



# Rule 21 Working Group 3

SIWG CALL ISSUES 27 AND 28  
DECEMBER 19, 2018

# Agenda

2:00-2:10 Schedule and introduction Issues 27 & 28

2:10-2:30 Issue framing/scope, initial written comments

2:30-3:30 Issue 27 comments

3:30-3:45 Issue 28 comments

3:45-4:00 Next steps, plan for next calls

# Schedule – WG3-SIWG Calls

For Issues 27 and 28, there will be a separate set of SIWG phone discussions leading to in-person meeting April 17:

- Dec 19: 2-4pm PST
- Jan 11: 2:30-4pm PST
- Jan 31: 1-2:30pm PST
- Feb 21: 1-2:30pm PST
- Mar 14: 1-2:30pm PST
- Apr 4: 1-2:30pm PST

## Issues 27 and 28

Issue 27. What should be the operational requirements of smart inverters? What rules and procedures should the Commission adopt for adjusting smart inverter functions via communication controls?

Issue 28. How should the Commission coordinate with the Integrated Distributed Energy Resource proceeding to ensure operational requirements are aligned with any relevant valuation mechanisms?

# Phase 1

Phase 1 Autonomous Functions (approved April 2015)

- Anti-Islanding
- Voltage Ride-Through
- Frequency Ride-Through
- Volt/VAR Control
- Default and Emergency Ramp Rates
- Fixed Power Factor
- “Soft-Start” Methods

# Phase 2

## Phase 2 Communications (approved April 2017)

- Three Pathways:
  - IOU – DER
  - IOU – DERMS
  - IOU – Retail Aggregator
- Default Protocol: IEEE 2030.5 (aka SEP 2.0)
- Current compliance deadline is February 22, 2019, though a deadline extension is under discussion
- Capability only, no functional requirements are yet scheduled

# Phase 3

## Phase 3 Advanced Functions

1. Monitor Key DER Data
2. DER Cease to Energize/Return to Service Request
3. Limit Maximum Real Power Mode
4. Set Real Power Mode
5. Frequency-Watt Mode
6. Volt-Watt Mode
7. Dynamic Reactive Current Support Mode
8. Scheduling Power Values and Modes

# Phase 3 Effective 2/22/19\*

**1. Monitor Key DER Data:** inverter or aggregator sends information, such as voltage and active and reactive power, to the utility.

**5. Frequency Watt Mode:** reduce power in response to rising frequency or vice versa.

**6. Volt Watt Mode:** modify active power from DERs based on predetermined voltage ranges to prevent the local voltage on the distribution circuit from rising/dropping outside of allowable levels.

**8. Scheduling Power Values and Modes:** this function enables scheduling of active and reactive power, as well as modification of settings of other functions.

\*Deadline extension for Functions 1 and 8 is under discussion

# Phase 3 Under Discussion

(Effective 12 months after approval of a nationally recognized standard that includes the function)

**4. Set Active Power Mode:** This function establishes the active power that a DER or a system of DERs can produce or use.

**7. Dynamic Reactive Support:** This function is similar to the Volt Var Function from Phase 1. However, instead of modifying reactive power in response to the steady-state voltage level, this function responds to the rate of change in voltage.

# Phase 3 Pending IEEE 1547.1

(Effective earlier of December 2019 or 12 months after approval of the IEEE 1547.1 standard revision)

**1. DER Disconnect and Reconnect Command (Cease to Energize and Return to Service):** the utility can send a command to the inverter to disconnect the DER from the local electrical system or prevent the DER from energizing the local system.

**3. Limit Maximum Active Power Mode:** establishes an upper limit on active power that a DER or system of DERs can produce or use.

# Issue 27 Framing and Scope

- What is the range of initial opportunities for specifying operational requirements?
- What set of use cases are initially desired (beneficial) and what functions are needed for these use cases?
- How does each function get operationalized?
- Which circuit-level thresholds or conditions should activate functions?
- Which functions are mandatory? Which are customer-selected?
- Value streams left for NEM and IDER?

# Issue 27 Utility Comments

- We need some of these functions ad hoc today, but we do not need blanket activation. At some point in the future, we will need blanket activation.
- Rule 21 should allow for some of these functions to be activated by mutual agreement between the distribution provider and customer.
  - Telemetry
  - IDER and other future sourcing mechanisms
  - Mitigating issues identified at the time of interconnection
  - Operation during abnormal conditions. A customer could choose to be controlled during abnormal conditions, rather than manually disconnected as may happen today.
- Would like to consider and discuss a circuit-level penetration threshold as a function of load or hosting capacity beyond which we begin requiring blanket activation.
  - Communication activation would be on a going forward basis at interconnection. Retroactive activation would only be implemented by mutual agreement.
  - PG&E is open to the concept of alarms or similar measures to mitigate leaving smart inverter functions activated for longer than intended.

# Issue 27 Utility Comments

## What should be the operational requirements of smart inverters?

### All Smart Inverters (Phase I – Phase III)

- Smart Inverters shall operate using the default Rule 21 settings for all functions unless directed by the utility. Specified settings for specific generating facilities shall be within the adjustable range. Specified settings outside the adjustable range are allowed under mutual agreement as long inverter certification is covered
- Pre-ATP; ATP will be granted with either default of specified settings as required by the utility
- Post-ATP: When utility specifies a modification on a default setting for an operating generating facility with ATP, such modification should be done no later than 5 BDs from request. Confirmation of setting should be provided in writing to utility or verify on site by utility as required.

### All Smart Inverters (Phase II – Phase III)

- Generating Facilities with SIs shall communicate information to utility in accordance to Rule 21 section Hh-5 and section Hh-7 in coordination with utility capability to communicate with Generating Facilities. The development of a plan when both GF and utility systems will be ready for communication may be appropriate at this point.
- When communication from Utility to Generating Facility are activated, Generating facility should perform the functions as specified in Hh - 8

# Issue 27 Utility Comments

**What rules and procedures should the Commission adopt for adjusting smart inverter functions via communication controls?**

- The only capability/requirement for smart inverters that we have under rule 21 for modifications on functions is via the scheduling of functions (Section Hh.6 – Scheduling capability requirements)
- When IEEE1547/1547.1 is established and adopted in Rule 21, the ability to adjust the various functions default settings will be available.
- Scheduling functions as specify in section Hh-6 should be utilized in coordination is DER participation in programs or services. Utility should be able to schedule in accordance to the electrical needs of the local area or system.

# Issue 27 Other Party Comments

- Are there limits (“rails”) on the adjustability of a function/parameter to ensure a customer isn’t overly impacted (e.g. maximum slope of volt-watt, maximum curtailment, maximum “cease to energize” time)?

# Issue 27 Comments

# Issue 28 Utility Comments

- Rule 21 relates to IDER in that some of the functions defined within Rule 21 can be used by the DERs sourced through IDER. That being said, operational requirements should be defined within the IDER proceeding. IDER will require the specific functionality to serve a grid need.
- IDER will require the appropriate measurement and verification to ensure the grid need was met.
- The recent Joint IOU White Paper, "[Enabling Smart Inverters for Distribution Grid Services](#)", outlines some of the considerations for Smart Inverter-enabled DERs to address distribution grid needs.

# Issue 28 Other Party Comments

- It would probably be good to give an overview of the IDER proceeding for SIWG members that have not been involved.
- Values of services must be defined before a market for those services can be created. Requirements to utilize a 2030.5 communications channel should be introduced only once the market exists and customers can discern/compare the value of communications services such as aggregation or EMS systems.
- Need to define compliance/validation criteria to show that services are rendered.

# Issue 28 Comments



# Next Steps, Plans for Next Calls