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Rule 21 Working Group 3

CONFERENCE CALL

FEBRUARY 27, 2019

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Agenda

2:00-3:00 Issue 23

- Continue discussion from Feb 6 call and Feb 13 meeting
- Validation of V2G discharge disabling
- Authorizing V2G DC-EVSE connections (including testing, certification, and any language changes to Rule 21)
- Consideration of V2G AC/mobile pilots
- Workshop and/or continuing venue on V2G AC/mobile standards and certification

3:00-4:00 Issues A and B

- Continue discussion from Jan 23 and Feb 13 meetings
- Comments on CALSSA-IREC proposal (Jan 16 submission)
- Comments on SCE counter-proposal (Jan 30 submission)
- SCE proposed flowchart for an “end-to-end” process

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Issue 23

Should the Commission consider issues related to the interconnection of electric vehicles and related charging infrastructure and devices and, if so, how?

Sub-issues:

a) Applicabiilty of Rule 21 to V1G?
b) V2G-capable with V2G de-activated:
   - How to test, certify, verify? Requires a technical working group?
   - Should Rule 21 still apply?
c) Does V2G-DC require Rule 21 language changes, or just interconnection portal upgrades?
d) How to develop V2G-AC standards? By what process? What are the key elements/questions of that process?
e) V2G-AC pilots:
   - Should the process for granting interconnection approvals to pilots projects involving AC-coupled EVs be streamlined?
   - Should specific eligibility criteria for such a streamlined process be developed?

Issue 23 Scoping Thoughts

- Stakeholders requested more procedural clarity
- ED staff met to discuss which elements of the initial discussions on Issue 23 should be handled in WG3
- Based on both procedural and practical considerations, the following three items were identified:

    1. Rule 21 process streamlining for DC-coupled EVs
    2. Process for pilot projects involving AC-coupled EVs
    3. Standards for AC-coupled inverters

Staff thoughts only—not an official stance of the CPUC

Issue 23

CESA-Nuvve-Honda Proposal (Jan 24)	IOU Comments (Feb 5; SDG&E Feb 10 added)
Proposal #1. Establish applicability of Rule 21 only when bi-directional capabilities are activated and utilized	PG&E and SDG&E: V1G must comply w/Rules 2, 15, 16. SCE: clarify that Rule 21 does not apply to V1G. PG&E: V2G-capable with V2G turned off; (a) need to verify and guarantee turned off; (b) safeguards to avoid unapproved activation; (c) customer awareness--submit interconnection request and obtain approval prior to V2G use SCE: V2G-capable with V2G turned off; (a) Rule 21 should still apply (b) agree to streamlined interconnection process equivalent to section N & O (c) need certification to ensure V2G not enabled SDG&E: V2G-capable with V2G turned off; (a) Rule 21 should still apply (b) Need assurance against accidental discharge (c) Technical discussions needed and should take place outside of WG3

Issue 23 Proposal #1
SCE Counter-Proposal (Feb 12)

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SCE proposes redline to include Vehicle-to-Grid Load:

4. Interaction with Other Tariffs for Stationary or Mobile Storage Charging Load Treatment

For retail customers interconnecting stationary or mobile energy storage devices pursuant to this Rule, the load aspects of the storage devices will be treated pursuant to Rules 2, 3, 15, and 16 just like other load, using the incremental net load for non-residential customers, if any, of the storage devices.

Rationale for redline: This section in the rule is simply stating that increase load from charging will not be considered as part of Rule 21. It does not matter if it stationary storage or mobile storage in vehicle, it load portion is part of other rules (15/16) and thus no need increase the complexity of this language. In reality, the original language is good enough but capture the stakeholder's comments more explicitly, the minor red-lines could be added to Rule 21 Section B.4

Consideration for definitions on Vehicle-to-Grid Device and Activate; activation. SCE proposed definitions:

Vehicle-to-Grid Device: Electric Vehicle with an onboard storage device that is capable of bi-directional electrical energy with the use of a stationary onsite electrical vehicle supply equipment (EVSE) for interface with the customer load and utility electric power system

Activate; activation - SCE does not see it necessary to define these broadly used terms.

Issue 23

CESA-Nuvve-Honda Proposal (Jan 24)	IOU Comments (Feb 5)
Proposal #2. Authorize V2G DC interconnections and make the appropriate modifications to the Rule 21 tariff and portal	PG&E: V2G DC with off-board EVSE certified Rule 21 compliant acceptable for interconnection. Still need to be reviewed & approved for local facility impact, voltage, loading, similar to any other interconnection. SCE: V2G DC with off-board EVSE should follow existing Rule 21 and UL1741/SA certification process, and may use section N. SCE: "does not support determining the technical requirements, implementation mechanisms, and specific changes to tariff language within this proceeding"; consider other venues such as IC Discussion Forum

CPUC: Would updates to interconnection paperwork and portals be beneficial? What updates? An option to select EVs as the interconnecting resource has been mentioned. How does this topic tie into Issue 22? Are tariff changes required?

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https://gridworks.org/initiatives/rule-21-working-group-3/

Issue 23 Proposal #2
SCE Counter-Proposal (Feb 12)

Additional areas of testing and certification need to be addressed and clarified in order to allow V2G-DC systems to be approved under Rule 21 in an expedited process.

1) For interconnection purposes under Rule 21, the EVSE which contains the stationary inverter must be treated consistent with all other inverter in the tariff

2) Testing and certification of the controls which prevent bi-directional power flow are necessary. These test should be consistent with PUC approved Non-export AC/DC converter definition requirements.

3) Operational configuration selection testing and certification. There is currently no testing and certification for the selection of specific EVSE configuration. Testing and certification should test the logic and controls of EVSEs to test that a configuration parameters limit the operation of the EVSE

4) No need to update interconnection portal exclusively to EVSE's as these will be treated as all other inverters connected at the PCC as provided by the customer

5) SCE does not see the need to adopt Sec. N for interconnection of EVSE used for V2G-DC.

6) SCE counter proposal to CESA's proposal of establishing NEM equivalent process for EVSEs (V2G-DC PVEs). SCE highlights that the NEM expedited process is based on meeting rule 21 A-H and being below 11KVA. To the extent that EVSE's can meet the same requirement with certifications, size limit, and simplicity of interconnection, then SCE believes that these EVSE interconnection can meet the same requirement.

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Issue 23

CESA-Nuvve-Honda Proposal (Jan 24)	IOU Comments (Feb 5; SDG&E added Feb 10)
Proposal #3. Broaden the definition of "smart inverter" to include a system of components and allow certification to IEEE 1547 standards to enable V2G AC interconnections Proposal #4. Direct a sub-group in this proceeding to consider SAE J3072 applicability or changes needed for certain V2G AC systems to meet smart inverter requirements	PG&E: V2G AC on-board inverter must be certified Rule 21 compliant. May be UL-1741 SA or a new SAE standard compliant with 1547.1. Need certification by a NRTL, could update Rule 21 to accept an equivalent SAE standard once reviewed and accepted by California IOUs. SCE and SDG&E: need a working group for all V2G (technical) issues; WG3 should (only) discuss venue and scoping

CPUC: Should CPUC encourage the development of standards for inverters for AC-coupled EVs that will facilitate their interconnection in the future? If so, how?

- Would a workshop be an appropriate discussion venue for this topic?
- Does J3072 test all functionality that is important for grid safety and reliability? If not, can it be updated to do so?
- Do other standards or standards-making bodies better meet the needs of consumers and of the CA grid?
- Is there a stakeholder who is familiar with both UL 1741SA and with J3072 who would be willing to present a comparison?

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Issue 23

Honda Proposal on V2G-AC (added Feb 12)	
The system would conform to IEEE 1547.1, provided that the point of interconnection (or EVSE) is UL-listed. This would clarify that there is always a UL-listed 'gatekeeper' for the system somewhere between the system and the grid. The wording is flexible, but the key concepts are that (a) the system would conform to IEEE 1547.1, and (b) UL has certified that it is safe to allow a connection between the system and the grid.	

Issue 23 Proposal #3
SCE Counter-Proposal (Feb 12)

1) SCE does not see necessary to update definition of “Smart Inverter” as that definition does not require that it be a “box”. However SCE would be acceptable to add “or inverter system” to the definition if stakeholders deem it would necessary for market clarification.

2) SCE agrees that once the updated to IEEE1547.1 is updated for increased inverter functionality (smart inverters) then Rule 21 will be updated to required certification of all inverters and inverter systems (stationary and onboard) to be certified under by an OSHA approve NRTL as currently implemented. Simply testing against the standard is not sufficient but consistent with all other inverters, NRTL certification will be required.

3) SAE J3072 does address certification of the inverter. SAE J3072 is only for information exchange between the EVSE and the onboard inverter system for purposes of configuring the onboard inverter systems. J3072 does not test the inverter for compliance with any IEEE standards. Instead, J3072 4.7 and 4.8 reference the IEEE1547 2003 for testing. Therefore, onboard inverter systems should be required to be certified and tested an OSHA approved NRTL consistent with all inverters connected to the grid.

4) Certification should only account when PEVs are connected to the grid (equivalent to stationary storage) not when inverter are not connected to the grid.

5) SCE is not in agreement to make any modifications to certification requirement under Rule 21 until all other standards have been approved and Rule 21 has been updated to conform to new updated IEEE1547 standards.

Issue 23 Proposal #4
SCE Counter-Proposal (Feb 12)

1) SCE does not support the interconnection of V2G AC until the standards, testing and certification processes have been clarified. Doing so, can lead to long review of interconnection requests and potential safety issues. For safety requirements, SCE heavily relies on the certification processes as outlined in question #1. SCE will not deviate from these requirements which complies with interconnection safety requirements for interconnection.

2) For these systems to be eligible for NEM paired storage, V2G systems would have to comply with the requirements of PUC decision R14-07-002 – Decision Granting Petition for modification of decision 14-05-003.

3) SCE agrees with CESA that WG#3 does not provide the sufficient time to address the very complex issues related to standards, compliance testing, and certification processes that is required to allow V2G -AC systems to interconnect to the grid in an expedited process. These issues include: compliance with NEC codes, compliance requirement under the various standards, and Rule 21 modifications

4) While SIWG has been task with addressing a number of technical issues from resolution E-4898, SCE believes that the SIWG is largely completed with those tasks and thus would be available for working on these complex technical issues. However, SAE technical personal, must be added to the SIWG to insure that all technical issues are properly addressed.

5) Given the complexity of the many technical specification, SCE does not support adding this scope to future working groups (WG #4). Instead, SCE proposes [a dedicated working group].

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CESA-Nuvve-Honda Proposal (Jan 24)	IOU Comments (Feb 5; SDG&E Feb 10 added)
Proposal #5. Clarify a pathway for parties to interconnect V2G AC systems on a timely basis for experimental and/or temporary use until the appropriate rules are updated in the future, consistent with any recommendations resulting from R.18-12-006, the VGI Roadmap, or other transportation electrification proceedings	PG&E: no specific comments SCE: same comment as for #4 SDG&E: V2G systems should not deviate from Rule 21 requirements even on a temporary or pilot basis.

CPUC:

- Should the process for granting interconnection approvals to pilots projects involving AC-coupled EVs be streamlined?
- What existing pilots are seeking this type of interconnection and what is their current status?
- Should specific eligibility criteria for such a streamlined process be developed?
- Should the Commission establish a target number of pilots or a limit on how many pilots may qualify for the streamlined process? Should only pilots be eligible for this streamlined process?

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Issue 23 Proposal #5
SCE Counter-Proposal (Feb 12)

1) The main issue that SCE has observed with V2G systems in the lack of compliance with certification requirements. For interconnection safety requirements, SCE relies heavily on the certification requirements that been approved by various standard committees (IEEE, UL). It is compliance with these standards why SCE has been able to interconnect large amount of DERs in grid in a safe and reliable manner.

To this end, SCE will not support any type of temporary or experimental interconnection which has not been deemed to be safe by approved certification entities. Doing so would be against SCE's principle of "safety first". Thus to the extent that certification compliance to the applicable standard is part of the temporary/experimental process, then SCE can work with interested stakeholder on that process that can allow temporary inteconnection. However, SCE will not provide deviation to certification requirement under Rule 21

2) SCE would be acceptable to temporarily exempt V2G systems from smart inverter requirements. However, NRTL certification as required under section L for inverters using section H will be required. This exemption would only until the revision of IEEE1547.1 is updated and adopted under Rule 21.

Issue 23

CESA-Nuvve-Honda Proposal (Jan 24)	IOU Comments (Feb 5; SDG&E added Feb 10)
	OTHER GENERAL COMMENTS PG&E: coordinate with CEC VGI Roadmap Update, CPUC TE, other inter-agency efforts PG&E: WG3 findings should be consistent with joint IOU SI white paper and approaches PG&E: address aggregation and sub-metering in other venues and coordinate w/Rule 21, because scope extends beyond interconnection SCE: concerned about other aspects of V2G in this proceeding not directly related to interconnection, take on in other proceedings SDG&E: Detailed technical discussions whether and how Rule 21 should be revised to support the integration of electric vehicles should be done by a technical work group such as the SIWG.

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Issues A & B

Issue A: What changes are needed to clarify the parameters for approval of system design to achieve non-export and limited export?

Issue B: How should utilities treat generating capacity for behind the meter paired solar and storage systems that are not certified non-export?

Some questions or sub-issues:

a) Timing of our process: wait for CRD standard, or not, before developing WG3 proposal?

b) Scope of CRD: will CRD Phase 1 address NEM, non-export, and inadvertent export? Does Issue B require CRD Phase 2?

c) End-to-end process: what is it, can we specify during WG3?

d) Dependency on WG2: do Issues A & B depend on resolution of WG2 Issues 8 and 9?

Issue A Brief (CALSSA & IREC Jan 16)

Proposal:

CALSSA and IREC propose that Rule 21 recognize the new standard.

1. If a system is certified to the standard as non-export with a response time within the defined boundaries of Rule 21, it should be eligible for inadvertent export.
2. If a system is certified to the standard with a fixed maximum export higher than zero, it should qualify as limited export.

Issue B Brief (CALSSA & IREC Jan 16)

Proposal:

1. Amend Rule 21 to accept a maximum export value (or limited export) for systems using equipment that is certified to the Power Control Systems CRD.
2. Within 60 calendar days of completion of Phase 2 of the Power Control Systems CRD, utilities must issue an advice letter incorporating scheduled changes to maximum export values for solar and storage systems.
3. Expressly identify that certified limited export projects will be studied according to the maximum export value for specified technical issues (i.e. not at nameplate value except for in cases of short-circuit duty contribution).

Revised Schedule

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Date	Meeting	Initial discussion	Final discussion	Location
Feb 27	Call			
Mar 6	In person	20 & 22	23 & A & B	CPUC–Golden Gate Room
Mar 20	Call			
Mar 27	In person	24	22 & 24	CPUC – Courtyard Room
Apr 10	Call			
Apr 17	In person		20 & 27 & 28	CPUC – Courtyard Room
May 1	Call			
May 8	In person	Final report		CPUC – Golden Gate Room
May 22	Call			
May 29	In person		Final report	CPUC – Courtyard Room
Jun 12	Call			
Jun 24	Report due			