

PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

ENERGY DIVISION

RESOLUTION E-4411
September 22, 2011

R E S O L U T I O N

Resolution E-4411. Pacific Gas & Electric Company (PG&E)

PROPOSED OUTCOME: This Resolution approves PG&E's Advice Letter (AL) 3508-E-A with clarifying modifications to Electric Rule 21, Generating Facility Interconnections, Section D to afford more flexibility in determining the requirements for generating facilities interconnecting on PG&E's secondary distribution system.

ESTIMATED COST: None

By Advice Letter 3508-E-A filed on March 28, 2011

SUMMARY

PG&E proposes to revise Electric Rule 21, Generating Facility Interconnections, Section D to afford more flexibility in determining the requirements for generating facilities interconnecting on PG&E's secondary distribution system. Particularly, the requirement for shared single phase distribution transformer replacement, when interconnecting a generating facility over 20 kVA, is replaced with a project specific determination for transformer replacement after completion of a site specific PG&E engineering analysis. This analysis would employ the same criteria for transformers absent any generating facilities. PG&E also proposes to add the option for generating facilities to measure the voltage for the trip setting times at the generator terminal instead of at the Point of Common Coupling (PCC) which would facilitate generating facilities exporting to a highly loaded circuit.

BACKGROUND

On August 18, 2009 PG&E submitted AL 3508-E proposing two revisions to Electric Rule 21 – Generating Facility Interconnections Section D. First,

PG&E proposed to base the requirement for a dedicated distribution transformer, when interconnecting a 20 kilovolt-ampere (kVA) or larger photovoltaic generator, on an engineering evaluation of the existing transformer's capacity rather than requiring one in all cases. Second, PG&E proposed to clarify voltage requirements consistency with Electric Rule 2, Description of Service.

On September 21, 2009 Keyes & Fox on behalf of the Interstate Renewable Energy Council (IREC) timely protested, arguing that PG&E's proposal would grant PG&E undefined discretion to require dedicated distribution transformers even to interconnect generators smaller than 20 kVA. The IREC protest also questioned whether "inappropriate" operating voltage requirements should continue to be imposed on inverter-based generating facilities.

The Division of Ratepayer Advocates (DRA) also filed a timely protest on September 21, 2009, arguing that PG&E should not impose interconnection requirements that differ from those of other California Investor Owned Utilities (IOUs), Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E), and that the AL process was an improper vehicle for this proposed tariff change, because it did not allow sufficient opportunity for public input. DRA argued that PG&E should instead propose any Rule 21 tariff change within the established Rule 21 Working Group.

On September 28, 2009, PG&E timely responded to the protests. PG&E stated that its proposed tariff change resulted from PG&E's experience that, in some instances, a dedicated transformer is not required for larger (>20 kVA) generating facilities. The PG&E internal standards for distribution transformer sizing take daily load factors, ambient temperatures, ventilation and other factors into account and are used even absent any customer generation. As a result, PG&E argued, any transformer should be evaluated per PG&E's internal standards and practices regardless of customer generating facility size. PG&E argued that its proposed evaluation may help applicants whose facilities happen to exceed the Rule 21-imposed limit (20 kVA) obtain expedited interconnections and CSI incentive payments.

As to the voltage requirement changes, PG&E responded that the proposed changes only make Rule 21's voltage requirements consistent

with the voltage requirements that already exist in Rule 2, Description of Service.

In response to IREC's and DRA's protest that Rule 21 should be kept consistent with the other IOUs' tariffs, PG&E stated that it was reviewing the proposed changes with the other IOUs, and that it would welcome the reactivation of the Rule 21 Working Group. As the Rule 21 Working Group was not active at the time of filing, PG&E argued that the AL process was the most efficient means to achieve consensus among stakeholders prior to seeking Commission approval for tariff changes.

On August 31, 2009 Energy Division suspended the AL until January 8, 2010 to serve additional parties and allow PG&E to propose to IREC clarifying language for the guidelines it would use to determine the need for a new distribution transformer, and to communicate such language to the other IOUs.

On January 8, 2010 the AL was suspended for an additional 30 days, until February 8, 2010, in anticipation of PG&E submitting a Supplemental AL upon pending completion of the discussions with IREC and the other IOUs.

On March 28, 2011, PG&E filed Supplemental AL 3508-E-A, which is the subject of this resolution.

NOTICE

Notice of AL 3508-E-A was made by publication in the Commission's Daily Calendar. PG&E states that a copy of the Advice Letter was mailed and distributed in accordance with Section 3.14 of General Order 96-B.

PROTESTS

PG&E's Advice Letter AL 3508-E-A was timely protested by the City of San Diego (CSD) and Jody London Consulting on behalf of Sustainable Conservation (SC) on April 8, 2011.

PG&E timely responded to the protests on April 25, 2011.

DISCUSSION

Energy Division has reviewed PG&E's proposal and CSD's and SC's protests.

1. PG&E's proposal

In the time since submittal of the original AL 3608-E on August 2009, PG&E has worked extensively with SCE and SDG&E to agree on consistent changes to their respective Rule 21 tariffs and understands that each of these IOUs will be filing nearly identical changes to those contained in this AL. SCE meanwhile filed AL 2575-E on April 20, 2011 requesting identical changes to its Rule 21. This AL is suspended pending resolution of the instant AL.

Additionally, PG&E discussed all changes with IREC and the Energy Division and incorporated feedback into the proposed Rule 21 modifications. The proposed change to the tariff language will read as follows, including non-substantive corrections by Substitute Sheets submitted on April 15, 2011:

1.1. Section D.3.d is replaced with new Sections D.1.e. and D.1.f.:

D.1.e. The maximum aggregated Gross Ratings for all the Generating Facilities connected to a secondary distribution transformer shall not exceed the transformer rating modified per established utility practice absent any customer generators. When PG&E's analysis determines a transformer change is required, PG&E will furnish the customer with an explanation of why the change is needed.

D.1.f. Generating facilities connected to a single-phase transformer with 120/240 volt 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 PG&E's analysis determines a transformer change is required, PG&E will furnish the customer with an explanation of why the change is needed.

1.2. Section D.2.b.1 is modified to read:

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 PG&E'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.

1.3. Modify Section D.2.b.2 to read:

Generating Facilities (greater than 30 kVA). PG&E 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.

1.4. Modify one entry in Table D.1 Voltage Trip Setting under Section D.2.b.3. to delete the row starting:

“Greater than or equal to 106 Volts but less than or equal to 132 Volts,” as there are no trip times set in this range. In addition, minor formatting changes to the table and the table heading were made.

1.5. Section D.2.i is modified to read:

Power Factor: The Producer shall provide adequate reactive power compensation on site to maintain the generating facility power factor near unity at rated output or a PG&E 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, PG&E may offer reactive power support in the form of power factor correction capacitors on its distribution system, under a Special Facilities agreement, as described in section E.3.a or Rule as applicable.

1.6. Throughout Rule 21 replaced the term, “Gross Nameplate Rating” with “Gross Rating” and replaced the term “Net Nameplate Rating” with “Net Rating.” Other minor formatting changes were corrected.

2. CSD's protest

- 2.1. CSD protests that it is premature to approve PG&E's proposal because the other two major IOUs have not yet submitted their proposals which could provide additional comments benefitting ED's review of PG&E's proposal.
- 2.2. CSD also protests that the phrase in Section D.1.e: *"Gross Rating for all the Generating Facilities connected to a secondary distribution transformer shall not exceed the transformer rating, modified per established utility practice absent any customer generators"* is vague and requests that PG&E clearly explain the process by which the transformer rating may be modified.
- 2.3. CSD further protests that PG&E has not justified the phrase in Section D.2.b.1 that the *"...voltage range at the PCC, with the generator on-line, shall stay within +/-5% of nominal"* and in Section D.2.i the more stringent requirement that the generators *"...maintain the generating facility power factor near unity at rated output or a PG&E specified power factor within a power factor range from 0.9 leading to 0.9 lagging, based on local conditions."* CSD states that PG&E has not provided a cost-benefit analysis for system operation and additional cost to small generating facilities.

3. SC's protest

- 3.1. SC protests that this AL was premature and should be suspended pending resolution of numerous proposals from PG&E affecting Rule 21, among them PG&E's proposed filing to suspend the use of Rule 21 for an undefined "interim period" for any generator that is a Qualifying Facility (QF); PG&E's AL 3830-E, which would revise tariffs and standard contracts for small renewable generators and eligible water and wastewater treatment facilities; and the joint PG&E/SCE/SDG&E application to FERC to suspend going forward the utilities' obligation to purchase electric energy from certain QFs. SC argues that approving this AL without benefit of consideration of all of PG&E's proposals in different jurisdictional venues could prejudice the Commission's effort in those venues.

Last, SC argues that the CPUC's reconvening of the Rule 21 Working Group on April 29, 2011, demonstrates the need for tariff consistency among the IOUs and with state law.

4. PG&E' response to CSD's protest

4.1. PG&E points out that this Supplemental AL resulted from extensive collaboration with SCE and SDG&E and discussions with IREC and the Energy Division to incorporate feedback to the original AL. PG&E further notes that SCE and SDG&E have indicated that they will file nearly identical proposals to modify their respective Rule 21 tariffs, which renders CSD's repetition of the consistency argument unnecessary. PG&E notes that in fact, SCE filed AL 2575-E on April 20, 2011, proposing substantially similar language changes to its Rule 21.

4.2. PG&E explains that the "utility practices" referenced in Section D.1.e refers to PG&E's internal engineering standards and work practices it is employing to determine safe electrical loading levels on its transformers and on the local electrical distribution system.

4.3. PG&E responds to CSD's objection to the "more stringent" voltage and power factor requirements in Section D.2.d.1 and D.2.i by noting that the proposed modification only eliminates reference to an unused voltage trip level and corrects and clarifies the voltage trip setting and power factor language.

5. PG&E's response to SC's protest

5.1. PG&E refers to the response to CSD's protest and adds that SC's protest does not address the specific tariff revisions contained in this filing. PG&E argues that SC's assertion that the changes should not be approved until there is a "better understanding of the entire universe of proposed changes" is groundless. If SC's proposal for delaying a decision on this AL were followed, PG&E argues, customer-generators who are presently waiting to interconnect would not benefit from the more flexible requirements proposed here. Last, PG&E notes that any issues not addressed in this filing could be a subject of a future Rule 21 Working Group meeting.

6. Analysis

- 6.1. We agree with PG&E that a decision should be rendered on this AL without awaiting results from other Rule 21-related activities. Thus, CSD's and CS's request to delay the approval of this AL until all Rule 21 problems regarding interconnections under various tariffs are resolved should be denied.

SCE has meanwhile filed AL 2575-E seeking approval for identical changes to its Rule 21. PG&E's original AL was served on the Rule 21 Working Group roster, which includes stakeholders in all IOU service territories, giving ample opportunity for comments from customer-generators served by each of the IOUs.

The CPUC has re-activated the Rule 21 Working Group, (holding a first workshop on April 29, 2011) and is the proper forum for discussion of interconnection issues under various retail and wholesale tariffs (Net Energy Metering (NEM), Wholesale Distribution Access (WDAT), Feed-in Tariff (FIT), Qualifying Facility (QF), etc). The issues addressed in PG&E's proposal are technical and apply to all generating facilities under Rule 21.

- 6.2. In response to protests to the original AL, PG&E agreed to base its discretion to determine the necessity for a dedicated transformer on its internal engineering standards and work practices used for rating consumption-only transformers. PG&E further agreed to explain the technical reasons on request. We believe justifying the rating of a transformer based on the various parameters (ambient temperature, ventilation, loading, design, location, etc.) is reasonable, even for small generator interconnections. We believe that the proposed language of Sec. D.1.e. appropriately communicates this discretion.
- 6.3. Per Rule 2, Description of Service, PG&E is required to provide service within +/-5% of nominal voltage. This voltage range must therefore be maintained at the PCC when operating a generator so that other customers are not affected. PG&E's proposal does not impose a more stringent requirement and is already specified in Rule 21, Section D.2.a. Table D.1 in Rule 21 shows the trip times for

the voltage range of 106 V to 132 V to minimize nuisance tripping and has not changed.

However PG&E proposed to change the Table D.1 Voltage range column heading to allow measurement at the “Generator Terminal or PCC”. The “Generator Terminal” measurement option leaves uncertainty and may result in a voltage range outside of Rule 2 at the PCC. Furthermore, a Generating Facility may have multiple “Generator Terminals” creating uncertainty as to measurement location.

- 6.4. PG&E discussed the concern noted in 6.3 above with SCE, SDG&E, IREC, and the Commission’s Energy Division and obtained consensus to propose deleting the “Generator Terminal” measurement option to read: “Table D.1: Voltage Trip Settings for Generating Facilities” and to change the heading of the Voltage range columns to: “Voltage at Point of Common Coupling (the Ranges Below Are Used to Trip the Generating Facility During Abnormal Distribution System Conditions”.

Furthermore, consensus was reached that Table D.1 footnote stating that for Generating Facilities greater than 30 kVA the trip set points may be “negotiated with PG&E” would be changed to state that different set points than in the table “may be required by PG&E”.

In its comments to the draft resolution PG&E requested to relocate and revise the last sentence of the footnote of Table D.1 as a separate footnote to the title of Table D.1, as recommended by IREC. The sentence would also be revised to read:” For Generators 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 D.1 may be negotiated with PG&E”.

The Commission agrees that the modifications reached by consensus and the modification in PG&E’s comments would clarify the rule and maintain the Rule 2 voltage range at the PCC.

- 6.5. The proposed Power Factor requirement is not more restrictive than in the current Section D.2.i. Where the current language requires each generator to be capable of operating within the power factor range of 0.9 leading to 0.9 lagging, PG&E's proposal only requires the entire Generating Facility to maintain this range. ..."
- 6.6. In its comments PG&E furthermore requested that the title of Section D.2.b be changed from "Operating Voltage Range" to "Voltage Trip Settings", for consistency with the title of Table D.1.

The Commission agrees with this minor editorial change.

- 6.7. In its comments PG&E pointed out that the added "clarification" by the Energy Division to Section D.2.i "...from 0.9 leading to 0.9 lagging at the PCC or point of interconnection, based ..." would pose an unreasonable requirement for both PG&E and for its customers because (larger) deviations from unity power factor can and do occur at PCCs even absent customer generators and are allowed, e.g. per Schedules E-19 and E-20, for a defined rate. Therefore PG&E requests that this "clarification" and OP 3 be deleted.

The Commission agrees with PG&E's request and the draft resolution has been revised accordingly.

COMMENTS

Public Utilities Code section 311(g)(1) provides that this resolution must be served on all parties and subject to at least 30 days public review and comment prior to a vote of the Commission. Section 311(g)(2) provides that this 30-day period may be reduced or waived upon the stipulation of all parties in the proceeding.

The 30-day comment period for the draft of this resolution was neither waived nor reduced. Accordingly, this draft resolution was mailed to parties for comments, and will be placed on the Commission's agenda no earlier than 30 days from today.

PG&E commented timely on September 8.

FINDINGS AND CONCLUSIONS

1. PG&E has worked extensively with SCE, SDG&E and IREC to agree on the proposed language changes in Rule 21, Section D.
2. SCE submitted AL 2575-E on April 20, 2011 proposing identical modifications to its Rule 21.
3. IREC did not protest PG&E's Supplemental AL 3508-E-A.
4. PG&E's proposed changes are technical and apply to all customer-generators under PG&E's Rule 21.
5. The reactivated Rule 21 Working Group, led by CPUC, is the proper forum to discuss technical and procedural problems with interconnection.
6. PG&E will use the same internal engineering standards and work practices to determine whether a dedicated transformer is required when a new generating facility requests interconnection as it does for such determinations where no generating facility is present.
7. PG&E will provide its reason for requiring a dedicated transformer upon request by the customer-generator.
8. It is reasonable to determine the need for a dedicated transformer on engineering standards and experience, rather than impose a blanket requirement of installing a dedicated transformer in all cases where a generating facility sized larger than 20 kVA applies for interconnection under Rule 21.
9. Providing a specific set of transformer standards in Rule 21 is beyond the scope of Rule 21.
10. The voltage and power factor ranges required for generator operation are stated within the service requirements of Rule 2, and have the purpose of protecting other customers' service.
11. PG&E's proposal to allow measuring the voltage for the generator trip times in Table D.1 at the "Generator Terminal or PCC" creates uncertainty and may not guarantee the voltage range per Rule 2 at the PCC.

THEREFORE IT IS ORDERED THAT:

1. PG&E's Tariff Rule 21, Sections D.2.b.1, D.2.b.2, D.3.d, D.2.i and Table D.1 shall be modified as set forth in Appendix A. All other parts of PG&E's Tariff Rule 21 shall remain unchanged, except for minor formatting and term corrections. These revisions to Tariff Rule 21 are effective as of the effective date of this Resolution.
2. PG&E shall file within 20 days of the effective date of this Resolution, a Supplemental Advice Letter to conform its Tariff Rule 21 to the changes authorized in Ordering Paragraph 1.

This Resolution is effective today.

I certify that the foregoing resolution was duly introduced, passed and adopted at a conference of the Public Utilities Commission of the State of California held on September 22, 2011; the following Commissioners voting favorably thereon:

/s/ Paul Clanon

Paul Clanon
Executive Director

MICHAEL R. PEEVEY
PRESIDENT
TIMOTHY ALAN SIMON
MICHEL PETER FLORIO
CATHERINE J. K. SANDOVAL
MARK J. FERRON
Commissioners

Appendix A

Section D.3.d is replaced with new Sections D.1.e. and D.1.f. to read:

“D.1.e. The maximum aggregated Gross Ratings for all the Generating Facilities connected to a secondary distribution transformer shall not exceed the transformer rating modified per established utility practice absent any customer generators. When PG&E’s analysis determines a transformer change is required, PG&E will furnish the customer with an explanation of why the change is needed.

D.1.f. Generating facilities connected to a single-phase transformer with 120/240 volt 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 PG&E’s analysis determines a transformer change is required, PG&E will furnish the customer with an explanation of why the change is needed.”

Section D.2.b title is changed to: “ Voltage Trip Settings”

Section D.2.b.1 is modified to read:

“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 PG&E’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.”

Section D.2.b.2 is modified to read:

“Generating Facilities (greater than 30 kVA). PG&E 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."

Table D.1 title is changed to:

"Voltage Trip Settings for Generating Facilities" and the heading of the Voltage range columns to: "Voltage at Point of Common Coupling (the Ranges Below Are Used to Trip the Generating Facility During Abnormal Distribution System Conditions)."

Table D.1, delete the row starting with:

"Greater than or equal to 106 Volts but less than or equal to 132 Volts,"

Table D.1, revise the last sentence of the footnote and make it a separate footnote to the title of Table D.1 to read:

" 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 D.1 may be negotiated with PG&E."

Section D.2.i is modified to read:

"Power Factor: The Producer shall provide adequate reactive power compensation on site to maintain the generating facility power factor near unity at rated output or a PG&E 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, PG&E may offer reactive power support in the form of power factor correction capacitors on its distribution system, under a Special Facilities agreement, as described in section E.3.a or Rule as applicable."

Throughout Rule 21 replace the term, "Gross Nameplate Rating" with "Gross Rating" and replace the term "Net Nameplate Rating" with "Net Rating" and correct other minor formatting and terminology errors.