

Decision 23-06-005 June 8, 2023

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking on the Commission's Own Motion to improve distribution level interconnection rules and regulations for certain classes of electric generators and electric storage resources.

Rulemaking 11-09-011

DECISION ADOPTING ADDITIONAL SAFETY REQUIREMENTS TO ADDRESS LOAD MASKING

Summary

This decision directs Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company (Utilities) to provide, to the California Independent System Operator, the telemetry data currently required by Electric Tariff Rule 21, which Utilities collect from interconnecting distributed energy resources customers. The sharing of telemetry data will mitigate (1) safety and reliability risks on the transmission and distribution systems; and (2) negative impacts on the wholesale market, which are created by the lack of generation output visibility – or load masking – caused by both export and non-export generating facilities with capacities larger than one megawatt.

To ensure clarity, this decision also revises a proposed definition of load masking to now reference both the transmission and distribution systems,

acknowledge the potential impacts to the wholesale market, and recognize that load masking is caused both by export and non-export generating facilities.

Rulemaking 11-09-011 is closed.

1. Background

The Commission initiated Rulemaking (R.) 11-09-011 on September 22, 2011 to review and, if necessary, revise the rules and regulations governing interconnecting generation and storage resources to the electric distribution systems of Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E), and Southern California Edison Company (SCE) (jointly, Utilities). Such rules and regulations are set forth in Electric Tariff Rule 21 (Rule 21). R.11-09-011 addressed the issues identified in the June 20, 2012 Assigned Commissioner's Scoping Memo and Ruling and was closed by the Commission.

The rulemaking was re-opened to review a modification of Decision (D.) 12-09-018 in R.11-09-011 and/or a modification to Rule 21 to address safety and reliability concerns. Below are summaries of D.12-09-018 as well as D.22-07-001 – the decision prompting this decision – followed by the procedural history leading to this decision.

1.1. Relevant Aspects of Decision 12-09-018

D.12-09-018 adopted a settlement agreement reforming Rule 21. As noted in D.12-09-018, the Commission found the settlement to be reasonable in light of the record “as it accomplishes a number of critical goals of this rulemaking by addressing policy and technical issues essential to timely, predictable and transparent interconnection to the distribution system.”¹ The Commission also

¹ D.12-09-018 at 2.

found the settlement to be consistent with law and in the public interest.² Relevant to this decision, D.12-09-018 adopted additional new language in subsection B.1 of Rule 21 to “more clearly state when an applicant may apply for interconnection pursuant to Rule 21 procedures, as opposed to the California Independent System Operator (CAISO) procedure or the procedures in a utility’s [Wholesale Distribution Tariff]”³ as follows:

“All Generating Facilities seeking Interconnection with Distribution Provider’s Transmission System shall apply to the California Independent System Operator (CAISO) for Interconnection and be subject to CAISO Tariff except for 1) Net Energy Metering Generating Facilities and 2) Generating Facilities that do not export to the grid or sell any exports sent to the grid (Non-Export Generating Facilities). Net Energy Metering Generating Facilities and Non-Export Generating Facilities subject to Commission jurisdiction shall interconnect under this Rule regardless of whether they interconnect to Distribution Provider’s Distribution or Transmission System....

“Generating Facility interconnections to Distribution Provider’s Distribution System that are subject to Federal Energy Regulatory Commission (FERC) jurisdiction shall apply under Distribution Provider’s Wholesale Distribution Tariff (WDAT).”⁴

1.2. Overview of Decision 22-07-001

Following a review of transmission grid interconnection through Rule 21, the Commission adopted D.22-07-001, which determined that an increasing number of large generating facilities interconnecting through the transmission grid under the net energy metering tariff, *i.e.*, Rule 21, creates challenges to the

² D.12-09-018 at Conclusion of Law 7.

³ D.12-09-018, Appendix A at A-1.

⁴ D.12-09-018, Appendix A at A-1.

ability of the CAISO to ensure the safety and reliability of the transmission grid. In D.22-07-001, the Commission found “that an immediate revision of the net energy metering exception in subsection B.1 of Rule 21 is necessary as there are no viable solutions in the record to address the concern.” Hence, D.22-07-011 revised subsection B.1 to limit the exemption of net energy metering generating facilities to those facilities less than or equal to one megawatt of capacity.

Specific to this decision, the Commission further found that “non-export generating facilities do not create the same safety and reliability concerns as net energy metering generating facilities” and, therefore, maintained the Rule 21, subsection B.1 exception for these facilities from the requirement to interconnect through the CAISO tariff. However, the Commission concluded that a discussion of load masking as it relates to non-export systems should continue in order to better understand the specific circumstances where a non-export system would create material operational challenges, in order to address such challenges.⁵ Further, the Commission also concluded that Energy Division should facilitate a workshop to determine the presence of such challenges and consider how to address these challenges.⁶

1.3. Procedural History Following Decision 22-07-001

Pursuant to D.22-07-001, Energy Division facilitated the required workshop on January 26, 2023. During this workshop, the CAISO and Utilities presented information related to load masking. (*See* Section 3.1 for a proposed and adopted definition of load masking.) Utilities’ presentation focused on the

⁵ D.22-07-001 at Conclusion of Law 1.

⁶ D.22-07-001 at Conclusion of Law 7 and Ordering Paragraph 5.

impact of load masking on each utility. In its presentation, CAISO described the need for operational visibility of all distributed energy resources.

On February 23, 2023, the Administrative Law Judge issued a *Ruling Seeking Responses to Questions on Load Masking Workshop*. The Ruling described the January 26, 2023 workshop and provided copies of the slide presentations to parties, as well as two slides from the November 13, 2022 Smart Inverter Working Group meeting that defined load masking. The Ruling explained that during the Smart Inverter Working Group meeting, participants discussed load masking in preparation for the January 26, 2023 workshop. The Ruling instructed parties to file comments responding to four questions regarding load masking.

On March 3, 2023, CAISO, California Energy Storage Alliance (CESA), PG&E, and SCE filed opening comments responding to the questions contained in the February 23, 2023 Ruling, hereafter referred to as Opening Comments to February 23, 2023 Ruling. CESA and SDG&E filed reply comments on March 10, 2023, hereafter referred to as Reply Comments to February 23, 2023 Ruling.

This matter was submitted on March 10, 2023 upon the filing of the Reply Comments to February 23, 2023 Ruling.

2. Issues Before the Commission

There is one remaining issue in this proceeding: to continue the discussion of load masking as it relates to non-export systems to better understand the specific circumstances where a non-export system would create material operational challenges and explore how to address these challenges.

3. Addressing Load Masking

As previously determined in D.22-07-001, “non-export generating facilities do not create the same safety and reliability concerns as net energy metering generating facilities.” However, as described below, the Commission finds that

load masking is caused both by export and non-export facilities and, therefore, either resource reduces the localized electric load served. Further, the lack of generation output visibility prevents system operators (*i.e.*, the CAISO) from determining the real system load conditions, which leads to barriers to grid planning and operations. Accordingly, Utilities are directed to provide, to the CAISO, the obtained telemetry required by Rule 21 transmission grid interconnections. These findings and directives are further discussed below.

There being no other issues to be addressed, R.11-09-011 is closed.

3.1. Load Masking Should Be Defined

Parties were asked to comment on the following definition of load masking:

Load masking describes a situation in which the lack of generation output visibility prevents system operators and engineers from determining the real system load conditions, which can inhibit the ability to plan and operate the distribution system.

All parties responding to the ruling generally agreed with this definition but offered additional specificity. All parties agreed that the definition should be expanded to include the transmission system in addition to the distribution system.⁷ The Commission finds it is reasonable to expand the definition to reference the transmission system as well as the distribution system, given the focus of reopening this proceeding involves interconnection to the transmission system.

⁷ CAISO Opening Comments to February 23, 2023 Ruling at 2-3; CESA Opening Comments to February 23, 2023 Ruling at 5; PG&E Opening Comments to February 23, 2023 Ruling at 1; SCE Opening Comments to February 23, 2023 Ruling at 1-2; and SDG&E Reply Comments to February 23, 2023 Ruling at 1-2.

The CAISO submits that the definition should also consider the impact of load masking on the wholesale markets. The CAISO asserts that the “unexpected and sudden appearance of large load disrupts market schedules and outcomes set in the CAISO day-ahead and real-time markets” and contends that “when [net energy metering] generation drops and masked loads suddenly appear, the effects reach the transmission system and the wholesale markets, which must suddenly respond to balance supply and demand.”⁸ Further, the CAISO maintains that changes or fluctuations in load can lead to the need to procure additional generation through exceptional dispatch or increase the need for regulation and ancillary services.⁹ No party opposed this expansion of the definition of load masking.

The Commission agrees that load masking can impact wholesale markets if there is an unplanned fluctuation in load. Hence, it is reasonable to reference the impact of load masking on wholesale markets when defining load masking.

Additionally, SCE contends that in the description of load masking from the Smart Inverter Working Group presentation, load masking is claimed to be caused by both export and non-export distributed energy resources.¹⁰ PG&E and CAISO agree, asserting that “regardless of exports, customer generation masks load, and large, highly variable generation will mask highly variable load.”¹¹ No party expressed opposition to this addition either during the workshop or in

⁸ CAISO Opening Comments to February 23, 2023 Ruling at 3.

⁹ CAISO Opening Comments to February 23, 2023 Ruling at 3.

¹⁰ SCE Opening Comments to February 23, 2023 Ruling at 1-2.

¹¹ CAISO Opening Comments to February 23, 2023 Ruling at 3 citing earlier PG&E comments in this proceeding: PG&E Opening Comments to November 23, 2021 Ruling, December 21, 2021 at 2.

comments to the February 23, 2023 Ruling.¹² The Commission agrees that load masking is caused both by export and non-export facilities.

The Commission concludes that a definition of load masking should refer to both the transmission and distribution systems, recognize the potential for negative impacts of load masking on wholesale markets, and acknowledge that load masking is caused both by export and non-export generating facilities. Accordingly, the Commission should adopt the following definition for load masking:

- Load Masking describes a situation in which the lack of generation output visibility prevents system operators and engineers from determining the real system load conditions, which can inhibit the ability to plan and operate the distribution and transmission system.
- Load masking is caused by both export and non-export facilities and thus, from the point of view of the grid operator, the distributed energy resource will reduce the localized electrical load served even if the distributed energy resource does not export power into the grid.
- With load masking, the lack of generation output visibility prevents system operators from determining the real system load conditions, which can inhibit the ability to plan and operate the grid and negatively impact wholesale markets.

3.2. Telemetry Provided to California Independent System Operator Should Mitigate Load Masking Risks

Parties recognize that Rule 21 requires facilities greater than one megawatt (MW) to provide telemetry data to the interconnecting utility. As described

¹² See SDG&E Reply Comments to February 23, 2023 Ruling at 1-2 supporting the additional language. (See CAISO Opening Comments to February 23, 2023 Ruling at 3 stating that “non-export and export generation are entirely alike in their ability to create load masking.”)

below, commenting parties agree that this data should be shared with CAISO to mitigate the risks of load masking.

Parties were queried about operational challenges on the transmission grid created by load masking. Specifically, parties were asked if there are operational challenges beyond those involving frequency, line loading, or voltage issues. From a utility perspective, PG&E offered examples of other operational challenges including loss of Direct Transfer Trip, switching operations coming back from an island/isolation, and requesting generation output changes to allow loop switching.¹³ PG&E submitted that following any equipment outage, including these, a utility needs to ensure crews and customers are safe during restoration of the equipment.¹⁴ Neither SDG&E nor SCE have facilities interconnecting through Rule 21 to the transmission system in their territories and therefore have no experience with load masking on the transmission system.¹⁵

As operator of the transmission system, the CAISO asserts that the sudden appearance of unexpected load invariably will have some impact on frequency, line loading, and voltage.¹⁶ CAISO's role as the balancing authority is to balance load and generation. The CAISO contends the sudden appearance of previously masked loads leads to imbalances in supply and demand and reliability impacts such as frequency excursions, line loading, and voltage impacts.¹⁷ Other

¹³ PG&E Opening Comments to February 23, 2023 Ruling at 2.

¹⁴ PG&E Opening Comments to February 23, 2023 Ruling at 2 citing to its load masking workshop presentation at page 5.

¹⁵ February 23, 2023 Ruling, Attachment 1 at 8 and 10.

¹⁶ CAISO Opening Comments to February 23, 2023 Ruling at 3.

¹⁷ CAISO Opening Comments to February 23, 2023 Ruling at 3-4.

operational challenges the CAISO describes include exacerbating contingencies, disrupting load forecast assumptions, creating outages, and increased draws on operating reserves.¹⁸ Beyond operational challenges, the CAISO submits that load masking creates planning challenges such as the inability to accurately model load demand, which then leads to inaccurate transmission and resource capabilities and, eventually, decreased local reliability.¹⁹

Utilities, the CAISO, and CESA all agree that the improved visibility that comes with increased data sharing of real-time telemetry data can mitigate the risks of load masking.²⁰ CESA maintains that requiring the sharing of this data with the CAISO “would be the least disruptive approach to mitigating their concerns with the risks of non-exporting systems masking load.”²¹ Additionally, SDG&E stated that greater visibility can mitigate reliability issues.²² Further, the CAISO points out that the Commission already recognized the importance of providing visibility to the CAISO in D.22-07-001, which required Utilities to share Rule 21 required telemetry data with the CAISO for export generating facilities interconnecting to the transmission system.²³

The record of this proceeding indicates that load masking can create operational and planning challenges. Further, the record also shows that the increased visibility that comes with required telemetry data should mitigate the risks of load masking. The Commission has previously determined it is

¹⁸ CAISO Opening Comments to February 23, 2023 Ruling at 4.

¹⁹ CAISO Opening Comments to February 23, 2023 Ruling at 4.

²⁰ PG&E Opening Comments to February 23, 2023 Ruling at 2; CAISO Opening Comments to February 23, 2023 Ruling at 3-5; and CESA Opening Comments to February 23, 2023 Ruling at 4.

²¹ CESA Reply Comments to February 23, 2023 Ruling at 4.

²² SDG&E Reply Comments to February 23, 2023 Ruling at 3.

²³ CAISO Opening Comments to February 23, 2023 Ruling at 4.

reasonable to require Utilities to share Rule 21 required telemetry data with the CAISO for export generating facilities interconnecting to the transmission system. Because this decision previously found that load masking is caused by both export and non-export facilities, it is reasonable to apply to non-export facilities the previous directive to share telemetry data with CAISO. Accordingly, the Commission should direct Utilities to share, with the CAISO, the telemetry data currently required by Rule 21 for non-export generating facilities interconnecting to the transmission system.

As recognized in the February 23, 2023 Ruling, Rule 21 only requires telemetry data for systems greater than one MW interconnecting to the transmission system. CESA contends that this proceeding should only focus on the impact of systems greater than one MW. CESA asserts that in D.22-07-001 the Commission confirmed that the safety and reliability concerns voiced by the CAISO were based on “eliminating the ‘one-megawatt cap [for net energy metering systems] and is focused on the interconnection of large net energy metering generating facilities.”²⁴

In the February 23, 2023 Ruling, parties were asked whether there are operational challenges impacting the reliability and safety of the transmission grid resulting from non-export generation facilities smaller than one MW. Parties agree that systems one MW or smaller present smaller challenges. Utilities state that “there would be little reliability impact if the total gross generating capability of the facility is less than one MW.”²⁵ While CAISO expresses concern

²⁴ CESA Opening Comments to February 23, 2023 Ruling at 7 citing D.22-07-001 at 19.

²⁵ SDG&E Reply Comments to February 23, 2023 Ruling at 2. (*See also* PG&E Opening Comments to February 23, 2023 Ruling at 3 and SCE Opening Comments to February 23, 2023 Ruling at 4.)

about a situation where “small resources aggregate in a dense area or an area already facing reliability or deliverability challenges,”²⁶ PG&E maintains there is no risk for adding multiple 0.99 MW generators that become large in the aggregate.²⁷ PG&E asserts that their transmission planning assumes that when the aggregate of all generation at a site exceeds one MW, telemetry would be required.²⁸

The Commission finds that the current Rule 21 requirement of providing telemetry data for non-export systems greater than one MW interconnecting to the transmission system is sufficient to address the safety and reliability of the transmission grid, as was also determined in D.22-07-001. Accordingly, the Commission should not revise Rule 21 to require telemetry data for non-export systems less than or equal to one MW interconnecting to the transmission system through Rule 21.

3.3. The Scope of this Proceeding Does Not Include Whether to Require the Collection of Additional Data from All Distributed Energy Resources

During the Load Masking Workshop, CAISO asserted concerns regarding the visibility of distributed energy resources. In its presentation at the workshop, CAISO maintained that increased visibility of these resources “for non-market participating [distributed energy resources] will be essential to utilizing and developing the demand forecasting tools essential to support this transition.”²⁹ In comments to the February 23, 2023 Ruling, CESA stated that “this is a larger

²⁶ CAISO Opening Comments to February 23, 2023 Ruling at 5.

²⁷ PG&E Opening Comments to February 23, 2023 Ruling at 3.

²⁸ PG&E Opening Comments to February 23, 2023 Ruling at 3.

²⁹ February 23, 2023 Ruling, Attachment 2 at 8.

issue that will require extensive discussions amongst CAISO, [Utilities], other load-serving entities, [distributed energy resource] providers, and other stakeholders to create viable solutions.”³⁰ CESA contended that such issues are not in the scope of this proceeding and that another current rulemaking, R.21-06-017, which is currently discussing issues of distribution system operator models, may be a more appropriate venue to discuss increased data collection to improve visibility.³¹ CAISO also discussed this issue in comments, suggesting that the Commission coordinate data needs it presented with Phase 1, Track 2 of R.22-11-013.³²

The Commission finds that the scope of this proceeding is limited to a review of the exception in subsection B.1 of Rule 21 regarding the interconnection of export and non-export systems to the transmission system. Further, both R.21-06-017 and R.22-11-013 are discussing data as they relate to distributed energy resources. Hence, the Commission should not expand the data collection requirements in this proceeding to address the broader world of distributed energy resources.

There being no other issues before the Commission in this proceeding, R.11-09-011 should be closed.

4. Comments on Proposed Decision

The proposed decision of Administrative Law Judge Kelly A. Hymes in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the Commission’s Rules of Practice and Procedure. Comments were filed on May 24, 2023 by

³⁰ CESA Opening Comments to February 23, 2023 Ruling at 2-3.

³¹ CESA Opening Comments to February 23, 2023 Ruling at 2-4.

³² CAISO Opening Comments to February 23, 2023 Ruling at 1-2.

CAISO, who supported the proposed decision and proposed no changes. No party filed reply comments.

5. Assignment of Proceeding

Alice Reynolds is the assigned Commissioner and Kelly A. Hymes is the assigned Administrative Law Judge in this proceeding.

Findings of Fact

1. The focus of reopening this proceeding involves interconnection to the transmission system.
2. Load masking can impact wholesale markets.
3. Load masking is caused by both export and non-export generating facilities.
4. Load masking can create operational and planning challenges.
5. Increased visibility that comes with required telemetry data can mitigate the risks of load masking.
6. The Commission has previously determined it is reasonable to require Utilities to share Rule 21 required telemetry data with the CAISO for export generating facilities interconnecting to the transmission system.
7. Rule 21 requires telemetry data for systems greater than one MW interconnecting to the transmission system.
8. The Commission previously found that the floor of one MW in capacity for requiring telemetry data is sufficient to address the safety and reliability of the transmission grid.
9. The scope of this proceeding is limited to a review of the exception in subsection B.1 of Rule 21 regarding the interconnection of export and non-export generating facilities to the transmission system.

10. R.21-06-017 and R.22-11-013 are discussing data as they relate to distributed energy resources.

11. There are no other issues before the Commission in R.11-09-011.

Conclusions of Law

1. The Commission should adopt a definition of load masking that (a) refers to both the transmission and distribution system; (b) recognizes the potential for negative impacts of load masking on wholesale markets; and (c) acknowledges that load masking is caused by both export and non-export generating facilities.

2. The Commission should require Utilities to share, with the CAISO, the telemetry data currently required by Rule 21 for non-export facilities interconnecting to the transmission system.

3. The Commission should not revise Rule 21 to require telemetry data for non-export generating facilities less than or equal to one MW interconnecting to the transmission grid.

4. The Commission should not broaden data collection requirements in this proceeding to address requirements for the broader world of distributed energy resources.

5. R.11-09-011 should be closed.

O R D E R

IT IS ORDERED that:

1. The following definition of load masking is adopted:
 - Load Masking describes a situation in which the lack of generation output visibility prevents system operators and engineers from determining the real system load conditions, which can inhibit the ability to plan and operate the distribution and transmission system.
 - Load masking is caused by both export and non-export facilities and thus, from the point of view of the grid

operator, the distributed energy resources will reduce the localized electrical load served even if the distributed energy resources do not export power into the grid.

- With load masking, the lack of generation output visibility prevents system operators from determining the real system load conditions, which can inhibit the ability to plan and operate the grid, and negatively impact wholesale markets.

2. Beginning no later than the issuance date of this decision, Pacific Gas and Electric Company, San Diego Gas & Electric Company, and Southern California Edison Company shall each share with the California Independent System Operator all required telemetry data they each receive from non-export generating facilities, which are greater than one megawatt, interconnecting to the transmission system through Electric Tariff Rule 21.

3. Rulemaking 11-09-011 is closed.

This order is effective today.

Dated June 8, 2023, at San Francisco, California.

ALICE REYNOLDS
President
GENEVIEVE SHIROMA
DARCIE L. HOUCK
JOHN REYNOLDS
KAREN DOUGLAS
Commissioners