (Volts)

(iv) Frequency measured at the AC terminals of the Smart Inverter (Hz) (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

7. MONITORING AND TELEMETRY REQUIREMENTS (Cont'd.)

b. When the Generating Facility includes energy-storage with Smart Inverters, the following monitoring and telemetry capability are required:

(i) The Smart Inverter shall be capable of communicating the operational state of charge as a percentage of energy storage capacity.

c. Operational State as In-Service or not In-service communication capability requirements. The Smart Inverter shall be capable of communicating when the Smart Inverter is capable of providing electric services as follows:

(i) In-Service state: An operational state which indicates that the Smart Inverter is connected to the electric system and operating as determined locally by the Generating Facility operator or by a scheduling control system as outlined in section Hh.6

(ii) Not In-Service state: An operating state which indicates that the Smart Inverter is not capable of connecting to the electric system and not capable of providing any type of electrical support as required locally or as commanded by a scheduling control system as outlined in section Hh. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

7. MONITORING AND TELEMETRY REQUIREMENTS (Cont'd.)

d. Monitoring and performance information should be communicated in aggregate at the Generating Facility as follows:

(i) When the Generating Facility includes only Smart Inverters: The production or consumption of active and reactive power shall be communicated as an aggregate of all Smart Inverters within the Generating Facility.

(ii) When a Generating Facility includes Smart Inverters and other technologies such as synchronous or induction generation systems, the Generating Facility should communicate the following:

a) The production or consumption of active and reactive power shall be communicated in aggregate of all Smart Inverters within the Generating Facility

b) The production or consumption of active and reactive power shall be communicated in aggregate of all the other technologies within the Generating Facility

(iii) When the Generating Facility with Smart Inverters includes one or multiple energy storage systems: The available operational energy should be communicated as an aggregate of all the energy storage systems. (L)

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.) (L)

8. CONTROL THROUGH COMMUNICATION CAPABILITIES

a. The capability for these requirements will be mandatory for Generating Facilities utilizing inverter-based technologies for which an Interconnection Request is submitted on or after the earlier of the dates shown in the "Table of Phase 3 Effective Dates Pursuant to Resolution E-4898" in Section Hh.2.p.

The utilization of these functions is permissible under mutual agreement between the utility and the generating facility before the effective date.

Smart Inverters shall have the capabilities of accepting an operational controls through communications in accordance to the following:

(i) Cease to energize control command. When the Smart Inverter receives a cease-to-energize command through communication it must enter into a cease-to-energize state of operation or shall initiate the opening of the DER switch referenced in the ECP in order to galvanically isolate the DER system from the Distribution System

(ii) Return to service control command. When the Smart Inverter receives a return-to-service control command, the Smart Inverter may return to service operation as required by Generating Facility operator or as required by the scheduling control system as required by section H.6

(iii) Limit Active Power command. When the Smart Inverter receives a command to limit its production of real power, the Smart Inverter shall reduce its real power production to the specified percent of real power capacity of the Smart Inverter or to a specified real power value.

(iv) Set Active Power Level Mode Function. The capability for this requirement will become mandatory for Generating Facilities utilizing inverter-based technologies for which an Interconnection Request is submitted twelve (12) months after approval of a nationally recognized standard that includes the function.

(v) Suspension of Active Power restriction. When the Smart Inverter receives a command to suspend the command for active power reduction, the Smart Inverter may return to normal operation as required by Generating Facility operator or as required by the scheduling control system as required by section H.6. (L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 224
GENERATING FACILITY INTERCONNECTIONS

I. THIRD-PARTY INSTALLATIONS, RESERVATION OF UNUSED FACILITIES, AND REFUND OF SALVAGE VALUE (L)

1. INTERCONNECTION FACILITIES AND DISTRIBUTION UPGRADES

Except as provided for in the Generator Interconnection Agreement of this Rule, Interconnection Facilities connected to Distribution Provider's side of the PCC and Distribution Upgrades shall be provided, installed, owned, and maintained by Distribution Provider at Producer's expense.

2. THIRD-PARTY INSTALLATIONS (L)

Producer may, at its option, employ a qualified contractor that meets the Contractor Qualifications set forth under Electric Rule 15, Section G, to provide and install Interconnection Facilities or Distribution Upgrades, to be owned and operated by Distribution Provider, on Distribution Provider's side of the PCC.* Such Interconnection Facilities and Distribution Upgrades shall be installed in accordance with Distribution Provider's design and specifications. Upon final inspection and acceptance by Distribution Provider, Producer shall transfer ownership of such Producer installed Interconnection Facilities or Distribution Upgrades to Distribution Provider and such facilities shall thereafter be owned and maintained by Distribution Provider at Producer's expense. Producer shall pay Distribution Provider's reasonable cost of design, administration, and monitoring of the installation for such facilities to ensure compliance with Distribution Provider's requirements. Producer shall also be responsible for all costs, including any income tax liability, associated with the transfer of Producer installed Interconnection Facilities and Distribution Upgrades to Distribution Provider. (P)/(L) (P)/(L) (L) (L) (P)/(L) (L) (L)

* Only duly authorized employees of utility are allowed to connect to, disconnect from, or perform any work upon Utility's facilities. (P)/(L) (P)/(L)

(Continued)

I. THIRD-PARTY INSTALLATIONS, RESERVATION OF UNUSED FACILITIES, AND REFUND OF SALVAGE VALUE (Cont'd.) (L)

3. RESERVATION OF UNUSED FACILITIES

When a Producer wishes to reserve Distribution Provider-owned Interconnection Facilities or Distribution Upgrades installed and operated as Added Facilities for Producer at Producer's expense, but idled by a change in the operation of Producer's Generating Facility or otherwise, Producer may elect to abandon or reserve such facilities consistent with the terms of its agreement with Distribution Provider. If Producer elects to reserve idle Interconnection Facilities or Distribution Upgrades, Distribution Provider shall be entitled to continue to charge Producer for the costs related to the ongoing operation and maintenance of the Added Facilities.

4. REFUND OF SALVAGE VALUE

When a Producer elects to abandon the Special Facilities or Added Facilities for which it has either advanced the installed costs or constructed and transferred to Distribution Provider, Producer shall, at a minimum, receive from Distribution Provider a credit for the net salvage value of the Added Facilities.

J. METERING, MONITORING AND TELEMETERING

1. GENERAL REQUIREMENTS

All Generating Facilities shall be metered in accordance with this Section J and shall meet all applicable standards of Distribution Provider contained in Distribution Provider's applicable tariffs and published Distribution Provider manuals dealing with Metering specifications.

2. METERING BY NON-DISTRIBUTION PROVIDER PARTIES

The ownership, installation, operation, reading, and testing of revenue Metering Equipment for Generating Facilities shall be by Distribution Provider except to the extent that the Commission authorizes any or all these services be performed by others. (L)

(Continued)

J. METERING, MONITORING AND TELEMETERING (Cont'd.) (L)

3. NET GENERATION OUTPUT METERING

Generating Facility customers may be required to install Net Generation Output Metering for evaluation, monitoring, and verification purposes and to determine applicable standby and non-bypassable charges as defined in Distribution Provider's tariffs, to satisfy applicable California Independent System Operator (CAISO) reliability requirements, and for Distribution System planning and operations.

However, Generating Facility customers do not need to install Net Generation Output Metering where less intrusive and/or more cost effective options, for Producer/Customer, are available for providing generator data to Distribution Provider. These Generating Facilities may opt to have Distribution Provider estimate load data in accordance with Distribution Provider's applicable tariffs to determine or meet applicable standby and non-bypassable and other applicable charges and tariff requirements. However, if a Generating Facility customer objects to Distribution Provider's estimate of the Generator(s) output, the customer may elect to install the Net Generation Output Metering, or have Distribution Provider install Net Generation Output Metering at the customer's expense.

(a) All metering options available to the customer must conform to the requirements set forth in Distribution Provider's Rule 22. If Distribution Provider does not receive meter data in accordance with Rule 22, Distribution Provider shall have the right to install Distribution Provider-owned Net Generation Output Metering at the customer's expense. The relevant factors in determining the need for Net Generation Output Metering are as listed below:

i) Data requirements in proportion to need for information;

ii) Producer's election to install equipment that adequately addresses Distribution Provider's operational requirements; (L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 227
GENERATING FACILITY INTERCONNECTIONS

J. METERING, MONITORING AND TELEMETERING (Cont'd.) (L)

3. NET GENERATION OUTPUT METERING (Cont'd.)

iii) Accuracy and type of required Metering consistent with purposes of collecting data;

iv) Cost of Metering relative to the need for and accuracy of the data;

v) The Generating Facility's size relative to the cost of the Metering/monitoring;

vi) Other means of obtaining the data (e.g. Generating Facility logs, proxy data, etc.);

vii) Requirements under any Generator Interconnection Agreement with Producer.

The requirements in this Section may not apply to Metering of Generating Facilities operating under Distribution Provider's Net Energy Metering tariffs. Nothing in this Section J.3 supersedes Section D.4, Compliance with Laws, Rules and Tariff Schedules.

Distribution Provider will report to the Commission or designated authority, on a quarterly basis, the rationale for requiring Net Generation Output Metering equipment in each instance along with the size and location of the facility. (L)

The standard timeline for installation of Net Generation Output Meters is as follows: (P)/(L)

i) 20 business for design and 20 business days for construction, or

ii) design and construction timelines as agree with the customer.

The 20-day clock commences upon payment and after the customer had done everything necessary on their end to prepare for construction. By mutual agreement, Applicant and Distribution Provider may agree to a timeline that is different from the timeline described above. (P)/(L)

(Continued)

J. METERING, MONITORING AND TELEMETERING (Cont'd.) (L)

4. POINT OF COMMON COUPLING (PCC) METERING

For purposes of assessing Distribution Provider's charges for retail service, Producer's PCC Metering shall be reviewed by Distribution Provider, and if required, replaced to ensure that it will appropriately measure electric power according to the provisions of the Customer's electric service Tariff. Where required, the Customer's existing meter may be replaced with a bi-directional meter so that power deliveries to and from Producer's site can be separately recorded. Alternately, Producer may, at its sole option and cost, require Distribution Provider to install multi-metering equipment to separately record power deliveries to Distribution Provider's Distribution System and retail purchases from Distribution Provider. Where necessary, such PCC Metering shall be designed to prevent reverse registration.

Generating Facilities participating in Net Energy Metering shall have metering provided pursuant to the terms of the applicable Net Energy Metering tariff schedule.

5. TELEMETERING

If the nameplate rating of the Generating Facility is 1 MW or greater, Telemetering equipment at the Net Generation Output Metering location may be required at Producer's expense. If the Generating Facility is Interconnected to a portion of Distribution Provider's Distribution System operating at a voltage below 10 kV, then Telemetering equipment may be required on Generating Facilities 250 kW or greater. Distribution Provider shall only require Telemetering to the extent that less intrusive and/or more cost effective options for providing the necessary data in real time are not available. Distribution Provider will report to the Commission or designated authority, on a quarterly basis, the rationale for requiring Telemetering equipment in each instance along with the size and location of the facility.

Customer-owned, behind-the-meter, telemetry equipment is allowed where practicable to mitigate the costs associated with Distribution Provider's ownership of the equipment (i.e., the Income Tax Component of Contribution and Cost of Ownership charges), per D.19-03-013 Ordering Paragraph 5. Distribution Provider will allow for a cap of thirty calendar days to repair or replace malfunctioning equipment as notified by the Distribution Provider and if the malfunctioning equipment is not repaired by the thirtieth day, the Distribution Provider can make the necessary repairs and charge the customer for related costs or can disconnect the distributed energy resource. (L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 229
GENERATING FACILITY INTERCONNECTIONS

J. METERING, MONITORING AND TELEMETERING (Cont'd.) (L)

6. LOCATION

Where Distribution Provider-owned Metering is located on Producer's premises, Producer shall provide, at no expense to Distribution Provider, a suitable location for all such Metering Equipment.

7. COSTS OF METERING

Producer will bear all costs of the Metering required by this Rule, including the incremental costs of operating and maintaining the Metering Equipment.

8. MULTIPLE TARIFF METERING

The requirements of Section J.3 may not apply where a Generating Facility includes multiple generators eligible for service under more than one Net Energy Metering (NEM) tariff schedule (e.g. NEM-1, NEM-2, NEMBIO, NEMFC), or where a Generating Facility consists of one or more NEM-eligible generators in combination with one or more non-NEM eligible generators without Non-Export relays ("Reverse Power Protection"). To ensure proper tariff administration, metering will be required at the PCC and at each of the NEM eligible generator groups eligible for service under the same NEM tariff schedule. For combinations of multiple NEM eligible generators under different tariffs, billing administration and metering requirements will be as specified in the appropriate NEM tariff schedule.

Where a Generating Facility consists of one or more NEM eligible generator groups in combination with one or more non-NEM generators, metering of the non-NEM generators is not required, except as specified in Section J.3. (L)

(Continued)

K. DISPUTE RESOLUTION PROCESS (L)

In addition to the informal procedures for timeline-related disputes set out in Section F.1.d, the following procedures will apply for disputes arising from this Rule:

1. SCOPE

The Commission shall have initial jurisdiction to interpret, add, delete or modify any provision of this Rule or of any agreements entered into between Distribution Provider and Applicant or Producer to implement this tariff ("Implementing Agreements") and to resolve disputes regarding Distribution Provider's performance of its obligations under Commission-jurisdictional tariffs, the applicable agreements, and requirements related to the interconnection of Applicant's or Producer's Generating Facility or Interconnection Facilities pursuant to this Rule.

2. PROCEDURES

Any dispute arising between Distribution Provider and Producer (individually referred to in Section K as "Party" and collectively "the Parties") regarding Distribution Provider's or Producer's performance of its obligations under its tariffs, the Implementing Agreements, and requirements related to the interconnection of Producer's Facilities pursuant to this Rule shall be resolved according to the following procedures:

a. The dispute shall be documented in a written notice ("notice") by the aggrieved Party to the other Party containing the relevant known facts pertaining to the dispute, the specific dispute and the relief sought, and express notice by the aggrieved Party that it is invoking the procedures under this Section. The notice shall be sent to the Party's email address and physical address set forth in the Generator Interconnection Agreement or Interconnection Request, if there is no Generator Interconnection Agreement. A copy of the notice shall also be sent to the Energy Division, Office of the Director, at the Commission. The receiving Party shall acknowledge the notice within five (5) Calendar Days of its receipt. (L)

(Continued)

K. DISPUTE RESOLUTION PROCESS (Cont'd.) (L)

2. PROCEDURES (Cont'd.)

a Upon the aggrieved Party notifying the other Party of the dispute, each Party must designate a representative with the authority to make decisions for its respective Party to review the dispute within seven (7) Calendar Days. In addition, upon receipt of the notice, Distribution Provider shall provide the aggrieved Party with all relevant regulatory and/or technical details and analysis regarding any Distribution Provider interconnection requirements under dispute within twenty-one (21) Calendar Days.

Within forty-five (45) Calendar Days of the date of the notice, the Parties' authorized representatives will be required to meet and confer to try to resolve the dispute. Parties are expected to operate in good faith and use best efforts to resolve the dispute.

b. If a resolution is not reached in forty-five (45) Calendar Days from the date of the notice, either 1) a Party may request to continue negotiations for an additional forty-five (45) Calendar Days or 2) the Parties may by mutual agreement make a written request for mediation to the ADR Coordinator in the Commission's ALJ Division. The request may be submitted by electronic mail to adr_program@cpuc.ca.gov. Alternatively, both Parties by mutual agreement may request mediation from an outside third-party mediator with costs to be shared equally between the Parties.

c. At any time, either Party may file a formal complaint before the Commission pursuant to California PUC section 1702 and Article 4 of the Commission's Rules of Practice and Procedure.

Nothing in this section shall be construed to limit the rights of any Party to exercise rights and remedies under Commission law. (L)

(Continued)

K. DISPUTE RESOLUTION PROCESS (Cont'd.) (L)

3. PERFORMANCE DURING DISPUTE

Pending resolution of any dispute under this Section, the Parties shall proceed diligently with the performance of their respective obligations under this Rule and the Implementing Agreements, unless the Implementing Agreements have been terminated. Disputes as to the Interconnection Request and implementation of this Section shall be subject to resolution pursuant to the procedures set forth in this Section.

L. CERTIFICATION AND TESTING CRITERIA

1. INTRODUCTION

This Section describes the test procedures and requirements for equipment used for the Interconnection of Generating Facilities to Distribution Provider's Distribution or Transmission System. Included are Type Testing, Production Testing, Commissioning Testing, and Periodic Testing. The procedures listed rely heavily on those described in appropriate Underwriters Laboratory (UL), Institute of Electrical and Electronic Engineers (IEEE), and International Electrotechnical Commission (IEC) documents—most notably UL 1741 and IEEE 929 as well as the testing described in *May 1999 New York State Public Service Commission's Interconnection Requirements.* As noted in Section B, this Rule has been revised to be consistent with ANSI/IEEE 1547-2003 Standard for Interconnecting Distribution Resources with Electric Power Systems. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

1. INTRODUCTION (Cont'd.)

The tests described here, together with the technical requirements in Section H of this Rule, are intended to provide assurance that the Generating Facility's equipment will not adversely affect Distribution Provider's Distribution or Transmission System and that a Generating Facility will cease providing power to Distribution Provider's Distribution or Transmission System under abnormal conditions. The tests were developed assuming a low level of Generating Facility penetration or number of connections to Distribution Provider's Distribution or Transmission System. At high levels of Generating Facility penetration, additional requirements and corresponding test procedures may need to be defined.

Section L also provides criteria for "Certifying" Generators, inverters or converters. Once a Generator, inverter or converter has been Certified per this Rule, it may be considered suitable for Interconnection with Distribution Provider's Distribution or Transmission System. Subject to the exceptions described in Section L, Distribution Provider will not repeat the design review or require retesting of such Certified Equipment. It should be noted that the Certification process is intended to facilitate Generating Facilities Interconnections. Certification is not a prerequisite to interconnect a Generating Facility for Section H, except for Non-Export AC/DC Converters seeking an expedited process, but it is a prerequisite for inverters installed after September 8, 2017, pursuant to Section Hh of this Rule. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

2. CERTIFIED AND NON-CERTIFIED INTERCONNECTION EQUIPMENT

a. Certified Equipment

Equipment tested and approved (i.e. "Listed") by an accredited NRTL as having met both the Type Testing and Production Testing requirements described in this document is considered to be Certified Equipment for purposes of Interconnection with Distribution Provider's Distribution or Transmission System. Certification may apply to either a pre-packaged system or an assembly of components that address the necessary functions. Type Testing may be done in the manufacturer's factory or test laboratory, or in the field. At the discretion of the testing laboratory, field-certification may apply only to the particular installation tested. In such cases, some or all of the tests may need to be repeated at other installations.

When equipment is Certified by a NRTL, the NRTL shall provide to the manufacturer, at a minimum, a Certificate with the following information for each device:

Administrative:

(1) The effective date of Certification or applicable serial number (range or first in series), and/or other proof that certification is current;

(2) Equipment model number(s) of the Certified equipment;

(3) The software version utilized in the equipment, if applicable;

(4) Test procedures specified (including date or revision number); and

(5) Laboratory accreditation (by whom and to what standard). (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

2. CERTIFIED AND NON-CERTIFIED INTERCONNECTION EQUIPMENT (Cont'd.)

a. Certified Equipment (Cont'd.)

Technical (as appropriate):

(1) Device ratings (kW, kV, Volts, amps, etc.);

(2) Maximum available fault current in amps;

(3) In-rush Current in amps;

(4) Trip points, if factory set (trip value and timing);

(5) Trip point and timing ranges for adjustable settings;

(6) Nominal power factor or range if adjustable;

(7) If the equipment is Certified as Non-Exporting and the method used (reverse power or underpower);

(8) If the equipment is Certified as Non-Islanding; and

(9) If the equipment is Certified as a Non-Export AC/DC Converter.

It is the responsibility of the equipment manufacturer to ensure that Certification information is made publicly available by the manufacturer, the testing laboratory, or by a third party.

b. Non-Certified Equipment

For non-Certified equipment, some or all of the tests described in this Rule may be required by Distribution Provider for each Generating and/or Interconnection Facility. The manufacturer or a laboratory acceptable to Distribution Provider may perform these tests. Test results for non-Certified equipment must be submitted to Distribution Provider for the Supplemental Review. Approval by Distribution Provider for equipment used in a particular Generating and/or Interconnection Facility does not guarantee Distribution Provider's approval for use in other Generating and/or Interconnection Facilities. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

3. TYPE TESTING

a. Type Tests and Criteria for Interconnection Equipment Certification

Type testing provides a basis for determining that equipment meets the specifications for being designated as Certified equipment under this Rule. The requirements described in this Section cover only issues related to Interconnection and are not intended to address device safety or other issues.

Table L.1 defines the test criteria by Generator or inverter technology. While UL 1741(1) and UL 1741 – Supplement SA were written specifically for inverters, the requirements are readily adaptable to synchronous Generators, induction Generators, as well as single/multi-function controllers and protection relays. Until a universal test standard is developed, Distribution Provider or NRTL shall adopt the procedures referenced in Table L.1 as appropriate and necessary for a Generating Facility and/or Interconnection Facilities or associated equipment performance and its control and Protection Functions. These tests shall be performed in the sequence shown in Table L.2.

Non-Export AC/DC Converters must satisfy the requirements in its definition in Section C. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

3. TYPE TESTING (Cont'd.)

a. Type Tests and Criteria for Interconnection Equipment Certification (Cont'd.)

Table L.1, Type Test and Requirements for Interconnection Equipment Certification

Type Test	Reference 1	Inverter (6)	Smart Inverter (7)	Synchronous Generators	Induction Generators
Utility Interaction	UL 1741 – 39, 40	X	X	X	X
Utility Compatibility (Required testing to 1547 & 1547.1)	UL 1741 - 46	X	X	X	X
DC Isolation	IEEE 1547.1(8) -5.6	X	X	-	-
Dielectric Voltage Withstand	IEEE 1547.1(8) -5.5.3	X	X	X	X
Harmonic Distortion	IEEE 1547.1(8) -5.11	X	X	X	X
DC Injection	IEEE 1547.1(8) -5.6	X	X	-	-
Distribution Provider Voltage Variation	IEEE 1547.1(8) -5.2	X	-	X	X
Distribution Provider Frequency Variation	IEEE 1547.1(8) -5.3	X	-	X	X
Abnormal Tests	UL 1741 – 47				
Loss of Control Circuit	UL 1741 – 47.8	X	X	X	X
Short Circuit	UL 1741 - 47.3	X	X	X	X
Load Transfer	UL 1741 - 47.7	X	X	X	X
Surge Withstand Capability	L.3.e	X	X	X	X
Anti-Islanding (non-Smart Inverters)	L.3.b	(2)	-	(2)	(2)
Non-Export	L.3.c	(3)	(3)	(3)	(3)
In-rush Current	L.3.d	-	-	-	(4)
Synchronization	L.3.f	(5)	(5)	X	(5)
Anti-islanding (Smart Inverters)	UL 1741 SA - SA8	-	X	-	-
Low and High Voltage Ride-through (L/H VRT)	UL 1741 SA – SA9	-	X	-	-
Low and High Frequency Ride-through (L/H FRT)	UL 1741 SA - SA10	-	X	-	-
Normal and Soft-Start Ramp Rate (RR)	UL 1741 SA - SA11	-	X	-	-
Specified Power Factor	UL 1741 SA - SA12	-	X	-	-
Volt/Var Mode (Q(V))	UL 1741 SA - SA13	-	X	-	-
Frequency-Watt(FW) - optional	UL 1741 SA - SA14	-	X	-	-
Volt-Watt (VW) - optional	UL 1741 SA - SA15	-	X	-	-
Markings and Instructions	UL 1741 SA6, SA16	-	X	-	-

Table Notes:

(1) References are to section numbers in either UL 1741 and/or UL 1741-Supplement SA (Inverters, Converters and Charge Controllers for Use in Independent Power Systems) or this Rule. References in UL 1741 to "photovoltaics" or "inverter" may have to be adapted to the other technologies by the testing laboratory to appropriately apply in the tests to other technologies.
(2) Required only if Non-Islanding designation.
(3) Required only if Non-Export designation is desired.
(4) Required for Generators that use Distribution Provider power to motor to speed.
(5) Required for all self-excited induction Generators as well as Inverters that operate as voltage sources when connected to Distribution Provider's Distribution or Transmission System.
(6) Inverters compliant with Section H.
(7) Inverters compliant with Section Hh.
(8) IEEE 1547.1 refers to 2005 revision.

"X" = Required "-" = Not Required

(L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

3. TYPE TESTING (Cont'd.)

a. Type Tests and Criteria for Interconnection Equipment Certification (Cont'd.)

Table L.2 Type Tests Sequence for Interconnection Equipment Certification

Test No.	Type Test
1	Distribution Provider Voltage and Frequency Variation
2	Synchronization
3	Surge Withstand Capability
4	Distribution Provider Voltage and Frequency Variation, including ride through
5	Synchronization
6	Other Required and Optional Tests

Tests 1, 2, and 3 must be done first and in the order shown. Tests 4 and on follow in order convenient to the test agency.

b. Anti-Islanding Test

Devices that pass the Anti-Islanding test procedure described in UL 1741 Section 46.3 will be considered Non-Islanding for the purposes of these Interconnection requirements. The test is required only for devices for which a Certified Non-Islanding designation is desired.

c. Non-Export Test

Equipment that passes the Non-Export test procedure described in Section L.7.a will be considered Non-Exporting for the purposes of these Interconnection requirements. This test is required only for devices for which a Certified Non-Export designation is desired. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

3. TYPE TESTING (Cont'd.)

d. In-rush Current Test

Generation equipment that utilizes Distribution Provider power to motor up to speed will be tested using the procedure defined in Section L.7.b to determine the maximum current drawn during this startup process. The resulting In-rush Current is used to estimate the Starting Voltage Drop.

e. Surge Withstand Capability Test

The interconnection equipment shall be tested for the surge withstand requirement in Section H.1.c in all normal operating modes in accordance with IEEE Std C62.45-2002 for equipment rates less than 1000 V to confirm that the surge withstand capability is met by using the selected test level(s) from IEEE Std C62.41.2-2002. Interconnection equipment rated greater than 1000 V shall be tested in accordance with manufacturer or system integrator designated applicable standards. For interconnection equipment signal and control circuits, use IEEE Std C37.90.1-2002. These tests shall confirm the equipment did not fail, did not misoperate, and did not provide misinformation (IEEE 1547-5.1.3.2).

The location/exposure category for which the equipment has been tested shall be clearly marked on the equipment label or in the equipment documentation. External surge protection may be used to protect the equipment in harsher location/exposure categories. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

3. TYPE TESTING (Cont'd.)

f. Synchronization Test

This test is applied to synchronous Generators, self-excited induction generators, and inverters capable of operating as voltage-source while connected to Distribution Provider's Distribution or Transmission System. The test is also applied to the resynchronization Function (transition from stand-alone to parallel operation) on equipment that provides such functionality. This test may not need to be performed on both the synchronization and re-synchronization functions if the manufacturers can verify to the satisfaction of the testing organization that monitoring and controls hardware and software are common to both functions. This test is not necessary for induction generators or current-source inverters. Instead, the ln-rush Current test Section L.3.d shall be applied to those generators.

This test shall demonstrate that at the moment of the paralleling-device closure, all three synchronization parameters in Table L.3 are within the stated limits. This test shall also demonstrate that if any of the parameters are outside of the limits stated in the table, the paralleling-device shall not close (IEEE 1547-5.1.2A). The test will start with only one of the three parameters: (1) voltage difference between Generating Facility and Distribution Provider's Distribution or Transmission System; (2) frequency difference; or (3) phase angle outside of the synchronization specification. Verify that the Generating Facility is brought within specification prior to synchronization. Repeat the test five times for each of the three parameters. For manual synchronization with synch check or manual control with auto synchronization, the test must verify that paralleling does not occur until the parameters are brought within specifications. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

3. TYPE TESTING (Cont'd.)

f. Synchronization Test (Cont'd.)

Table L.3
***Synchronization Parameter Limits* [1]**

Aggregate Rating of Generator Units (kVA)	Frequency Difference (Δf, Hz)	Voltage Difference Phase Angle (ΔV, %)	Difference (ΔΦ,°)
0-500	0.3	10	20
> 500-1,500	0.2	5	15
> 1,500-10,000	0.1	3	10

[1] – IEEE 1547-5.1.1B

g. Paralleling Device Withstand Test

The di-electric voltage withstand test specified in Section L.1 shall be performed on the paralleling device to ensure compliance with those requirements specified in Section H.1.c (IEEE 1547-5.1.3.3).

h. Backfeed Test

Non-Export AC/DC Converters must satisfy the requirements in its definition in Section C.

4. PRODUCTION TESTING

At a minimum, each interconnection system shall be subjected to Distribution Provider Voltage and Frequency Variation Test procedure described in UL1741 under Manufacturing and Production Tests, Section 68 and the Synchronization test specified in Section L.3.f. Interconnection systems with adjustable set points shall be tested at a single set of set points as specified by the manufacturer. This test may be performed in the factory or as part of a Commissioning Test (Section L.5). (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

5. COMMISSIONING TESTING

a. Commissioning Testing

Commissioning Testing, where required, will be performed on-site to verify protective settings and functionality. Upon initial Parallel Operation of a Generating Facility, or any time interface hardware or software is changed that may affect the functions listed below, a Commissioning Test must be performed. An individual qualified in testing protective equipment (professional engineer, factory–certified technician, or licensed electrician with experience in testing protective equipment) must perform Commissioning Testing in accordance with the manufacturer's recommended test procedure to verify the settings and requirements per this Rule.

Distribution Provider may require written Commissioning test procedure be submitted to Distribution Provider at least 10 working days prior to the performance of the Commissioning Test. Distribution Provider has the right to witness Commissioning Test. Distribution Provider may also require written certification by the installer describing which tests were performed and their results. Protective Functions to be tested during commissioning, particularly with respect to non-Certified equipment, may consist of the following:

(1) Over and under voltage

(2) Over and under frequency

(3) Anti-Islanding function (if applicable)

(4) Non-Exporting function (if applicable)

(5) Inability to energize dead line (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

5. COMMISSIONING TESTING (Cont'd.)

a. Commissioning Testing (Cont'd.)

(6) Time delay on restart after Distribution Provider source is stable

(7) Distribution Provider system fault detection (if used)

(8) Synchronizing controls (if applicable)

(9) Other Interconnection Protective Functions that may be required as part of the Generator Interconnection Agreement

Commissioning Test shall include visual inspections of the interconnection equipment and protective settings to confirm compliance with the interconnection requirements.

b. Review, Study, and Additional Commissioning Test Verification Costs

A Producer shall be responsible for the reasonably incurred costs of the reviews, studies and additional Commissioning Test verifications conducted pursuant to Section E of this Rule. If the initial Commissioning Test verification is not successful through no fault of Distribution Provider, Distribution Provider may impose upon Producer a cost based charge for subsequent Commissioning Test verifications. All Costs for additional Commissioning Test verifications shall be paid by Producer within thirty days of receipt of Distribution Provider's invoice. The invoice provided by Distribution Provider shall consist of the hourly rate multiplied by the hours incurred by Distribution Provider and will separately specify the amount of time spent on-site from that spent in roundtrip travel to the Commissioning Test site. Additional cost, if any, will be specified on the invoice. If the initial Commissioning Test verification is not successful through the fault of Distribution Provider, that visit will not be considered the initial Commissioning Test verification. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

5. COMMISSIONING TESTING (Cont'd.)

c. Other Checks and Tests

Other checks and tests that may need to be performed include:

(1) Verifying final Protective Function settings

(2) Trip test (L.5.g)

(3) In-service tests (L.5.h)

d. Certified Equipment

Generating Facilities qualifying for interconnection through the Fast Track process incorporate Certified Equipment that have, at a minimum, passed the Type Tests and Production Tests described in this Rule and are judged to have little or no potential impact on Distribution Provider's Distribution or Transmission System. For such Generating Facilities, it is necessary to perform only the following tests:

(1) Protective Function settings that have been changed after Production Testing will require field verification. Tests shall be performed using injected secondary frequencies, voltages and currents, applied waveforms, at a test connection using a Generator to simulate abnormal Distribution Provider voltage or frequency, or varying the set points to show that the device trips at the measured (actual) Distribution Provider voltage or frequency.

(2) The Non-Islanding function shall be checked by operating a load break disconnect switch to verify the Interconnection equipment ceases to energize Distribution Provider's Distribution or Transmission System and does not re-energize it for the required time delay after the switch is closed. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

5. COMMISSIONING TESTING (Cont'd.)

d. Certified Equipment (Cont'd.)

(3) The Non-Exporting function shall be checked using secondary injection techniques. This function may also be tested by adjusting the Generating Facility output and local loads to verify that the applicable Non-Exporting criteria (i.e., reverse power or underpower) are met.

The Supplemental Review or an Interconnection Study may impose additional components or additional testing.

e. Non-Certified Equipment

Non-certified Equipment shall be subjected to the appropriate tests described in Type Testing (Section L.3) as well as those described in Certified Equipment Commissioning Tests (Section L.5.d). With Distribution Provider's approval, these tests may be performed in the factory, in the field as part of commissioning, or a combination of both. Distribution Provider, at its discretion, may also approve a reduced set of tests for a particular Generating Facility or, for example, if it determines it has sufficient experience with the equipment.

f. Verification of Settings

At the completion of Commission testing, Producer shall confirm all devices are set to Distribution Provider-approved settings. Verification shall be documented in the Commissioning Test Certification. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

5. COMMISSIONING TESTING (Cont'd.)

g. Trip Tests

Interconnection Protective Functions and devices (e.g. reverse power relays) that have not previously been tested as part of the Interconnection Facilities with their associated interrupting devices (e.g. contactor or circuit breaker) shall be trip tested during commissioning. The trip test shall be adequate to prove that the associated interrupting devices open when the protective devices operate. Interlocking circuits between Protective Function devices or between interrupting devices shall be similarly tested unless they are part of a system that has been tested and approved during manufacturing.

h. In-service Tests

Interconnection Protective Functions and devices that have not previously been tested as part of the Interconnection Facilities with their associated instrument transformers or that are wired in the field shall be given an in-service test during commissioning. This test will verify proper wiring, polarity, CT/PT ratios, and proper operation of the measuring circuits. The in-service test shall be made with the power system energized and carrying a known level of current. A measurement shall be made of the magnitude and phase angle of each Alternating Current (AC) voltage and current connected to the protective device and the results compared to expected values. For protective devices with built-in Metering Functions that report current and voltage magnitudes and phase angles, or magnitudes of current, voltage, and real and reactive power, the metered values may be used for in-service testing. Otherwise, portable ammeters, voltmeters, and phase-angle meters shall be used. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

6. PERIODIC TESTING

Periodic Testing of Interconnection-related Protective Functions shall be performed as specified by the manufacturer, or at least every four years. All Periodic Tests prescribed by the manufacturer shall be performed. Producer shall maintain Periodic Test reports or a log for inspection by Distribution Provider. Periodic Testing conforming to Distribution Provider test intervals for the particular Line Section may be specified by Distribution Provider under special circumstances, such as high fire hazard areas. Batteries used to activate any Protective Function shall be checked and logged once per month for proper voltage. Once every four years, the battery must be either replaced or a discharge test performed.

7. TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS

This Section describes the additional Type Tests necessary to qualify a device as Certified under this Rule. These Type Tests are not contained in Underwriters Laboratories UL 1741 Standard *Inverters, Converters and Controllers for Use in Independent Power Systems,* or other referenced standards.

a. Non-Exporting Test Procedures

The Non-Exporting test is intended to verify the operation of relays, controllers and inverters designed to limit the export of power and certify the equipment as meeting the requirements of Screen I, Options 1 and 2, of the review process. Tests are provided for discrete relay packages and for controllers and inverters with the intended Functions integrated. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

7. TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS (Cont'd.)

a. Non-Exporting Test Procedures (Cont'd.)

i) Discrete Reverse Power Relay Test

This version of the Non-Exporting test procedure is intended for discrete reverse power and underpower relay packages provided to meet the requirements of Options 1 and 2 of Screen I. It should be understood that in the reverse power application, the relay will provide a trip output with power flowing in the export (toward Distribution Provider's Distribution or Transmission System) direction.

Step 1: Power Flow Test at Minimum, Midpoint and Maximum Pickup Level Settings

Determine the corresponding secondary pickup current for the desired export power flow of 0.5 secondary watts (the minimum pickup setting, assumes 5 amp and 120V CT/PT secondary). Apply nominal voltage with minimum current setting at zero (0) degrees phase angle in the trip direction. Increase the current to pickup level. Observe the relay's (LCD or computer display) indication of power values. Note the indicated power level at which the relay trips. The power indication should be within 2% of the expected power. For relays with adjustable settings, repeat this test at the midpoint, and maximum settings. Repeat at phase angles of 90, 180 and 270 degrees and verify that the relay does not operate (measured watts will be zero or negative). (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

7. TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS (Cont'd.)

a. Non-Exporting Test Procedures (Cont'd.)

i) Discrete Reverse Power Relay Test (Cont'd.)

Step 2: Leading Power Factor Test

Apply rated voltage with a minimum pickup current setting (calculated value for system application) and apply a leading power factor load current in the non-trip direction (current lagging voltage by 135 degrees). Increase the current to relay rated current and verify that the relay does not operate. For relays with adjustable settings, this test should be repeated at the minimum, midpoint, and maximum settings.

Step 3: Minimum Power Factor Test

At nominal voltage and with the minimum pickup (or ranges) determined in Step 1, adjust the current phase angle to 84 or 276 degrees. Increase the current level to pickup (about 10 times higher than at 0 degrees) and verify that the relay operates. Repeat for phase angles of 90, 180 and 270 degrees and verify that the relay does not operate.

Step 4: Negative Sequence Voltage Test

Using the pickup settings determined in Step 1, apply rated relay voltage and current at 180 degrees from tripping direction, to simulate normal load conditions (for three-phase relays, use Ia at 180, Ib at 60 and Ic at 300 degrees). Remove phase-1 voltage and observe that the relay does not operate. Repeat for phases-2 and 3. (L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 250
GENERATING FACILITY INTERCONNECTIONS

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

7. TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS (Cont'd.)

a. Non-Exporting Test Procedures (Cont'd.)

i) Discrete Reverse Power Relay Test (Cont'd.)

Step 5: Load Current Test

Using the pickup settings determined in Step 1, apply rated voltage and current at 180 degrees from the tripping direction, to simulate normal load conditions (use Ia at 180, Ib at 300 and Ic at 60 degrees). Observe that the relay does not operate.

Step 6: Unbalanced Fault Test

Using the pickup settings determined in Step 1, apply rated voltage and 2 times rated current, to simulate an unbalanced fault in the non-trip direction (use Va at 0 degrees, Vb and Vc at 180 degrees, Ia at 180 degrees, Ib at 0 degrees, and Ic at 180 degrees). Observe that the relay, especially single phase, does operate properly.

Step 7: Time Delay Settings Test

Apply Step 1 settings and set time delay to minimum setting. Adjust the current source to the appropriate level to determine operating time, and compare against calculated values. Verify that the timer stops when the relay trips. Repeat at midpoint and maximum delay settings. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

7. TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS (Cont'd.)

a. Non-Exporting Test Procedures (Cont'd.)

i) Discrete Reverse Power Relay Test (Cont'd.)

Step 8: Dielectric Test

Perform the test described in IEC 414 using 2 kV RMS for 1 minute.

Step 9: Surge Withstand Test

Perform the surge withstand test described in IEEE C37.90.1.1989 or the surge withstand capability test described in L.3.e.

ii) Discrete Underpower Relay Test

This version of the Non-Exporting test procedure is intended for discrete underpower relay packages and meets the requirements of Option 2 of Screen I. A trip output will be provided when import power (toward Producer's load) drops below the specified level.

Note: For an underpower relay, pickup is defined as the highest power level at which the relay indicates that the power is less than the set level. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

7. TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS (Cont'd.)

a. Non-Exporting Test Procedures (Cont'd.)

ii) Discrete Underpower Relay Test (Cont'd.)

Step 1: Power Flow Test at Minimum, Midpoint and Maximum Pickup Level Settings

Determine the corresponding secondary pickup current for the desired power flow pickup level of 5% of peak load minimum pickup setting. Apply rated voltage and current at 0 (zero) degrees phase angle in the direction of normal load current.

Decrease the current to pickup level. Observe the relay's (LCD or computer display) indication of power values. Note the indicated power level at which the relay trips. The power indication should be within 2% of the expected power. For relays with adjustable settings, repeat the test at the midpoint, and maximum settings. Repeat at phase angles of 90, 180 and 270 degrees and verify that the relay operates (measured watts will be zero or negative).

Step 2: Leading Power Factor Test

Using the pickup current setting determined in Step 1, apply rated voltage and rated leading power factor load current in the normal load direction (current leading voltage by 45 degrees). Decrease the current to 145% of the pickup level determined in Step 1 and verify that the relay does not operate. For relays with adjustable settings, repeat the test at the minimum, midpoint, and maximum settings. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

7. TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS (Cont'd.)

a. Non-Exporting Test Procedures (Cont'd.)

ii) Discrete Underpower Relay Test (Cont'd.)

Step 3: Minimum Power Factor Test

At nominal voltage and with the minimum pickup (or ranges) determined in Step 1, adjust the current phase angle to 84 or 276 degrees. Decrease the current level to pickup (about 10% of the value at 0 degrees) and verify that the relay operates. Repeat for phase angles 90, 180 and 270 degrees and verify that the relay operates for any current less than rated current.

Step 4: Negative Sequence Voltage Test

Using the pickup settings determined in Step 1, apply rated relay voltage and 25% of rated current in the normal load direction, to simulate light load conditions. Remove phase 1 voltage and observe that the relay does not operate. Repeat for Phases-2 and 3.

Step 5: Unbalanced Fault Test

Using the pickup settings determined in Step 1, apply rated voltage and two times rated current, to simulate an unbalanced fault in the normal load direction (use Va at 0 degrees, Vb and Vc at 180 degrees, Ia at 0 degrees, Ib at 180 degrees, and Ic at 0 degrees). Observe that the relay (especially single-phase types) operates properly. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

7. TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS (Cont'd.)

a. Non-Exporting Test Procedures (Cont'd.)

ii) Discrete Underpower Relay Test (Cont'd.)

Step 6: Time Delay Settings Test

Apply Step 1 settings and set time delay to minimum setting. Adjust the current source to the appropriate level to determine operating time, and compare against calculated values. Verify that the timer stops when the relay trips. Repeat at midpoint and maximum delay settings.

Step 7: Dielectric Test

Perform the test described in IEC 414 using 2 kV RMS for 1 minute.

Step 8: Surge Withstand Test

Perform the surge withstand test described in IEEE C37.90.1.1989 or the surge withstand test described in Section L.3.e. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

7. TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS (Cont'd.)

a. Non-Exporting Test Procedures (Cont'd.)

iii) Tests for Inverters and Controllers with Integrated Functions

Inverters and controllers designed to provide reverse or underpower functions shall be tested to certify the intended operation of this function. Two methods are acceptable:

Method 1: If the inverter or controller utilizes external current/voltage measurement to determine the reverse or underpower condition, then the inverter or controller shall be functionally tested by application of appropriate secondary currents and potentials as described in the Discrete Reverse Power Relay Test, Section L.7.a.i of this Rule.

Method 2: If external secondary current or voltage signals are not used, then unit-specific tests must be conducted to verify that power cannot be exported across the PCC for a period exceeding two seconds. These may be factory tests, if the measurement and control points are integral to the unit, or they may be performed in the field.

iv) Tests for Inadvertent Export Inverters

Test requirements for certified inverters with integrated functions for Inadvertent Export shall verify the performance requirements specified in Section Mm of this Rule.

(L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

7. TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS (Cont'd.)

a. Non-Exporting Test Procedures (Cont'd.)

v) Interim Tests for Non-Export AC/DC Converters ("Converter")

Step 1: Limitation of Back-feed Under Steady State Conditions

Apply the nominal DC operating voltage of the Converter across its DC terminals with a battery source or simulated equivalent of a battery source. Vary the battery source by 100%, 75%, 50%, 25%, and 10% of Converter rated output power. The measured steady-state DC current component at each of the AC terminals of the Converter is required to be less than 0.5% of the Converter's rated RMS AC current. This test is to be repeated for 80% nominal DC operating voltage and for 125% nominal DC operating voltage. Testing requirements can be modified upon mutual agreement of the Distribution Provider and the Applicant.

Step 2: Back-feed Under Fault Conditions – DC Output Shorted

With a battery source or simulated equivalent of a battery source connected to the DC terminals, apply rated conditions of the Converter then short its DC terminals for 200 milliseconds. After 5 cycles of inducing the short circuit, record the measured peak current at each of the AC terminals of the Converter. These peak currents within this time interval are each required to be less than 0.5% of the Converter's rated RMS AC current. Testing requirements can be modified upon mutual agreement of the Distribution Provider and the Applicant. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

7. TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS (Cont'd.)

a. Non-Exporting Test Procedures (Cont'd.)

v) Interim Tests for Non-Export AC/DC Converters ("Converter") (Cont'd.)

Step 3: Back-feed Under Fault Conditions – AC Input Shorted: Phase-Ground, Phase-Phase, and 3-Phase

With a battery source or simulated equivalent of a battery source connected to the DC terminals, apply rated conditions of the Converter, then apply a short between any two phases on the grid side of the Converter for 200 milliseconds. After 5 cycles of inducing the short circuit, record the measured peak current at each of the AC terminals of the Converter. These peak currents within this time interval are each required to be less than 0.5% of the Converter's rated RMS AC current. This test is to be repeated for phase-ground and 3-phase shorts. Testing requirements can be modified upon mutual agreement of the Distribution Provider and the Applicant.

Step 4: Back-feed Under Fault Conditions – Component Faults

Distribution Provider can elect to test for back-feed under the condition of a short circuit across certain components which are internal to the Converter. Potential tests can include inducing a short circuit across different terminals for electronic switches and/or across different terminals for internal transformers. Ultimately, the components used for testing will be chosen on a case-by-case basis and will depend on the Converter's circuit topology. Testing requirements can be modified upon mutual agreement of the Distribution Provider and the Applicant.

Step 5: Harmonics Testing

Under normal loading conditions at 10%, 25%, 50%, 75%, and 100% of the Converter's rated power output, conduct harmonic current distortion measurements on each of the AC terminals. Measurements should be below the maximum harmonic current distortion requirements given in IEEE 1547-4.3.3. (L)

(Continued)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.) (L)

7. TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS (Cont'd.)

b. In-rush Current Test Procedures

This test will determine the maximum In-rush Current drawn by the Generator.

i) Locked-Rotor Method

Use the test procedure defined in NEMA MG-1 (manufacturer's data is acceptable if available).

ii) Start-up Method

Install and setup the Generating Facility equipment as specified by the manufacturer. Using a calibrated oscilloscope or data acquisition equipment with appropriate speed and accuracy, measure the current draw at the Point of Interconnection as the Generating Facility starts up and parallels with Distribution Provider's Distribution or Transmission System. Startup shall follow the normal, manufacturer-specified procedure. Sufficient time and current resolution and accuracy shall be used to capture the maximum current draw within 5%. In-rush Current is defined as the maximum current draw from Distribution Provider during the startup process, using a 10-cycle moving average. During the test, Distribution Provider source, real or simulated, must be capable of maintaining voltage within +/- 5% of rated at the connection to the unit under test. Repeat this test five times. Report the highest 10-cycle current as the In-rush Current. A graphical representation of the time-current characteristic along with the certified In-rush Current must be included in the test report and made available to Distribution Provider. (L)

(Continued)

M. INADVERTENT EXPORT (L)

Under certain operating conditions, an Applicant may choose to completely offset their facility load by installing generation systems which are optimally sized to meet their peak demand with load following functionality on the Generator controls to ensure conditional export of electrical power from the Generating Facility to Distribution Provider's Distribution or Transmission System. In situations where the loading changes rapidly and/or the Generator cannot ramp down quickly enough, the Generating Facility may need to export small amounts of power for limited duration. The event of exporting uncompensated power for a short time is referred to as Inadvertent Export.

The following are the minimum requirements for Inadvertent Export systems. Other factors relevant to the interconnection study process (e.g. 15% screen results, short circuit current ratio, etc.) may necessitate additional technical requirements (e.g. reclose block, transfer trip, ground bank, etc.) that are not explicitly noted here. Inadvertent Export may not be available for interconnections to Networked Secondary Systems.

1. For Inadvertent Export interconnection requests, additional Protective Functions and equipment to detect Distribution or Transmission System faults (per Distribution Provider's standard practices) may be required over and above the basic Protective Functions and equipment associated with the four options in the Export Screen. Protective Functions may include, but are not limited to, directional overcurrent/voltage-restraint overcurrent Protective Functions for line-to-line fault detection and overcurrent/overvoltage Protective Functions for line-to-ground detection. The addition of a ground bank or ground detector may also be necessary. (L)

(Continued)

M. INADVERTENT EXPORT (Cont'd.) (L)

2. The effect on equipment ratings can be mitigated by limiting the amount of inadvertent export allowed. To a large degree, Voltage Regulation may be similarly handled. The amount of Inadvertent Export is dependent on specific Distribution Provider requirements and should be limited to the lesser of the following values:

   a. 50% of the Generating Facility Capacity, or

   b. 10% of the continuous conductor rating in watts at 0.9 power factor for the lowest rated feeder conductor upstream of the GF (i.e. 200kW @ 12kV), or

   c. 110% of the largest load block in the facility, or

   d. 500kW or some other maximum level indicated by Distribution Provider

3. In addition to the limits above, the following are required:

   a. A reverse power Protective Function will be provided to trip the connected Generator(s) within two seconds if the proposed amount of Inadvertent Export is exceeded.

   b. The frequency of Inadvertent Export occurrences should be less than two occurrences per 24-hour period.

   c. A separate reverse power or underpower Protective Function will be required (in addition to the reverse power Protective Function described in 3a. above) to trip the connected Generator(s) if the duration of reverse power or underpower (i.e. ANY export) exceeds 60 seconds. (L)

(Continued)

Mm. INADVERTENT EXPORT FOR INTERCONNECTION REQUESTS UTILIZING UL-1741 CERTIFIED OR SA LISTED GRID SUPPORT (NON-ISLANDING) INVERTERS (L)

The following are the minimum requirements for Inadvertent Export systems that meet the criteria specified below. Other factors relevant to the interconnection study process (e.g., 15% screen results, short circuit current ratio, etc.) may necessitate additional technical requirements (e.g., reclose block, transfer trip, ground bank, etc.) that are not explicitly noted here. Inadvertent Export may not be available for interconnections to Networked Secondary Systems.

The certified control functions internal to the inverter control or external control system may be used to replace the discrete reverse/under power relay functions described in Section M provided the requirements outlined below are met.

1) All of the following requirements must be met by the Generating Facility to qualify for Inadvertent Export under this Section.

   a. The Generating Facility must utilize only UL-1741 certified or UL-1741 SA listed grid support non-islanding inverters; and,

   b. The Generating Facility must have an aggregate maximum nameplate capacity of 500 kVA or less; and,

   c. The Generating Facility's total energy export must not exceed its nameplate rating (kVA-gross) multiplied by 0.1 hours per day over a rolling 30-day period (e.g., for a 100 kVA-gross nameplate Generating Facility, the maximum energy allowed to be exported for a 30-day period is 300 kWh) ; and,

   d. Export from the Generating Facility across the PCC to the Distribution System is less than 100 kVA. (L)

(Continued)

Mm. INADVERTENT EXPORT FOR INTERCONNECTION REQUESTS UTILIZING UL-1741 CERTIFIED OR SA LISTED GRID SUPPORT (NON-ISLANDING) INVERTERS (Cont'd.) (L)

2) To govern the level of Inadvertent Export allowable under this Section, the Generating Facility must utilize a NRTL-certified control system or NRTL-certified inverter system that meets all of the following requirements.

a. Must result in the Generating Facility disconnecting from the Distribution System, ceasing to energize the Distribution System or halting energy production within two (2) seconds after either:

i. The period of continuous export exceeds 30 seconds;

or,

ii. The level of export exceeds 100 kVA.

b. Must monitor that the total energy export is maintained within the allowable energy export outlined above 1.c and provide an indication or notification (e.g., electronic, alarm) if that energy export limit is exceeded.

c. Failure of the of the control or inverter system for more than thirty (30) seconds, resulting from loss of control signal, loss of control power or a single component failure or related control sensing of the control circuitry, must result in the Generating Facility entering Non-Export operation where no energy is exported across to the PCC to the Distribution System.

Interim approval of the control or inverter system may be permitted upon mutual agreement of PG&E and the Producer. (L)

(Continued)

Mm. INADVERTENT EXPORT FOR INTERCONNECTION REQUESTS UTILIZING UL-1741 CERTIFIED OR SA LISTED GRID SUPPORT (NON-ISLANDING) INVERTERS (Cont'd.) (L)

3) Applicability of Engineering Review Screens.

Inadvertent Export systems that meet the requirements described herein are processed under Initial Review Screens A through J as described in Section H. If these systems fail Screen J, they then bypass Screens K and L and are processed under Screens M and M1 as described below.

Screen M: Is the aggregate Generating Facility capacity on the Line Section less than 15% of Line Section peak load for all line sections bound by automatic sectionalizing devices?

- If Yes (pass), Initial Review is complete.
- If No (fail), continue to Screen M1.

Screen M1: Is the aggregate of all distributed energy resources (DER) causing reverse power flow (1) at a line section with a voltage regulator device(s) or (2) at a protection device, including the circuit breaker / field recloser?*,**

- If No (pass), existing DER does not cause reverse power flow at (1) or (2) and Initial Review is complete.
- If Yes (fail), existing DER causes reverse power flow at (1) or (2); fail Initial Review and Supplemental Review is required.

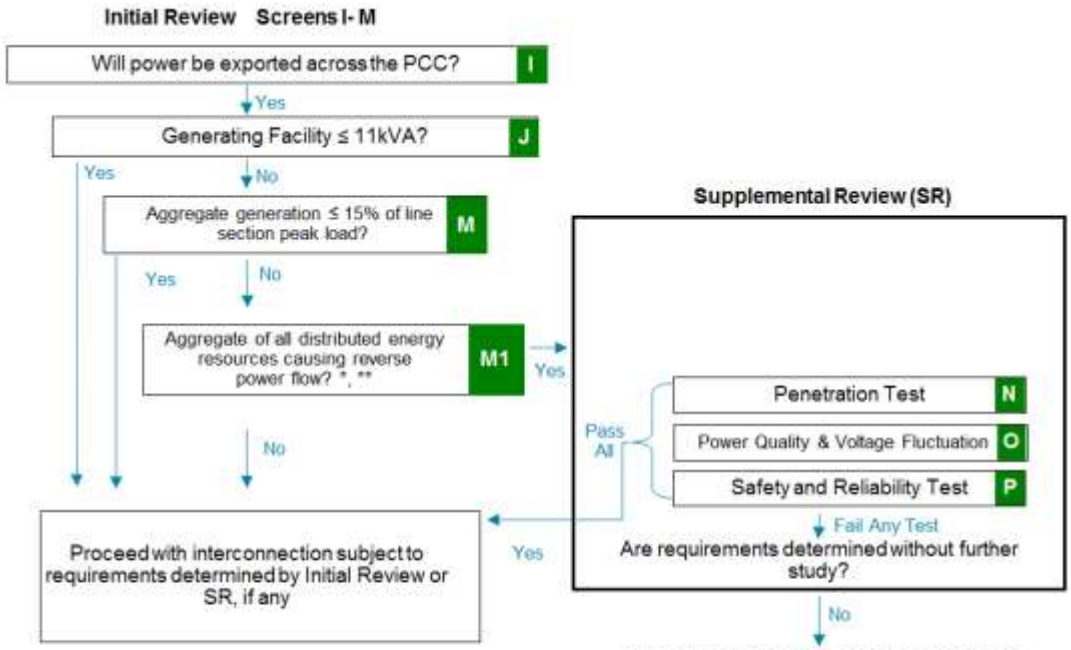
* For the purposes of applying Screen M1 herein, Distribution Provider shall utilize a zero coincidence factor when considering the impact of other Inadvertent Export systems that meet the requirements of Section Mm (i.e., projects that qualify for Option 6 under Section G.1.i) such that those Inadvertent Export systems do not impact Screen M1's aggregate analysis determination for the individual Inadvertent Export project being evaluated.

** The presence of existing non-certified DER on the line section may require additional review to ensure safe and reliable grid operation. (L)

(Continued)

Mm. INADVERTENT EXPORT FOR INTERCONNECTION REQUESTS UTILIZING UL-1741 CERTIFIED OR SA LISTED GRID SUPPORT (NON-ISLANDING) INVERTERS (Cont'd.) (L)

3) Applicability of Engineering Review Screens. (Cont'd.)



* For the purposes of applying Screen M1 herein, Distribution Provider shall utilize a zero coincidence factor when considering the impact of other Inadvertent Export systems that meet with the requirements of Section Mm (i.e., projects that qualify for Option 6 under Section G.1.i) such that those Inadvertent Export systems do not impact Screen M1's aggregate analysis determination for the individual analysis determination for the individual Inadvertent Export project being evaluated.

** The presence of existing non-certified DER on the line section may require additional review to ensure safe and reliable grid operation. (L)

(Continued)

Mm1. OPTION 8: Non-Export Utilizing Certified Power Control Systems (P)(L)

The following are the minimum requirements for Non-Export systems that use certified power control systems (PCS) with an open loop response time (OLRT) no more than two seconds. It should be noted that other factors relevant to the Interconnection Study process may necessitate additional technical requirements that are not explicitly noted here.

1. Use a PCS that passes the requirements of the 2019 Underwriters Laboratories (UL) Power Control Systems Certification Requirements Decision (CRD) test protocol. Non-export systems may use a PCS that passes later published revisions to the CRD test protocol or may use a PCS that is certified to the UL 1741 certification standard, if UL incorporates the test protocol for PCS into UL 1741 in the future. The NRTL evaluation must have determined that the PCS conforms to the non-exporting functionality in accordance with the relevant CRD or UL published standard.

2. Use a PCS that is certified with an OLRT of two seconds or less, as provided in the PCS's specification data sheets.

3. The PCS must reduce export to zero or less within two seconds of commencing export. A PCS that is certified with an open-loop response time of two seconds or less, and a time to reach steady state of 10 seconds or less, meets this requirement.

4. Set the PCS to not export (zero-export).

5. Use only UL 1741 listed grid-support non-islanding inverters as approved by this tariff.

6. Maintain voltage fluctuations at the limits specified in Electric Rule 2. (P)/(L)

(Continued)

Mm1. OPTION 8: Non-Export Utilizing Certified Power Control Systems (Cont'd) (P)/(L)

The evaluation of a non-export system requesting interconnection under this section:

1. Shall omit evaluation for screen D;

2. Shall utilize the Generating Facility's Gross Nameplate Rating for screens F, F1, and G;

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

4. Screen P may be applied using the Generating Facility's Gross Nameplate Rating for evaluations that use fault current calculations. For other evaluations under screen P, the value identified in iii above may be used.

(P)(L)

(Continued)

Mm2. OPTION 9: Limited Export Utilizing Certified Power Control Systems (P)/(L)

The following are minimum requirements for limited export systems that use certified power control systems (PCS) with an open loop response time (OLRT) no more than two seconds to maintain a level of export that is lower than the nameplate rating. It should be noted that other factors relevant to the Interconnection Study process may necessitate additional technical requirements that are not explicitly noted here.

1. Use a PCS that passes the requirements of the 2019 Underwriters Laboratories (UL) Power Control Systems Certification Requirements Decision (CRD) test protocol. Limited export systems may use a PCS that passes later published revisions to the CRD test protocol, or may use a PCS that is certified to the UL 1741 certification standard, if UL incorporates the test protocol for PCS into UL 1741 in the future. The NRTL evaluation must have determined that the PCS conforms to the export limiting functionality in accordance with the relevant CRD or UL published Standard.

2. Use a PCS that is certified with an OLRT of two seconds or less as provided in the PCS's specification data sheets.

3. The PCS must reduce export to the approved export limit, or less, within two seconds of exceeding the approved export limit. A PCS that is certified with an open-loop response time of two seconds or less, and a time to reach steady state of ten seconds or less, meets this requirement.

4. Set the PCS to not exceed the proposed level of export.

5. Use only UL 1741 listed grid-support non-islanding inverters as approved by this tariff.

6. Maintain voltage fluctuations at the limits specified in Electric Rule 2.

(P)(L)

(Continued)

Mm2. OPTION 9: Limited Export Utilizing Certified Power Control Systems (Cont'd) (P)/(L)

The evaluation of a limited export system requesting interconnection under this section:

1. Shall utilize the Generating Facility's Gross Nameplate Rating for screens F, F1, and G.

2. If the maximum steady state value is greater than 1% of the PCS controlled nameplate (as provided in the NRTL testing reports) utilize the requested limited export value plus the maximum steady state value of the PCS times the PCS controlled nameplate, to evaluate the impacts to the grid under screens D, I, J, K, M, N, and O. If the maximum steady state value is less than 1% of the PCS controlled nameplate (as provided in the NRTL testing reports), utilize only the requested limited export value under screens D, I, J, K, M, N and O.

3. Screen P shall be applied using the Generating Facility's Gross Nameplate Rating for evaluations that use fault current calculations. For other evaluations under screen P, the value identified in ii above may be used.

(P)(L)

(Continued)

Mm3. OPTION 10: Non-Export with Inadvertent Export Utilizing Certified Power Control Systems (P)/(L)

The following are the minimum requirements for Non-Export systems that use certified power control systems (PCS) with an open loop response time (OLRT) between two and ten seconds. It should be noted that other factors relevant to the Interconnection Study process may necessitate additional technical requirements that are not explicitly noted here.

1. Have a nameplate capacity equal to or less than 1,000 kVA.

2. Use a PCS that passes the requirements of the 2019 Underwriters Laboratories (UL) Power Control Systems Certification Requirements Decision (CRD) test protocol. Non-Export may use a PCS that pass later published revisions to the CRD test protocol, or may use a PCS that is certified to the UL 1741 certification standard, if UL incorporates the test protocol for PCS into UL 1741 in the future. The NRTL evaluation must have determined that the PCS conforms to the non-exporting functionality in accordance with the relevant CRD or UL published standard.

3. Use a PCS that is certified with an OLRT of no more than ten seconds, as provided in the PCS's specification data sheets.

4. Set the PCS to not export (zero-export).

5. Use only UL 1741 listed grid-support non-islanding inverters as approved by this tariff.

6. Maintain voltage fluctuations at the limits specified in Electric Rule 2. (P)(L)

(Continued)

Mm3. OPTION 10: Non-Export with Inadvertent Export Utilizing Certified Power Control Systems (Cont'd) (P)/(L)

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

1. Apply screens A through M using the aggregate nameplate inverter rating.

2. Notify the applicant if supplemental review is required, and if so, require the applicant to identify, within 15 business days of being notified, the frequency of inadvertent export, the real power level in watts of inadvertent export, and the time duration of inadvertent export.

3. If distribution upgrades are identified, use screen P to recognize power control parameters, taking into account local feeder conditions; the customer's operating profile; and the magnitude, duration, and frequency of anticipated export;

4. Complete supplemental review within 15 days of receiving the required information specified under ii) above.

5. If the applicant does not provide the operating profile information within the specified 15 business days, perform supplemental review based on information included in the interconnection request within 30 business days of the request for customer operating profile information.

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

(P)(L)

(Continued)

Mm4. OPTION 11: Limited Export with Inadvertent Export Utilizing Certified Power Control Systems (P)/(L)

The following are the minimum requirements for limited export controlled systems that use certified power control systems (PCS) with an open loop response time (OLRT) between two and ten seconds to maintain a level of export that is lower than the nameplate rating. It should be noted that other factors relevant to the Interconnection Study process may necessitate additional technical requirements that are not explicitly noted here.

1. Have a nameplate capacity equal to or less than 1,000 kVA.

2. Use a PCS that passes the requirements of the 2019 Underwriters Laboratories (UL) Power Control Systems Certification Requirements Decision (CRD) test protocol. Limited export systems may use a PCS that pass later published revisions to the CRD test protocol, or may use a PCS that is certified to the UL 1741 certification standard, if UL incorporates the test protocol for PCS into UL 1741 in the future. The NRTL evaluation must have determined that the PCS conforms to the export limiting functionality in accordance with the relevant CRD or UL published standard.

3. Use a PCS that is certified with an OLRT of no more than ten seconds, as provided in the PCS's specification data sheets.

4. Set the PCS to not to exceed the proposed level of export.

5. Use only UL 1741 listed grid-support non-islanding inverters as approved by this tariff.

6. Maintain voltage fluctuations at the limits specified in Electric Rule 2. (P)(L)

(Continued)

Mm4. OPTION 11: Limited Export with Inadvertent Export Utilizing Certified Power Control Systems (Cont'd) (P)/(L)

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

1. Apply screens A through M using the aggregate nameplate inverter rating.

2. Notify the applicant if supplemental review is required, and if so, require the applicant to identify, within 15 business days of being notified, the frequency of inadvertent export, the real power level in watts of inadvertent export, and the time duration of inadvertent export.

3. If distribution upgrades are identified, use screen P to recognize power control parameters, taking into account local feeder conditions; the customer's operating profile; and the magnitude, duration, and frequency of anticipated export.

4. Complete supplemental review within 15 days of receiving the required information specified under ii) above.

5. If the applicant does not provide the operating profile information within the specified 15 business days, perform supplemental review based on information included in the interconnection request within 30 business days of the request for customer operating profile information. (P)(L)

(Continued)

N. EXPEDITED INTERCONNECTION PROCESS FOR NON-EXPORT ENERGY STORAGE GENERATING FACILITIES (L)

Applicants with Interconnection Requests for Non-Export Energy Storage Generating Facilities who meet the requirements outlined below are eligible for expedited interconnection in accordance with the Fast Track Process technical review requirements of Section F.2. Applicants with Non-Export AC/DC Converters that meet the requirements outlined in O. below are also eligible. (L) (P)/(L) (L)

1. ELIGIBILITY REQUIREMENTS

Applicants seeking to interconnect a Generating Facility under the provisions of this Section N must meet the following eligibility requirements.

a. Applicant must electronically submit a completed Interconnection Request, including completing all application fields and submitting all supporting documentation necessary to facilitate the expedited review as required by Distribution Provider. Such documentation may include, but is not limited to, single line diagrams with specific details, manufacturer data sheets for proposed equipment, description of control systems, validation of the right to do business in the state, etc. Distribution Provider shall clearly communicate these requirements as part of the application process. Applicant shall select this process option in the Interconnection Request.

b. Applicant's Generating Facility must meet the requirements outlined in Section N.2 below.

c. Applicant's Interconnection Request must be eligible for and select the Fast Track Process.

d. Applicant's Interconnection Request must pass Fast Track Initial Review and not require any Interconnection Facilities, Distribution Upgrades or Network Upgrades to remain eligible under this Section. As such, Interconnection Requests that select the Cost Envelope Option are not eligible.

e. Applicants selecting this section shall use the corresponding interconnection agreement type provided for eligible Generating Facilities. (L)

(P)

(P)

(Continued)

N. EXPEDITED INTERCONNECTION PROCESS FOR NON-EXPORT ENERGY STORAGE GENERATING FACILITIES (Cont'd.) (L)

2. GENERATING FACILITY ELIGIBILITY CRITERIA

An Applicant's Generating Facility must meet and adhere to the following criteria.

a. The Generating Facility must be comprised solely of the following specific categories of generation technology: Non-Exporting battery storage.

b. The Generating Facility must have an aggregate maximum inverter nameplate rating of no greater than 500 kW. There is no limitation on an energy storage device's kWh capacity rating.

c. The Generating Facility must be located behind an existing single retail meter and Point of Common Coupling with a single, clearly marked and accessible disconnect. No other Generators, other than isolated back-up Generators, may be at the same Point of Interconnection or Point of Common Coupling.

d. The Generating Facility must utilize Option 3 or Option 4 to meet the non-export protection requirements of Screen I in Section G.1.i.

e. The Generating Facility must have a single or coordinated control system for all charging functions if utilizing multiple inverters. The control system must also ensure that there is no increase in the Interconnection Customer's existing peak load demand.

f. The Generating Facility must utilize only inverter-based, UL 1741 and UL 1741 SA-listed equipment. Additionally, all installed equipment must meet Distribution Provider's current electric service requirements with no violations or variances. (L)

(Continued)

O. Non-Export AC/DC CONVERTER ELIGIBILITY CRITERIA (L)

Applicants with Non-Export AC/DC Converters who meet the eligibility criteria below qualify for the expedited interconnection process outlined in Section N of this Rule.

1. The Non-Export AC/DC Converter must have an aggregate maximum inverter nameplate rating of no greater than 500 kW. There is no limitation on an energy storage device's kWh capacity rating.

2. Applicant's Interconnection Request must be eligible for and select the Fast Track Process.

3. Applicant's Interconnection Request must pass Fast Track Initial Review and not require any Interconnection Facilities, Distribution Upgrades or Network Upgrades to remain eligible under this Section.

4. Applicants selecting this section shall use the corresponding interconnection agreement type provided for Non-Export AC/DC Converters eligible under this Section. As such, Interconnection Requests that select the Cost Envelope Option are not eligible.

5. Applicant's Non-Export AC/DC converter must meet the Certification requirements in the Section C Definition of "Non-Export AC/DC Converters". (L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 276
GENERATING FACILITY INTERCONNECTIONS

(L)

Appendix A Forms Associated with Rule 21 Generating Facility Interconnections			
Form Number	Title	Associated Tariffs	Use Guidance
Pre-Application Request			
79-1181	Rule 21 Pre-Application Report Request	Rule 21	For Generator Developer to request basic info about local distribution circuit
Study Agreement			
79-1162	Rule 21 Detailed Study Agreement	Rule 21	Independent Study and Distribution Group Study Process Study Agreement
NEM and Non-Export Interconnection Forms			
79-978	Interconnection Agreement for Net Energy Metering of Solar or Wind Electric Generating Facilities of 1,000 kW or Less, Other Than Facilities of 30 kW or Less	NEM, Rule 21	Solar and/or Wind > 30 kW and ≤ 1 MW expanded NEM used with Form 79-1174-02
79-978-02	Interconnection Agreement for Net Energy Metering (NEM2) of Solar or Wind Electric Generating Facilities of 1,000 Kilowatts or Less, Other than Facilities of 30 Kilowatts or Less	NEM2, Rule 21	Solar and/or Wind > 30 kW and ≤ 1 MW expanded NEM2 used with Form 79-1174-02
79-997	Interconnection Agreement for Net Energy Metering of Biogas Digester Generating Facilities	NEM, Rule 21	NEMBIO (Closed to new applicants), NEMBIOA Interconnection Agreement used with Form 79-1174
79-1010	Interconnection Agreement for Net Energy Metering of Fuel Cell Generating Facilities	NEM, Rule 21	NEMFC Interconnection Agreement used with Form 79-1174
79-1069	Generating facility Interconnection Agreement (Multiple Tariff)	NEM, Rule 21	NEMMT Interconnection Agreement used with Form 79-1174
79-1069-02	Generating Facility Interconnection Agreement (Multiple Tariff NEM2MT)	NEM2, Rule 21	NEM2MT Interconnection Agreement used with Form 79-1174-02
79-1109 ***	Virtual Net Energy Metering Application and Interconnection Agreement For The Building Owner of Multifamily Affordable Housing With A Solar Generating Facility of 1 Megawatt or Less	NEM, Rule 21	NEMV Interconnection Agreement used with Form 79-974

(L)

(Continued)

Appendix A (Cont'd.)
Forms Associated with Rule 21
Generating Facility Interconnections

Form Number	Title	Associated Tariffs	Use Guidance
NEM and Non-Export Interconnection Forms (Cont'd.)			
79-1193	AGREEMENT AND CUSTOMER AUTHORIZATION Net Energy Metering (NEM) Interconnection For Solar And/Or Wind Electric Generating Facilities Of 30 Kilowatts Or Less with Energy Storage of 10 Kilowatts Or Less or Energy Storage with Power Control System Certification	NEM	For NEM pair storage scenarios using Power Control Systems to ensure NEM integrity
79-1193-02	AGREEMENT AND CUSTOMER AUTHORIZATION Net Energy Metering (NEM2) Interconnection For Solar And/Or Wind Electric Generating Facilities Of 30 Kilowatts Or Less with Energy Storage of 10 Kilowatts Or Less or Energy Storage with Power Control System Certification	NEM2	For NEM2 pair storage scenarios using Power Control Systems to ensure NEM integrity
79-1109-02***	NEM2VMSH Virtual Net Energy Metering Application and Interconnection Agreement for the Building Owner of Multifamily Affordable Housing with a Solar Generating Facility of 1 Megawatt or Less	NEM2VMSH, Rule 21	NEM2VMSH Interconnection Agreement used with Form 79-1174-02
79-1151A	Net Energy Metering Interconnection for Solar And/or Wind Electric Generating Facilities Of 30 Kilowatts Or Less Agreement and Customer Authorization	NEM, Rule 21	NEMS Interconnection Agreement be used with 79-1151B Application
79-1151A-02	Agreement And Customer Authorization - Net Energy Metering (NEM2) Internconnection For Solar And/Or Wind Electric Generating Facilities Of 30 Kilowatts Or Less	NEM2, Rule 21	NEM2S Application to be used with 79-1151A Interconnection Agreement
79-1151B	Net Energy Metering Interconnection For Solar And/or Wind Electric Generating Facilities Of 30 Kilowatts Or Less Application	NEM, Rule 21	NEMS Application to be used with 79-1151A Interconnection Agreement
79-1151B-02	Application - Net Energy Metering (NEM2) Interconnection For Solar And/Or Wind Electric Generating Facilities Of 30 Kilowatts Or Less	NEM2, Rule 21	NEM2S Application to be used with 79-1151A-02 Interconnection Agreement
79-1124 ***	Eligible Low Income Development Virtual Net Energy Metering Application and Interconnection Agreement for Multifamily Affordable Housing with Solar Generation Totaling 1 Megawatt or Less	NEMVMASH, Rule 21	NEMVMASH Interconnection Agreement

(L)

(L)

(Continued)

Appendix A (Cont'd.)
Forms Associated with Rule 21
Generating Facility Interconnections

Form Number	Title	Associated Tariffs	Use Guidance
NEM and Non-Export Interconnection Forms (Cont'd.)			
79-1124-02***	Eligible Low Income Development Virtual Net Energy Metering (NEM2VMSH) Application and Interconnection Agreement for Multifamily Affordable Housing with Solar Generation Totaling 1 Megawatt or Less	NEM2VMSH, Rule 21	NEM2VMSH Interconnection Agreement
79-1131 ***	NEMV Application and Interconnection Agreement for a Solar (PV) or Wind Generating Facility of 1 MW or Less *Serving Multiple Tenants Served at a Single Property Delivery Point*	NEM, Rule 21	NEMV Interconnection Agreement
79-1131-02***	NEM2V Application and Interconnection Agreement for a Solar (PV) or Wind Generating Facility of 1 MW or Less *Serving Multiple Tenants Served at a Single Property Delivery Point*	NEM2V, Rule 21	NEM2V Interconnection Agreement
79-1137	Interconnection Agreement for Net Energy Metering for a Renewable Electrical Generation Facility of 1,000 kW or Less, Except Solar or Wind (SB 489)	NEM, Rule 21	NEMV, NEMEXP, NEMEXPM Interconnection Agreement typically used with Forms 79-974 and 79-1142 Applications
79-1137-02	Interconnection Agreement for Net Energy Metering (NEM2/NEM2V) for a Renewable Electricity Generation Facility of 1,000 Kilowatts or Less, Except Solar or Wind	NEM2, NEM2V, Rule 21	NEM2V, NEM2EXP, NEM2EXPM Interconnection Agreement typically used with Forms 79-1174-02
79-1142 ***	NEMV Interconnection Application for a Renewable Electrical Generation Facility of 1 Megawatt or Less	NEM, Rule 21	Used with Form 79-1137 (L)
79-973	Generating Facility Interconnection Agreement For Non-Export Generating Facilities (Rule 21 Interconnection Agreement)	Rule 21	Interconnection Agreement used for RESBCT and non-NEM generation with Application 79-974 and 79-1112
79-992	Customer Generation Agreement (Third party Generator on Premises, Non-Exporting)	Rule 21	Used with Forms 79-1174
79-1070	Export Addendum to Generating Facility Interconnection Agreement for Non-Export Generating Facilities (Form 79-973) Sized 2 Megawatts or Less	Rule 21	Export addendum used with Form 79-973
79-1136	PG&E Interconnection Agreement For an Existing Small Generating Facility Interconnecting to the Distribution System under Rule 21	Rule 21	Used for existing QFs with Form 79-974 (L)

(L)

(L)

(Continued)

Appendix A (Cont'd.)
Forms Associated with Rule 21
Generating Facility Interconnections

Form Number	Title	Associated Tariffs	Use Guidance
Other NEM and Non-Export Forms (Cont'd.)			
79-1192	Interconnection Agreement for Non-Export Storage Generating Facilities 500KW or Less	Rule 21	Used for expedited interconnection of non-export energy storage, pursuant to Rule 21 Section N, PG&E AL 4941-E & E-A and D.16-06-052, & Attachment C, Section II.1
79-1199	Agreement And Customer Authorization Non-Export Stand-Alone Energy Storage Of 30 Kilowatts Or Less	Rule 21	Interconnection Agreement For non-export storage ≤ 30 kW
79-1206-02	Eligible Low-Income Development Virtual Net Energy Metering (NEM2VSOM) Interconnection Agreement For The Solar On Multifamily Affordable Housing (SOMAH) Program With Solar Generation Totaling 1 Mw Or Less	NEM2VSOM	NEM2VSOM Interconnection agreement for solar 1 MW or less.
79-1130	Request to Opt-out of / Opt-in to Compensation for Surplus Electricity	NEM	AB 920- Opt not to receive compensation for net annual excess energy
79-1202 ****	Load Aggregation Appendix	NEM, NEM2, Rule 21	Use as an Appendix with Form 79-1151A, 79-1151A-02, 79-978, 79-978-02,79-1137, 79-1137-02, 79-1069 or 79-1069-02
79-1155	Schedules NEM, NEMV, NEMVMASH, Net Surplus Electricity (NSE) Renewable Energy Credits Compensation	NEM, Rule 21	
79-1155-02	Schedules NEM2, NEM2V, NEM2VMSH, Net Surplus Electricity (NSE) Renewable Energy Credits Compensation	NEM2 NEM2V NEM2VMSH, Rule 21	
79-1174	Rule 21 Generator Interconnection Application	NEM (NEMEXP, NEMMT and NEMA), NEMFC, NEMV, NEMVMASH, RES-BCT, Rule 21	Rule 21 customer interconnection application form for expanded net-energy metered (all NEM > 30 kw and all non-Solar/Wind NEM), NEMFC, NEMV, NEMVMASH, RES-BCT, and non-export and limited export Rule 21 generation. (Standard NEM for solar and/or wind ≤ 30 kw will continue to use the 79-1151B application.)

(L)

(L)

(Continued)

ELECTRIC RULE NO. 21 Sheet 280
GENERATING FACILITY INTERCONNECTIONS

(L)

Appendix A (Cont'd.) Forms Associated with Rule 21 Generating Facility Interconnections			
Form Number	Title	Associated Tariffs	Use Guidance
Other NEM and Non-Export Forms (Cont'd.)			
79-1174-02	Rule 21 Generator Interconnection Application	NEM2 (NEM2EXP, NEM2MT and NEM2A), NEMFC, NEM2V, NEM2VMSH, RES-BCT, Rule 21	Rule 21 customer interconnection application form for expanded net-energy metered (all NEM2 > 30 kw and all non-Solar/Wind NEM), NEMFC, NEM2V, NEM2VMSH, RES-BCT, and non-export and limited export Rule 21 generation. (Standard NEM for solar and/or wind ≤ 30 kw will continue to use the 79-1151B application.)
Export for Sale Interconnection Forms			
79-1145	Rule 21 Exporting Generator Interconnection Request	Rule 21	Preferred online application: https://www.pge.com/en_US/large-business/services/alternatives-to-pge/electric-generation-interconnection.page
79-1197	Local Government Renewable Energy Self-Generation Bill Credit Transfer (RES-BCT) Re-Allocation Request	RES-BCT	Use to establish RES-BCT benefiting account re-allocations
79-1198-02	Interconnection Agreement For Net Energy Metering (NEM2) And Renewable Electrical Generating Facility Sized Greater Than 1,000 Kw	NEM2	FT and Detailed Study Interconnection Agreement for >1MW NEM2 Generating Facilities
79-1200	Rule 21 Generator Interconnection Agreement For Exporting Generating Facilities	Rule 21	FT and Detailed Study Interconnection Agreement for Exporting Generating Facilities
Other Agreements			
79-280	Agreement for Installation of Allocation of Special Facilities for Parallel Operation of Non-Utility-Owned Generation and/or Electrical Standby Service (Electric Rules 2 and 21)	Rule 21	Special Facilities Agreement to be used with Form 79-702
79-702	Appendix A: Detail of Special Facilities Charges to be used in concert with form 79-280	Rule 21	Used with Form 79-280

*** The application section of these forms is replaced by 79-1174.
**** For NEMA expanded customers, use the online 79-1174 form.

(L)

(Continued)

APPENDIX B (L)

Unit Cost Guide

Distribution Provider shall publish a Unit Cost Guide for facilities generally required to interconnect generation in Distribution Provider's Distribution System. The Unit Cost Guide shall not be binding for actual facility costs and is provided only for additional cost transparency, developer reference, and Distribution Provider's reference when preparing the cost estimate provided in any applicable studies. The Unit Cost Guide shall not replace the estimated cost provided by Distribution Provider in an Interconnection Study or an initial or supplemental review under the Fast Track Process.

The Unit Cost Guide shall include the anticipated cost of procuring and installing Interconnection Facilities and Distribution Upgrades generally utilized by the Applicant. An annual adjustment shall be performed within the Unit Cost Guide for five (5) years to account for the anticipated timing of procurement to accommodate a potential range of Commercial Operation Dates.

The Unit Cost Guide shall be updated annually in accordance with the process set forth in D.16-06-052. (L)

(Continued)

ELECTRIC TABLE OF CONTENTS Sheet 1

TABLE OF CONTENTS

SCHEDULE	TITLE OF SHEET	CAL P.U.C. SHEET NO.	
Title Page		**50945**-E	(T)
Rate Schedules		50795,50796,50807,50798,50799,50800,50657,49654,49184-E	
Preliminary Statements		49185,48878,50629,50630,49682,50058,50631-E	
Rules		50632,50633,**50946**-E	(T)
Maps, Contracts and Deviations		50635-E	
Sample Forms		50636,49743,50637,50638,50639,49735, 50640,50641,49307,50642,49309,49310,49311-E	

(Continued)

ELECTRIC TABLE OF CONTENTS Sheet 20

RULE	TITLE OF SHEET	CAL P.U.C. SHEET NO.
	Rules (Cont'd)	
Rule 21	Generating Facility Interconnections..... 42298,49771,50319,**50947,50948,50949,50950,**	(T)
	50951,50952,50953,50954,50955,50956,50957,42312,42313,42314,42315,42316,50331,42318,	|
	42319,**50958,50959,50960,50961,50962,50963,**42326,42327,42328,42329,42330,42331,42332,	(T)
	42333,42334,50334,42336,42337,42338,42339,42340,46374,42342,42343,42344,42345,42346,	
	42347,42348,50335,50336,50337,50338,49785,49786,49787,49788,49789,49790,49791,49792,	
	50339,49794,49795,49796,49797,50340,49799,50341,50342,50343,50344,50345,50346,50347,	
	50964,50965,50966,50967,50968,50969,50970,50971,50972,50973,50974,50975,50976,50977,	(T)
	50978,50979,50980,50981,50982,50983,50984,50985,50986,50987,50988,50989,50990,50991,	|
	50992,50993,50994,50995,50996,50997,50998,50999,51000,51001,51002,51003,51004,51005,	|
	51006,51007,51008,51009,51010,51011,51012,51013,51014,51015,51016,51017,51018,51019,	|
	51020,51021,51022,51023,51024,51025,51026,51027,51028,51029,51030,51031,51032,51033,	|
	51034,51035,51036,51037,51038,51039,51040,51041,51042,51043,51044,51045,51046,51047,	|
	51048,51049,51050,51051,51052,51053,51054,51055,51056,51057,51058,51059,51060,51061,	|
	51062,51063,51064,51065,51066,51067,51068,51069,51070,51071,51072,51073,51074,51075,	|
	51076,51077,51078,51079,51080,51081,51082,51083,51084,51085,51086,51087,51088,51089,	|
	51090,51091,51092,51093,51094,51095,51096,51097,51098,51099,51100,51101,51102,51103,	|
	51104,51105,51106,51107,51108,51109,51110,51111,51112,51113,51114,51115,51116,51117,	|
	51118,51119,51120,51121,51122,51123,51124,51125,51126,51127,51128,51129,51130,51131,	|
	51132,51133,51134,51135,51136,51137,51138,51139,51140,51141,51142,51143,51144,51145,	|
	51146,51147,51148,51149,51150,51151,51152,51153,51154,51155,51156,51157,51158,51159,	|
	.....**51160,51161,51162,51163,51164,51165,51166,51167-E**	(T)
Rule 22	Direct Access Service..... 33491,29165,29166,29167,29168,29169,29170,29171,14896,	
	30872,30873,32758,32992,32993,32994,32995,30879,30880,30881,30882,30883,	
	30884,30885,30886,30887,30888,30889,30890,30891,30892,30893,30894,30895,	
	43002,30897,30898,30899,30900,30901,30902,30903,30904,30905,30906,30907,	
	30908,30910,30911,30912,30913,30914,30915,48747,30493,30494,30495,30496,	
	..... 30497,30498,30923,30924,30925,30926,33499,33500,33501,33502,33503-E	
Rule 22.1	Direct Access Service Switching Exemption Rules..... 44759,32404,44760,44761,	
	 44762,44763,44764,44765,44766,44767,	
	.....44768,44769,44770,44771,44772,44773,44774-E	
Rule 23	Standby Service.....	
	..... 48308,48309,32810,25530*,25531*25532*,25533*,25534*,	
	..... 30933,29202,25537*,48310,48311,48312,48313,48314,48315,48316,	
	48317,48318,48319,48320,48321,48322,48323,48324,48325,48326,48327,	
	48328,48329,48330,48331,48332,48333,48334,48335,48336,48337,48338,	
	48339,48340,48341,48342,48343,48344,48748,48346,48347,48348,48349,	
	48350,48351,483452,48353,48354,48355,48356,48357,48358,48359,48360,	
	.....48361,48362,48363,48364,48365,48366,48367,-E	
Rule 23.2	Community Choice Aggregation Open Season 25575,25576,25577,27270,27271-E	
Rule 24	Direct Participation Demand Response..... 33694,36693,35814,35856,36694,36695,	
	33818,36696,35820,36697,36698,35823,36699,35825,36700,36701,35828,35829,	
	..... 35830,35831,35832,35833,35834,35835,35836,35837,36702,35839,35840,36703-E	
Rule 25	Release Of Customer Data To Third Parties 34333,34334,34335,34336,34337-E	
Rule 27	Privacy and Security Protections for Energy Usage Data..... 32189,32190,32191,32192,32193,	
	..... 32194,32195,32196,32197,32198,32199,32200,32201,32202,32203,32204,32205-E	
Rule 27.1	Access to Energy Usage and Usage-Related Data While	
	Protecting Privacy of Personal Data 34311,34312,34313,34314,34315-E	
Rule 28	Mobilehome Park Utility Conversion Program 48536,47080,47081,47082,	
	..... 47083,50623,47085,47086-E	

(Continued)

Advice 6287-E
August 6, 2021

Attachment 2

Redline Tariff Revisions

For convenience of the reader, PG&E has included redline revisions in Attachment 2. Where Electric Rule 21 has been revised, the affected sheets are included in Attachment 1.

In this advice letter and accordance to CPUC General Order 96B, Section 9.5.3, PG&E has implemented the use of the "(P)" symbol to signify material subject to change under a pending advice letter. The redlines in Attachment 2 are color coded to the specific advice letter. The color coding is as follows:

Redline Text Color	Advice Letter	Subject	Comments
	5988-E-A	Supplemental: Advice Letter Modifying Electric Rule 21 Pursuant to Decision 20-09-035 for Working Group 2 and 3	Effective as of May 19, 2021
	6014-E-A	Supplemental: Advice Letter Modifying Electric Rule 21 Pursuant to Decision 20-09-035 for Working Group 2 and 3 (due 60 Days from Issuance)	Pending Approval
	6286-E	Advice Letter Modifying Electric Rule 21 Pursuant to Ordering Paragraphs 7, 49, 50 Decision 20-09-035 for Working Group 2 and 3	Effective as of August 6, 2021
	6287-E	Modifications to Electric Rule 21 Pursuant to Decision 20-09-035 Addressing Remaining Ordering Paragraph Issues in Working Group 2 and 3	In this advice letter, the redline tariff revisions do not show sheets that only have location changes.

TABLE OF CONTENTS (Cont'd.)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS 78
a. Initial Review 78
b. Optional Initial Review Results Meeting 828 ~~1~~ (T)
c. Supplemental Review 838 ~~2~~
d. Optional Supplemental Review Results Meeting 878 ~~6~~
e. Execution of the Generator Interconnection Agreement 878 ~~7~~

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS 919 ~~0~~
a. Detailed Study Track Selection Process 919 ~~0~~
b. Independent Study Process 939 ~~2~~
c. Distribution Group Study Process 102 ~~101~~
d. WDT Transmission Cluster Study Process 116 ~~115~~
e. Generator Interconnection Agreement 118 ~~117~~
f. Engineering & Procurement (E&P) Agreement 121 ~~120~~

4. INTERCONNECTION FINANCIAL SECURITY 121 ~~120~~
a. Types of Interconnection Financial Security 121 ~~120~~
b. Initial Posting of Interconnection Financial Security 122 ~~121~~
c. Second Posting of Interconnection Financial Security 124 ~~123~~

(Continued)

d. Third Posting of Interconnection Financial Security 125 ~~124~~

e. General Effect of Withdrawal of Interconnection Request or Termination of the Generator Interconnection Agreement on Interconnection Financial Security for Interconnection Requests Studied Under the Independent Study Process 126 ~~125~~ (T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

F.		REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)		
	5.	COMMISSIONING TESTING AND PARALLEL OPERATION	134 ~~133~~	(T)
		a. Commissioning Testing	134 ~~133~~	
		b. Parallel Operation or Momentary Parallel Operation	134 ~~133~~	
	6.	WITHDRAWAL	135 ~~134~~	
	7.	Cost Envelope Option	136 ~~135~~	
		a. Eligibility for Cost Envelope Option	136 ~~135~~	
		b. Cost Responsibility for Facilities Subject to Cost Envelope	138 ~~137~~	
		c. Timing of Applicant's Selection of Cost Envelope and Payment of Deposit	139 ~~138~~	
		d. Distribution Provider's Preparation of the Cost Envelope Estimate	141 ~~140~~	
		e. Cost Elements Not Subject to Cost Envelope	142 ~~141~~	
		f. Modifications	144 ~~143~~	
		g. Tender of the Generator Interconnection Agreement Under the Cost Envelope Option	145 ~~144~~	
G.		ENGINEERING REVIEW DETAILS	146 ~~145~~	
	1.	INITIAL REVIEW SCREENS	148 ~~147~~	
		a. Screen A: Is the PCC on a Networked Secondary System?	148 ~~147~~	
		b. Screen B: Is Certified Equipment used?	149 ~~148~~	
		c. Screen C: Is the Starting Voltage Drop within acceptable limits?	150 ~~149~~	(T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

d. Screen D: Is the transformer or secondary conductor rating exceeded? 151 150 (T)

e. Screen E: Does the Single-Phase Generator cause unacceptable imbalance? 151 150

f. Screens F and F1: Is the Short Circuit Current Contribution Ratio within acceptable limits? 152 151

g. Screen G: Is the Short Circuit Interrupting Capability Exceeded? 153 152

h. Screen H: Is the line configuration compatible with the Interconnection type? 154 153

i. Screen I: Will power be exported across the PCC? 155 154

j. Screen J: Is the Gross Rating of the Generating Facility 3011 kVA or less? 159 157

k. Screen K: Is the Generating Facility a Net Energy Metering (NEM) Generating Facility with nameplate capacity less than or equal to 500kW? 159 157

l. Screen L: Transmission Dependency and Transmission Stability Test 160 158

m. Screen M: When ICA information is available at the requested Point of Interconnection, Screen M should be evaluated in accordance with the Gross Nameplate Rating or typical PV output profile; Is the aggregate Generating Facility capacity on the Line Section less than 15% of Line Section peak load for all line sections bounded by automatic sectionalizing devices? 161 158 (T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

G.		ENGINEERING REVIEW DETAILS (Cont'd.)		
	2.	SUPPLEMENTAL REVIEW SCREENS	163 ~~159~~	(T)
		a. Screen N: Penetration Test	163 ~~160~~	|
		b. Screen O: Power Quality and Voltage Tests	166 ~~161~~	|
		c. Screen P: Safety and Reliability Tests	167 ~~162~~	|
	3.	DETAILED STUDY SCREENS	169 ~~164~~	|
		a. Screen Q: Is the Interconnection Request electrically Independent of the Transmission System?	170 ~~164~~	|
		b. Screen R: Is the Interconnection Request independent of other earlier-queued and yet to be studied interconnection requests interconnecting to the Distribution System?	171 ~~166~~	|
		c. Independent Study Process and Distribution Group Study Process Interconnection Studies	172 ~~167~~	|
H.		GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS	175 ~~170~~	|
	1.	GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS	172 ~~171~~	|
		a. Protective Functions Required	176 ~~171~~	|
		b. Momentary Paralleling Generating Facilities	177 ~~172~~	|
		c. Suitable Equipment Required	177 ~~172~~	|
		d. Visible Disconnect Required	178 ~~173~~	|
		e. Drawings Required	179 ~~174~~	|
		f. Generating Facility Conditions Not Identified	180 ~~175~~	(T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

H. GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.)

2. PREVENTION OF INTERFERENCE 180 ~~175~~ (T)
a. Voltage Regulation 180 ~~175~~
b. Voltage Trip Setting 181 ~~176~~
c. Paralleling 184 ~~179~~
d. Flicker 184 ~~179~~
e. Integration with Distribution Provider's Distribution System Grounding 185 ~~180~~
f. Frequency 185 ~~180~~
g. Harmonics 187 ~~182~~
h. Direct Current Injection 188 ~~183~~
i. Power Factor 188 ~~183~~

3. TECHNOLOGY SPECIFIC REQUIREMENTS 189 ~~184~~
a. Technology Specific Requirements 189 ~~184~~
b. Induction Generators 189 ~~184~~
c. Inverters 190 ~~185~~
d. Limitations on Inverters Not Classified as Smart Inverters 190 ~~185~~
e. Non-Export AC/DC Converters 190 ~~185~~ (T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

H.		GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.)		
	4.	SUPPLEMENTAL GENERATING FACILITY REQUIREMENTS	191 ~~186~~	(T)
		a. Fault Detection	191 ~~186~~	
		b. Transfer Trip	191 ~~186~~	
		c. Reclose Blocking	191 ~~186~~	
Hh.		SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS	191 ~~186~~	
	1.	GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS	193 ~~188~~	
		a. Protective Functions Required	193 ~~188~~	
		b. Momentary Paralleling Generating Facilities	194 ~~189~~	
		c. Suitable Equipment Required	195 ~~190~~	
		d. Visible Disconnect Required	195 ~~190~~	
		e. Drawings Required	198 ~~192~~	
		f. Generating Facility Conditions Not Identified	198 ~~192~~	
	2.	PREVENTION OF INTERFERENCE	198 ~~192~~	
		a. Voltage Regulation	199 ~~193~~	
		b. Voltage Trip and Ride-Through Settings	199 ~~193~~	
		c. Paralleling	201 ~~196~~	
		d. Flicker	201 ~~196~~	

(Continued)

e. Integration with Distribution Provider's Distribution System Grounding 201 ~~196~~ (T)

(Continued)

ELECTRIC RULE NO. 21 Sheet 10
GENERATING FACILITY INTERCONNECTIONS

TABLE OF CONTENTS (Cont'd.)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.)

2. PREVENTION OF INTERFERENCE (Cont'd.)

f. Frequency 202 ~~197~~ (T)

g. Harmonics 203 ~~198~~

h. Direct Current Injection 204 ~~199~~

i. Fixed Power Factor 204 ~~199~~

j. Dynamic Volt/VAR Operations 204 ~~200~~

k. Ramp Rate Requirements 205 ~~202~~

l. Recommended Frequency-Watt Settings 207 ~~202~~

m. Smart Inverters 209 ~~204~~

n. Default Activation States for Phase 1 Functions 211 ~~205~~

o. Load Shedding or Transfer 211 ~~206~~

p. Default Activation States for Phase 1 Functions 211 ~~206~~

q. Phase 3 Function 212 ~~207~~

r. Load Shedding or Transfer 213 ~~208~~

3. TECHNOLOGY SPECIFIC REQUIREMENTS 213 ~~208~~

4. SUPPLEMENTAL SMART INVERTER REQUIREMENTS 214 ~~209~~

a. Fault Detection 214 ~~209~~

(Continued)

b. Transfer Trip 214 ~~209~~

c. Reclose Blocking 214 ~~209~~

5. COMMUNICATION REQUIREMENTS 215 ~~210~~

a. Generating Facilities utilizing inverter-based technologies must adhere to all of the following communication protocol requirements: 215 ~~210~~ (T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

Hh.		SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.)		
	5.	COMMUNICATION REQUIREMENTS (Cont'd.)		
		b. Additional communication protocol requirements shall also apply to Generating Facilities utilizing inverter-based technologies as provided in the following documents	216 ~~211~~	(T)
		c. Additional communication protocol requirements shall also apply to Generating Facilities utilizing inverter-based technologies as provided in the following documents:	217 ~~212~~	
	6.	SCHEDULING CAPABILITY REQUIREMENTS	218 ~~213~~	
	7.	MONITORING AND TELEMETRY REQUIREMENTS	220 ~~215~~	
	8.	CONTROL THROUGH COMMUNICATION CAPABILITIES	223 ~~218~~	
I.		THIRD-PARTY INSTALLATIONS, RESERVATION OF UNUSED FACILITIES, AND REFUND OF SALVAGE VALUE	224 ~~219~~	
	1.	INTERCONNECTION FACILITIES AND DISTRIBUTION UPGRADES	224 ~~219~~	
	2.	THIRD-PARTY INSTALLATIONS	224 ~~219~~	
	3.	RESERVATION OF UNUSED FACILITIES	225 ~~220~~	
	4.	REFUND OF SALVAGE VALUE	225 ~~220~~	
J.		METERING, MONITORING AND TELEMETERING	225 ~~220~~	
	1.	GENERAL REQUIREMENTS	225 ~~220~~	
	2.	METERING BY NON-DISTRIBUTION PROVIDER PARTIES	225 ~~220~~	
	3.	NET GENERATION OUTPUT METERING	226 ~~221~~	
	4.	POINT OF COMMON COUPLING (PCC) METERING	227 ~~222~~	

(Continued)

ELECTRIC RULE NO. 21 Sheet 11
GENERATING FACILITY INTERCONNECTIONS

5. TELEMETERING 228 ~~223~~
6. LOCATION 229 ~~224~~
7. COSTS OF METERING 229 ~~224~~
8. MULTIPLE TARIFF METERING 229 ~~224~~ (T)

(Continued)

TABLE OF CONTENTS (Cont'd.)

K.		DISPUTE RESOLUTION PROCESS	230 ~~225~~	(T)
	1.	SCOPE	230 ~~225~~	
	2.	PROCEDURES	230 ~~225~~	
	3.	PERFORMANCE DURING DISPUTE	232 ~~227~~	
L.		CERTIFICATION AND TESTING CRITERIA	232 ~~227~~	
	1.	INTRODUCTION	232 ~~227~~	
	2.	CERTIFIED AND NON-CERTIFIED INTERCONNECTION EQUIPMENT	234 ~~229~~	
		a. Certified Equipment	234 ~~229~~	
		b. Non-Certified Equipment	235 ~~230~~	
	3.	TYPE TESTING	236 ~~231~~	
		a. Type Tests and Criteria for Interconnection Equipment Certification	236 ~~231~~	
		b. Anti-Islanding Test	238 ~~233~~	
		c. Non-Export Test	238 ~~233~~	
		d. In-rush Current Test	239 ~~234~~	
		e. Surge Withstand Capability Test	239 ~~234~~	
		f. Synchronization Test	240 ~~235~~	
		g. Paralleling Device Withstand Test	241 ~~236~~	

(Continued)

h. Backfeed Test

241 (T)
~~236~~

(Continued)

TABLE OF CONTENTS (Cont'd.)

L. CERTIFICATION AND TESTING CRITERIA (Cont'd.)

4. PRODUCTION TESTING 241 ~~236~~ (T)
5. COMMISSIONING TESTING 242 ~~237~~
   a. Commissioning Testing 242 ~~237~~
   b. Review, Study, and Additional Commissioning Test Verification Costs 243 ~~238~~
   c. Other Checks and Tests 244 ~~239~~
   d. Certified Equipment 244 ~~239~~
   e. Non-Certified Equipment 245 ~~240~~
   f. Verification of Settings 245 ~~240~~
   g. Trip Tests 246 ~~241~~
   h. In-service Tests 246 ~~241~~
6. PERIODIC TESTING 246 ~~241~~
7. TYPE TESTING PROCEDURES NOT DEFINED IN OTHER STANDARDS 246 ~~241~~
   a. Non-Exporting Test Procedures 246 ~~241~~
   b. In-rush Current Test Procedures 258 ~~253~~ (T)

(Continued)

ELECTRIC RULE NO. 21 Sheet 14
GENERATING FACILITY INTERCONNECTIONS

TABLE OF CONTENTS (Cont'd.)

M.		INADVERTENT EXPORT	259 ~~254~~	(T)
Mm.		INADVERTENT EXPORT FOR INTERCONNECTION REQUESTS UTILIZING UL-1741 CERTIFIED OR SA LISTED GRID SUPPORT (NONISLANDING) INVERTERS	261 ~~256~~	
Mm1.		OPTION 8: Non-Export Utilizing Certified Power Control Systems	265 ~~261~~	
Mm2.		OPTION 9: Limited Export Utilizing Certified Power Control Systems	267 ~~263~~	
Mm3.		OPTION 10: Non-Export with Inadvertent Export Utilizing Certified Power Control Systems	269 ~~265~~	
Mm4.		OPTION 11: Limited Export with Inadvertent Export Utilizing Certified Power Control Systems	271 ~~267~~	
N.		EXPEDITED INTERCONNECTION PROCESS FOR NON-EXPORT ENERGY STORAGE GENERATING FACILITIES	273 ~~260~~	
	1.	ELIGIBILITY REQUIREMENTS	273 ~~260~~	
	2.	GENERATING FACILITY ELIGIBILITY CRITERIA	274 ~~261~~	
O.		AC/DC CONVERTER ELIGIBILITY CRITERIA	275 ~~262~~	
Appendix A		Forms Associated with Rule 2 Generating Facility Interconnections	276 ~~63~~	
Appendix B		Unit Cost Guide	281 ~~68~~	(T)

(Continued)

C. DEFINITIONS (Cont'd.)

Field Testing: Testing performed in the field to determine whether equipment meets Distribution Provider's requirements for safe and reliable Interconnection.

Function: Some combination of hardware and software designed to provide specific features or capabilities. Its use, as in Protective Function, is intended to encompass a range of implementations from a single-purpose device to a section of software and specific pieces of hardware within a larger piece of equipment to a collection of devices and software.

Generating Facility: All Generators, electrical wires, equipment, and other facilities, excluding Interconnection Facilities, owned or provided by Producer for the purpose of producing electric power, including storage.

Generating Facility Capacity: The net capacity of the Generating Facility and the aggregate net capacity of the Generating Facility where it includes multiple Generators.

Generation Profile: The active power output of a Generating Facility over a period of time. The Generation Profile may be less than the Gross Nameplate Capacity at certain times, for example when using a typical PV Generation Profile or a Limited Generation Profile. (N)

Generator: A device converting mechanical, chemical, or solar energy into electrical energy, including all of its protective and control functions and structural appurtenances. One or more Generators comprise a Generating Facility.

Generator Interconnection Agreement: An agreement between Distribution Provider and Producer providing for the Interconnection of a Generating Facility that gives certain rights and obligations to effect or end Interconnection. For the purpose of this Rule, Net Energy Metering or power purchase agreements authorized by the Commission are also defined as Generator Interconnection Agreements.

(Continued)

C. DEFINITIONS (Cont'd.)

Good Utility Practice: Any of the practices, methods and acts engaged in or approved by a significant portion of the electric utility industry during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

Governmental Authority: Any federal, state, local or other governmental regulatory or administrative agency, court, commission, department, board, or other governmental subdivision, legislature, rulemaking board, tribunal, or other governmental authority having jurisdiction over the Parties, their respective facilities, or the respective services they provide, and exercising or entitled to exercise any administrative, executive, police, or taxing authority or power; provided, however, that such term does not include Interconnection Customer, Distribution Provider, or any Affiliate thereof.

Gross Rating; Gross Nameplate Rating; Gross Capacity or Gross Nameplate Capacity: The total gross generating capacity of a Generator or Generating Facility as designated by the manufacturer(s) of the Generator(s).

Host Load: The electrical power, less the Generator auxiliary load, consumed by the Customer, to which the Generating Facility is connected.

Inadvertent Export: The unscheduled and uncompensated export of real power from a Generating Facility (GF) for a limited duration as specified in Sections M, ~~and~~ Mm and Mm3. (P)

Independent Study Process: The interconnection study process set forth in Section F.3.d.

Initial Review: See Section F.2.a.

In-rush Current: The current determined by the In-rush Current Test. (L)

In-Service Date: The estimated date upon which Applicant reasonably expects it will be ready to begin use of Distribution Provider's Interconnection Facilities. (L)

(Continued)

C. DEFINITIONS (Cont'd.)

(L)

Integration Capacity Analysis (ICA) Values: Values which represent the maximum capacity that can be interconnected at a given Point of Interconnection without exceeding Distribution Provider equipment thermal limits or any of the Distribution System voltage, power quality, protection, and operational flexibility (safety) limits, each of which is independently calculated. (N)

Integration Capacity Analysis – Static Grid (ICA-SG) Values: The minimum ICA value at a given Point of Interconnection from the set of the thermal, voltage, power quality, and protection ICA Values.

Integration Capacity Analysis – Operational Flexibility (ICA-OF) Values: The minimum ICA value at a given Point of Interconnection from the set of the thermal, voltage, power quality, protection, and operational flexibility ICA Values.

Integration Capacity Analysis – Operational Flexibility 576 (ICA-OF 576) Profile: Annual Profile composed of 576 hours where each hour is represented by its ICA-OF Value.

Integration Capacity Analysis – Static Grid 576 (ICA-SG 576) Profile: Annual Profile composed of 576 hours where each hour is represented by its ICA-SG Value. (N)

Interconnection; Interconnected: The physical connection of a Generating Facility in accordance with the requirements of this Rule so that Parallel Operation with Distribution Provider's Distribution or Transmission System can occur (has occurred).

Interconnection Agreement: See Generator Interconnection Agreement.

Interconnection Customer: See Applicant.

Interconnection Facilities: The electrical wires, switches and related equipment that are required in addition to the facilities required to provide electric Distribution Service to a Customer to allow Interconnection. Interconnection Facilities may be located on either side of the Point of Common Coupling as appropriate to their purpose and design. Interconnection Facilities may be integral to a Generating Facility or provided separately. Interconnection Facilities may be owned by either Producer or Distribution Provider.

(Continued)

C. DEFINITIONS (Cont'd.)

Interconnection Facilities Study: A study conducted by Distribution Provider for an Interconnection Customer under the Independent Study Process to determine a list of facilities (including Distribution Provider's Interconnection Facilities, Distribution Upgrades, and Network Upgrades as identified in the Interconnection System Impact Study), the cost of those facilities, and the time required to interconnect the Generating Facility with Distribution Provider's r's Distribution or Transmission System. The scope of the study is defined in Section G.3.c. (L)

Interconnection Financial Security: Any of the financial instruments listed in Section F.4.a. (L)

Interconnection Request: An Applicant's request to interconnect a new Generating Facility, or to increase the capacity of, or make a Material Modification to the operating characteristics of, an existing Generating Facility that is interconnected with Distribution Provider's Distribution or Transmission System.

Interconnection Study: A study to establish the requirements for Interconnection of a Generating Facility with Distribution Provider's Distribution System or Transmission System, pursuant to this Rule.

Interconnection System Impact Study: An engineering study conducted by Distribution Provider for an Interconnection Customer under the Independent Study Process that evaluates the impact of the proposed interconnection on the safety and reliability of Distribution Provider's Distribution and/or Transmission System and, if applicable, an Affected System. The scope of the study is defined in Section G.3.c.i.

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

Large Generating Facility: A Generating Facility having a Generating Facility Capacity of more than 20 MW.

Like for like: For inverters, like-for-like means certified, same nameplate or smaller, same fault current or smaller. For solar panels, like-for-like means certified, same CEC-AC rating of the system or smaller. For batteries, like-for-like means same or less kWh & kW rating and same operating profile. For transformers, like-for-like means same connection type, same or smaller impedance and capacity. (L)

(Continued)

C. DEFINITIONS (Cont'd.)

(L)

Line Section: That portion of Distribution Provider's Distribution or Transmission System connected to a Customer bounded by automatic sectionalizing devices or the end of the distribution line.

Local Furnishing Bond: Tax-exempt bonds utilized to finance facilities for the local furnishing of electric energy, as described in Internal Revenue Code, 26 U.S.C. § 142(f).

Local Furnishing Distribution Provider: Any Distribution Provider that owns facilities financed by Local Furnishing Bonds.

(L)

Mandatory Operation: The Smart Inverter operates at maximum available current without tripping during Distribution Provider's Transmission or Distribution System excursions outside the region of continuous operation. Any functions that protect the Smart Inverter from damage may operate as needed.

Material Modification: Those modifications that have a material impact on cost or timing of any Interconnection Request with a later queue priority date or a change in Point of Interconnection. A Material Modification does not include a change in ownership of a Generating Facility, (ii) a modification described in Table F.1, nor (iii) a modification described in Tables Ee.1, 2 or 3 that does not require a new interconnection request.

Metering: The measurement of electrical power in kilowatts (kW) and/or energy in kilowatt-hours (kWh), and if necessary, reactive power in kVAR at a point, and its display to Distribution Provider, as required by this Rule.

Metering Equipment: All equipment, hardware, software including meter cabinets, conduit, etc., that are necessary for Metering.

Momentary Cessation: The Smart Inverter momentarily reduces current output to the Distribution Provider's Transmission or Distribution System to below 10% of the maximum continuous output current rating. The Smart Inverter is allowed to increase current output to the Distribution Provider's Transmission or Distribution System without any intentional reconnection delay once voltage exits the Momentary Cessation region and enters a Permissive Operation region or Continuous Operation region.

(L)

(L)

(Continued)

C. DEFINITIONS (Cont'd.)

Momentary Parallel Operation: The Interconnection of a Generating Facility to the Distribution and Transmission System for one second (60 cycles) or less. (L)

Nationally Recognized Testing Laboratory (NRTL): A laboratory accredited to perform the Certification Testing requirements under this Rule.

Net Energy Metering (NEM): Metering for the receipt and delivery of electricity between Producer and Distribution Provider pursuant to California Public Utilities Code (PUC) sections 2827, 2827.1 (as currently implemented by Commission Decision (D.)16-01-044), 2827.8, or 2827.10.

NEM-1: Refers to Interconnection Requests for service pursuant to Schedules NEM, NEMV, and NEMVMASH.

NEM-2: Refers to Interconnection Requests for service pursuant to Schedules NEM2, NEM2V, NEM2VMSH, and NEM2VSOM. (L)

Net Rating or Net Nameplate Rating: The Gross Rating minus the consumption of electrical power of the auxiliary load.

Network Upgrades: Delivery Network Upgrades and Reliability Network Upgrades.

Networked Secondary System: An AC distribution system where the secondaries of the distribution transformers are connected to a common bus for supplying electricity directly to consumers. There are two types of secondary networks: grid networks (also referred to as area networks or street networks) and Spot Networks. Synonyms: Secondary Network. Refer to IEEE 1547.6 for additional detail.

Non-Emergency: Conditions or situations that are not Emergencies, including but not limited to meter reading, inspection, testing, routine repairs, replacement, and maintenance.

Nominal: Standard frequency and voltage.

Non-Export; Non-Exporting: When the Generating Facility is sized and designed such that the Generator output is used for Host Load only and is designed to prevent the transfer of electrical energy from the Generating Facility to Distribution Provider's Distribution or Transmission System.

(Continued)

E. INTERCONNECTION REQUEST SUBMISSION PROCESS (Cont'd.)

2. INTERCONNECTION REQUEST PROCESS (Cont'd.)

b. Applicant Selects a Study Process

An Applicant may select one of two interconnection evaluation processes in accordance with the following eligibility requirements:

i) Fast Track Eligibility

~~Non-Exporting Generating Facilities and NEM-1 Generating Facilities are eligible for Fast Track evaluation regardless of the Gross Nameplate Rating of the proposed Generating Facility. NEM-2 Generating Facilities and Exporting Generating Facilities with a Gross Nameplate Rating no larger than 3.0 MW on a 12 kV or higher voltage interconnection point for PG&E are also eligible for Fast Track evaluation.~~ (P)

~~For an Exporting Generating Facility that agrees to the installation of Distribution Provider-approved protective devices at Applicant's cost such that the Exporting Generating Facility's net export will never exceed the Fast Track eligibility limits, the Generating Facility's net export will be considered for purposes of Fast Track eligibility. However, these Interconnection Requests will be required to complete Supplemental Review and Applicants should pre-pay for Supplemental Review at the time the Interconnection Request is submitted.~~

The Distribution Provider shall evaluate Non-Exporting Generating Facilities and NEM-1 Generating Facilities under the Fast Track Review Process described in Section F.2 below. Applicants for all other Generating Facilities may request that the Distribution Provider evaluate their project under the Fast Track Review Process described in Section F.2 below. Customers are encouraged to review the ICA for information relevant to their project. (P)

ii) Detailed Study Eligibility

Interconnection Requests that are not eligible for Fast Track evaluation must apply for Detailed Study. An Applicant may also choose to apply directly for Detailed Studies. Detailed Study shall require (i) an Independent Study Process, (ii) a Distribution Group Study Process, or (iii) a WDT Transmission Cluster Study Process. The specific study process used will depend on the results of the Electrical Independence Tests for the Transmission (T)

(Continued)

and Distribution Systems.

(Continued)

E. INTERCONNECTION REQUEST SUBMISSION PROCESS (Cont'd.)

2. INTERCONNECTION REQUEST PROCESS (Cont'd.)

b. Applicant Selects a Study Process (Cont'd.)

iii) Request for Deliverability Assessment

Unless specified otherwise in the Interconnection Request, Generating Facilities eligible to be studied under the Fast Track Process, Independent Study Process or Distribution Group Study Process will be assumed to have selected Energy-Only Deliverability Status. Nothing herein will prohibit an Applicant from seeking a deliverability assessment in accordance with the WDT. Applicants studied under the WDT Transmission Cluster Study Process may seek a deliverability assessment in accordance with the applicable provisions of the WDT.

Applicant may submit a request to convert their Interconnection Request to the Federal Energy Regulatory Commission (FERC) jurisdiction Wholesale Distribution Tariff (WDT) process subject to PG&E's WDT Section 6.8.1.1 requirements. Additional information is available at: https://www.pge.com/egi (P)

c. Applicant Completes an Interconnection Request

All Applicants shall submit a complete and valid Interconnection Request. When applicable per Table E.1, a nonrefundable $800 Interconnection Request fee, and for Applicants that elect Detailed Study in the Interconnection Request, a study deposit shall be required per instructions in the Interconnection Request. Applicants who proceed to Detailed Study after Fast Track will provide a Detailed Study deposit as specified in Section E.3.a.

Applicant shall submit a separate Interconnection Request for each Point of Interconnection. An Interconnection Request for the expansion of capacity of an existing operating Generating Facility shall be treated the same as an Interconnection Request for a new Generating Facility pursuant to this Rule.

i) Interconnection Requests for the Independent Study Process will be accepted throughout the year, except during the Distribution Group Study windows. All Detailed Study Interconnection Requests (except those applying directly to the WDT Transmission Cluster Study Process) submitted during the Distribution Group Study Windows will be processed as

(Continued)

Distribution Group Study Process Applicants.

(Continued)

E. INTERCONNECTION REQUEST SUBMISSION PROCESS (Cont'd.)

2. INTERCONNECTION REQUEST PROCESS (Cont'd.)

c. Applicant Completes an Interconnection Request (Cont'd.)

TABLE E.1

Summary of Interconnection Request Fees, Deposits and Exemptions

Generating Facility Type	Interconnection Request Fee	Supplemental Review Fee	Detailed Study Deposit	Additional Commissioning Test Verification	Cost Envelope Option Deposit****	Modifications Fee per Ee *****
Non-Net Energy Metering and > 1 MW NEM-2	$800	$2,500*	For a Generating Facility with a Gross Nameplate Rating of 5 MW or less and applying to the Independent Study Process, $10,000 for a System Impact Study or the DGS Phase I Interconnection Study in the case of the Distribution Group Study Process; and $15,000 for an Interconnection Facilities Study or DGS Phase II Interconnection Study in the case of the Distribution Group Study Process. For a Generating Facility with a Gross Nameplate Rating above 5 MW, $50,000 plus $1,000 per MW of electrical output of the Generating Facility, or the increase in electrical output of the existing Generation Facility, as applicable, rounded up to the nearest whole MW, up to a maximum of $250,000.	$150/Person Hour**	$2,500	$0
≤ 1 MW NEM-2***	$145	$0	$0	N/A	$2,500	$0
NEM-1	$0	$0	$0	N/A	$2,500	n/a
Non-NEM Solar ≤ 1MW******	First $5,000 of study fees waived			$150/Person Hour**	$2,500	$0

* Optional $1,000 additional fault current study fee pursuant to Section F.2.c.ii. Pursuant to D. 20-09-035, Applicants have the option to pre-pay the non-refundable Supplemental Review Fee (such as concurrently with the Interconnection Request fee) or separately upon completion of the Initial Review. (P) | (P)

** Plus additional costs for travel, lodging and meals.

*** Applicants that participate in the Single-Family Affordable Solar Homes (SASH) program are exempt from the Interconnection Request fee.

**** Interconnection Requests that have selected the Cost Envelope Option and that subsequently qualify for and pass the Fast Track Process evaluation, as well as NEM Generating Facilities and Solar ≤ 1 MW Generating Facilities evaluated under the Independent Study Process, must provide the Cost Envelope Option deposit in accordance with Section F.7 to remain eligible for the Cost Envelope Option.

***** The fee will be set to $0 for now, until PG&E submits a new Advice Letter to increase it. Note: the fee does not apply to NEM-1 nor NEMFC by statute. SASH is also exempt from this fee per D. 16-01-044.

****** Solar ≤ 1MW that does not sell power to Distribution Provider (per D.01-07-027) nor participate in NEM-1 or NEM-2

(Continued)

E. INTERCONNECTION REQUEST SUBMISSION PROCESS (Cont'd.)

4. INTERCONNECTION COST RESPONSIBILITY (Cont'd.)

f. Summary Tables (Cont'd.)

Table E.3 Summary of Producer Cost Responsibility for Multiple Tariff Interconnections

Existing Generating Facility	New Generating Facility	Interconnection Request Fee		Supplemental Review Fee		Detailed Study Cost		Interconnection Facilities Cost		Distribution Upgrades Cost	
		YES	NO	YES	NO	YES	NO	YES	NO	YES	NO
NEM	Non-NEM, NEM-2 (>1 MW)	X		X		X		X		X[b]	
NEM-1	NEM-1		X		X		X	X			X
NEM-1	NEM-2 (≤1MW)*	X			X		X	X			X
Non-NEM	NEM-1		X[c]		X[c]		X[c]	X			X[b,c]
Non-NEM	NEM-2 (>1 MW)	X		X		X		X		X	
Non-NEM	NEM-2 (≤1MW)*	X			X[c]		X[c]	X			X[b,c]
Simultaneous NEM and Non-NEM		X		X		X		X		X[b]	

a) Except as provided in Section D.13.e

b) Proration will be based upon the annual expected energy output (kWh) derived from the nameplate of the Generator(s) modified by technology-specific capacity/availability factors of all NEM and non-NEM Generators for the costs that cannot be clearly assigned to each type of tariff.

c) Change of operation of a non-NEM eligible Generator at any time to export is treated as a simultaneous NEM and non-NEM Interconnection Request, resulting in associated costs being allocated to Producer.

g. Cost Reconciliation

Unless agreed to otherwise between Applicant and Distribution Provider, Distribution Provider shall provide Applicant a detailed reconciliation of the costs on interconnection facilities and distribution upgrades within 12 months of project completion. (P)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

1. OVERVIEW OF THE INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Fast Track Review

Fast Track evaluation allows for rapid review of the Interconnection of those Generating Facilities that do not require Detailed Study. Regardless of study process, all Generating Facilities shall be designed to meet the applicable requirements of Section H which identifies Generating Facility Design and Operation Requirements.

Fast Track review consists of an Initial Review and, if required, a Supplemental Review. The need for Supplemental Review will be determined based on the results of Initial Review Screens A through M in Section G.1. Applicants that successfully pass Initial Review Screens A through M will be allowed to interconnect without Supplemental Review.

Non-Export AC/DC Converter installations that have a complete and valid Interconnection Request will be eligible to bypass screens B through D and F through M.

If Supplemental Review is required, Distribution Provider will notify Applicant and Applicant must pay a nonrefundable Supplemental Review fee, per Table E-1 or withdraw its Interconnection Request. If the Applicant pre-paid the Supplemental Review fee (such as concurrently with the Interconnection Request Fee), the Supplemental Review, if required, will be conducted upon completion of the Initial Review. Supplemental Review shall consist of the application of Screens N through P in Section G.2. Applicants that pass Screens N through P will be allowed to interconnect without additional review. (P) (P)

If Supplemental Review reveals that a proposed Generating Facility cannot be interconnected to Distribution Provider's Distribution System by means of Fast Track evaluation, Distribution Provider will notify Applicant that Detailed Study will be required.

Failure to pass Fast Track evaluation means only that further review and/or study are required before the Generating Facility can be interconnected with Distribution Provider's Distribution System. It does not mean that the Generating Facility cannot be interconnected.

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS

a. Initial Review

Upon receipt of a complete and valid Interconnection Request, Distribution Provider shall perform Initial Review using the process in Section G.1. The Initial Review determines if (i) the Generating Facility qualifies for Fast Track Interconnection through Initial Review, or (ii) the Generating Facility requires a Supplemental Review. Absent extraordinary circumstances, Distribution Provider shall notify Applicant in writing of the results of Initial Review within fifteen (15) Business Days following validation of an Interconnection Request.

(N)

As part of the evaluation of Screen M, when Integration Capacity Analysis Values are available at the requested Point of Interconnection, Distribution Provider will determine if Integration Capacity Analysis Values at the proposed Point of Interconnection need to be updated. If Distribution Provider determines that the Integration Capacity Analysis Values at the proposed Point Interconnection need to be updated, the Distribution Provider will update the values for the proposed Point of Interconnection using the Integration Capacity Analysis tool on the specific electrical node or by running the Integration Capacity Analysis on all the electrical nodes in the circuit. Distribution Provider shall not perform additional Integration Capacity Analysis as part of the interconnection process of projects with less than 30 kilovolt amperes nameplate capacity. Distribution Provider shall share the results of any Integration Capacity Analysis updates with the Applicant and provide an explanation of changes to grid conditions or the interconnection queue which led to the need to obtain updated Integration Capacity Analysis Values. Distribution Provider shall comply with confidentiality provisions and data redaction policies.

(N)

(L)

(L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.) (L)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS

a. Initial Review (Cont'd)

For all Interconnection Requests that pass Initial Review and do not require Interconnection Facilities or Distribution Upgrades, Distribution Provider shall provide Applicant with a Generator Interconnection Agreement within fifteen (15) Business Days of providing notice of Initial Review results. For Interconnection Requests that pass Initial Review but do require Interconnection Facilities or Distribution Upgrades, within fifteen (15) Business Days of providing notice of Initial Review results, Distribution Provider shall provide Applicant with a non-binding cost estimate of the Interconnection Facilities or Distribution Upgrades. For those Interconnection Requests where Applicant has selected the Cost Envelope Option, within ten (10) Business Days of providing Applicant the non-binding cost estimate for the required Interconnection Facilities and/or Distribution Upgrades, Applicant shall provide the Distribution Provider the Cost Envelope Option deposit, in accordance with Section F.7.a.i.3. If Applicant fails to provide the Cost Envelope Option deposit in accordance with Section F.7.a.i.3, Applicant's request for the Cost Envelope Option shall be deemed withdrawn and the Interconnection Request shall not be eligible for the Cost Envelope Option.

For all Interconnection Requests that pass Initial Review, refer to Section F.2.e for cost responsibility and time frames for completing the Generator Interconnection Agreement. (L)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS

a. Initial Review (Cont'd.)

For Interconnection Requests that fail Initial Review, Distribution Provider shall provide the technical reason, data and analysis supporting the Initial Review results in writing and provide Applicant the option to either attend an Initial Review results meeting or proceed directly to Supplemental Review. NEM-1 and ≤1 MW NEM-2 Applicants covered under Section D.13.a, and Applicants that pre-pay for the Supplemental Review (such as concurrently with the Interconnection Request Fee), shall proceed directly to Supplemental Review without an Initial Review results meeting. Applicant shall notify Distribution Provider within ten (10) Business Days following such notification whether to (i) proceed to an Initial Review results meeting, (ii) proceed to Supplemental Review, or (iii) withdraw the Interconnection Request. Applicant may request one extension of no more than ten (10) Business Days to respond. If Applicant fails to notify Distribution Provider within ten (10) Business Days of such notification, or at the end of the extension, if one was requested, the Interconnection Request shall be deemed withdrawn. (P) (P)

No changes may be made to the planned Point of Interconnection or Generating Facility size included in the Interconnection Request during the Fast Track Process, except as provided in Table F.1 below, or unless such changes are agreed to by Distribution Provider. Where agreement has not been reached, Applicants choosing to change the Point of Interconnection or Generating Facility size, except as provided for in Table F.1, must reapply and submit a new Interconnection Request.

Applicants that elect to proceed to Supplemental Review, unless the Applicant has pre-paid, shall provide a nonrefundable Supplemental Review fee set forth in Section E.2.c with their response. The Supplemental Review fee shall be waived for Interconnection Requests requesting Interconnection of NEM-1 or ≤1 MW NEM-2 Generating Facilities and for solar-powered non-NEM ≤1 MW Generating Facilities that do not sell power to Distribution Provider, per Commission D.01-07-027. (P) (P)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Optional Initial Review Results Meeting

Within five (5) Business Days of Applicant's request for an Initial Review results meeting, Distribution Provider shall contact Applicant and offer to convene a meeting at a mutually acceptable time to review the Initial Review screen analysis and related results to determine what modifications, if any, may permit the Generating Facility to be connected safely and reliably without Supplemental Review.

In the event the Applicant has pre-paid the Supplemental Review fee (such as concurrently with the Interconnection Request Fee), the Distribution Provider will proceed, if necessary, with Supplemental Review upon completion of Initial Review and shall not be required to offer an Initial Review results meeting. (P)

If modifications that obviate the need for Supplemental Review are identified, and Applicant and Distribution Provider agree to such modifications, Distribution Provider shall provide Applicant with a Generator Interconnection Agreement within fifteen (15) Business Days of the Initial Review results meeting if no Interconnection Facilities or Distribution Upgrades are required. If Interconnection Facilities or Distribution Upgrades are required, Distribution Provider shall provide Applicant with a non-binding cost estimate of any Interconnection Facilities or Distribution Upgrades within fifteen (15) Business Days of the Initial Review results meeting. For those Interconnection Requests where Applicant has selected the Cost Envelope Option, within ten (10) Business Days of providing Applicant the non-binding cost estimate for the required Interconnection Facilities and/or Distribution Upgrades, Applicant shall provide the Distribution Provider the Cost Envelope Option deposit, in accordance with Section F.7.a.i.3. If Applicant fails to provide the Cost Envelope Option deposit in accordance with Section F.7.a.i.3, Applicant's request for the Cost Envelope Option shall be deemed withdrawn and the Interconnection Request shall not be eligible for the Cost Envelope Option.

For all Interconnection Requests that pass Initial Review, refer to Section F.2.e for cost responsibility and time frames for completing the Generator Interconnection Agreement.

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Optional Initial Review Results Meeting (Cont'd.)

If Applicant and Distribution Provider are unable to identify or agree to modifications that enable Applicant to pass Initial Review, Applicant shall notify Distribution Provider within ten (10) Business Days of the Initial Review results meeting whether it would like to proceed with Supplemental Review or withdraw its Interconnection Request. Applicant may request one extension of no more than ten (10) Business Days to respond. If Applicant fails to notify Distribution Provider within ten (10) Business Days of the Initial Review results meeting, or at the end of the extension, if one was requested, the Interconnection Request shall be deemed withdrawn.

c. Supplemental Review

i) If Applicant requests Supplemental Review and submits a nonrefundable Supplemental Review fee, if required, Distribution Provider shall complete Supplemental Review within twenty (20) Business Days, absent extraordinary circumstances, following authorization and receipt of the fee. Supplemental Review determines if (i) the Generating Facility qualifies for Fast Track Interconnection, or (ii) the Generating Facility requires Detailed Study.

ii) If the Applicant pre-paid the Supplemental Review fee (such as concurrently with the Interconnection Request Fee), Distribution Provider will complete the Supplemental Review, if required, within twenty (20) Business Days from the completion of the Initial Review. (P)

iii) If the Applicant chooses to move to Supplemental Review or has pre-paid the non-refundable Supplemental Review fee, they have the option to elect that the Distribution Provider provide a fault current study as part of the Supplemental Review. This fault current study would extend the Supplemental Review time by up to ten (10) Business Days, and would require an additional nonrefundable fee of $1,000. (P) (P)

This fault current study will determine if the Generating Facility can detect phase and ground faults on the Distribution Provider's Distribution System or the distribution feeder breaker where the Applicant proposes to connect the Generating Facility.

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Supplemental Review (Cont'd.)

iii) The result of the fault current study will determine if direct transfer trip (DTT) will be required from the Distribution System to the Generating Facility site. Note that for Applicants proposing to interconnect to the Distribution System where there is expected to be power backfeed to the Transmission System, DTT from the transmission may still be required and a Detailed Interconnection Study will be required to make this determination (Cont'd). (P)

Should the Applicant request a Supplemental Review results meeting, as described in Section F.2d, the optional fault current study analysis and related results shall, at the Applicant's request, be reviewed to determine what modifications, if any, may permit the Generating Facility to be connected safely and reliably.

~~If the Applicant chooses to move to Supplemental Review, they have the option to elect that the Distribution Provider provide a fault current study as part of the Supplemental Review. This fault current study would extend the Supplemental Review time by up to ten (10) Business Days, and would require an additional nonrefundable fee of $1,000. (Cont'd.)~~ (P)

The Applicant must provide the following data to Distribution Provider when requesting Supplemental Review in order to select this option:

Generator:
- MVA Rating
- kV Rating
- Base MVA
- Base kV
- Xd" (direct axis subtransient reactance)
- Xd' (direct axis transient reactance)
- Xd (Synchronous reactance)
- X2 (Negative Sequence reactance)
- X0 (Zero Sequence reactance)

XFMR Data:
- Winding configuration (delta-Wye grd or Wye grd-Delta)
- MVA Rating
- KV Rating
- Base MVA

(Continued)

ELECTRIC RULE NO. 21 Sheet 79
GENERATING FACILITY INTERCONNECTIONS

Base KV
Z1 HV-LV
Z0 HV-LV

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Supplemental Review (Cont'd.)

iii) Line Data: (P)
Impedance data for line from XFMR to POI (if applicable)
Z1
Z0

POI Location~~:~~ (P)

~~iii~~iv) For Interconnection Requests that pass Supplemental Review and do not require Interconnection Facilities or Distribution Upgrades, Distribution Provider shall provide Applicant with a Generator Interconnection Agreement within fifteen (15) Business Days of providing notice of Supplemental Review results. For Interconnection Requests that pass Supplemental Review and do require Interconnection Facilities or Distribution Upgrades, within fifteen (15) Business Days of providing notice of Supplemental Review results, Distribution Provider shall provide Applicant with a non-binding cost estimate of any Interconnection Facilities or Distribution Upgrades. For those Interconnection Requests where Applicant has selected the Cost Envelope Option, within ten (10) Business Days of providing Applicant the non-binding cost estimate for the required Interconnection Facilities and/or Distribution Upgrades, Applicant shall provide the Distribution Provider the Cost Envelope Option deposit, in accordance with Section F.7.a.i.3. If Applicant fails to provide the Cost Envelope Option deposit in accordance with Section F.7.a.i.3, Applicant's request for the Cost Envelope Option shall be deemed withdrawn and the Interconnection Request shall not be eligible for the Cost Envelope Option. (P)

For all Interconnection Requests that pass Supplemental Review, refer to Section F.2.e for cost responsibility and time frames for completing the Generator Interconnection Agreement.

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Supplemental Review (Cont'd.)

~~i~~v) For Interconnection Requests that fail Supplemental Review, Distribution Provider shall provide the technical reason, data and analysis supporting the Supplemental Review results in writing, including, if Distribution Provider can make the determination, which Detailed Study track Applicant qualifies for, and provide Applicant the option to attend a Supplemental Review results meeting or proceed directly to Detailed Study. Applicant shall notify Distribution Provider within fifteen (15) Business Days following such notification whether to (i) proceed to a Supplemental Review results meeting, (ii) proceed to Detailed Study, or (iii) withdraw the Interconnection Request. Applicant may request one extension of no more than fifteen (15) Business Days to respond. If Applicant fails to notify Distribution Provider within fifteen (15) Business Days of such notification, or at the end of the extension, if one was requested, the Interconnection Request shall be deemed withdrawn. (P)

Applicants that elect to proceed to Detailed Study shall provide the applicable study deposit set forth in Section E.3.a with their response. Detailed Study fees for solar Generating Facilities up to 1 MW interconnecting to the Distribution System that do not sell power to Distribution Provider will be waived up to the amount of $5,000. Except as provided for in Section F.3.d, NEM-1 and ≤1 MW NEM-2 Generating Facilities are exempt from any costs associated with Detailed Studies.

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

2. FAST TRACK INTERCONNECTION REVIEW PROCESS (Cont'd.)

e. Execution of the Generator Interconnection Agreement (Cont'd.)

shall negotiate concerning the cost estimate, or any disputed provisions of the appendices to a draft Generator Interconnection Agreement, for not more than ninety (90) Calendar Days after Distribution Provider provides Applicant with the Generator Interconnection Agreement. If Applicant determines that negotiations are at an impasse, it may request termination of the negotiations and initiate Dispute Resolution procedures pursuant to Section K. If Applicant fails to sign the Generator Interconnection Agreement or initiate Dispute Resolution within ninety (90) Calendar Days, the Interconnection Request shall be deemed withdrawn.

After Applicant, or a Producer where those are different entities, has executed the Generator Interconnection Agreement, Distribution Provider will commence design, procurement, construction and installation of Distribution Provider's Distribution Upgrades and/or Interconnection Facilities that have been identified in the Generator Interconnection Agreement. Distribution Provider and Producer will use good faith efforts to meet schedules in accordance with the requirements of the Generator Interconnection Agreement and estimated costs as appropriate. Producer is responsible for all applicable costs associated with Parallel Operation to support the safe and reliable operation of the Distribution System and Transmission System as set forth in Section E.4.

Distribution Provider and Producer shall negotiate in good faith concerning a schedule for the construction of Distribution Provider's Interconnection Facilities and Distribution Upgrades. (P)

Unless agreed to otherwise between Applicant and Distribution Provider, Distribution Provider shall schedule a mitigation work scoping meeting no later than 10 business days after receiving the payment for the engineering advance.

Distribution Provider shall provide quarterly updates on substation upgrades to Producers whose projects are dependent on a substation upgrade. (P)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Independent Study Process

i) Scoping Meeting

Within five (5) Business Days after Distribution Provider notifies Applicant that the Interconnection Request has passed Screens Q and R and is thus eligible for the Independent Study Process, Distribution Provider shall contact Applicant to establish a date agreeable to Applicant and Distribution Provider for a scoping meeting. Distribution Provider shall inform Applicant of the Detailed Study start date. (P) (P)

The purpose of the scoping meeting shall be: (i) to discuss reasonable Commercial Operation Dates and alternative interconnection options; (ii) to exchange information, including any transmission data that would reasonably be expected to impact Applicant's interconnection options; (iii) to analyze such information; and (iv) to determine feasible Points of Interconnection and eliminate alternatives given resources and available information.

Distribution Provider will bring to the scoping meeting, as reasonably necessary to accomplish its purpose, such already available technical data, including, but not limited to; (i) general facility loadings, (ii) general instability issues, (iii) general short circuit issues, (iv) general voltage issues, and (v) general reliability issues.

Applicant will bring to the scoping meeting, in addition to the technical data in Attachment A of the Rule 21 Exporting Generating Facility Interconnection Request form, any system studies previously performed. Distribution Provider, the CAISO, if applicable, and Applicant will also bring to the meeting personnel and other resources as may be reasonably required to accomplish the purpose of the meeting in the time allocated for the meeting. On the basis of the meeting, Applicant shall designate its Point of Interconnection. The duration of the meeting shall be only what is sufficient to accomplish its purpose.

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

b. Independent Study Process (Cont'd.)

ix) Interconnection Facilities Study Results Meeting

If requested by Applicant, a results meeting shall be held among Distribution Provider, the CAISO, if applicable, and Applicant to discuss the results of the Interconnection Facilities Study, including assigned cost responsibility. Within five (5) Business Days of the request, Distribution Provider shall contact Applicant to establish a date agreeable to Applicant, Distribution Provider and the CAISO, if applicable, for the results meeting.

Within thirty (30) Calendar Days after the Interconnection Facilities Study results meeting, Distribution Provider shall tender a draft Generator Interconnection Agreement, together with draft appendices, to Applicant.

x) Second and Third Postings of Interconnection Financial Security

Applicant will post its second and third postings of Interconnection Financial Security as set forth in Sections F.4.c and F.4.d based on the cost responsibility for Network Upgrades, Distribution Upgrades, and Distribution Provider's Interconnection Facilities set forth in the final Interconnection Facilities Study, or the final Interconnection System Impact Study if the Interconnection Facilities Study is waived in accordance with Section F.3.b.vii.

c. Distribution Group Study Process

i) Initiation of Distribution Study Process

Applicants that apply for the Independent Study Process that pass Screen Q but fail Screen R will be eligible for inclusion in a Distribution Study Group. Applicant must submit all materials required to complete their Interconnection Request no later than ten (10) Business Days after the close of the relevant Distribution Group Study window. This includes notification from Applicant that they want to proceed with the Distribution Group Study Process, if applicable, in accordance with Section F.3.a. Distribution Provider shall inform Applicant of the Detailed Study start date. (P) (P)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

c. Distribution Group Study Process (Cont'd.)

xvi) Automatic Timing Extension

If during any six month period, the number of Interconnection Requests exceeds by fifty (50) percent the number of active Interconnection Request in the preceding six month period, the study timelines for Distribution Group Studies begun during the next twelve (12) months will automatically increase as follows. The time to complete the DGS Phase I Interconnection Study pursuant to Section F.3.c.iv will increase from sixty (60) Business Days to one hundred twenty (120) Business Days. The time to complete the DGS Phase II Interconnection Study pursuant to Section F.3.c.x will increase from sixty (60) Business Days to one hundred twenty (120) Business Days. The time to tender a draft Generator Interconnection Agreement pursuant to F.3.e.i will increase from thirty (30) Calendar Days to forty-five (45) Calendar Days. Distribution Provider will notify Applicants in the Distribution Study Group in writing after commencement of DGS Phase I Interconnection Study of the extension.

d. WDT Transmission Cluster Study Process

If Applicant's Interconnection Request fails Screen Q or elects to be studied under the WDT Transmission Cluster Study Process, Applicant shall have the option of applying for Interconnection under the WDT Transmission Cluster Study Process of the Wholesale Distribution Tariff in accordance with its provisions. If Applicant fails Screen Q, Applicant's Interconnection Request shall be deemed withdrawn under this Rule regardless of whether Applicant applies for Interconnection under the WDT. Distribution Provider shall inform Applicant of the Detailed Study start date. (P) (P)

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

3. DETAILED STUDY INTERCONNECTION REVIEW PROCESS (Cont'd.)

e. Generator Interconnection Agreement (Cont'd.)

ii) Negotiation (Cont'd.)

DGS Phase II Interconnection Facilities Study report (or the final DGS Phase I Interconnection Study report if the DGS Phase II Interconnection Study is waived) in the case of the Distribution Group Study Process or Interconnection Facilities Study report (or final Interconnection System Impact Study report if the Interconnection Facilities Study is waived) in the case of the Independent Study Process, it shall be deemed to have withdrawn its Interconnection Request.

Unless agreed to otherwise between Applicant and Distribution Provider, Distribution Provider will send an invoice to Applicant within five business days of execution of the Interconnection Agreement. (P)

Unless agreed to otherwise between Applicant and Distribution Provider, Distribution Provider shall schedule a mitigation work scoping meeting no later than 10 business days after receiving the payment for the engineering advance. (P)

iii) Extensions of Commercial Operation Date

Extensions of the Commercial Operation Date will be agreed upon in the executed Generator Interconnection Agreement. Reasonable Commercial Operation Dates will be discussed at the DGS Phase II Interconnection Study results meeting, or the DGS Phase I Interconnection Study results meeting if the DGS Phase II Interconnection Study results meeting is waived, in the case of the Distribution Group Study Process, the Interconnection Facilities Study results meeting, or the Interconnection System Impact Study results meeting if the Interconnection Facilities Study is waived in the case of the Independent Study Process. A request for an extension of the Commercial Operation Date after the Generator Interconnection Agreement is executed will be agreed to provided that, the Producer is still responsible for funding any Distribution Upgrades and Network Upgrades as specified in the Generator Interconnection Agreement and under the same payment schedule agreed upon in the Generator Interconnection Agreement. This provision has no impact on any power purchase

(Continued)

agreement terms.

(Continued)

F. REVIEW PROCESS FOR INTERCONNECTION REQUESTS (Cont'd.)

7. COST ENVELOPE OPTION (Cont'd.)

f. Modifications

Under the Independent Study Process, any requested modifications, including required updates to costs under the Cost Envelope Option, shall be made in accordance with Section F.3.b.v. If Applicant elects to proceed with re-evaluation of the costs under the Cost Envelope Option pursuant to Section F.3.b.v, Distribution Provider shall complete the re-evaluation within the sum of the time allowed for each step utilized by the Distribution Provider for preparation of the initial Cost Envelope Estimate pursuant Section F.3.b from receipt of all required technical data related to the proposed changes and payment of the estimated cost of the re-evaluation.

g. Tender of the Generator Interconnection Agreement Under the Cost Envelope Option

Negotiation and execution of the Generator Interconnection Agreement shall be in accordance with Section F.2.e for Interconnection Requests evaluated under the Fast Track Process, and in accordance with Section F.3.e.ii for Interconnection Requests evaluated under the Independent Study Process.

8. STANDARD DESIGN AND CONSTRUCTION TIMELINE (N)

Subject to emergencies, delays from other agencies, and other reasons,[1] the standard timeline for design and construction of interconnection-related distribution upgrades is as follows:

i) 60 business days for design and 60 business days for construction, or
ii) Design and construct timelines as agreed to between Applicant and Distribution Provider.

The 60-day clock commences upon payment and after Applicant has done everything necessary on its end to prepare for construction.

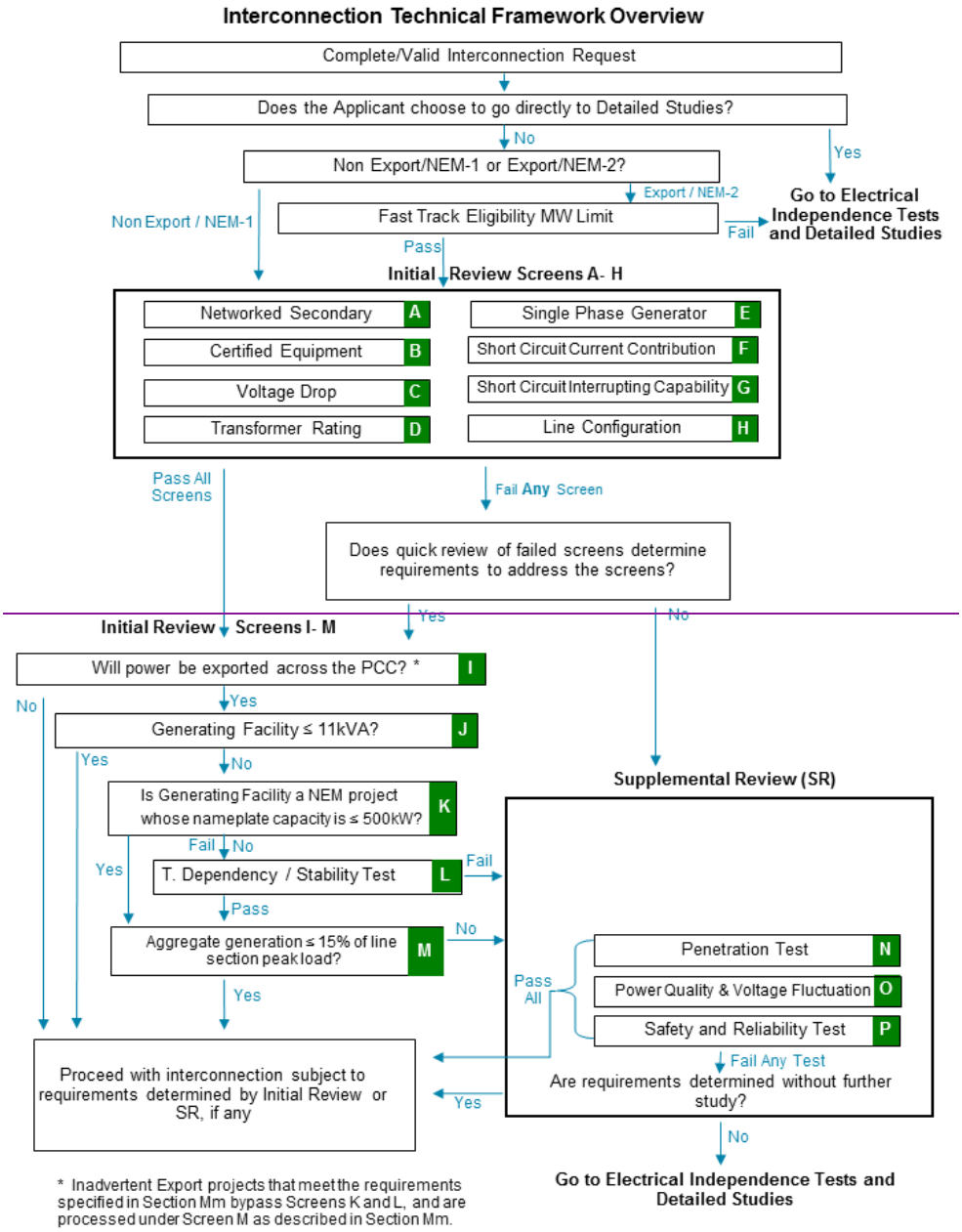
[1] "Other reasons" include: long lead times for procurement of materials; licensing, rights acquisition, and/or permitting; higher-voltage distribution (generally greater than 50 kilovolts); modifications to equipment (to remove and/or replace) inside substations; civil work performed by Distribution Provider (that is typically performed by Applicant); line extension or reconductoring greater than 500 feet in length. (N)

(Continued)

G. ENGINEERING REVIEW DETAILS

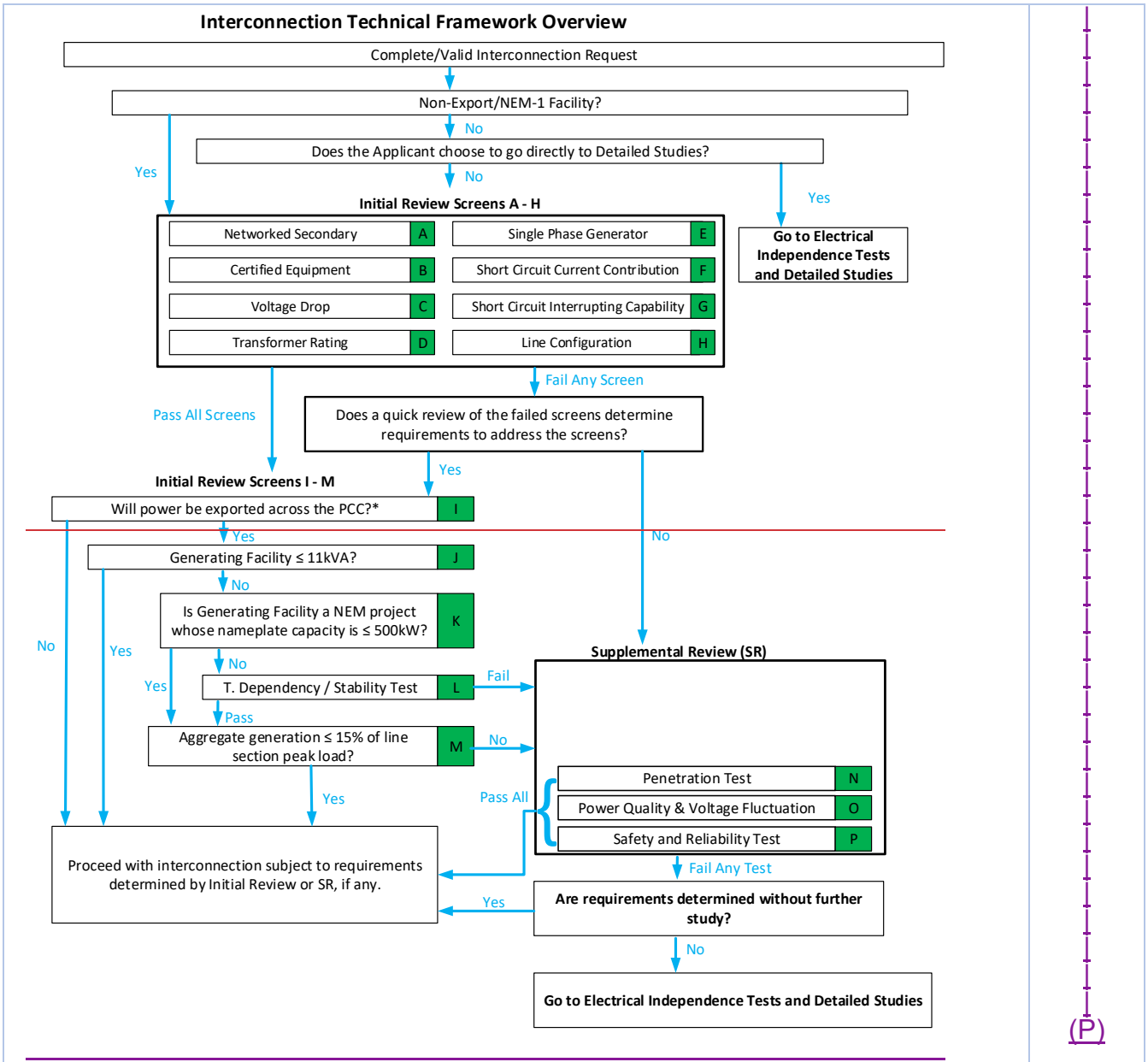
Delete table below:

(P)



Delete pending table below:

(Continued)

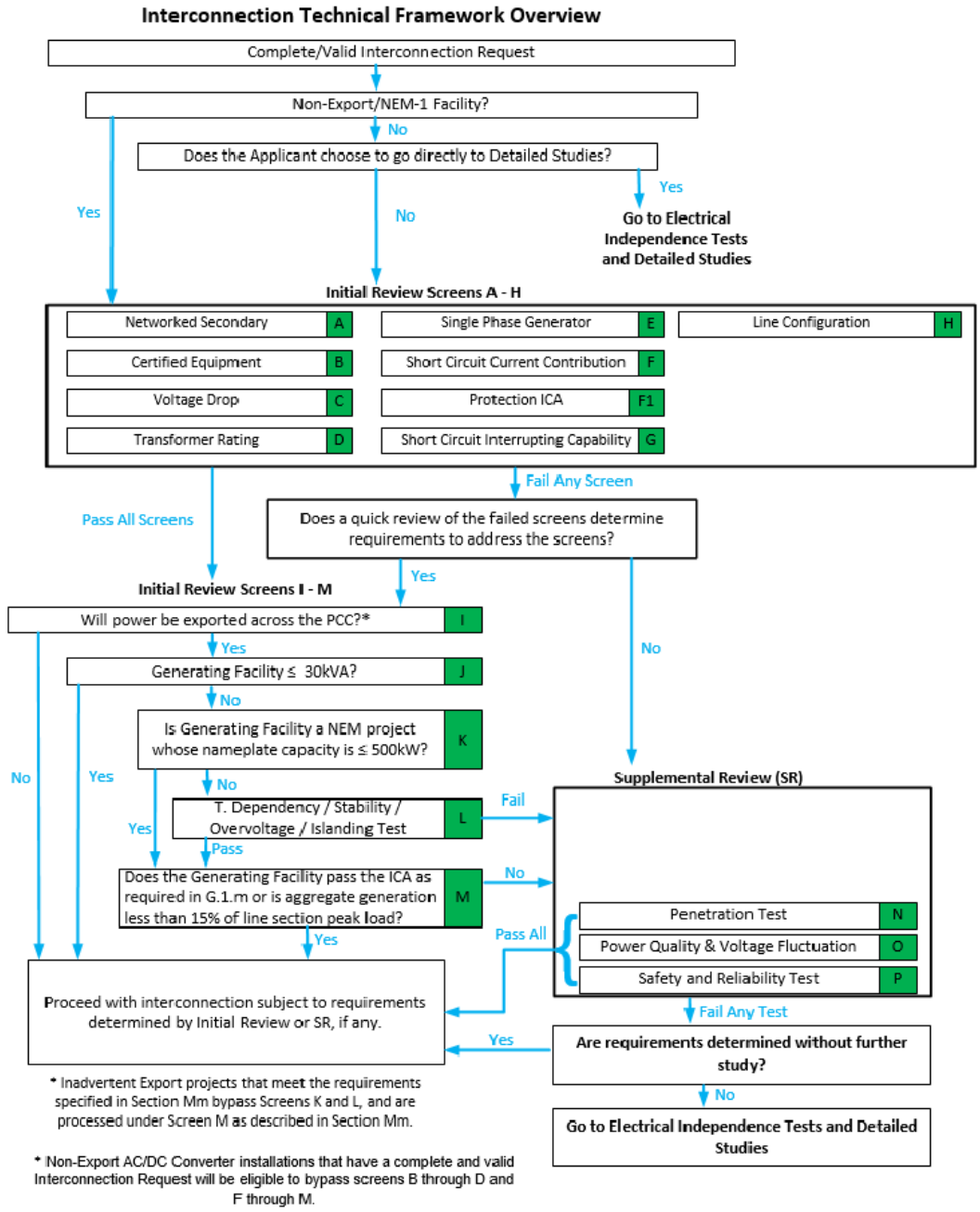


(P)

Add new table below:

(Continued)

ELECTRIC RULE NO. 21 Sheet 141
GENERATING FACILITY INTERCONNECTIONS



(T)

(T)

* Non-Export AC/DC Converter installations that have a complete and valid Interconnection Request will be eligible to bypass screens B through D and F through M. If Generating Facility meets the conditions in Screen I below (Section G.1.i), skip Screens K, L, and M. (P) (P)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

e. Screen E: Does the Single-Phase Generator cause unacceptable imbalance? (Cont'd.)

Significance: Generating Facilities connected to a single-phase transformer with 120/240 V secondary voltage must be installed such that the aggregated gross output is as balanced as practicable between the two phases of the 240 volt service. When Distribution Provider's analysis determines a transformer change is required. Distribution Provider will furnish the customer with an explanation of why the change is needed.

f. Screens F and F1: Is the Short Circuit Current Contribution Ratio within acceptable limits? (T)

Screen F: Is the Short Circuit Current Contribution Ratio within acceptable limits? (N) (N)

- If Yes (pass), continue to Screen F1~~G~~. (T)
- If No (fail), continue to Screen ~~G~~ F1 pursuant to Section G.1. (T)

Note: This Screen does not apply to Generating Facilities with a Gross Rating of 30~~11~~ kVA or less. (T)

When measured at primary side (high side) of the Dedicated Distribution Transformer serving a Generating Facility, the sum of the Short Circuit Contribution Ratios of all Generating Facilities connected to Distribution Provider's Distribution System circuit that serves the Generating Facility must be less than or equal to 0.1.

Significance: If the Generating Facility passes this s~~S~~creen, it can be expected that it will have no significant impact on Distribution Provider's Distribution System's short circuit duty, fault detection sensitivity, relay coordination or fuse-saving schemes. (T)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

f. Screen F1: Is the per unit short circuit current contribution under allowable levels? (N)

Is the short circuit current contribution less than or equal to 1.2 per unit or is the Generating Facility Gross Nameplate Rating multiplied by its per unit contribution less than the Protection Integrated Capacity Analysis (ICA) Value1 multiplied by 1.2 per unit?

• If Yes to either (pass), continue to Screen G.
• If No to both (fail), continue to Screen G pursuant to Section G.1.

Significance: Generating systems with a per unit short circuit contribution of 1.2 or less can bypass this screen and directly use the ICA because ICA calculations assume that Generating Facilities have a per unit short circuit contribution of 1.2. For Generating Facilities with a per unit short circuit contribution greater than 1.2, the Distribution Provider will use the Protection ICA Value at the point of interconnection in conjunction with the Generating Facility's per unit short circuit contribution to determine whether the facility passes Screen F1. (N)

g. Screen G: Is the Short Circuit Interrupting Capability Exceeded?

Does the proposed Generating Facility, in aggregate with other Generating Facilities on the distribution circuit, cause any distribution protective devices and equipment (including, but not limited to, substation breakers, fuse cutouts, and line reclosers), or Interconnection Request equipment on the system to exceed 87.5 % of the short circuit interrupting capability; or is the Interconnection proposed for a circuit that already exceeds 87.5 % of the short circuit interrupting capability?

- If Yes (fail) continue to Screen H pursuant to Section G.1.
- If No (pass), continue to Screen H

Note: This Screen does not apply to Generating Facilities with a Gross Rating of 3011 ~~11~~ kVA or less. (T)

[1]Protection ICA Value is one of the component values of the ICA Value that pertains to sensing faults on the grid.

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

g. Screen G: Is the Short Circuit Interrupting Capability Exceeded? (Cont'd) (L)

Significance: If the Generating Facility passes this screen, it can be expected that it will not cause any of Distribution Provider's equipment to be overstressed. (L)

h. Screen H: Is the line configuration compatible with the Interconnection type?

- If Yes (pass), continue to Screen I.
- If No (fail), continue to Screen I pursuant to Section G.1.

Note: This Screen does not apply to Generating Facilities with a Gross Rating of 3011 ~~11~~ kVA or less (T)

Line Configuration Screen: Identify primary distribution line configuration that will serve the Generating Facility. Based on the type of Interconnection to be used for the Generating Facility, determine from Table G.1 if the proposed Generating Facility passes the Screen.

Table G-1
Type of Interconnection

Primary Distribution Line Type Configuration	Type of Interconnection to be made to Primary Distribution Line	Result/Criteria
Three-phase, three-wire	Any type	Pass Screen
Three-phase, four-wire	Single-phase, line-to-neutral	Pass Screen
Three-phase, four-wire (For any line that has such a section OR mixed three-wire & four-wire)	All others	To pass, aggregate Generating Facility nameplate rating must be less than or equal to 10% of Line Section peak load

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

h. Screen H: Is the line configuration compatible with the Interconnection type? (Cont'd.)

Significance: If the primary distribution line serving the Generating Facility is of a "three-wire" configuration, or if the Generating Facility's distribution transformer is single-phase and connected in a line-to-neutral configuration, then there is no concern about overvoltages to Distribution Provider's, or other Customer's equipment caused by loss of system neutral grounding during the operating time of the Non-Islanding Protective Function.

i. Screen I: Will power be exported across the PCC?

- If Yes, Continue to Screen J. This includes Options 5, ~~and~~ 6, 9, 10, and 11 below. (P) (P)

- If No, then to ensure that the Generating Facility does not export across the PCC, the Generating Facility must incorporate ~~one of the first four options shown~~ Options 1, 2, 3, 4, 7, or 8 below. Following that selection, Screen J, K, L, and M are skipped and Initial Review is complete. If Option 8 is used, see section Mm2 to determine screen application. (P)

Option 1 ("Reverse Power Protection"): To ensure power is never exported across the PCC, a reverse power Protective Function may be provided. The default setting for this Protective Function shall be 0.1% (export) of the service transformer's rating, with a maximum 2.0 second time delay. For multiple tariff interconnections refer to Section J.8.

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

i. Screen I: Will power be exported across the PCC? (Cont'd.)

Option 4 (Relative Generating Facility Rating): This option, when used, requires the Net Rating of the Generating Facility to be so small in comparison to its host facility's minimum load, that the use of additional Protective Functions is not required to ensure that power will not be exported to Distribution Provider's Distribution or Transmission System. This option requires the Generating Facility capacity to be no greater than 50% of Producer's verifiable minimum Host Load over the past 12 months.

Option 5: Inadvertent Export as described in Section M.

Option 6: Inadvertent Export utilizing UL-1741 or UL-1741 SA/SB listed grid support (Non-Islanding) inverters as described in Section Mm. (P)

Option 7: Non-Export utilizing Non-Export AC/DC Converter as described in Section O. (P)

Option 8: Non-Export utilizing Certified Power Control Systems with an open loop response time no more than two seconds as described in Section Mm1.

Option 9: Limited Export utilizing Certified Power Control Systems with an open loop response time no more than two seconds as described in Section Mm2.

Option 10: Non-Export with Inadvertent Export utilizing Certified Power Control Systems with an open loop response time greater than two seconds and no more than ten seconds as described in Section Mm3.

Option 11: Limited Export with Inadvertent Export utilizing Certified Power Control Systems with an open loop response time greater than two seconds and no more than ten seconds as described in Section Mm4. (P)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (P)/(L)

1. INITIAL REVIEW SCREENS (Cont'd.)

i. Screen I: Will power be exported across the PCC? (Cont'd.)

Significance:

1. If it can be assured that the Generating Facility will not export power, Distribution Provider's Distribution or Transmission System does not need to be studied for load-carrying capability or Generating Facility power flow effects on Distribution Provider voltage regulators.

2. This Screen permits the use of reverse-power or minimum-power relaying as a Non-Islanding Protective Function (Option 1, 2, and 3).

3. This Screen allows, under certain defined conditions, for Generating Facilities that incorporate Certified Non-Islanding protection to qualify for interconnection through the Fast Track process without implementing reverse power or minimum power Protective Functions (Option 3). (P)/(L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

j. Screen J: Is the Gross Rating of the Generating Facility 30~~11~~ kVA or less? (T)

- If Yes (pass), skip Screens K, L and M; Initial Review is complete.
- If No (fail), continue to Screen K.[i]

Significance: The Generating Facility will have a minimal impact on fault current levels and any potential line overvoltages from loss of Distribution Provider's Distribution System neutral grounding.

k. Screen K: Is the Generating Facility a Net Energy Metering (NEM) Generating Facility with nameplate capacity less than or equal to 500 kW?

- If Yes (pass), skip screen L and continue to screen M.
- If No (fail), continue to screen L.

Significance: The purpose of this Screen is solely to facilitate interconnection of NEM facilities below this size threshold by allowing such facilities to bypass Screen M. The use of nameplate capacity expedites the Initial Review analysis. In Supplemental Review, the net export will be analyzed.

[i] Inadvertent Export systems that meet the requirements specified in Section Mm bypass Screens K and L, and are processed under Screen M as described in Section Mm.

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

I. Screen L: Transmission Dependency, ~~and Transmission~~ Stability, Overvoltage, and Islanding Tests (T) (T)

Is the Interconnection Request for an area where: (i) there are known, or posted, transient/dynamic stability limitations, or (ii) the proposed Generating Facility has interdependencies, known to Distribution Provider, with earlier-queued Transmission System interconnection requests, or (iii) islanding conditions are possible based on PG&E's currently adopted and published screening policies with respect to antiislanding screening, or (iv) transmission ground fault overvoltage is possible based on PG&E's currently adopted and published screening policies with respect to overvoltage screening. Where (i) or (ii) or (iii) or (iv)above are met, the impacts of this Interconnection Request to the Transmission System may require ~~Detailed~~ further Study. (T) (T)

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

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

PG&E will temporarily apply anti-islanding tests until the resolution of Issue 18* R. 17.-07-007 Working Group Four in made effective in PG&E's tariffs. (N) (N)

* Issue 18 is "Should the Commission adopt changes to anti-islanding screen parameters to reflect research on islanding risks when using UL 1741-certified inverters in order to avoid unnecessary mitigations? If yes, what should those changes entail?" (N) (N)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

m. Screen M: When ICA information is available at the requested Point of Interconnection, Screen M should be evaluated in accordance with the Gross Nameplate Rating or typical PV output profile.

For Interconnection Requests based on Gross Nameplate Rating

a. Is the Generating Facility aggregate Gross Nameplate Rating greater than 90% of the lower value in the ICA-SG 576 Profile? or

b. Is the Generating Facility aggregate Gross Nameplate Rating greater than 90% of the lower value in the ICA-OF 576 Profile?

If the response is "yes" to either a) or b), the Interconnection Request fails Screen M and must be evaluated under the Supplemental Review or Detailed Study to determine mitigation requirements.

For Interconnection Requests based on typical PV output profile

a. Is the Generating Facility real power production based on PV Watts or equivalent greater than 90% of the ICA-SG 576 value in any hour? or

b. Is the Generating Facility real power production based on PV Watts or equivalent greater than 90% of the ICA-OF 576 value in any hour?

If the response is "yes" to either a) or b), the Interconnection Request fails Screen M and must be evaluated under the Supplemental Review or Detailed Study to determine mitigation requirements.

When ICA information is not available at the requested Point of Interconnection, Screen M should be evaluated as follows:

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

1. INITIAL REVIEW SCREENS (Cont'd.)

m. Screen M: Is the aggregate Generating Facility capacity on the Line Section less than 15% of Line Section peak load for all line sections bounded by automatic sectionalizing devices? ~~(Cont'd.)~~ (T)

- If Yes (pass), Initial Review is complete. (L)
- If No (fail), Supplemental Review is required.

Significance:

1. Low penetration of Generating Facility capacity will have a minimal impact on the operation and load restoration efforts of Distribution Provider's Distribution System. (L)

2. The operating requirements for a high penetration of Generating Facility capacity may be different since the impact on Distribution Provider's Distribution System will no longer be minimal, therefore requiring additional study or controls.

The purpose of this Screen is solely to identify if the Generating Facility needs additional study and is not intended as justification for limiting the penetration of generation on a line section.

2. SUPPLEMENTAL REVIEW SCREENS

The Supplemental Review consists of Screens N through P. If any of the Screens are not passed, a quick review of the failed Screen(s) will determine the requirements to address the failure(s) or that Detailed Studies are required. In certain instances, Distribution Provider may be able to identify the necessary solution and determine that Detailed Studies are unnecessary. Some examples of solutions that may be available to mitigate the impact of a failed Screen are:

1. Replacing a fixed capacitor bank with a switched capacitor bank.

2. Adjustment of line regulation settings.

3. Simple reconfiguration of the distribution circuit.

(L)

[ii] Inadvertent Export systems that meet the requirements specified in Section Mm are processed under Screen M as described in Section Mm. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

2. SUPPLEMENTAL REVIEW SCREENS (Cont'd.)

a. Screen N: Penetration Test

If Integration Capacity Analysis Values are available at the requested Point of Interconnection, evaluate Screen N as follows: (N)

i) Penetration Level:
For Interconnection Requests based on nameplate capacity: Is the Interconnection Request Gross Nameplate Rating equal to or below 90% of the minimum annual ICA-SG Value (i.e. minimum value) in the ICA-SG 576 Profile?

For Interconnection Requests based on typical PV output profile: Is the Interconnection Request real power production, based on PV Watts or equivalent, equal to or below 90% the ICA-SG value at each hour in the ICA-SG 576 Profile?

ii) Screen F1: Did the Interconnection Request pass Screen F1?

Did the Interconnection Request pass Screen F1?

If yes to both of the above (pass), continue to Screen O.

If "no" to either or both of the above(fail), a quick review of the failure within Supplemental Review may determine the requirements to address the failure; otherwise Electrical Independence Tests or Detailed Studies are required.

- If the failure(s) that cannot be addressed in Supplemental Review, the Distribution Provider will conduct a review to identify the reasons why further studies are required. (N)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (N)

2. SUPPLEMENTAL REVIEW SCREENS (Cont'd.)

a. Screen N: Penetration Test (Cont'd)

ii) Screen F1: Did the Interconnection Request pass Screen F1?

Did the Interconnection Request pass Screen F1?

- If the failure(s) cannot be addressed in Supplemental Review, the distribution provider must identify a reason why a specific technical constraint is not captured by the ICA and the why the project must proceed to Electrical Independence Tests and Detailed Studies.

- If voltage is a prevailing constraint, then the smart inverter default volt/var function will be used in power flow analysis for the evaluation of the proposed project. This will reveal if the proposed project causes any voltage impacts of concern. If concerns related to steady state voltage, thermal, or protection exist and the Distribution Provider can identify simple upgrades through power flow analysis (e.g., installation of voltage regulator devices or protection devices to mitigate reduction of reach), then the Distribution Provider will determine the mitigation requirements within Screen N. When larger upgrades or complex protection evaluation is required, Screen N will fail and the technical evaluation will be conducted under the Detailed Study process.

- If no reason for further study is identified, or if requirements to address the failure can be identified in screen N, proceed to Screen O.

- Note: If Electrical Independence tests and Detailed Studies are required, Applicants will continue to the Electrical Independence Tests and Detailed Studies after review of the remaining Supplemental Review Screens if Applicant elects to proceed.

(N)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.) (N)

2. SUPPLEMENTAL REVIEW SCREENS (Cont'd.)

a. Screen N: Penetration Test (Cont'd)

If Integration Capacity Analysis Values are not available, evaluate Screen N as follows: (N)

Where 12 months of line section minimum load data is available, can be calculated, can be estimated from existing data, or determined from a power flow model, is the aggregate Generating Facility capacity on the Line Section less than 100% of the minimum load for all line sections bounded by automatic sectionalizing devices upstream of the Generating Facility? (L)

- If yes (pass), continue to Screen O.
- If no (fail), a quick review of the failure may determine the requirements to address the failure; otherwise Electrical Independence Tests and Detailed Studies are required. Continue to Screen O. (Note: If Electrical Independence tests and Detailed Studies are required, Applicants will continue to the Electrical Independence Tests and Detailed Studies after review of the remaining Supplemental Review Screens, if Applicant elects to proceed.)

Note 1: If none of the above options are available, this screen defaults to Screen M.

Note 2: The type of Generating Facility technology will be taken into account when calculating, estimating, or determining circuit or Line Section minimum load relevant for the application of this screen. For solar Generating Facilities with no battery storage, daytime minimum load will be used (i.e., 10 am to 4 pm for fixed panel solar Generating Facilities and 8 am to 6 pm for solar Generating Facilities utilizing tracking systems), while absolute minimum load will be used for all other Generating Facility technologies.

Note 3: When this screen is being applied to a NEM Generating Facility, the net export in kW, if known, that may flow across the Point of Common Coupling into Distribution Provider's Distribution System will be considered as part of the aggregate generation. (L)

(Continued)

G. ENGINEERING REVIEW DETAILS (Cont'd.)

2. SUPPLEMENTAL REVIEW SCREENS (Cont'd.)

b. Screen O: Power Quality and Voltage Tests (Cont'd.)

In aggregate with existing Generating Facility capacity on the Line Section, distribution circuit, and/or substation. (Cont'd.)

iii) Can it be determined within the Supplemental Review that the harmonic levels meet IEEE 519 limits at the Point of Common Coupling (PCC)?

iv) Can it be determined within the Supplemental Review that the Generating Facility will not cause any voltage impacts considering the settings of the Volt-Var function and the characteristics of the circuit segment? (P)

- If yes to all of the above (pass), continue to Screen P.
- If no to any of the above (fail), a quick review of the failure may determine the requirements to address the failure; otherwise Electrical Independence Tests and Detailed Studies are required. Continue to Screen P. (Note: If Electrical Independence tests and Detailed Studies are required, Applicants will continue to the Electrical Independence Tests and Detailed Studies after review of the remaining Supplemental Review Screens.)

Significance: Adverse voltages and undesirable interference may be experienced by other Customers on Distribution Provider's Distribution System caused by operation of the Generating Facility(ies).

c. Screen P: Safety and Reliability Tests

Does the location of the proposed Generating Facility or the aggregate generation capacity on the Line Section create impacts to safety or reliability that cannot be adequately addressed without Detailed Study?

- If yes (fail), review of the failure may determine the requirements to address the failure; otherwise Electrical Independence Tests and Detailed Studies are required. Continue to Section G.3.
- If no (pass), Supplemental Review is complete.

(Continued)

Hh. SMART INVERTER GENERATING FACILITY DESIGN AND OPERATING REQUIREMENTS (Cont'd.)

The inverter requirements are intended to be consistent with UL 1741 - Supplement SA using Section Hh of Rule 21 as the source requirement document and ANSI/IEEE 1547-2003 and 1547a Standard for Interconnecting Distributed Resources with Electric Power Systems (IEEE 1547 including amendment 1547a), where possible. In the event of conflict between this Rule, and UL 1741 - Supplement SA, and/or IEEE 1547-2003 or IEEE 1547a, this Rule shall take precedence. Exceptions are taken to IEEE 1547 Clauses 4.1.4.2 Distribution Secondary Spot Networks and Clauses 4.1.8.1 or 5.1.3.1, which address Protection from Electromagnetic Interference. Rule 21 does not adopt the Generating Facility power limitation of 10 MW incorporated in IEEE 1547.

The Smart Inverter default settings and default activation states may be modified upon mutual agreement between Applicant and Distribution Provider. (P) (P)

Process for changing default settings for new Interconnection Requests: (P)

Distribution Provider, in the study process for new Generating Facilities, may determine and provide the optimum Smart Inverter Settings for the reactive power settings, including changes to the reactive power default settings (Example: Deactivate Volt/Var and activate Fixed Power Factor at given power factor).

Distribution Provider, in the study process for new Generating Facilities, may determine and provide the optimum Smart Inverter Settings for the Ramp Rate settings depending on the Generating Facility technology (such as solar, storage).

Distribution Provider, in the study process for new Generating Facilities, may determine the optimum Smart Inverter Settings for the volt/watt settings including changes to the default settings (Example: Change the volt/watt set points). The Applicant may select to agree on the new settings or select to perform upgrades to operate using the existing default volt/watt settings.

Default settings for voltage ride-through, frequency ride-through requirements, and Frequency/Watt should not be modified on an individual project basis unless the Interconnection Studies have determined that the default settings may not meet grid reliability requirements.

Process for changing default settings for Generating Facilities with an executed Interconnection Agreement:

When grid changes or Generating Facility changes require that the Smart

(Continued)

Inverter operating parameters be reevaluated, the Distribution Provider or Producer may request changes to the Smart Inverter operating parameters. The request must include the reason for and timing of the proposed changes. The requested changes must be within the Smart Inverter function adjustability limits, must be within the limits specified in this tariff, and must be mutually agreed upon. (P)

1. GENERAL INTERCONNECTION AND PROTECTIVE FUNCTION REQUIREMENTS

The Protective Functions and requirements of this Rule are designed to protect Distribution Provider's Distribution and Transmission System and not the Generating Facility. A Producer shall be solely responsible for providing adequate protection for its Generating Facility and Interconnection Facilities. Producer's Protective Functions shall not impact the operation of other Protective Functions on Distribution Provider's Distribution and Transmission System in a manner that would affect Distribution Provider's capability of providing reliable service to its customers.

a. Protective Functions Required

Smart Inverters operating in parallel with Distribution Provider's Distribution or Transmission System shall be equipped with the following Protective Functions to sense abnormal conditions on Distribution Provider's Distribution or Transmission System and cause the Smart Inverter to be automatically disconnected from Distribution Provider's Distribution or Transmission System or to prevent the Smart Inverter from being connected to Distribution Provider's Distribution or Transmission System inappropriately:

(i) Over and under voltage trip functions and over and under frequency trip functions;

(Continued)

ELECTRIC RULE NO. 21 Sheet 214
GENERATING FACILITY INTERCONNECTIONS

I. THIRD-PARTY INSTALLATIONS, RESERVATION OF UNUSED FACILITIES, AND REFUND OF SALVAGE VALUE

1. INTERCONNECTION FACILITIES AND DISTRIBUTION UPGRADES

Except as provided for in the Generator Interconnection Agreement of this Rule, Interconnection Facilities connected to Distribution Provider's side of the PCC and Distribution Upgrades shall be provided, installed, owned, and maintained by Distribution Provider at Producer's expense.

2. THIRD-PARTY INSTALLATIONS

~~Subject to the approval of Distribution Provider, a~~ Producer may, at its option, employ a qualified contractor that meets the Contractor Qualifications set forth under Electric Rule 15, Section G, to provide and install Interconnection Facilities or Distribution Upgrades, to be owned and operated by Distribution Provider, on Distribution Provider's side of the PCC.* Such Interconnection Facilities and Distribution Upgrades shall be installed in accordance with Distribution Provider's design and specifications. Upon final inspection and acceptance by Distribution Provider, Producer shall transfer ownership of such Producer installed Interconnection Facilities or Distribution Upgrades to Distribution Provider and such facilities shall thereafter be owned and maintained by Distribution Provider at Producer's expense. Producer shall pay Distribution Provider's reasonable cost of design, administration, and monitoring of the installation for such facilities to ensure compliance with Distribution Provider's requirements. Producer shall also be responsible for all costs, including any income tax liability, associated with the transfer of Producer installed Interconnection Facilities and Distribution Upgrades to Distribution Provider. (P) | (P)

* Only duly authorized employees of utility are allowed to connect to, disconnect from, or perform any work upon Utility's facilities. (P) | (P)

(Continued)

J. METERING, MONITORING AND TELEMETERING (Cont'd.)

3. NET GENERATION OUTPUT METERING (Cont'd.)

iii) Accuracy and type of required Metering consistent with purposes of collecting data;

iv) Cost of Metering relative to the need for and accuracy of the data;

v) The Generating Facility's size relative to the cost of the Metering/monitoring;

vi) Other means of obtaining the data (e.g. Generating Facility logs, proxy data, etc.);

vii) Requirements under any Generator Interconnection Agreement with Producer.

The requirements in this Section may not apply to Metering of Generating Facilities operating under Distribution Provider's Net Energy Metering tariffs. Nothing in this Section J.3 supersedes Section D.4, Compliance with Laws, Rules and Tariff Schedules.

Distribution Provider will report to the Commission or designated authority, on a quarterly basis, the rationale for requiring Net Generation Output Metering equipment in each instance along with the size and location of the facility.

The standard timeline for installation of Net Generation Output Meters is as follows: (P)

i) 20 business for design and 20 business days for construction, or
ii) design and construction timelines as agree with the customer.

The 20-day clock commences upon payment and after the customer had done everything necessary on their end to prepare for construction. By mutual agreement, Applicant and Distribution Provider may agree to a timeline that is different from the timeline described above. (P)

4. POINT OF COMMON COUPLING (PCC) METERING

For purposes of assessing Distribution Provider's charges for retail service, Producer's PCC Metering shall be reviewed by Distribution Provider, and if required, replaced to ensure that it will appropriately measure electric power according to the provisions of the Customer's electric service Tariff. Where required, the Customer's existing meter may be replaced with a bi-directional meter so that power deliveries to and from Producer's site can be separately recorded. Alternately,

(Continued)

Mm1. OPTION 8: Non-Export Utilizing Certified Power Control Systems (P)

The following are the minimum requirements for Non-Export systems that use certified power control systems (PCS) with an open loop response time (OLRT) no more than two seconds. It should be noted that other factors relevant to the Interconnection Study process may necessitate additional technical requirements that are not explicitly noted here.

1. Use a PCS that passes the requirements of the 2019 Underwriters Laboratories (UL) Power Control Systems Certification Requirements Decision (CRD) test protocol. Non-export systems may use a PCS that passes later published revisions to the CRD test protocol or may use a PCS that is certified to the UL 1741 certification standard, if UL incorporates the test protocol for PCS into UL 1741 in the future. The NRTL evaluation must have determined that the PCS conforms to the non-exporting functionality in accordance with the relevant CRD or UL published standard.

2. Use a PCS that is certified with an OLRT of two seconds or less, as provided in the PCS's specification data sheets.

3. The PCS must reduce export to zero or less within two seconds of commencing export. A PCS that is certified with an open-loop response time of two seconds or less, and a time to reach steady state of 10 seconds or less, meets this requirement.

4. Set the PCS to not export (zero-export).

5. Use only UL 1741 listed grid-support non-islanding inverters as approved by this tariff.

6. Maintain voltage fluctuations at the limits specified in Electric Rule 2. (P)

(Continued)

Mm1. OPTION 8: Non-Export Utilizing Certified Power Control Systems (Cont'd) (P)

The evaluation of a non-export system requesting interconnection under this section:

1. Shall omit evaluation for screen D;

2. Shall utilize the Generating Facility's Gross Nameplate Rating for screens F, F1, and G;

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

4. Screen P may be applied using the Generating Facility's Gross Nameplate Rating for evaluations that use fault current calculations. For other evaluations under screen P, the value identified in iii above may be used.

(P)

(Continued)

Mm2. OPTION 9: Limited Export Utilizing Certified Power Control Systems (P)

The following are minimum requirements for limited export systems that use certified power control systems (PCS) with an open loop response time (OLRT) no more than two seconds to maintain a level of export that is lower than the nameplate rating. It should be noted that other factors relevant to the Interconnection Study process may necessitate additional technical requirements that are not explicitly noted here.

1. Use a PCS that passes the requirements of the 2019 Underwriters Laboratories (UL) Power Control Systems Certification Requirements Decision (CRD) test protocol. Limited export systems may use a PCS that passes later published revisions to the CRD test protocol, or may use a PCS that is certified to the UL 1741 certification standard, if UL incorporates the test protocol for PCS into UL 1741 in the future. The NRTL evaluation must have determined that the PCS conforms to the export limiting functionality in accordance with the relevant CRD or UL published Standard.

2. Use a PCS that is certified with an OLRT of two seconds or less as provided in the PCS's specification data sheets.

3. The PCS must reduce export to the approved export limit, or less, within two seconds of exceeding the approved export limit. A PCS that is certified with an open-loop response time of two seconds or less, and a time to reach steady state of ten seconds or less, meets this requirement.

4. Set the PCS to not exceed the proposed level of export.

5. Use only UL 1741 listed grid-support non-islanding inverters as approved by this tariff.

6. Maintain voltage fluctuations at the limits specified in Electric Rule 2. (P)

(Continued)

Mm2. OPTION 9: Limited Export Utilizing Certified Power Control Systems (Cont'd) (P)

The evaluation of a limited export system requesting interconnection under this section:

1. Shall utilize the Generating Facility's Gross Nameplate Rating for screens F, F1, and G.

2. If the maximum steady state value is greater than 1% of the PCS controlled nameplate (as provided in the NRTL testing reports) utilize the requested limited export value plus the maximum steady state value of the PCS times the PCS controlled nameplate, to evaluate the impacts to the grid under screens D, I, J, K, M, N, and O. If the maximum steady state value is less than 1% of the PCS controlled nameplate (as provided in the NRTL testing reports), utilize only the requested limited export value under screens D, I, J, K, M, N and O.

3. Screen P shall be applied using the Generating Facility's Gross Nameplate Rating for evaluations that use fault current calculations. For other evaluations under screen P, the value identified in ii above may be used. (P)

(Continued)

Mm3. OPTION 10: Non-Export with Inadvertent Export Utilizing Certified Power Control Systems (P)

The following are the minimum requirements for Non-Export systems that use certified power control systems (PCS) with an open loop response time (OLRT) between two and ten seconds. It should be noted that other factors relevant to the Interconnection Study process may necessitate additional technical requirements that are not explicitly noted here.

1. Have a nameplate capacity equal to or less than 1,000 kVA.

2. Use a PCS that passes the requirements of the 2019 Underwriters Laboratories (UL) Power Control Systems Certification Requirements Decision (CRD) test protocol. Non-Export may use a PCS that pass later published revisions to the CRD test protocol, or may use a PCS that is certified to the UL 1741 certification standard, if UL incorporates the test protocol for PCS into UL 1741 in the future. The NRTL evaluation must have determined that the PCS conforms to the non-exporting functionality in accordance with the relevant CRD or UL published standard.

3. Use a PCS that is certified with an OLRT of no more than ten seconds, as provided in the PCS's specification data sheets.

4. Set the PCS to not export (zero-export).

5. Use only UL 1741 listed grid-support non-islanding inverters as approved by this tariff.

~~1.~~6. Maintain voltage fluctuations at the limits specified in Electric Rule 2 (P)

(Continued)

Mm3. OPTION 10: Non-Export with Inadvertent Export Utilizing Certified Power Control Systems (Cont'd) (P)

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

1. Apply screens A through M using the aggregate nameplate inverter rating.

2. Notify the applicant if supplemental review is required, and if so, require the applicant to identify, within 15 business days of being notified, the frequency of inadvertent export, the real power level in watts of inadvertent export, and the time duration of inadvertent export.

3. If distribution upgrades are identified, use screen P to recognize power control parameters, taking into account local feeder conditions; the customer's operating profile; and the magnitude, duration, and frequency of anticipated export;

4. Complete supplemental review within 15 days of receiving the required information specified under ii) above.

5. If the applicant does not provide the operating profile information within the specified 15 business days, perform supplemental review based on information included in the interconnection request within 30 business days of the request for customer operating profile information.

6. Use only the largest facility in the line section for aggregate evaluation for subsequent interconnection requests. (P)

(Continued)

Mm4. OPTION 11: Limited Export with Inadvertent Export Utilizing Certified Power Control Systems (P)

The following are the minimum requirements for limited export controlled systems that use certified power control systems (PCS) with an open loop response time (OLRT) between two and ten seconds to maintain a level of export that is lower than the nameplate rating. It should be noted that other factors relevant to the Interconnection Study process may necessitate additional technical requirements that are not explicitly noted here.

1. Have a nameplate capacity equal to or less than 1,000 kVA.

2. Use a PCS that passes the requirements of the 2019 Underwriters Laboratories (UL) Power Control Systems Certification Requirements Decision (CRD) test protocol. Limited export systems may use a PCS that pass later published revisions to the CRD test protocol, or may use a PCS that is certified to the UL 1741 certification standard, if UL incorporates the test protocol for PCS into UL 1741 in the future. The NRTL evaluation must have determined that the PCS conforms to the export limiting functionality in accordance with the relevant CRD or UL published standard.

3. Use a PCS that is certified with an OLRT of no more than ten seconds, as provided in the PCS's specification data sheets.

4. Set the PCS to not to exceed the proposed level of export.

5. Use only UL 1741 listed grid-support non-islanding inverters as approved by this tariff. (P)

6. Maintain voltage fluctuations at the limits specified in Electric Rule 2.

(Continued)

Mm4. OPTION 11: Limited Export with Inadvertent Export Utilizing Certified Power Control Systems (Cont'd) (P)

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

1. Apply screens A through M using the aggregate nameplate inverter rating.

2. Notify the applicant if supplemental review is required, and if so, require the applicant to identify, within 15 business days of being notified, the frequency of inadvertent export, the real power level in watts of inadvertent export, and the time duration of inadvertent export.

3. If distribution upgrades are identified, use screen P to recognize power control parameters, taking into account local feeder conditions; the customer's operating profile; and the magnitude, duration, and frequency of anticipated export.

4. Complete supplemental review within 15 days of receiving the required information specified under ii) above.

5. If the applicant does not provide the operating profile information within the specified 15 business days, perform supplemental review based on information included in the interconnection request within 30 business days of the request for customer operating profile information. (P)

(Continued)

N. EXPEDITED INTERCONNECTION PROCESS FOR NON-EXPORT ENERGY STORAGE GENERATING FACILITIES

Applicants with Interconnection Requests for Non-Export Energy Storage Generating Facilities who meet the requirements outlined below are eligible for expedited interconnection in accordance with the Fast Track Process technical review requirements of Section F.2.[1] Applicants with Non-Export AC/DC Converters that meet the requirements outlined in O. below are also eligible. (P)

1. ELIGIBILITY REQUIREMENTS

Applicants seeking to interconnect a Generating Facility under the provisions of this Section N must meet the following eligibility requirements.

a. Applicant must electronically submit a completed Interconnection Request, including completing all application fields and submitting all supporting documentation necessary to facilitate the expedited review as required by Distribution Provider. Such documentation may include, but is not limited to, single line diagrams with specific details, manufacturer data sheets for proposed equipment, description of control systems, validation of the right to do business in the state, etc. Distribution Provider shall clearly communicate these requirements as part of the application process. Applicant shall select this process option in the Interconnection Request.

b. Applicant's Generating Facility must meet the requirements outlined in Section N.2 below.

c. Applicant's Interconnection Request must be eligible for and select the Fast Track Process.

d. Applicant's Interconnection Request must pass Fast Track Initial Review and not require any Interconnection Facilities, Distribution Upgrades or Network Upgrades to remain eligible under this Section. As such, Interconnection Requests that select the Cost Envelope Option are not eligible.

e. Applicants selecting this section shall use the corresponding interconnection agreement type provided for eligible Generating Facilities.

---

[1] ~~In accordance with Advice 4941-E-A, the provisions provided for in Section N are being implemented under a pilot approach with a July 1, 2017 through June 30, 2018 reporting period. As such, the provisions may be continued, modified and/or withdrawn as determined by the Commission~~ (P)

(P)

(Continued)

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

AT&T
Albion Power Company

Alta Power Group, LLC
Anderson & Poole

Atlas ReFuel
BART

Barkovich & Yap, Inc.
California Cotton Ginners & Growers Assn
California Energy Commission

California Hub for Energy Efficiency Financing

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

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

Chevron Pipeline and Power
City of Palo Alto

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

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

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

GenOn Energy, Inc.
Goodin, MacBride, Squeri, Schlotz & Ritchie
Green Power Institute
Hanna & Morton
ICF
IGS Energy
International Power Technology
Intestate Gas Services, Inc.
Kelly Group
Ken Bohn Consulting
Keyes & Fox LLP
Leviton Manufacturing Co., Inc.

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

Modesto Irrigation District
NLine Energy, Inc.
NRG Solar

Office of Ratepayer Advocates
OnGrid Solar
Pacific Gas and Electric Company
Peninsula Clean Energy

Pioneer Community Energy

Redwood Coast Energy Authority
Regulatory & Cogeneration Service, Inc.
SCD Energy Solutions
San Diego Gas & Electric Company

SPURR
San Francisco Water Power and Sewer
Sempra Utilities

Sierra Telephone Company, Inc.
Southern California Edison Company
Southern California Gas Company
Spark Energy
Sun Light & Power
Sunshine Design
Tecogen, Inc.
TerraVerde Renewable Partners
Tiger Natural Gas, Inc.

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