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From: Jerry D. Smith
To: DGI Interested Parties
Date: 10/28/99 4:28pm
Subject: DGI Access, Metering and Dispatch Committee Minutes

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AZ CORP COMMISSION
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As a party interested in the ACC's investigation of Distributed Generation and Interconnections you will find the following attached items concerning the DGI Workgroup's Access, Metering & Dispatch Committee:

1. Approved committee meeting minutes for August 30, 1999.
2. Approved committee meeting minutes for October 4, 1999.
3. Approved notes of September 20, 1999 Operation Subcommittee and Tariff Subcommittee meetings.

These items will be filed in ACC Docket Control per:

Docket No. E-00000A-99-0431

General investigation of Distributed Generation and Interconnections for potential retail electric competition rules consideration.

Arizona Corporation Commission

DOCKETED

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DOCKETED BY	<i>[Signature]</i>
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**Arizona Corporation Commission
Distributed Generation & Interconnection Workgroup
Access, Metering, and Dispatch Committee (AMD)
August 30, 1999 Meeting Minutes**

ATTENDEES

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	<u>Operations Subcommittee</u>			
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AGENDA ITEMS

- ❑ The AMD Committee was divided into two separate sub-committees: Tariffs and Operations.
- ❑ Chairs were selected as follows:
Chuck Miessner – AMD Committee,

Steve Schmollinger – Tariffs,
Steve Bischoff - Operations

- Committee members volunteered for the subcommittees as shown above.
- Issues assigned to the Committee were reviewed and assigned to the subcommittees as follows:

	Assigned Issue Number
Tariffs	1,2,3,13,15,18,19,20,22, sell-back policy
Operations	4,5,6,7,8,9,10,11,12,13,15,16,17,21

- Discussed what the final output and report might look like.
- Discussed methods for reaching consensus on issues. However, Jerry Smith clarified that the main objective of the committee was to educate the Commission on key issues, potential solutions, and viewpoints from various stakeholders. That is, instead of trying to reach consensus or vote on each issue, we are to articulate both sides of the issues.
- Discussed homework for the sub-committees.

**Arizona Corporation Commission
Distributed Generation & Interconnection Workgroup
Access, Metering, and Dispatch Committee (AMD)
October 4, 1999 Meeting Minutes**

ATTENDEES

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AGENDA ITEMS

- Chuck Skidmore gleefully volunteered to take notes for the minutes – thanks, Chuck!
- Dave Drummond provided a summary of the homework from the tariff subcommittee, see attached. The Tariff subcommittee met separately on 9/20 under the direction of Chairman Steve Schmollinger.
- Terry Linde provided a summary of the homework from the Operations subcommittee, see attached. The Operations subcommittee met separately on 9/20 under the direction of Chairman Steve Bischoff.

- Reviewed information for final report to guide our discussions

Final Report

- ✓ Current situation
- ✓ Future perspective
- ✓ Key issues (utilities and implementers viewpoints)
- ✓ Priorities (primary, secondary)
- ✓ Ideas
- ✓ Best practices
- ✓ Pros & cons
- ✓ Actions and recommendations

- Reviewed distributed generation operation scenarios to guide discussions.

Scenarios

- ✓ Size (0-1 mw, 1-10 mw, 10+ mw)
- ✓ Stand alone (disconnected from grid)
- ✓ Sellback (utility, wholesale, retail) vs. self-use
- ✓ Cogeneration
- ✓ Standby, emergency
- ✓ Peak shave
- ✓ Power quality application
- ✓ Net metering

- Conducted broad discussion of operations issues and impacts with guests Jerry Smith of APS and Jerry Smith of the ACC-Staff. Summary of discussion:
 - Discussion largely centered around self-generators connected to the grid either for supplemental or backup power and the possible implications of those arrangements from both an electrical and a financial perspective. Those self-generators could be either Direct Access customers who buy power from an Electric Service Providers (ESP), or Standard Offer customers who buy power from the Utility Distribution Company (UDC) affiliate.
 - The group recognized that a clearer understanding or definition of Distributed Generation would be helpful for many committee members, discussions often migrate from one type of DG application to another, for which the operations and policy impacts are considerably different. The group reviewed the DG operation scenarios and tried to be clearer about which situation they were talking about.
 - The group discussed their understanding of what exactly constitutes a distributed generator, both in general and specifically with regard to the ACC and the rules for competition.

- Generally Distributed Generation (DG) was talked about in terms of an electrical generator located near the end user or on site, with the primary intention of supplying power for the customer. The power could be baseload, peak-shaving, backup, emergency, or cogeneration. Excess power could be sold to the UDC, or to an ESP for the retail market. The latter could be intended for a retail customer such as a neighboring site which would not have to be transmitted over the UDC power grid, or a noncontiguous site which would have to access the UDC grid.
- The group concluded that DG sales to other retail sites would have to be made through an ESP, as provided by the ACC competitive rules.
- DG can be grid connected or remote. The group concluded that Grid connected applications are a primary focus for the Operational subcommittee.
- ESP's can also build merchant generation and sell to one or several customers nearby. The group seemed to agree that, though the generator is certainly geographically distributed, it is a merchant plant and will be coordinated by the ESP. The ESP will coordinate through its Scheduling Coordinator with the Control Area Operator (CAO), Independent System Operator (ISO) or Independent System Administrator (ISA) depending upon how the grid eventually gets organized. Access, metering and dispatch issues are already being addressed. The group concluded that type of generation is not a focus for the DG workgroup.
- DG could also be used by the utility for local generation or grid benefits. The group discussed whether a UDC could own this type of DG or if the competitive rules required utility DG to be owned by an affiliated Genco. The group concluded that utility-owned DG is also not a primary focus of the committee.
- The rest of the discussion focused on DG which is grid-connected, located on or near the customer's site, and primarily intended for the customer's use.
- There are both technical and financial implications for the grid.
- If the DG unit is large enough, its operation could affect the grid. A number of similar DG's could have an aggregate effect, under certain circumstances, that could affect the grid even more. Communication about the operation of the DG would need to flow to the UDC, the ESP, and the CAO. The information flow would need to be rapid and accurate in order to allow the CAO to react to emergencies and unusual operating circumstances.
- Even though the original intent might not be to flow power from the DG to the system, it could happen. The DG could over generate and feed power into the grid. Depending upon the metering arrangement, the meter could flow backwards. This could have the effect of "selling" power back the grid. A savvy DG might be able to avoid penalties for drawing more power than he is allotted at one time but running the

meter backwards to hide the excess use. Net metering could be used to advantage by the DG therefore net metering may be something that is not allowed.

- If Net metering is not allowed, should DG's have metering setups that will allow them to ship power to the grid free of charge? If they over generate, that would be there loss.
- Another possibility is that the CAO may want to tap unused DG capacity under certain circumstances. Should there be provision to allow this and if so, what compensation arrangements should be made?
- The DG could ship excess power backwards into the system specifically to sell it. Since the DG would not be an ESP it would have to use the ESP to broker the power. The ESP might, under certain circumstances, make use of excess DG to make up for shortages or take advantage of spot marketing opportunities. The book keeping could be difficult to track.
- Currently, under PURPA, cogenerators can sell electricity to the UDC at "avoided cost". Could such an arrangement work for the DG. Since the UDC is no longer in the generating business, the question arises as to how to value the "avoided cost". Also, if the DG never actually draws power from the distribution system but remains connected just in case, will the UDC be unable to properly recover stranded costs? Will the burden be unfairly shifted to those remaining users of the distribution system?
- Would a DG have to have a CC&N and be considered an ESP if the power generated were shipped through the grid to another DG owned site? To be sure the CAO would have to know it is happening and certainly the UDC should be paid for the use of its wires, but does the DG have the right to do this without having to satisfy all the same requirements that an ESP has to satisfy? If a DG were allowed to do this, what operational restrictions, metering and dispatch requirements should apply? Would the DG be required to pay imbalance charges and/or provide for ancillary services that might be required to maintain that balance?
- Could a collection of users joint venture to install a DG and ship power around the system to the members of the venture without having to become ESP's?
- If scenarios like 5&6 are allowed, who will coordinate with the CAO and schedule the power through the lines?

Next Meeting(s): Tuesday October 12th and Wednesday October 20th from 9:30 – 12:30.

**Operations Subcommittee
Homework Summary
September 20, 1999**

**Chairman, Steve Bischoff
Notes provided by Terry Linde**

DATE/TIME: September 20, 1999, 10:00 AM **FILE NO:** DGI-AMD-001
LOCATION: 1200 West Washington Street **WRITTEN BY:** Terry Linde
Phoenix, AZ
SUBJECT: ACC Committee Meeting **MINUTES OF MEETING** 001
Distributed Generation & **NO.:**
Interconnection Committee
Access, Metering & Dispatch
Committee

Operations Workgroup

PROJECT NO.:

PROJECT TITLE:

**DATE OF
MEETING:**

September 20, 1999

PRESENT:	Name	Company	Telephone #	Email Address
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1.0 For reference, the list of criteria that should be considered for each question to be evaluated, as developed during the earlier general session, are reproduced in this item below. INFO

For each question to be considered:

1.1 Brief description of the current situation

A look at what the future holds, from the perspective of:

- Utilities
- Implementers

Identify issues & concerns

Establish priorities

- Primary
- Secondary

Ideas & Concepts

Best Practices

Pros & cons

Action Items

1.2 The following is a list of potential operating scenarios and criteria that will influence the issues under consideration:

Combined heat & power (cogen)

Standby

Peak Shaving

Grid Support (private & utility)

Stand-alone (disconnected from grid)

Power Quality

Sell back (Utility/wholesale/retail/self use)

Size:

- 50kW & less
- 51-300 Kw
- 301kW-5MW
- >5MW

Distribution versus Transmission level (5MW & less)

Control, dispatchable?

Certified / Non-certified

Net metering

Others (be mindful of potential issues)

AMD Operations Subcommittee Session

2.0 Steve Bischoff was chosen as interim chairman until a permanent chair is chosen. Members of the committee were encouraged to consider others within their organizations that might be suited and sufficiently available to assume this role.

All

10/4/99

3.0 The set of workshop issues identified during the June 28th meeting, and assigned to the operations subcommittee appears below. During the September 20 meeting, the list of operations issues was listed in matrix fashion, as shown below. Each was assigned a "level of concern" rating, from the perspective of energy services providers and their customers.

The level of concern assigned to each issue is the highest rating that any interested party would assign to that issue (ie, an issue that may be of significant concern for one group, but less so for others will nevertheless receive a "high" rating). Ratings are "high" (H), "medium" (M), "low" (L) and "no concern" (N). Note that items labeled "N/A" were later eliminated from the list, on the basis that they were determined to be represented by other items on the list. See notes below.

The priority rating criteria is either "primary" (P) or "secondary" (S), and was assigned after discussion and assignment of levels of concern. An item received a "primary" priority rating if an "H" appeared in more than one column for that item.

Discussion relating to each of the items, in terms of the intent in listing the item as an issue, and the assignment of levels of concern, is recorded below the table.

Issue	DESCRIPTION OF ISSUE	LEVEL OF CONCERN			Priority (P/S)
		System Suppt	End use Customer	Disconn. From Grid	
4	UDC's total control a concern – Jurisdiction of all utilities for interconnections	H	L	N	S
5	Standardize equipment for monitoring and verification of interconnection (metering issue)	H	H	N	P
6	How will distributed generator customers contribute to ancillary service requirements	H	L	N	S
7	System dispatch / control for mutual system benefit	H	L	N	S
8	Management of / response to disturbances	H	H	N	P

9	More complex operational requirements when many distributed generators co-exist	H	H	N	P
10	Distributed generator load following capability	M	N	N	S
11	Real-time pricing affect on system dispatch and operation	L	L	N	S
12	Automation via supervisory control and data acquisition (metering issue)	N/A	N/A	N/A	N/A
13	Who should control distributed generator – Customer vs control area operator	H	H	N	P
15	If utility benefits from dispatch of units – How is customer / implementer compensated	H	H	N	P
16	Telemetry required for parallel operation (sell back) – (metering issue)	N/A	N/A	N/A	N/A
17	Distributed generator telemetry to send real time data to control area operator (metering issue)	H	M	N	S
21	Scheduling requirement	H	L	N	S

ITEM NO.	ITEM	ACTION	COMPLETION DATE
3.1	It was noted that, during the June 28 th meeting, Issues 5, 12, 16 and 17 were originally assigned to the metering and telemetry subgroup, and then later absorbed into the operations group. The metering issues are identified in the listing above.	<u>Info</u>	
3.2	A set of operating scenarios were developed, with power generating entities defined as follows: <ul style="list-style-type: none"> • System Support – Any DG that is operated for the principal purpose of bringing benefit or value to the system. • End use customer only – Any DG, connected with the grid, that is operated for the principal purpose of self-generating to offset internal power consumption. • Disconnected from the grid – Any DG that is not capable of being interconnected with the grid, consequently for self-generation purposes ONLY. 	<u>Info</u>	
3.3	Issue 4 above relates to the implementers concern that UDC's may attempt to impose undue control over the DG's for their benefit. Conceivably, utilities could impose onerous interconnect requirements, effectively blocking new entrants into the service area. In the future world, control may be exercised by CAO's (Control Area Operator) separate from the UDC (Utility	<u>Info</u>	

- Distribution Center) level.
- 3.4 Issue 5 relates to the establishment of requirements for relaying, pre-certification of equipment through the establishment of a standard, and the development of a standardized connection agreement. **Info**
 - 3.5 Issue 6, By being connected to the grid, distributed generators are a pool from which Ancillary Service Requirements might be drawn. **Info**
 - 3.6 Issue 8, the CAO must make sure that there is no back-feed during disturbances. The End Use Customer is connected because at some point he expects to be drawing power from the grid. **Info**
 - 3.7 Issue 9 concerns the relationship of the UDC within its obligations under its CCN and managing the system to meet the needs of interconnected parties. **Info**
 - 3.8 Issue 10 is in the "noise level" for all but those providing system support. Others are managing self-generation to offset their dependence on grid capacity. **Info**
 - 3.9 Issue 11 is intended to cover, from a wires perspective, operations and control area reliability, rather than a metering or tariff issue. **Info**
 - 3.10 A lot of discussion was devoted to understanding the substance of issue 12, relative to how it's distinct from issues 13 16 and 17. The consensus of the group was that this issue relates less to the type of control and more to control of DG's in general by the UDC, tripping and safety issues, and costs incurred by the DG in the provision of this capability. At the conclusion of the discussion, it was concluded that this issue is adequately covered under issue 13. Issue 12 is consequently eliminated from further discussion, except for consideration as a subset of issue 13.
Ron Franquero to discuss this conclusion with Jerry Smith, to confirm that, in reaching this conclusion, we have not overlooked the intent of the committee in identifying this item as an issue. **Info** Franquero 10/4/99
 - 3.11 Issue 13 to include consideration of any issues associated with issue 12. **Info**
 - 3.12 Regarding issue 15, it was noted that customer benefits are built into the rate structure, from the perspective that system investment (and therefore cost) is deferred with the addition of DG to the control area. The interconnection agreement, however, should anticipate and consider potential benefits from the addition of DG **Info**

- capacity to system stability and thereby avoid building disincentives to DG development into the agreement. Outage scheduling is one example.
- 3.13 Issue 16 was concluded to be a subset of issue 13 and therefore is eliminated from the list. As with issue 12, Ron Franquero to review with Jerry Smith. Franquero 10/4/99
- 3.14 Issue 17 relates less to the “who” of controls, and more to the technical aspects of status and data reporting back to the UDC and control forward to the DG’s. “Control” as it relates to Issue 17 is unique from issue 4, in that issue 4 relates to control from a system management perspective, rather than operational control. **Info**
- 4.0 Where are we?**
- 4.1 Based upon a review of the issues and level of concern table, the group concluded that we are only dealing with those DG’s that are connected, or capable of being connected, to the grid. Every item in the column headed “disconnected from the grid” was determined to be of no concern to the rest of the parties interacting with the grid. **Info**
- “Emergency generators” are expected to be connected to the grid, ONLY for the brief period that they are operating after grid power is returned. (Sounds like we need to define “emergency generators”)
- 4.2 Each issue requires review and homework to further prioritize it relative to the other issues. Each of the entities represented at the meeting were encouraged to “make a stab” at evaluating the issues according to the criterion identified during this morning’s session (summarized in item 1 above), with emphasis on the first four, as follows: **ALL** 10/4/99
- Current situation
 - Future picture
 - Issues, concerns from utility, implementer, and customer perspective
 - Priority
- 4.3 Ways in which the objectives in item 4.2 can be accomplished are: **Info**
- Investigate how the particular issue has been handled elsewhere, from a “best practices” perspective (other states in the process of deregulation, for example)
 - Look at the issue from a control area perspective

- Utilize input from this meeting and reprioritize issues, prepare to review in detail at the next meeting.

4.4 Specific assignments will follow at the next subcommittee session.

Info

4.5 ISO representation would be useful on this committee.
The next AMD operations subcommittee meeting will be set to follow the general DGI meeting presently scheduled for October 4, 1999 at this location. Assume that the subcommittee meeting will commence in the afternoon, say 1:00 pm.

Franquero

10/4/99

**Tariffs Subcommittee
Homework Summary
September 20, 1999**

Chairman, Steve Schmollinger
Notes provided by Dave Drummond

The following issues were identified and targeted for further discussion and analysis. Subcommittee members should plan on discussing items 1 and 2 during the next meeting scheduled for October 4th.

1. Recovery of distribution costs
2. Utility obligation to serve
 - a. standby
 - b. commodity
 - c. wires
 - d. buying back
3. PURPA
4. Surplus sales
 - a. over-the-fence (contiguous neighbor)
 - b. at what price
 - c. serving your own dispersed sites (UDC wheeling)
5. Jurisdiction
6. Net metering
7. Coordination/Scheduling
 - a. dispatch
 - b. value to Control Area Operator (CAO)
8. Value to the grid (benefits verses costs)
9. Information Ownership and Access
 - a. ownership
 - b. access
10. Tariffs
 - a. rules
 - b. policies
 - c. rate schedules
 - d. supplemental fees
 - e. maintenance fees
 - f. standby fees
 - g. buy-back requirements/charges
 - h. metering information
 - i. compensation for benefits and costs to the system
 - j. dispatch of the unit and conditions that trigger it