Rule 21 Working Group Meeting

January 23, 2002

San Diego Gas & Electric
8306 Century Park Court
San Diego, CA
Meeting Agenda
9:30 am – 4:00 pm

Combined Group Session 9:30 am to 11:00 am

- Introductions
- Utility Activity Sheets – Utilities requested that interconnections that have been approved can drop off the lists after one year. The group agreed.
- Combined group discussion on Section F (Net Metering) – some changes recommended
- Certification Rules – Capstone 330 & C60 are officially certified.
- Rule 21 Language Refinement (Continued) – 1. Discussed 10-day review different treatment betweeen PG&E & SCE 2. Agreements: Tom suggests 3 agreements: i. No export; ii. Incidental export; iii. Small qf contract for export; iv. Customer generation agreement-Agreement for 3rd party (each of previous 3 contracts could have 3rd party versions: iv-i, iv-ii, iv-iii). Possibility of 3 filings: a. Rule 21, (end of Jan-40 days to adoption) b. then i, ii, iv, iv-i, iv-ii, (regular filing wComments) c. then iii, iv-iii. Since export is more contentious, esp for PG&E.
- Small working group on Certification is being formed: Scott, ChuckW, Ed Grebel, Simon Chiang (?); they will draft language for how to get certified.
- Next Meeting and Location -- tbd

Breakout Groups 11:00 am to 4:00 pm

- Technical Group: Supplemental Review Work
- Non-Technical Group: Section F & Certification Language

Lunch 12:30 pm to 1:30 pm

Afternoon Session 1:30 pm to 4:00 pm

- Technical Group: Supplemental Review Work
- Non-Technical Group: Section F, Certification Language

Group discussion of how utilities were implementing the 10-day processing limit. Agreement that applications were taking longer than this. PG&E had put projects into detailed study to avoid going afoul of timelines; more recently had given customers extra time to complete application. SCE had been spending extra time on each one allowing the customer to try to complete the application. Process taking 30-40 hours instead of 10. Learning curve?

Group discussion of submittal dates for family of agreements proposed by Tom D. Agreement to submit all but the export agreement ASAP.

Group discussion of Section F. Section F left as it was in Dec. 2000 PUC Decision text, with a few minor changes proposed by Tom D.

Rule 21 Workgroup Meeting
Technical Committee
January 23, 2002
San Diego CA

The Technical committee met and discussed two topics:

- Xantrex SW islanding characteristics
- Supplemental Review

Xantrex:

The Xantrex SW is a grid-tied PV system inverter with battery backup capability used extensively in the CA buydown program. Retesting by UL in Nov 2001 showed that the unit, which was listed to 1741 in November 2000, did not pass the anti-islanding test. While Xantrex has developed a fix and is currently getting the unit re-listed, the fix is not simple, is costly to implement (essentially a unit replacement), and could cause extensive down time for DG owner. Utility engineers were reluctant to require across the board replacement, but wanted to understand the actual characteristics of the unit so that they could assess the potential hazard caused by continued operation of those units already installed.

A conference call was held on December 20, 2001 between representatives of the three California IOUs, CPUC, and Xantrex, facilitated by FOCUS team members from Endecon Engineering. During that call, specific information was requested by the utilities. Testing was performed by UL and Sandia National Labs, and data were obtained from the buydown program regarding system installations that utilize the SW. The Sandia testing showed that the unit was not able to detect an island with the required circuit quality factor (Q) of 2.5, it was able to detect an island with a Q of 0.75 without a distribution transformer in the circuit or, with a Q of over 3.0 with a transformer in the circuit. The Energy Commission Buydown data showed that there were nearly 350 SW's installed between January 1 and Dec 1, 2001. Sorted by area code, there were less than 30 locations with 3 or more units. This information suggests that the unit is able to detect all but the most resonant island conditions (for comparison, in England the islanding test required Q value is 0.6), and there are few locations with multiple units that might interact. It was suggested that where units represent less than 15% of the line section peak load, no action is necessary. The IOU's asked for copies of the Commission database to compare with their own information and to help assess where they might have concentrations of units.

Nonetheless, Xantrex representative Geoff Levin agreed to perform additional tests to determine if there is any interaction between units. He also agreed to approach Sandia about the transformer test to see if there might be a difference depending on whether the load was on the opposite side of the transformer from the inverter. <Note: Discussion is currently underway with Sandia to determine what appropriate testing might be warranted both to address this specific SW issue as well as to evaluate the topic more thoroughly on a generic basis. Verification that the presence of a distribution transformer can substantially reduce island detection time for inverter-based DR could have a positive impact when considering issues such as recloser/sectionalizer coordination.>

If you do not have but would like the documentation related to the SW test results and evaluations, please contact Chuck Whitaker at chuckw@endecon.com

Supplemental Review

The committee began discussing issues and approaches for dealing with supplemental review. This discussion began with a review of the topic prioritization from the Dec meeting:

Topic	**PGE**	**SCE**	**SDGE**	**Real Energy**	**Capstone**	**Overall**
Export		1	1		1	1
15%	2	2	1	1	3	1
Certified	1		3		3	2
SCCR		3		2		2
Line Configuration	3					2
11kVA						3
Network						3
Starting Voltage Drop						3

While discussing the options for meeting the non-export screen (Rule 21 Section I.3.b), it appears that there are few if any reverse power relays that can meet the requirements defined under Option 1, which state

Default setting shall be 0.1% (export) of transformer rating, with a maximum 2.0 second time delay

These settings are necessary to ensure that not only does the Generating Facility not export, but that it also does not inadvertently energize a dedicated transformer with an open primary—the transformer would draw somewhat more than 1% of its rating and thus trip the reverse power relay.

The 0.1% of transformer rating is often well below the minimum trip settings of available relay packages. It was suggested, however, that at least one manufacturer is developing a relay that would meet this requirement, and others may be considering development.

There are two primary concerns with systems that export over those that don't: the impact of reverse power flow on voltage regulation and islanding. Both of these items are of greater concern as penetration increases. The approach that the group has adopted with the supplemental review is to provide guidance as to what parameters should be considered under various circumstances. The parameters of interest for system that export are as follows:

- Penetration
- DR Anti-islanding capabilities
- DR technology (inverter / synchronous / induction)

In this case, penetration implies the aggregate DR output current relative to the line impedance between the DR and the first voltage regulation device. Short Circuit Duty is a measure of the local feeder impedance and is a parameter needed to evaluate the Short Circuit Contribution Ration in Screen 7 (Rule 21 Section I.3.g). The group concluded that if the aggregate DR full load output current is less than or equal to 10% of the local Short Circuit Duty (SCD), then there would be no concern about voltage regulation (assuming the other requirements, such as D.3.a.1 regarding power voltage regulation are also met). If, in addition, the DR is certified non-islanding, then both of the export concerns are addressed. While the group was hesitant to change the existing Initial Review Process screens, this new requirement does suggest a modification to the existing Export Screen.

At the next meeting we will continue supplemental review discussions with the following topics:

- Supplemental Review suggestions for Export
    - can we modify the IRP to accommodate some export?
    - What will be the requirements for a study
- Supplemental Review suggestions for systems exceeding the15% line segment (Screen 4)
- Supplemental Review suggestions for non-certified equipment (Screen 3)
- Supplemental Review suggestions for systems exceeding the SCCR requirements (Screen 7)