

ORIGINAL



0000065951

MEMORANDUM

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TO: Docket Control

FROM: Ernest C. Johnson *ECJ*
Director
Utilities Division

DATE: January 24, 2007

RE: STAFF REPORT ON INTERCONNECTION FOR THE GENERIC INVESTIGATION OF DISTRIBUTED GENERATION. (DOCKET NO. E-00000A-99-0431)

Attached is the Staff Report on Interconnection as a result of the generic investigation of distributed generation.

EGJ:BEK:tdp

Originator: Barbara Keene

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Service List For: Generic Investigation of Distributed Generation
Docket No. E-00000A-99-0431

Mr. Jeff Schiegel
SWEEP
1167 West Samalayuca Drive
Tucson, Arizona 84704

Mr. Robert Arman
ANNAN GROUP
6605 East Evening Glow
Scottsdale, Arizona 85262

Ms. Deborah R. Scott
Ms. Kimberly A. Grouse
SNELL & WILMER
One Arizona Center
400 East Van Buren
Phoenix, Arizona 85004

Mr. David Berry
WESTERN RESOURCE ADVOCATES
Post Office Box 1064
Scottsdale, Arizona 85252

Mr. Eric C. Guidry
WESTERN RESOURCE ADVOCATES
2260 Baseline, Suite 200
Boulder, Colorado 80302

Mr. C. Webb Crockett
Mr. Patrick I. Black
FENNEMORE CRAIG
3003 North Central Avenue, Suite 2600
Phoenix, Arizona 85012

Mr. Andrew Bettwy
SOUTHWEST GAS CORPORATION
5421 Spring Mountain Road
Las Vegas, Nevada 89102

Mr. Michael Patten
Ms. Laura Sixkiller
ROSHKA DeWULF & PATTEN
One Arizona Center
400 East Van Buren Street, Ste. 800
Phoenix, Arizona 85004

Mr. Dave Couture
TEP
Post Office Box 711
Tucson, Arizona 85702

Mr. Jerry Payne
COOPERATIVE INTERNATIONAL
FORESTRY
333 Broadway S.E.
Albuquerque, New Mexico 87102

Mr. Brian Hageman
Ms. Caren Peckerman
Mr. Richard Briul
DELUGE, INC.
4116 East Superior Avenue, Suite D3
Phoenix, Arizona 85040

Mr. Scott S. Wakefield
Mr. Stephen Ahearn
RUCO
1110 West Washington Street, Suite 220
Phoenix, Arizona 85007

Mr. John Wallace
GRAND CANYON STATE ELECTRIC
COOPERATIVE ASSOCIATION, INC.
120 North 44th Street, Suite 100
Phoenix, Arizona 85034

Ms. Jana Brandt
Ms. Kelly Barr
SALT RIVER PROJECT
Post Office Box 52025, MS PAB221
Phoenix, Arizona 85072

Mr. Gary Mirich
ENERGY STRATEGIES
One North Central Avenue, Suite 1120
Phoenix, Arizona 85004

Ms. Amy LeGere
4850 Reata Road
Flagstaff, Arizona 86004

Mr. Cohn Murchie
SOLAR ENERGY INDUSTRIES
ASSOCIATION
805 15th N.W., #510
Washington, DC 20005

Mr. Adam Browning
THE VOTE SOLAR INITIATIVE
182-2 Street, Suite 400
San Francisco, California 94105

Mr. Aaron Stallings
MOHAVE ELECTRIC COOPERATIVE
Post Office Box 1045
Bullhead City, Arizona 86430

Ms. Valerie Rauluk
GREATER TUCSON COALITION FOR
SOLAR ENERGY
Post Office Box 42708
Tucson, Arizona 85733

Mr. Christopher C. Kempley
Chief, Legal Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

Mr. Ernest G. Johnson
Director, Utilities Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

Ms. Lyn Farmer
Chief, Hearing Division
Arizona Corporation Commission
1200 West Washington Street
Phoenix, Arizona 85007

**STAFF REPORT
UTILITIES DIVISION
ARIZONA CORPORATION COMMISSION**

GENERIC INVESTIGATION OF DISTRIBUTED GENERATION

DOCKET NO. E-00000A-99-0431

STAFF REPORT ON INTERCONNECTION

JANUARY 24, 2007

STAFF ACKNOWLEDGMENT

The Staff Report on Interconnection for the Generic Investigation of Distributed Generation, Docket No. E-00000A-99-0431, was the responsibility of the Staff member listed below.

A handwritten signature in cursive script that reads "Barbara Keene".

Barbara Keene
Public Utilities Analyst Manager

EXECUTIVE SUMMARY
STAFF REPORT ON INTERCONNECTION
DOCKET NO. E-00000A-99-0431

Commission Decision No. 67744 directed Staff to schedule workshops to consider outstanding issues concerning distributed generation ("DG"). The first issue to be addressed by the workshops was DG interconnection. Workshops were held from July 2005 through March 2006. Participants in the Workshops included representatives from utilities, government agencies, energy efficiency and environmental advocacy groups, utility investors, large industrial consumers, advocates for renewable resources, competitive power providers, advocates for distributed generation, product suppliers, research entities, and others.

In addition, the Energy Policy Act of 2005 requires each state regulatory authority to consider certain PURPA¹ standards, including one on interconnection. The Commission may decline to implement the standard or adopt a modified standard. This Staff Report addresses the PURPA standard.

The Workshop participants developed an Interconnection Document that includes proposed processes and procedures for standardizing the interconnection of DG facilities of 10 MW or less. It was a difficult process that led to facilitating the installation of distributed generation while protecting the reliability and safety of the grid.

Staff's proposed version of the Interconnection Document is in Appendix 3. There were some parts of the document in which the group could not achieve consensus. Staff has chosen positions for those issues and has made other changes as described in this Staff Report. This Staff Report also contains descriptions of each section in the Interconnection Document as well as participant positions on the controversial issues.

Staff recommends that the Commission adopt a modified version of the PURPA standard on interconnection that would apply to all electric distribution companies in Arizona that are regulated by the Commission. Staff also recommends that the Commission direct Staff to begin a rulemaking process to convert the Interconnection Document into rules. In addition, Staff recommends that the electric distribution companies use the Interconnection Document as a guide for interconnecting DG facilities until such time as interconnection rules go into effect.

¹ Public Utility Regulatory Policies Act of 1978.

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Introduction

Commission Decision No. 67744 directed Staff to schedule workshops to consider outstanding issues concerning distributed generation ("DG"). The first issue to be addressed by the workshops was DG interconnection. Workshops were held on July 8, 2005; August 26, 2005; September 23, 2005; October 21, 2005; November 18, 2005; December 15, 2005; and March 17, 2006. Participants in the Workshops included representatives from utilities, government agencies, energy efficiency and environmental advocacy groups, utility investors, large industrial consumers, advocates for renewable resources, competitive power providers, advocates for distributed generation, product suppliers, research entities, and others. A list of organizations participating in the Workshops and/or providing comments is in Appendix 1.

In addition, the Energy Policy Act of 2005 requires each state regulatory authority to consider certain PURPA² standards, including one on interconnection. The Commission may decline to implement the standard or adopt a modified standard. The Commission was required to begin its consideration by August 8, 2006, and must complete its consideration by August 8, 2007. On January 23, 2006, Staff filed a memo Docket Control that interconnection was being addressed in Docket No. E-00000A-99-0431. This Staff Report addresses the PURPA standard.

The Workshop participants developed an Interconnection Document that includes proposed processes and procedures for standardizing the interconnection of DG facilities of 10 MW or less. It was a difficult process that led to facilitating the installation of distributed generation while protecting the reliability and safety of the grid.

Staff's proposed version of the Interconnection Document is in Appendix 3. There were some parts of the document in which the group could not achieve consensus. Staff has chosen positions for those issues and has made other changes as described in this Staff Report. This Staff Report also contains descriptions of each section in the Interconnection Document as well as participant positions on the controversial issues. In addition, Staff has made minor edits throughout the Document.

Staff recommends that the Commission adopt a modified version of the PURPA standard on interconnection that would apply to all electric distribution companies in Arizona that are regulated by the Commission. Staff also recommends that the Commission direct Staff to begin a rulemaking process to convert the Interconnection Document into rules. In addition, Staff recommends that the electric distribution companies use the Interconnection Document as a guide for interconnecting DG facilities until such time as interconnection rules go into effect.

Consideration of the PURPA Standard on Interconnection

The Energy Policy Act of 2005 requires each state regulatory authority to consider a PURPA standard on interconnection. The standard would apply to utilities with greater than

² Public Utility Regulatory Policies Act of 1978.

500,000 MWh in annual retail sales. The Commission may decline to implement the standard or adopt a modified standard. The standard is as follows:

Each electric utility shall make available, upon request, interconnection service to any electric consumer that the electric utility serves. For purposes of this paragraph, the term 'interconnection service' means service to an electric consumer under which an on-site generating facility on the consumer's premises shall be connected to the local distribution facilities. Interconnection services shall be offered based upon the standards developed by the Institute of Electrical and Electronics Engineers: IEEE Standard 1547 for Interconnecting Distributed Resources with Electric Power Systems, as they may be amended from time to time. In addition, agreements and procedures shall be established whereby the services are offered shall promote current best practices of interconnection for distributed generation, including but not limited to practices stipulated in model codes adopted by associations of state regulatory agencies. All such agreements and procedures shall be just and reasonable, and not unduly discriminatory or preferential.

The Commission is required to consider the three purposes of PURPA in its determination of whether to adopt the interconnection standard. The three purposes of PURPA are as follows:

- conservation of energy supplied by electric utilities,
- optimal efficiency of electric utility facilities and resources, and
- equitable rates for electric consumers

Staff's proposed Interconnection Document is consistent with the PURPA standard in that it includes reference to IEEE³ Standard 1547; however, the Interconnection Document also includes references to other standards, including other IEEE standards. In addition, the Interconnection Document addresses features of agreements and the procedures for interconnection.

Staff recommends that the Commission adopt a modified version of the PURPA standard on interconnection. The modified standard would be as follows:

Each electric utility shall make available, upon request, interconnection service to any electric consumer that the electric utility serves. For purposes of this paragraph, the term 'interconnection service' means service to an electric consumer under which an on-site generating facility on the consumer's premises shall be connected to the local distribution facilities. Interconnection services shall be offered based upon the Arizona Corporation Commission's rules for interconnection when such rules are adopted and become effective. Until such

³ The Institute of Electrical and Electronics Engineers.

rules are adopted and become effective, the Interconnection Document shall serve as a guide for interconnection unless otherwise ordered by the Commission.

Staff's proposed standard would apply to all electric distribution companies in Arizona that are regulated by the Commission. This would be in contrast to the PURPA standard that applies only to electric distribution companies with retail sales of more than 500,000 MWh. See Appendix 2 for a list of the electric distribution companies in Arizona.

Summary of the Interconnection Document

1. Applicability

This section of the Document describes the generating facilities that could be interconnected to utility distribution systems using the procedures contained in this Document.

1.1 Applicable Generating Facilities

This subsection states that the Document applies to Generating Facilities with a size of 10 MW or less interconnecting or applying to interconnect with electric public utilities subject to the jurisdiction of the Arizona Corporation Commission.

Staff made a modification to this subsection and throughout the Document by replacing the word "*rules*" with "*Document*." A subcommittee of Workshop participants had inserted the word "*rules*" throughout the text. However, the Document is not in rule format, and a rulemaking proceeding has not commenced.

1.2 Types of Generating Facilities

This subsection describes the two ways in which a distributed generator operates in connection with the utility grid: Parallel System and Separate System. With a Parallel System, the distributed generator is connected to the Utility's system (either on a continuous basis or momentarily), resulting in a transfer of power between the two systems. A Separate System is one in which there is no possibility of electrically connecting or operating the distributed generator in parallel with the Utility's system.

One type of a Parallel System is an Islandable System. An Islandable System is a Generating Facility interconnected to the Utility's system, where the Generating Facility is designed to serve part of the Utility grid that has become or is purposefully separated from the rest of the grid.

In regard to Islandable System, the DG Advocates⁴ wanted a statement about IEEE Standard 1547.4⁵ to be included in the Document as follows: "*Currently there are no rules or standards governing this type of Generating Facility operation and protocols are established on a case-by-case basis. The ACC may revisit Islandable Systems after a successful balloting of IEEE Standard 1547.4.*"

The DG Advocates wanted their language because they believe that "islanding" has a negative connotation in the Utility framework and that Utility engineers typically work to prevent it. The IEEE Standard 1547.4 is still in draft form. If the DG Advocates' language were to be adopted, Arizona would be providing affirmative feedback to the IEEE committee that at least two states (Arizona and Pennsylvania) are interested in seeing this standard developed. The IEEE standards body, developer of the 1547 standard, has determined that the issue of "purposeful islands" is of sufficient value and merit that it is worth attempting to solve the technical issues associated with it. The technical issues may prove the most easy to solve. Legal issues may prove intractable, but that is not a reason to pretend as if the issue does not exist.

The Joint Utilities⁶ preferred the following: "*Currently there are no rules, standards or protocols governing this type of system operation. As such, an Islandable System as defined herein is not allowed.*"

The Joint Utilities prefer their language because of the following reasons: no industry-wide standards, safety hazard, synchronization issues, power quality issues, and reliability concerns. There are no industry-wide rules, standards, or protocols governing this type of system operation. An Islandable System presents a safety hazard for utility personnel who may be restoring power on the utility system because of the potential for inadvertent energization into a cleared work area by a source of power not under the Utility's control. Currently, Utilities do not have provisions to resynchronize with an islanded system on their feeder in order to prevent damage to the distributed generator and/or the Utility grid. The Utility cannot rely on the distributed generator to meet the Utility's power quality requirements, possibly affecting the quality of service to other customers. The added complexity of a distributed generator will result in extended outage durations. In addition, the ACC has the authority to revisit its rules at any time.

⁴ The DG Advocates included American Council for an Energy Efficient Economy, Americans for Solar Power, Arizona Solar Energy Industry Association, Distributed Energy Association of Arizona, Greater Tucson Coalition for Solar Energy, Intermountain Combined Heat and Power Center, Intermountain Combined Heat and Power Initiative, Southwest Energy Efficiency Project, Vote Solar Initiative, U.S. Combined Heat and Power Association, and Western Resource Advocates.

⁵ IEEE Standard 1547 was adopted by the Institute of Electrical and Electronics Engineers to establish criteria and requirements for interconnection of distributed resources with electric power systems; 1547.4 is a draft guide for design, operation, and integration of distributed resource island systems with electric power systems.

⁶ The Joint Utilities included Arizona Public Service Company, Duncan Valley Electric Cooperative, Graham County Electric Cooperative, Mohave Electric Cooperative, Navopache Electric Cooperative, Sulphur Springs Valley Electric Cooperative, Trico Electric Cooperative, Tucson Electric Power Company, and UniSource Energy Services. Salt River Project was in general agreement.

Staff agrees with the Joint Utilities on the topic of Islandable System. Industry-wide standards do not yet exist. The 1547.4 is still a draft standard, and the IEEE working group is not scheduled to meet again about that proposed standard until January 30, 2007. The safety and reliability issues are too important to ignore, and the Commission could revisit the issue in the future if warranted.

2. Rights and Responsibilities

This section describes the rights and responsibilities of both the customer with a Generating Facility and the Utility.

2.1 Customer Rights and Responsibilities

This subsection describes the rights and responsibilities of a customer with a Generating Facility and desiring to interconnect it with the Utility's grid. A customer has the right to interconnect with a Utility's grid and the right to receive prompt and reasonable responses from the Utility. The customer has responsibilities to provide information to the Utility and meet various requirements that will help to maintain Utility grid reliability and safety.

Staff has removed a phrase concerning the utility's obligation to interconnect because it is already in the subsection Utility Rights and Responsibilities where it more appropriately belongs.

2.2 Utility Rights and Responsibilities

This subsection describes the Utility's rights and responsibilities regarding interconnection. A Utility is obligated to interconnect Generating Facilities, but also has the responsibility to safeguard its system, other consumers, and the general public.

In the subsection, Customer Rights and Responsibilities, there is a statement that the customer is responsible for all interconnection facilities required to be installed to interconnect the customer's Generating Facility to the Utility system at the customer's sole expense. The DG Advocates wanted a statement about benefits to be included in this Utility Rights and Responsibilities subsection. The wording would be as follows: "*If facility upgrades are needed to accommodate the Generating Facility, a Utility is required to assess and recognize any benefits of adding the Generating Facility to the distribution system, in addition to the costs, and only charge the customer for the costs net the benefits.*"

The Joint Utilities were opposed to including the statement because the Utility cannot quantify the cost-benefit of adding the customer's Generating Facility to the distribution system. The first reason is that no benefits of non-firm non-dispatchable can be quantified because the utility does not control the operation of the Generating Facility. For example, fluctuations in fuel costs may impact whether the owner of the Generating Facility will operate the facility. Because the addition of the Generating Facility cannot be considered firm power, the Utility cannot rely on it to reduce the size of feeder conductors, substation transformers or feeder protective

equipment or to provide voltage support. The second reason is that the Utility is unable to quantify the benefits to reliability also because the Utility has no control over the operation of the Generating Facility. The third reason is that quantification measures are not clearly defined. The fourth reason is that there is no guarantee that Utilities will realize the long-term benefits of adding such upgrades. The distributed generator is not obligated to stay in business. The Utilities propose that the provision be deferred pending the outcome of a study being conducted by the U.S. Department of Energy on the potential benefits of cogeneration and small power production.

The DG Advocates want to include the statement because the DG owner should not have to bear the entire cost of upgrades if those upgrades benefit other ratepayers. DG provides benefits in VAR support and grid management. Utilities regularly invest in capacitor banks to correct power factor and provide voltage support. DG is often designed to compensate for local power factor, thus saving Utilities the costs of capacitor bank upgrades. Larger generators serve as spinning reserve. The gross fault current on the grid can be lower after a DG installation because of a change in the configuration of tie breakers. The benefits can occur even when the distributed generator is off-line. According to the US Combined Heat and Power Association, there are 139 MW of nonutility-owned combined heat and power in Arizona. While Utilities may not have explicitly taken this installed base into account when they made their system investments, it is implicitly factored in by the reduction in load growth for which they would have had to install capacity to serve. The difficulty in quantifying the benefits should not result in the determination that the value is zero.

Staff believes that including the value of benefits when calculating costs may be beneficial; however, it may not always be practical to do so. Staff recommends that the wording of the statement be as follows: *"If facility upgrades are needed to accommodate the Generating Facility, a Utility will reduce the charge to the customer by the amount of any benefits to the grid that are readily quantifiable."*

The DG Advocates propose that another sentence be added to the end of this subsection. The sentence is the following: *"In addition, a Utility cannot reject an Application on the basis of distribution system conditions that are already deficient, or charge a Customer for facility upgrades that are overdue or soon to be required to ensure compliance with good utility practice."*

The DG Advocates want the sentence added because they have found situations in other states where a Utility blocks the installation of a distributed generator or charges excessive amounts for facility upgrades because the Utility grid is not in good condition. The DG owner is not responsible for grid management and should not be held accountable for existing grid deficiencies. The proposed sentence would ensure that this problem does not occur in Arizona.

Staff believes that a Utility has an obligation to maintain its grid in good condition, and the Utility should not unfairly block a DG installation. However, if reliability or safety would be further compromised by a DG installation, the Utility has an obligation to prevent or delay the

installation until the reliability or safety situation is alleviated, regardless of who is responsible for the grid problem. Staff recommends the following statement: *"In addition, a Utility cannot reject an Application on the basis of distribution system conditions that are already deficient, or charge a Customer for facility upgrades that are overdue or soon to be required to ensure compliance with good utility practice, except that applications can be rejected in instances where reliability or safety would be further compromised by a DG installation."*

2.3 Easements/Rights of Way

The customer must provide or obtain and provide any easements and rights of way necessary for an interconnection.

2.4 Insurance

The Workshop participants are in disagreement over the issue of insurance. The Joint Utilities want the owner of a Generating Facility of at least 50 kW to be required to have liability and property damage insurance. The DG Advocates oppose the requirement for insurance.

The Joint Utilities propose the following language: *"The Customer shall maintain public liability and property damage insurance in amounts not less than ONE MILLION DOLLARS (\$1,000,000) per occurrence. Residential customers who operate a static inverter based Generating Facility rated less than 50 kW are exempt from this requirement. At no time shall the Utility require that the Customer negotiate any policy or renewal of any policy covering any liability through a particular insurance company, agent, solicitor, or broker."*

The Utilities believe that covering risks by carrying insurance is a necessary cost of doing business for commercial and industrial customers interconnecting to the distribution system for their own business purposes, as opposed to serving native load. It is not fair to require the Utility or its ratepayers to assume the risks associated with such business ventures. Residential customers installing systems with minimal risk would be exempt from insurance requirements. The cost of insurance is generally consistent with the risks, as determined by the insurance industry. The Utilities currently have insurance requirements which are being complied with by distributed generators.

The DG Advocates propose the following alternate language: *"The Customer is not required to provide general liability insurance coverage as part of this Agreement, or any other Utility requirement. Due to the risk of incurring damages, the ACC may recommend that every Interconnection Customer protect itself with insurance or other suitable financial instrument sufficient to meet its construction, operating and liability responsibilities pursuant to this Agreement. At no time shall the Utility require that the Customer negotiate any policy or renewal of any policy covering any liability through a particular insurance provider, agent, solicitor, or broker. The inability of the Utility to require the Customer to provide general liability insurance coverage for operation of the Generating Facility is not a waiver of any rights the Utility may have to pursue remedies at law against the Customer to recover damages."*

The language proposed by the DG Advocates is in the NARUC interconnection model. The DG Advocates believe that any owner of interconnected distributed generation equipment will already have sufficient general liability insurance to cover the "infinitesimal" risk that its operation will result in a liability claim. They support a simple attestation on the interconnection application form that the owner or operator has in place a general liability insurance policy. Other states have rejected the need for DG owners to hold additional insurance. An insurance requirement is unnecessary and redundant because the Document contains provisions for indemnification. It has created a substantial barrier for DG in other states, and utilities hold each other harmless when they interconnect with each other. DG owners should decide how much insurance they want to hold to protect their equipment. Each side of the interconnection should protect themselves. An insurance requirement also creates an arbitrary financial burden.

Staff agrees with the DG Advocates to use their proposed language regarding insurance (based on the NARUC interconnection model), with some edits. It alerts customers about their liability responsibilities without creating an undue burden on the customer. Staff's proposed language is the following: *"The Customer is not required to provide general liability insurance coverage as a condition for Interconnection. Due to the risk of incurring damages, it is recommended that every Interconnection Customer protect itself with insurance or other suitable financial instrument sufficient to meet its construction, operating, and liability responsibilities. At no time shall the Utility require that the Customer negotiate any policy or renewal of any policy covering any liability through a particular insurance provider, agent, solicitor, or broker. The inability of the Utility to require the Customer to provide general liability insurance coverage for operation of the Generating Facility is not a waiver of any rights the Utility may have to pursue remedies at law against the Customer to recover damages."*

2.5 Non-Circumvention

The DG Advocates⁷ propose including a subsection on non-circumvention. This would prohibit a Utility from offering a discounted electric rate to a customer as an alternative to installing distributed generation. The language is as follows:

A Utility and/or its affiliates shall not use information or knowledge of proposed distributed generation projects submitted to it for interconnection or study to initiate competing proposals to the customer that offer either discounted rates in return for not installing the distributed generation, or offer competing distributed generation projects, unless the rate offered is pursuant to an existing published tariff rate and the rate is available to all other customers in that rate class.

Customers are not precluded from sharing information in their possession regarding a potential distributed generation project with a utility or its affiliates, or from using information regarding a potential distributed generation project to negotiate a discounted rate or other mutually beneficial arrangement with a

⁷ Western Resource Advocates takes no position on this issue.

utility or its affiliates, so long as any negotiated discounted rates or arrangements are 1) pursuant to an existing published tariff rate, or 2) available to all other customers in that rate class.

The DG Advocates maintain that the ability of a Utility to meet or beat an offer to install DG by an interested third party or the customer will undermine the DG industry and stop it. It is not proper for Utilities to use interconnection applications and the information they contain to compete with the proposed project or to undercut an agreed business arrangement. The DG Advocates believe that nothing in the provision precludes customers from talking to the Utility and others when evaluating a potential project. If the customer asks the Utility for a better rate, the Utility can give one, as long as it is also given to all other customers in that class.

The Arizonans for Electric Choice and Competition ("AECC"), representing commercial and industrial customers, proposes revisions to the DG Advocates' proposal. AECC recognizes that it may be reasonable to provide assurances to DG providers that the provision of information for interconnection or other study would not be used by a competitor to the DG provider's disadvantage. At the same time, customers should not be precluded from using information in their possession regarding DG options to negotiate a mutually beneficial arrangement with the Utility. AECC's revised language is as follows: "*A utility and its affiliates shall not use knowledge of proposed distributed generation projects submitted to it for interconnection or study to initiate competing proposals to the customer that offer either discounted rates in return for not installing the distributed generation, or offer competing distributed generation projects. Customers are not precluded from sharing information in their possession regarding a potential distributed generation project with a utility or its affiliates, or from using information regarding a potential distributed generation project to negotiate a discounted rate or other mutually beneficial arrangement with a utility or its affiliates.*"

The Joint Utilities oppose the subsection on non-circumvention in its entirety. They believe that it is a rate issue outside the scope of the working group. The provision could preclude a Utility from being able to advise a customer of a cheaper, more efficient way to receive the same service. A customer should not be denied access to information on possible rates to achieve the same result. The Commission must approve any discounted rate offered to a customer, and any interested party has the opportunity to intervene and oppose such rate. The provision limits the Commission's ability to review alternative proposals on a case-by-case basis. In addition, the Joint Utilities believe that the DG Advocates' proposal is in conflict with A.A.C. R14-2-1606.C.6 that contains a reference to self-generation deferral rates.

Staff agrees with the AECC and supports their proposed language. It provides for the information provided to the Utility for interconnection to only be used for that purpose. It also allows a customer to negotiate with the Utility for a discounted rate if it so chooses. Any negotiated rate would have to be approved by the Commission before going into effect. The Commission only approves such a rate if it is in the public interest. Staff only recommends approval of a special contract containing a discounted rate if the customer has a viable alternative to the tariffed rate, and other ratepayers would benefit by the customer remaining on the Utility's

system. Similarly situated customers are treated equally. A discounted rate is recommended only for a customer in a situation that is not similar to the situation of other customers.

3. General Process and Procedures for All Levels

This section contains the general process and procedures to be used for all interconnections regardless of the three interconnection tracts.

3.1 Designation of Contact Persons

Each customer applying for interconnection and each Utility shall designate a contact person or persons. The Utility will also provide its contact names to the Commission and on the Utility's website.

3.2 Non-discrimination

The Utility shall process all applications for interconnection in a non-discriminatory manner.

3.3 Application Submission Requirements

This subsection describes some additional information that may be required by the Utility.

3.4 Minor Modifications

Minor modifications to an application are allowed without the application being considered incomplete or treated as new.

3.5 Certification

In order for equipment to qualify as "certified," it must comply with specific codes and standards and other requirements listed in this subsection.

The Joint Utilities propose that the specific codes and standards not be listed in the Interconnection Document. Instead, the codes and standards should be listed in each Utility's Interconnection Manual. If the provisions of this Document were to become rules, the version of the standard listed in the rule would remain in effect even if the entity that produces the standard updates the version of the standard. The inclusion of the codes and standards in each Interconnection Manual would allow updated or new standards to be used without going through a rulemaking process every time new or revised codes or standards are published. This would avoid conflicts with cities having jurisdiction over electric inspections.

Staff agrees that it would not be practical to list the codes and standards in rules. However, since this Document is not proposed rules, it would be helpful for all interested parties to know what codes and standards are being considered. If the provisions of this Document are converted into proposed rules, then the codes and standards should be removed and placed in each Interconnection Manual.

3.6 No Additional Requirements

A Utility may not require additional controls or tests if a customer's Generating Facility complies with all requirements in the Interconnection Document, unless agreed to by the parties or required by the Commission.

3.7 Disconnect from or Reconnect with the Grid Procedure

This subsection lists the conditions under which a Utility may disconnect a customer's Generating Facility from the Utility system. Those conditions are: (a) expiration or termination of the Interconnection Agreement; (b) non-compliance with the technical interconnection requirements; (c) system emergency; (d) routine maintenance, repairs, and modifications; and (e) absence of executed Interconnection Agreement.

Incremental Demand Charges

The DG Advocates propose that a paragraph on incremental demand charges be included in this subsection of the Document. The paragraph is the following: "*During the term of an Interconnection Agreement a Utility may require that a Customer disconnect its Generating Facility and/or take it off-line as a result of Utility system conditions described in subsection (c) and (d) above. Incremental demand charges arising from disconnecting the Generating Facility as directed by the Utility during such periods shall not be assessed by Utility to the Customer.*"

The DG Advocates want the paragraph in the Document to help customers know what they can expect in an interconnection. Some customers have demand charges that are set for the whole month based on their highest point of usage during that month. If the Utility needs to take the customer's Generating Facility offline for a system emergency or for system maintenance, the customer's demand during that time period may be much higher than it would be if the Generating Facility were operating. The demand for the month should not be set based on the time when the disruption occurred.

The Joint Utilities propose that the language about incremental demand charges not be included in this Document. The issue has not been fully vetted with the current Workshop participants. Staff had advised the Workshop participants that rate and tariff issues would be addressed in a separate proceeding. The Joint Utilities request that the incremental demand charge issue be reserved for that group so that the parties knowledgeable about rates and tariffs can be present to discuss the issue.

Staff agrees with the Joint Utilities that the DG Advocates' proposed language on incremental demand charges should not be included in the Interconnection Document. The topic of rates in regard to distributed generation will be addressed separately. Many of the participants in the DG Workshops to date are those with expertise in the technical/engineering field rather than in the accounting/ratemaking field.

Termination of Interconnection Agreement

Another part of this subsection describes when an Interconnection Agreement would no longer be in effect. There is disagreement about part of one of the conditions under which the agreement would terminate. The condition is "(d) *the Customer terminates its electric utility service with the Utility and/or vacates, abandons, sells or transfers either the Customer's interest in the property on which the Generating Facility is located, or the Customer's ownership rights in the Generating Facility, without mutual agreement of the parties.*" The disagreement is about the phrase "*sells or transfers.*"

The Joint Utilities want the phrase "*sells or transfers*" included so that the Generating Facility will not be transferred to and/or used by another party without the Utility's consent. It would enable the Utilities to minimize risk by allowing them to terminate the agreement without the need for legal recourse.

The DG Advocates recommend that the phrase "*sells or transfers*" not be included. If nothing has changed with the Generating Facility or interconnection except the name of the owner, then there is no valid reason for needing to void the Interconnection Agreement. Voiding the agreement would require the new owner to go through the interconnection process again that the previous owner went through, potentially paying for new studies and potentially waiting up to six months before receiving permission to restart the generator. There is no reason for the Interconnection Agreement to be treated differently than other agreements of a business. Businesses exist as legal entities independent of their owners. The words "*vacates or abandons*" should be sufficient for the Utility. A new owner would either want to continue operating the Generating Facility or would agree to terminate the agreement. The DG Advocates propose that the Assignment provision from the Federal Energy Regulatory Commission's ("FERC's") "Small Generator Interconnection Agreement" be incorporated into the ACC standard Interconnection Agreement.

Staff agrees with the DG Advocates on this issue. The phrase "*sells or transfers*" does not appear to be needed and could potentially lead to unnecessary costs and delays. It is reasonable to include an Assignment provision in the Interconnection Agreement to deal with the issue. However, the agreement should contain clear language that the new owner would operate the DG unit in the same manner as approved by the utility through the interconnection process.

3.8 Dispute Resolution

This subsection describes the steps that would be followed in the event of a dispute. Those steps are notification and response, good faith negotiation, dispute resolution by mediation, and Arizona Corporation Commission. Staff changed the title of the first step from "**Initiation and Response**" to "**Notification and Response**" to better reflect its content.

In paragraph (d), Staff has removed the words "irrevocably" before "consent" and "exclusive" before "jurisdiction" because, under the Commission's judicial review statutes, parties may challenge a Commission decision in court.

If the Interconnection Document were to be converted into rules, the Dispute Resolution subsection would be more appropriate to be placed in the Interconnection Agreements instead of in the rules.

3.9 Other Issues

The DG Advocates propose adding subsection 3.9 which would consist of two parts: **Distribution or transmission line charge** and **Interconnection operations and maintenance costs**. The language would be as follows:

***Distribution or transmission line charge.** No distribution or transmission line charge shall be assessed to a customer for exporting energy to the utility system. For purposes of this paragraph distribution and transmission charges means access and line charges, transformation charges, and line loss charges.*

***Interconnection operations and maintenance costs.** No charge for operation and maintenance of the utility system's facilities shall be assessed against a customer for exporting energy to the utility system.*

The DG Advocates propose the above language because current customer-owned Generating Facilities sell power at the wholesale value. The utility can then sell that power to other customers at the retail value and recover distribution charges. To impose distribution line charges would provide an unjust windfall to the Utility, since they would recover distribution charges from both the generator and the retail customers receiving the power.

The Joint Utilities oppose the above language. The use of transmission facilities is FERC jurisdictional and subject to FERC transmission rates. DG entities should not receive rate treatment different from that of any other entity using the Utilities' distribution or transmission system. This is a rate issue and should be more appropriately addressed in a working group convened to address the rate/tariff issues.

Staff agrees with the Joint Utilities that the DG Advocates' proposed language on distribution or transmission line charge and interconnection operations and maintenance costs

should not be included in the Interconnection Document. The topic of rates in regard to distributed generation will be addressed separately. Many of the participants in the DG Workshops to date are those with expertise in the technical/engineering field rather than in the accounting/ratemaking field.

4. Specific Process and Procedures for Each Level

This section provides the process and procedures for three interconnection levels or tracks.

4.1 Summary of Interconnection Levels/Tracks

This subsection defines the three interconnection levels or tracks. Level 1 is the Super Fast Track for the least complex interconnections and facilities with a power rating of 10 kW or less. Level 2 is the Fast Track for interconnections that are more complex and facilities with a power rating of 2 MW or less. Level 3 is the Study Track for the most complex interconnections and facilities have a power rating of 10 MW or less. Each level progressively has more requirements.

Also contained here is a paragraph about Generating Facilities being allowed on distribution networks on a trial basis at the discretion of the Utility. Additional details are in subsection 4.6.

4.2 Screens

This subsection lists nine screens or technical criteria that are used to determine which level or track the interconnection application will follow. To qualify for the Level 1 Super Fast Track, the fifth and sixth screens must be met. To qualify for the Level 2 Fast Track, all nine screens must be met. All proposed Generating Facilities that do not meet the screens for the other levels would go through the Level 3 Study Track.

4.3 Level 1 Super Fast Track Process

This subsection describes the steps and timeline of the Level 1 Super Fast Track process. The first step is the customer submitting an Application. The Utility then receives the Application and notifies the customer as to whether the Application is complete or incomplete. The Utility reviews the complete Application. After approval of the Application, an Interconnection Agreement is signed. The Utility performs a site inspection. After the Generating Facility meets all applicable requirements, the Utility notifies the customer of approval for parallel operation or of any deficiencies. If the Generating Facility does not pass the initial site inspection, the customer corrects outstanding issues and schedules a re-inspection.

The DG Advocates request that no softening of the timeframes be made to the Level 1 process, such as adding the word "normally" before a required number of days. However, no

Workshop participant has made such a proposal for Level 1. No change to the Document is required.

4.4 Level 2 Fast Track Process

This subsection describes the steps and timeline of the Level 2 Fast Track process. The customer is encouraged to contact the Utility to discuss the project prior to applying for interconnection. The customer then submits an Application. The Utility receives the Application and notifies the customer as to whether the Application is complete or incomplete. The Utility reviews the complete Application. After approval of the Application, an Interconnection Agreement is signed. The Utility performs a site inspection. After the Generating Facility meets all applicable requirements, the Utility notifies the customer of approval for parallel operation or of any deficiencies. If the Generating Facility does not pass the initial site inspection, the customer corrects outstanding issues and schedules a re-inspection.

Timelines

The Cooperatives⁸ and Tucson Electric Power ("TEP") propose to add the words "*normally not more than*" before the number of business days in the Level 2 process for the five business days to determine whether an Application is complete and the 15 business days to review the Application and notify the customer of the result. The Utility may need more time to consult an expert to determine the completeness of an Application. The Utility may need more time to review an Application if several Applications are filed within a short amount of time. In addition, an Application may meet all of the screens for Level 2, but the Utility will need to look at its own system to see if any changes need to be made to accommodate the generator. Examples are needing to modify breaker settings or needing to install a capacitor to correct power factor problems.

The DG Advocates oppose any softening of the timeframes in the Level 2 process. Level 3 timeframes have been softened to reflect the fact that Level 3 interconnections can be more complicated or variable. However, the Level 1 and Level 2 processes only apply to simpler and problem-free interconnections.

Staff agrees with the DG Advocates on this issue. If the Level 2 timeframes are set at reasonable levels, they should be firm. If a project is more complex than a typical Level 2 project and requires extra time to process, it should be moved to Level 3 unless the customer agrees that the Utility can have more time in Level 2.

⁸ The Cooperatives include Duncan Valley Electric Cooperative, Graham County Electric Cooperative, Mohave Electric Cooperative, Navopache Electric Cooperative, Sulphur Springs Valley Electric Cooperative, and Trico Electric Cooperative.

Application Fees

In the paragraph titled "**Customer Submits Application**" many of the Workshop participants support the sentence: "*No initial application fee or processing fee will be charged.*" The Cooperatives propose that the following language be added: "*A graduated application fee schedule similar to that laid out in the Wisconsin rule be charged by Cooperatives.*" Level 2 covers everything from a small 11 kW static inverter to a 1.9 MW rotating generator. Some of the more complex installations may require a significant amount of engineering review to determine if the Application is complete and meets all applicable screens. A graduated fee schedule would allow small simple systems to have a small application fee, and larger more complex systems would have a larger fee. Smaller Utilities have limited engineering staff and have to pay a consultant to review the larger more complex Applications. An application fee would help ensure that the customer proposing a Generating Facility, not the cooperative's other customers, pays the cost of integrating the resource on the system. In addition, the fee would limit incomplete and withdrawn applications.

The DG Advocates oppose any application fee. Large application fees can be an obstacle to the installation of DG projects. Small application fees are a nuisance to Utilities as they cost more to process than the revenue they bring in. The Joint Utilities agree to not charging an application fee.

Staff believes that an application fee may be appropriate for the reasons mentioned by the Cooperatives. Staff proposes that the language regarding application fees be the following: "*A Utility may charge an application fee, if a tariff containing such a fee is approved by the Commission.*"

Additional Review

When a Generating Facility has failed to meet one or more of the screens, the Utility may offer to perform an "Additional Review" (typically about three hours of study) to determine whether minor modifications to the electric distribution system would enable the interconnection to be made consistent with safety, reliability, and power quality. The Utility would provide to the Customer a non-binding, good faith estimate of the costs of such Additional Review and/or such minor modifications. The Utility would not undertake the Additional Review or minor modifications until the Customer consents to pay for the review and/or modifications.

The DG Advocates propose a cap on the hourly rates that Utilities may charge for conducting an Additional Review. Their proposed language is: "*Costs for the Additional Review shall not exceed \$100 per hour, adjusted for inflation, or otherwise hourly fees approved by the ACC.*"

The DG Advocates want the cap so that the costs for an Additional Review are predictable and to prevent gouging. Without the cap, it becomes impossible for businesses to plan for interconnection costs. The DG customer is a captive customer. The Utility could put its

highest paid engineers on the job, stretch out the amount of time spent on the project, and be assured of recouping those costs.

The Joint Utilities propose that the customer pay the actual costs for the Utility to conduct the Additional Review. Their proposed language is: *"The Customer shall be responsible for the Utility's actual costs for conducting the Additional Review. Upon receipt of the Utility's non-binding good faith estimate of the costs of such additional review, the Customer must agree in writing within 15 Business Days of the offer and submit a deposit for the estimated costs. The Customer must pay any review costs that exceed the deposit within 20 Business Days of receipt of the invoice. In addition, costs for Utility facilities and/or equipment modifications necessary to accommodate the Customer's generator interconnection will be the responsibility of the Customer."*

The Joint Utilities prefer their language in the Document because Additional Reviews could be costly to the Utility, particularly when the Utility must obtain outside engineering consultants to assist with the review. Unless the Utilities are allowed to recover their actual costs, the costs will have to be socialized at the expense of the Utility's ratepayers.

Staff believes that the hourly rate for an Additional Review should be fixed to provide a level of predictability in costs for the customer, prevent inequities among customers of a Utility, and reduce the potential for abuse. However, the amount of \$100 may not be the appropriate rate for all Utilities. Staff recommends the following language: *"A Utility may charge a fee for an Additional Review, if a tariff containing the hourly rate for Additional Review is approved by the Commission. In addition, costs for Utility facilities and/or equipment modifications necessary to accommodate the Customer's generator interconnection will be the responsibility of the Customer."* Staff changed the title for the paragraph from **"Fees for Level 2 interconnection"** to **"Fees for Level 2 Additional Review"** to better reflect the content.

Inspections

After approval of the Application and an Interconnection Agreement is signed, the Utility performs a site inspection within ten business days of request from the customer. The Workshop participants disagree about fees for the initial inspection. The Cooperatives propose the following language: *"There will be no charge for the initial site inspection by the Utility, unless the inspection will cause the Utility to incur a substantial expense. In which case, the utility shall provide the customer a written estimate of all costs before the site inspection is conducted."*

The Cooperatives want the possibility of charging an inspection fee if the Utility has to hire a consultant to be present for the commissioning and site inspection of a generator. The cost is incurred for the sole benefit of the customer installing the generator. It would be unfair for this cost to be absorbed by other customers. In addition, Utilities with large service territories may experience installations in remote sections of their system where substantial amounts of travel time and expense will be incurred to inspect the system.

The DG Advocates do not want a fee for site inspections and find the Cooperatives' proposed wording to be vague and undefined, and it could create an obstacle to a DG project by threatening to impose a high inspection fee. It could result in discriminatory treatment of customers, as there is no guidance on how inspection fees are to be determined. Not having an inspection fee allows the DG customer to accurately budget for the costs of a project and assures the DG customer of being treated fairly.

Staff believes that a fee for an initial inspection may be appropriate for the reasons mentioned by the Cooperatives. However, Utilities do not usually charge different rates for services in different parts of their service areas. For example, a Utility does not charge more to read a meter in one part of its service area than in another part of its service area. If a Utility believes that an inspection fee is justified under certain conditions, it should file a tariff for Commission approval that clearly specifies the conditions and the rate to be charged. Staff proposes the following language: "*A Utility may charge for the initial site inspection, if a tariff containing such a fee is approved by the Commission.*"

If the Generating Facility does not pass the initial site inspection, the customer corrects outstanding issues and schedules a re-inspection. The Workshop participants disagree on the timeline for the Utility re-inspection. The Cooperatives and TEP believe that the Utility should re-inspect within ten business days of notice from the Customer that the deficiencies have been remedied. This is the same time period as for an initial inspection. The DG Advocates propose that the Utility re-inspect within five days of notice from the customer that the deficiencies have been remedied. The DG Advocates believe that the re-inspection should be quicker than the initial inspection, and a period in excess of five days may be an obstacle to successful DG projects.

Staff recommends that the time requirement for re-inspections be set at ten business days. Even if the duration of the re-inspection is shorter than the duration of the initial inspection as claimed by the DG Advocates, it may take the same length of time to schedule both inspections.

For the same reasons as for initial inspections, the Cooperatives also propose the following language regarding fees for re-inspections: "*There will be no charge for the re-inspection by the Utility, unless the re-inspection will cause the Utility to incur a substantial expense. In which case, the utility shall provide the customer a written estimate of all costs before the site inspection is conducted.*" The DG Advocates oppose any fee for an inspection.

Staff believes that charging a fee for re-inspections is appropriate to discourage a customer from requesting multiple re-inspections before all deficiencies are remedied. Utilities would need to file a tariff for Commission approval before charging a re-inspection fee. Staff proposes the following language: "*A Utility may charge for a re-inspection, if a tariff containing such a fee is approved by the Commission.*"

4.5 Level 3 Study Track Process

This subsection describes the steps and timeline of the Level 3 Study Track process. The customer is encouraged to contact the Utility to discuss the project prior to applying for interconnection. The customer then submits an Application. The Utility receives the Application and notifies the customer as to whether the Application is complete or incomplete. The Utility reviews the complete Application. If further information is needed, a scoping meeting is held where the customer describes the proposed Generating Facility design and the Utility talks about system conditions at the proposed Point of Interconnection. The Utility will send an acknowledgement letter about the scope to the customer upon request. If requested by the customer, the Utility undertakes an interconnection feasibility study to provide a preliminary review of potential impacts resulting from the proposed interconnection. If deemed necessary by either party, the Utility undertakes a system impact study which is a full engineering review of all aspects of the generator's impact on the Utility system. If deemed necessary by the Utility, the Utility undertakes a facilities study which is a comprehensive analysis of the actual construction needed to take place based on the outcome of the impact study. After all requirements are met and all items identified in the studies are resolved, an Interconnection Agreement is signed. The Utility performs a site inspection and witnesses the testing of protective devices. After the Utility verifies that the Generating Facility is in compliance with all applicable requirements, the Utility notifies the customer of approval for parallel operation or of any deficiencies. If the Generating Facility does not pass the initial site inspection, the customer corrects outstanding issues and schedules a re-inspection.

Application Fees

In the paragraph titled "**Customer Submits Application**" many of the Workshop participants support the sentence: "*No initial application fee or processing fee will be charged.*" The Cooperatives propose that the following language be added: "*A graduated application fee schedule similar to that laid out in the Wisconsin rule be charged by Cooperatives.*" Some of the more complex installations may require a significant amount of engineering review to determine if the Application is complete and meets all applicable screens. A graduated fee schedule would allow simpler systems to have a small application fee, and larger more complex systems would have a larger fee. Smaller Utilities have limited engineering staff and have to pay a consultant to review the larger more complex Applications. An application fee would help ensure that the customer proposing a Generating Facility, not the cooperative's other customers, pays the cost of integrating the resource on the system. In addition, the fee would limit incomplete and withdrawn applications.

The DG Advocates oppose any application fee. Large application fees can be an obstacle to the installation of DG projects. Small application fees are a nuisance to Utilities as they cost more to process than the revenue they bring in. The Joint Utilities agree to not charging an application fee.

Staff believes that an application fee may be appropriate for the reasons mentioned by the Cooperatives. Staff proposes that the language regarding application fees be the following: *"A Utility may charge an application fee, if a tariff containing such a fee is approved by the Commission."*

Engineering Review

The DG Advocates propose a cap on the hourly rates that Utilities may charge for conducting an engineering review. Their proposed language is: *"Costs for the engineering review shall not exceed \$100 per hour per person, adjusted for inflation, or otherwise hourly fees approved by the ACC."*

The DG Advocates want the cap so that the costs for an engineering review are predictable and to prevent gouging. Without the cap, it becomes impossible for businesses to plan for interconnection costs. The DG customer is a captive customer. The Utility could put its highest paid engineers on the job, stretch out the amount of time spent on the project, and be assured of recouping those costs.

The Joint Utilities propose that the customer pay the actual costs for the Utility to conduct the review. Their proposed language is: *"The Customer shall be responsible for the Utility's actual costs for conducting the review. Upon receipt of the Utility's non-binding good faith estimate of the costs of such additional review, the Customer must agree in writing within 15 Business Days of the offer and submit a deposit for the estimated costs. The Customer must pay any review costs that exceed the deposit within 20 Business Days of receipt of the invoice. In addition, costs for Utility facilities and/or equipment modifications necessary to accommodate the Customer's generator interconnection will be the responsibility of the Customer. The Customer may not be charged for the review of a certified generator's protection equipment."*

The Joint Utilities prefer their language in the Document because the reviews could be costly to the Utility, particularly when the Utility must obtain outside engineering consultants to assist with the review. Unless the Utilities are allowed to recover their actual costs for the studies, the costs will have to be socialized at the expense of the Utility's ratepayers.

Staff believes that the hourly rate for an engineering review should be fixed to provide a level of predictability in costs for the customer, prevent inequities among customers of a Utility, and reduce the potential for abuse. However, the amount of \$100 may not be the appropriate rate for all Utilities. Staff recommends the following language: *"A Utility may charge a fee for an engineering review, if a tariff containing the hourly rate for engineering review is approved by the Commission. In addition, costs for Utility facilities and/or equipment modifications necessary to accommodate the Customer's generator interconnection will be the responsibility of the Customer. The Customer may not be charged for the review of a certified generator's protection equipment."*

Facilities Study

The Facilities Study is a comprehensive analysis of the actual construction needed to take place based on the outcome of the Impact Study. The Workshop participants disagree about the timeline for completion of the Facilities study. The Joint Utilities request 30 days to complete the Facilities Study, while the DG Advocates want the study completed in 20 days.

The Utilities want 30 days because Facility Studies often require the modification of a Utility's distribution system, which could include a redesign of the existing distribution system and/or the installation of new equipment. Specifications regarding the new equipment may need to be sent to vendors, and bids on the equipment to be evaluated. The design would likely require input from a number of Utility departments requiring scheduling and coordinating the necessary time and resources. Opportunities surface that can reduce the cost of required facilities if the DG customer makes modifications to their initial proposed design, needing time for discussion of the options. Cost estimates are often needed from equipment vendors. The Facilities Study is the most complex and time-consuming study of the three studies referenced in the Document.

The DG Advocates request that the time limit be 20 days with the wording "*normally not more than*" giving the Utilities increased flexibility. The timeframes can be changed by mutual agreement. To have effectively more than a month to complete the Facilities Study is unnecessary.

Staff agrees with the Utilities that 30 days is a reasonable amount of time to normally complete a Facilities Study.

Inspection

After the Interconnection Agreement is signed, the Utility performs a site inspection within ten business days of request from the customer. The Workshop participants disagree about fees for the initial inspection and for re-inspections. The Cooperatives propose the following language for the initial inspection: "*There will be no charge for the initial site inspection by the Utility, unless the inspection will cause the Utility to incur a substantial expense. In which case, the utility shall provide the customer a written estimate of all costs before the site inspection is conducted.*" The Cooperatives propose this language for re-inspections: "*There will be no charge for the re-inspection by the Utility, unless the re-inspection will cause the Utility to incur a substantial expense. In which case, the utility shall provide the customer a written estimate of all costs before the site re-inspection is conducted.*"

The Cooperatives want the possibility of charging an inspection or re-inspection fee if the Utility has to hire a consultant to be present. The cost is incurred for the sole benefit of the customer installing the generator. It would be unfair for this cost to be absorbed by other customers. In addition, Utilities with large service territories may experience installations in

remote sections of their system where substantial amounts of travel time and expense will be incurred to inspect or re-inspect the system.

The DG Advocates want no fee for initial site inspections and want to cap the fee for re-inspections at \$100 per occurrence. They find the Cooperatives' proposed wording to be vague and undefined, and it could create an obstacle to a DG project by threatening to impose high inspection and re-inspection fees. It could result in discriminatory treatment of customers, as there is no guidance on how inspection and re-inspection fees are to be determined. Not having initial inspection fees and capping re-inspection fees allow the DG customer to accurately budget for the costs of a project and assures the DG customer of being treated fairly.

Staff believes that a fee for an initial inspection may be appropriate for the reasons mentioned by the Cooperatives. However, Utilities do not usually charge different rates for services in different parts of their service areas. If a Utility believes that an inspection fee is justified under certain conditions, it should file a tariff for Commission approval that clearly specifies the conditions and the rate to be charged. Charging a fee for re-inspections is appropriate to discourage a customer from requesting multiple re-inspections before all deficiencies are remedied. Utilities would need to file a tariff for Commission approval before charging either an initial inspection fee or a re-inspection fee. Staff proposes the following language: "*The Utility may charge a fee for an initial inspection or for a re-inspection, if a tariff containing such a fee is approved by the Commission.*"

The Workshop participants disagree on the timeline for the Utility re-inspection. The Cooperatives and TEP believe that the Utility should re-inspect within ten business days of notice from the Customer that the deficiencies have been remedied. This is the same time period as for an initial inspection. The DG Advocates propose that the Utility re-inspect within five days of notice from the customer that the deficiencies have been remedied. The DG Advocates believe that the re-inspection should be quicker than the initial inspection, and a period in excess of five days may be an obstacle to successful DG projects.

Staff recommends that the time requirement for re-inspections be set at ten business days. Even if the duration of the re-inspection is shorter than the duration of the initial inspection as claimed by the DG Advocates, it may take the same length of time to schedule both inspections.

If updated documentation is required to reflect "as-built" conditions, the Customer submits it to the Utility for review and approval. The Workshops participants agreed that the Utility may assess a fee of not more than \$50. Staff has reworded the language to be "*The Utility may charge a fee, if a tariff containing such a fee is approved by the Commission.*"

4.6 Interconnection to Secondary Spot Network Systems

This subsection describes a pilot program that Arizona Public Service Company ("APS") has developed for interconnecting a small amount of inverter-based customer generation to a

Secondary Spot Network System. Currently, APS is the only Utility in Arizona that has a Secondary Spot Network System.

5. Utility Reporting Requirements

This subsection describes an Interconnection Manual that each Utility would file for Commission approval within 90 days after adoption of this Document. Each Utility would also maintain records concerning applications for interconnection.

The DG Advocates propose that the Utilities file annual interconnection reports with the Commission. The proposed language is as follows:

By March 30 of each year, every electric Utility shall file with the Commission a distributed generation interconnection report for the preceding calendar year that identifies each distributed generation facility interconnected with the Utility's distribution system. The report shall list the new Generating Facilities interconnected with the system since the previous year's report, any distributed generation facilities no longer interconnected with the Utility's system since the previous report, the capacity of each facility, and the feeder or other point on the Utility system where the facility is connected. The annual report shall also identify all complete Applications for interconnection received during the previous one-year period, and the disposition of such complete Applications. In addition, the annual report shall provide a summary of the number of complete applications received, the number of complete applications approved, and the number of complete applications denied by level for the reporting period. The Utility shall also indicate the reason for application denial in this report. The ACC shall list every customer who received a special rate consideration in lieu of connecting a Generating Facility.

The DG Advocates want the above language because they believe that it is necessary to ensure accountability in the interconnection process. The Commission needs to be aware of how many applications and interconnections were successful. It is not sufficient for the Commission to rely on the dispute process or customer complaints to identify problems with the interconnection procedures. Utilities already maintain records with virtually all of the data required in the report. Other states require a similar report.

The Joint Utilities oppose the annual reporting requirement because the Utilities are already required to submit similar information in their annual report to the Commission, it is unclear how the additional information would add more value to the information already reported, it would be administratively burdensome for the Utilities to report the reasons why each interconnection application is denied, the Utilities fail to understand the value gained by reporting the specific feeder or point of interconnection information for each new facility added or removed from the distribution system, and it is inappropriate to include a directive to the ACC to list every customer who receives a special rate.

Staff believes that an annual interconnection report would have some value for monitoring how well the interconnection process is working. However, the report should be much simpler than the DG Advocates propose. Staff's proposed wording is the following:

By March 30 of each year, every Utility shall file with the Commission a distributed generation Interconnection report for the preceding calendar year that lists the new Generating Facilities interconnected with the system since the previous year's report, any distributed generation facilities no longer interconnected with the Utility's system since the previous report, and the capacity of each facility. The annual report shall include, for the reporting period, a summary of the number of complete Applications received, the number of complete Applications approved, the number of complete Applications denied by level, and the reasons for denial.

6. Definitions

This subsection includes definitions of terms used in the Document. Staff has added definitions for "Islandable System" and "Separate System."

Appendix 1
List of Participating Organizations

American Council for an Energy-Efficient Economy
Americans for Solar Power
APS Energy Services
Arizona Competitive Power Alliance
Arizona Electric Power Cooperative
Arizonans for Electric Choice and Competition
Arizona Public Service Company
Arizona Solar Energy Industry Association
Arizona Utility Investors Association
ASPV/IREC/Sun Edison
BP Solar
CHP Initiative
City of Scottsdale
Commission Staff
Cummins Power Generation
Cummins Rocky Mountain
Curtis, Goodwin, Sullivan, Udall & Schwab
DCSI
Deluge, Inc.
Distributed Energy Association of Arizona
Empire Power Systems
Energy Strategies
ETA Engineering
Fort Huachuca
Fuel Cell Energy
Grand Canyon State Electric Cooperative Association
Greater Tucson Coalition for Solar Energy
Intermountain Combined Heat and Power Center
Intermountain Combined Heat and Power Initiative
International Brotherhood of Electrical Workers
MMR Power Solutions
Mohave Electric Cooperative
National Renewable Energy Laboratory
Navopache Electric Cooperative
Pinnacle West Capital Corporation
Pinnacle West Energy Corporation
Residential Utility Consumer Office
Salt River Project
Sandia National Laboratories
Solid USA

Southern Arizona Legal Aid
Southwest Energy Efficiency Project
Southwest Gas
Southwest Solar Institute
Southwest Windpower
Sulphur Springs Valley Electric Cooperative
Sun Miner
SunPower Corporation
Trico Electric Cooperative
Tucson Electric Power
United States Combined Heat & Power Association
Universal Energy & Environment
UNS Electric
UNS Gas
Vote Solar Initiative
Western Resource Advocates

Appendix 2
List of Electric Distribution Companies in Arizona⁹

Utilities with greater than 500,000 MWh of Arizona Retail Sales in 2005

Arizona Public Service Company
Mohave Electric Cooperative
Morenci Water and Electric Company
Sulphur Springs Valley Electric Cooperative
Trico Electric Cooperative
Tucson Electric Power Company
UNS Electric

Utilities with less than 500,000 MWh of Arizona Retail Sales in 2005

Ajo Improvement Company
Columbus Electric Cooperative
Dixie-Escalante Rural Electric Cooperative
Duncan Valley Electric Cooperative
Garkane Energy Cooperative
Graham County Electric Cooperative
Navopache Electric Cooperative

⁹ subject to Commission jurisdiction.

Appendix 3
Interconnection Document

**INTERCONNECTION
DOCUMENT**

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1. APPLICABILITY

1.1 Applicable Generating Facilities

This Document applies to all Generating Facilities with power ratings of 10 MW or less, operating (or applying to operate) in parallel with an electric public utility distribution system in Arizona.¹ This Document establishes technical and procedural requirements, terms, and conditions that will promote the safe and effective parallel operation of Customer-owned Generating Facilities. This Document includes provisions for interconnecting to a radial or secondary spot network system. It includes the three distinct types of generators: (a) solid-state or static inverters, (b) induction machines, and (c) synchronous machines.

These Interconnection procedures are limited to 10 MW or less. The total capacity of an individual Customer's Generating Facility may exceed 10 MW; however, no more than 10 MW of a facility's capacity will be interconnected at a single Point of Interconnection as provided for in these procedures.

The electric rates and schedules, terms and conditions of service, or other contract provisions governing the electric power sold by an electric public utility to an Arizona retail customer are subject to the jurisdiction of the Arizona Corporation Commission ("ACC"). The ACC also has jurisdiction when the Utility purchases excess power from Customer-owned Qualifying Facilities ("QFs") under 18 C.F.R. §§292.303, 292.306(2004).

The Federal Energy Regulatory Commission has jurisdiction over all Interconnections with facilities that are subject to the electric public Utility's Open Access Transmission Tariff ("OATT") at the time the interconnection request was made.

1.2 Types of Generating Facilities

Generating Facilities include induction and synchronous electrical generators as well as any type of electrical inverter capable of producing A/C power. The Customer may elect to run his Generating Facility in Parallel with the Utility's system (either on a continuous basis or momentarily), or he may run it as a Separate System with non-parallel load transfer between the two independent power systems. A description and the basic requirements for these methods of operation are outlined below.

Parallel System

A Parallel, or interconnected, generator is connected to a bus common with the Utility's system, and a transfer of power between the two systems is a direct result. A consequence of such interconnected operation is that the Customer's Generating Facility becomes an integral part of the distribution system, and it must be considered in the electrical protection and operation of the distribution system.

¹ subject to Commission jurisdiction.

Parallel Systems include any type of Generating Facility that can electrically parallel with, or potentially backfeed the Utility system. Additionally, any Generating Facility system using a "closed transition" type transfer switch or a multi-breaker transfer scheme, or an electrical inverter that can be configured or programmed to operate in a "utility interactive mode," may be required to have relays to prevent potential backfeeding to the Utility system, and is classified as a Parallel System. Continuous uninterruptible power supply, units without grid tie capability, and islanding inverter technologies are not considered Parallel Systems provided they are not a potential backfeed source to the Utility.

The Utility has specific interconnection, contractual, and inspection requirements, as outlined in these provisions, that must be complied with and information that needs to be submitted for all interconnected Generating Facilities. These may include protective relaying, metering, special rate schedules, applicable safety devices, and information requirements (as specified in each Utility's Interconnection Manual).

There are two sub-types of Parallel Systems, as described below: Momentary Parallel Systems and Islandable Systems. Momentary Parallel Systems have similar requirements as regular Parallel Systems, whereas Islandable Systems are unique.

- **Momentary Parallel System.** A Momentary Parallel System is one that transfers electrical load between the Utility grid and the Customer's Generating Facility by means of a "make-before break" transfer scheme. Momentary Parallel Systems synchronize the Generating Facility with the Utility grid for a period not to exceed ten seconds for the purpose of uninterrupted load transfer.

Momentary Parallel Systems are useful for customers who wish to have greater reliability of electric service without experiencing the momentary outage of service that occurs under a "break-before-make" transfer switch scheme. Additionally, this approach allows the customer to more effectively test the switchgear and generator with load during weekly and monthly testing.

- **Islandable System.** An Islandable System is a Generating Facility interconnected to a bus common with the Utility's system, where the Generating Facility is designed to serve part of the Utility grid that has become or is purposefully separated from the rest of the grid. Currently there are no rules, standards, or protocols governing this type of system operation. As such, an Islandable System as defined herein is not allowed.

Separate System

A Separate System is one in which there is no possibility of electrically connecting or operating the Customer's Generating Facility in parallel with the Utility's system. The Customer's equipment must transfer load between the two power systems in an open transition or non-parallel mode. If the Customer claims a Separate System, the Utility may require verification that the transfer scheme meets the non-parallel requirements.

Separate Systems used to supply part or all of the Customer's load during a Utility power outage must be connected to the Customer's wiring through a double throw, "break-before-make" transfer switch specifically designed and installed for that purpose. The transfer switch must be of a fail-safe design, which, under no circumstances, will allow the Generating Facility to electrically interconnect or parallel with Utility's system. The transfer switch must always disconnect the Customer's load from the Utility's power system prior to connecting it to the Generating Facility. Conversely, the transfer switch must also disconnect the load from the Generating Facility prior to re-connecting it with the Utility's system. These requirements apply to both actual emergency operations as well as any testing of the Generating Facility. All transfer switches and transfer schemes must be listed by a Nationally Recognized Testing Laboratory ("NRTL") for the purpose as used, and also inspected and approved by the jurisdictional electrical inspection agency.

Separate Systems that are not connected with the Utility system and do not pose a potential backfeed source are not subject to ACC jurisdiction or the provisions in this Document, short of verifying that the transfer scheme meets the non-parallel requirements.

There is one sub-type of Separate System, as described below: Portable Generators.

- **Portable Generators.** Portable Generators are not designed to be connected to a building's permanent wiring system, and are not to be connected to any such wiring unless a permanent and approved transfer switch is used. Failure to use a transfer switch can result in backfeed into the Utility system. (The generator voltage can backfeed through the Utility transformer and be stepped up to a very high voltage.) This can pose an electrocution hazard to anyone working on the power lines or on Utility equipment.

Portable Generators that are not connected with the Utility system and do not pose a potential backfeed source are not subject to ACC jurisdiction or the provisions in this Document short of verifying that the transfer scheme meets the non-parallel requirements.

2. RIGHTS AND RESPONSIBILITIES

2.1 Customer Rights and Responsibilities

A Customer has the right to interconnect a Generating Facility with the electric Utility system. A Customer has the right to expect prompt, reasonable, and professional responses from the Utility at every step of the interconnection process. A Customer has the right to expect reasonable cost estimates, outlines of the proposed work, supporting data, and justification for proposed work before the Utility undertakes any studies or system upgrades to accommodate the Generating Facility.

A Customer has the responsibility of disclosing to the Utility items specified herein on the Generating Facility and its operation. The Customer also has the responsibility of ensuring that:

- (a) the Generating Facility meets all minimum safety and protection requirements outlined in these provisions and the Utility's Interconnection Manual;
- (b) the Generating Facility meets all applicable construction codes, safety codes, electric codes, laws, and requirements of government agencies having jurisdiction;
- (c) all the necessary protection equipment is installed and operated to protect its equipment, Utility personnel, the public, and the Utility system;
- (d) the Generating Facility design, installation, maintenance, and operation reasonably minimizes the likelihood of causing a malfunction or other disturbance, damaging, or otherwise impairing the Utility system;
- (e) the Generating Facility will not adversely affect the quality of service to other customers (but no more or less than the present standard of care observed by regular Utility/consumer connections);
- (f) the Generating Facility will minimally hamper efforts to restore a feeder to service (specifically when a clearance is required);
- (g) the Generating Facility is maintained in accordance with applicable manufacturers' maintenance schedule; and
- (h) the Utility is notified of any emergency or hazardous condition or occurrence with the Customer's Generating Facility, which could affect safe operation of the Utility system. (This notification can be through electronic communication.)

The Customer is required to meet the timeframes specified in this Document unless the Utility and Customer mutually agree on other time frames and so long as the project moves forward in a fair and reasonable manner.

The Customer is responsible for all Interconnection facilities required to be installed to interconnect the Customer's Generating Facility to the Utility system. These may include connection, transformation, switching, protective relaying, metering and safety equipment, and any other requirements as outlined in these provisions or other special items specified by the Utility. All such interconnection facilities are to be installed by the Customer at its sole expense.

The Customer will own and be responsible for designing, installing, operating and maintaining control and protective devices, in addition to minimum protective relays and devices specified in the Utility's Interconnection Manual, to protect its facilities from abnormal operating conditions such as, but not limited to, electric overloading, abnormal voltages, and fault currents. Such protective devices must promptly disconnect the Generating Facility from the Utility's system in the event of a power outage on the Utility's system. The Customer will also own and be responsible for designing, installing, operating and maintaining interconnection facilities on the Customer's premises as may be required to deliver power from the Customer's Generating Facility to the Utility's system at the Point of Interconnection.

In the event that additional facilities are required to be installed on the Utility's system to accommodate the Customer's generation, the Utility will install such facilities at the Customer's expense. The Utility shall provide notice to the Customer of intent to install such facilities early in the process. The Customer is not responsible for Utility upgrades for other customers unrelated to the Generating Facility installation.

All Customers interconnecting a Generating Facility with the Utility system shall (a) sign an Interconnection/Connection Agreement, and all other applicable purchase, supply, and standby agreements, in accordance with the prevailing Document in effect at that time; and (b) comply with all applicable tariffs, rate schedules and Utility service requirements.

2.2 Utility Rights and Responsibilities

A Utility is obligated to interconnect Generating Facilities, subject to the requirements set forth in these provisions and in each Utility's Interconnection Manual.

A Utility has the right to expect prompt, reasonable, and professional responses from the Customer during the interconnection process.

Because a Utility is required to safeguard its system, other consumers, and the general public, a Utility has the right and responsibility to ensure that an interconnected Generating Facility:

- (a) will not present any unreasonable hazards to Utility personnel, other customers, or the public;
- (b) minimizes the possibility of damage to the Utility and other customers' equipment; and
- (c) minimally hampers efforts to restore a feeder to service (specifically when a clearance is required).

The Utility will notify the Customer if there is any evidence that the Customer's Generating Facility operation causes disruption or deterioration of service to other customers served from the utility system or if such operation causes damage to the utility system.

A Utility is required to meet the time frames specified in this Document unless the Utility and Customer mutually agree on other time frames and so long as the project moves forward in a fair and reasonable manner.

A Utility has the responsibility to make its Interconnection Manual, standard Application form(s) and Interconnection Agreement(s) readily available to Customers, and as soon as practical, readily accessible on its website.

A Utility has the responsibility to ensure that Customers with Generating Facilities are treated without discrimination.

Before the Utility undertakes any studies or system upgrades that will be charged to the Customer, a Utility has the responsibility to provide a detailed cost estimate, outline of the proposed work, supporting data, and justification for the proposed work.

A Utility must show good cause why a Customer's Generating Facility that satisfies the requirements of this Document and the Utility's Interconnection Manual should not be approved for interconnected operation.

If facility upgrades are needed to accommodate the Generating Facility, a Utility will reduce the charge to the customer by the amount of any benefits to the grid that are readily quantifiable. In addition, a Utility cannot reject an Application on the basis of distribution system conditions that are already deficient, or charge a Customer for facility upgrades that are overdue or soon to be required to ensure compliance with good utility practice, except that applications can be rejected in instances where reliability or safety would be further compromised by a DG installation.

2.3 Easements/Rights of Way

Utility Right to Access Utility-Owned Facilities and Equipment. Where an easement or right of way does not exist, but is required to accommodate the interconnection, the Customer must provide to the Utility suitable easements or rights of way, in the Utility's name, on the premises owned, leased, or otherwise controlled by the Customer. If the required easement or right of way is on another's property, the Customer must obtain and provide to the Utility a suitable easement or right of way, in the Utility's name, at the Customer's sole cost and in sufficient time to comply with the Interconnection Agreement requirements. The Utility will use reasonable efforts to utilize existing easements to accommodate the interconnection to the extent possible and will assist the Customer in securing necessary easements at the Customer's expense that do not exist but are necessary to accommodate the interconnection.

2.4 Insurance

The Customer is not required to provide general liability insurance coverage as a condition for Interconnection. Due to the risk of incurring damages, it is recommended that every Interconnection Customer protect itself with insurance or other suitable financial instrument sufficient to meet its construction, operating, and liability responsibilities. At no time shall the Utility require that the Customer negotiate any policy or renewal of any policy covering any liability through a particular insurance provider, agent, solicitor, or broker.

The inability of the Utility to require the Customer to provide general liability insurance coverage for operation of the Generating Facility is not a waiver of any rights the Utility may have to pursue remedies at law against the Customer to recover damages.

2.5 Non-Circumvention

A Utility and its affiliates shall not use knowledge of proposed distributed generation projects submitted to it for interconnection or study to initiate competing proposals to the customer that offer either discounted rates in return for not installing the distributed generation, or offer competing distributed generation projects. Customers are not precluded from sharing information in their possession regarding a potential distributed generation project with a Utility or its affiliates, or from using information regarding a potential distributed generation project to negotiate a discounted rate or other mutually beneficial arrangement with a Utility or its affiliates.

3. GENERAL PROCESS AND PROCEDURES FOR ALL LEVELS

3.1 Designation of Contact Persons

Each Utility shall designate a person or persons who will serve as the Utility's contact for all matters related to distributed generation Interconnection, identify to the Commission its distributed generation contact person, and provide convenient access through its internet web site to the names, telephone numbers, mailing addresses and electronic mail addresses for its distributed generation contact person(s).

Each customer applying for Interconnection shall designate a contact person or persons, and provide to the Utility the contact's name, telephone number, mailing address, and electronic mail addresses.

3.2 Non-discrimination

All Applications for interconnection and parallel operation of distributed generation shall be processed by the Utility in a non-discriminatory manner.

3.3 Application Submission Requirements

The Utility may require additional documentation to be submitted with the Application. Each Utility's Application form will specify what additional documentation is required. Additional documentation may include an electrical one-line diagram, an electrical three-line diagram, AC and DC control schematics, plant location diagram, and site plan. Upon request, the Utility will provide the Customer with sample diagrams that indicate the preferred level of detail and type of information required for a typical inverter-based system.

3.4 Minor Modifications

It is recognized that certain Applications may require minor modifications to the Generating Facility or the Application while they are being reviewed by the Utility. Such minor modifications to a pending Application shall not require that it be considered incomplete and treated as a new or separate Application.

3.5 Certification

Compliance with codes and standards. In order to qualify as "Certified" for any interconnection procedures, relevant equipment shall comply with the following codes, guides, and standards as applicable, and as specified in this document:

- (a) IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems (including use of IEEE 1547.1 testing protocols to establish conformity);

- (b) IEEE 1547.1 Standard for Conformance Testing Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems;
- (c) UL 1741 Inverters, Converters, and Controllers for Use in Independent Power Systems;
- (d) IEEE Std 929-2000 IEEE Recommended Practice for Utility Interface of Photovoltaic (PV) Systems;
- (e) NFPA 70 (2002), National Electrical Code;
- (f) IEEE Std C37.90.1-1989 (R1994), IEEE Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems;
- (g) IEEE Std C37.90.2 (1995), IEEE Standard Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers;
- (h) IEEE Std C37.108-1989 (R2002), IEEE Guide for the Protection of Network Transformers;
- (i) IEEE Std C57.12.44-2000, IEEE Standard Requirements for Secondary Network Protectors;
- (j) IEEE Std C62.41.2-2002, IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000V and Less) AC Power Circuits;
- (k) IEEE Std C62.45-1992 (R2002), IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000V and Less) AC Power Circuits;
- (l) ANSI C84.1-1995 Electric Power Systems and Equipment – Voltage Ratings (60 Hertz);
- (m) IEEE Std 100-2000, IEEE Standard Dictionary of Electrical and Electronic Terms NEMA MG 1-1998, Motors and Small Resources, Revision 3;
- (n) IEEE Std 519-1992, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems; and
- (o) NEMA MG 1-2003 (Rev 2004), Motors and Generators, Rev. 1.

Requirements for Certification. Generating Facility equipment proposed for use separately or packaged with other equipment in an Interconnection system shall be considered Certified for interconnected operation if:

- (a) it has been tested in accordance with industry standards for continuous utility interactive operation in compliance with the appropriate codes and standards referenced above by any Nationally Recognized Testing Laboratory (NRTL) recognized by the U. S. Occupational Safety and Health Administration to test and

certify Interconnection equipment pursuant to the relevant codes and standards listed above;

- (b) it has been labeled and is publicly listed by such NRTL at the time of the Interconnection application; and
- (c) such NRTL makes readily available for verification all test standards and procedures it utilized in performing such equipment certification, and, with consumer approval, the test data itself. The NRTL may make such information available on its website and by encouraging such information to be included in the manufacturer's literature accompanying the equipment.

The Customer must verify that the intended use of the equipment falls within the use or uses for which the equipment was tested, labeled, and listed by the NRTL.

Certified equipment shall not require further type-test review, testing, or additional equipment to meet the requirements of this Interconnection procedure and the Utility's Interconnection Manual. Nothing herein shall preclude the need for project Interconnection review and approval by the Utility or on-site commissioning testing prior to the Interconnection nor follow-up production testing by the NRTL.

If the certified equipment includes only interface components (switchgear, inverters, or other interface devices), then a Customer must show that the Generating Facility is compatible with the interface components and is consistent with the testing and listing specified for this type of Interconnection equipment.

Certified equipment does not include equipment provided by the Utility.

3.6 No Additional Requirements

If a Customer's Generating Facility complies with all applicable requirements in this Document and the Utility's Interconnection Manual, a Utility may not require the Customer to install additional controls, or perform or pay for additional tests, in order to obtain approval to interconnect except as mutually agreed to by the parties or required by the Commission. Additional equipment may be installed by the Utility at its own expense.

3.7 Disconnect from or Reconnect with the Grid Procedure

A Utility may disconnect a Customer's Generating Facility from the Utility system under the following conditions:

- (a) **Expiration or termination of Interconnection Agreement.** The Interconnection Agreement specifies the effective term and termination rights of the Utility and the Customer. Upon expiration or termination of the Interconnection Agreement with a Customer, in accordance with the terms of the agreement, the Utility may disconnect a Customer's Generating Facility.

- (b) **Non-compliance with technical Interconnection requirements.** A Utility may disconnect a Customer's Generating Facility if the facility is not in compliance with the technical requirements. Normally within two business days from the time the Customer notifies the Utility that the facility has been restored to compliance with the technical requirements, the Utility shall have an inspector verify such compliance. Upon such verification, the Customer in coordination with the Utility may reconnect the facility.
- (c) **System emergency.** A Utility may temporarily disconnect a Customer's Generating Facility without prior written notice in cases where continued Interconnection of the Generating Facility will endanger persons or property. During the forced outage of a Utility system, the Utility shall have the right to temporarily disconnect a Customer's facility to make immediate repairs on the Utility's system. When possible, the Utility shall provide the Customer with reasonable notice and reconnect the Customer as quickly as reasonably practical.
- (d) **Routine maintenance, repairs, and modifications.** A Utility may disconnect a Customer's Generating Facility from the grid with reasonable prior notice of a service interruption for routine maintenance, repairs, and Utility system modifications. The Utility shall allow reconnection of the Customer's Generating Facility as quickly as reasonably possible following any such service interruption.
- (e) **Absence of executed Interconnection Agreement.** In order to interconnect a Customer's Generating Facility to a Utility system, the Customer and the Utility must execute an Interconnection Agreement. The Utility may refuse to connect or may disconnect the Customer's Generating Facility if an executed Interconnection Agreement is not in effect.

The Parties shall cooperate with each other to restore the Generating Facility and the Utility system to their normal operating state as soon as reasonably practicable.

Temporary disconnection by Customer. The Customer retains the option to temporarily disconnect its Generating Facility from the Utility's system at any time. Such temporary disconnection shall not be a termination of the Interconnection Agreement unless specified as such.

Agreement survival rights. The Interconnection Agreement between the Utility and the Customer shall continue in effect after disconnection or termination of electric service to the extent necessary to allow or require either party to fulfill rights or obligations that arose under the agreement.

Duration and Termination of the Interconnection Agreement. The Interconnection Agreement shall become effective on the effective date specified in the Agreement and shall remain in effect thereafter unless and until:

- (a) it is terminated by mutual agreement of the parties;

- (b) it is replaced by another Interconnection Agreement with mutual consent of the parties;
- (c) it is terminated by either party pursuant to a breach or default of the Agreement; or
- (d) the Customer terminates its electric Utility service with the Utility and/or vacates or abandons the property on which the Generating Facility is located, or the Generating Facility, without mutual agreement of the parties.

Upon termination of the Interconnection Agreement, the Customer shall be responsible for ensuring that the electrical conductors connecting the Generating Facility to the Utility system are immediately lifted and permanently removed, so as to preclude any possibility of interconnected operation in the future. The Utility reserves the right to inspect the Customer's Generating Facility to verify that it is permanently disconnected.

3.8 Dispute Resolution

If a dispute arises between the parties regarding a provision contained in this Document and/or Agreement, or a party's performance of its obligations as stated in this Document and/or Agreement, or any other matter governed by the terms of the Document and/or Agreement, the parties agree that such dispute will be resolved in the manner prescribed in this section.

- (a) **Notification and Response.** Promptly upon the occurrence of the dispute, the aggrieved party will notify the other party in writing (the "Claimant's Statement"), setting forth in sufficient detail the basis for the dispute, the aggrieved party's position, and its proposal for resolution of the dispute. Within ten (10) business days following receipt of the Claimant's Statement, the other party will respond in writing (the "Responsive Statement") setting forth in sufficient detail the respondent's position and its proposal for resolution of the dispute.
- (b) **Good Faith Negotiation.** Within ten (10) business days after the aggrieved party's receipt of the Responsive Statement, the parties will meet and attempt in good faith to expeditiously negotiate a resolution to the dispute. In attendance for each party at that opening session and throughout the dispute resolution procedure described in this section will be a representative or representatives of each party who are authorized to act for the party and resolve this dispute without resort to higher authority.
- (c) **Dispute Resolution by Mediation.** Any dispute(s) arising out of or relating to this Document shall be subject to binding mediation by a mutually acceptable mediator. If no mediator is mutually acceptable, then a mediator shall be appointed by the Arizona Office of the American Arbitration Association, at the request of any party. The costs of mediation shall be borne by the losing party and as prescribed by the mediator.
- (d) **Arizona Corporation Commission.** In the event such dispute is not resolved by mediation, then the parties consent to jurisdiction to resolve any such dispute by the Arizona Corporation Commission of the State of Arizona.

4. SPECIFIC PROCESS AND PROCEDURES FOR EACH LEVEL

4.1 Summary of Interconnection Levels / Tracks

Level 1 Super Fast Track: Certified inverter-based facilities that have a power rating of 10 kW or less, are interconnected on a radial line, and meet screens (e) and (f) in section 4.2 below. Refer to Section 4.3 for additional details.

Level 2 Fast Track: Generating Facilities that have a power rating of 2 MW or less, are interconnected on a radial line, and meet screens (a) through (i) in section 4.2 below. Refer to Section 4.4 for additional details.

Level 3 Study Track: Generating Facilities that have a power rating of 10 MW or less that do not meet the criteria or screens for other Levels. Interconnection studies may be required. Refer to Section 4.5 for additional details.

Distribution Networks: On an interim basis, certified inverter-based Generating Facilities that have a power rating of 10 kW or less will be allowed to be interconnected on a secondary spot network system and otherwise as approved by the Utility. Generators will only be interconnected on a trial, pilot basis, at the discretion of the Utility, under the interconnection process set forth in the Utility's Interconnection Manual. This process may be revised upon completion of IEEE 1547.6. Refer to subsection 4.6 for additional details.

4.2 Screens

- (a) For Interconnection of a proposed generator to a radial distribution circuit, the aggregated generation, including the proposed generator, on the circuit will not exceed 15 percent of the total circuit annual peak load as most recently measured at the substation or on a line section. In the case of generators certified to UL 1741 and IEEE 1547, a line section is that portion of a distribution system connected to a customer's facility bounded by automatic sectionalizing devices, or the end of the distribution line. For non-certified generators, a line section is that portion of a distribution system connected to a customer's facility bounded by automatic sectionalizing devices, a fused lateral, or the end of the distribution line. The aggregated generation, including the proposed generator, must also be less than 50 percent of the minimum daytime feeder or line section load, where these data are available, unless the minimum load is zero.
- (b) The proposed generator, and new motors associated with the proposed generator, in aggregation with other generation on the distribution circuit, will not contribute more than 10 percent to the distribution circuit's maximum fault current at any point on the Utility's distribution system, including normal contingency conditions that may occur due to reconfiguration of the feeder or the distribution substation.
- (c) The proposed generator, in aggregate with other generation on the distribution circuit, will not cause any distribution protective devices and equipment (including but not limited to

substation breakers, fuse cutouts, and line reclosers), or customer equipment on the system, to exceed 90 percent of the short circuit interrupting capability; nor is the Interconnection proposed for a circuit that already exceeds 90 percent of the short circuit interrupting capability.

(d) The proposed generator is interconnected to the Utility as shown in the table below:

Primary distribution line configuration	Interconnection to primary distribution line
Three-phase, three wire	If a three-phase or single phase generator, Interconnection must be phase-to-phase
Three-phase, four wire	If a three-phase (effectively grounded) or single-phase generator, Interconnection must be line-to-neutral

- (e) If the proposed generator is to be interconnected on single-phase shared secondary, the aggregate generation capacity on the shared secondary, including the proposed generator, cannot exceed 10 kW, and the proposed generator must be listed to UL 1741.
- (f) If the proposed generator is single-phase and is to be interconnected on a transformer center tap neutral of a 240 volt service, its addition will not create an imbalance between the two sides of the 240 volt service of more than 20 percent of nameplate rating of the service transformer.
- (g) The proposed generator, in aggregate with other generation interconnected to the distribution low voltage side of the substation transformer feeding the distribution circuit where the generator proposes to interconnect, will not exceed 10 MW in an area where there are known or posted transient stability limitations to generating units located in the general electrical vicinity (e.g., 3 or 4 transmission voltage level busses from the Point of Interconnection).
- (h) The proposed generator's Point of Interconnection will not be on a transmission line.
- (i) The generator cannot exceed the capacity of the customer's existing electrical service.

4.3 Level 1 Super Fast Track Process

The Level 1 Process is available to Customers interconnecting either a single certified static inverter, with a continuous output power nameplate rating of 10 kW or less, or multiple certified static inverters with a combined continuous power nameplate rating of 10 kW or less (screen "e") to the Utility's distribution system. The inverter(s) must be UL 1741 listed, and certified to meet the shutdown protective functions (under/over voltage, under/over frequency and anti-islanding) specified in IEEE 929 (screen "f"). The Generating Facility must also meet all applicable codes and standards, as well as comply with the Utility Interconnection and contractual requirements.

Nothing in this process precludes the Customer and Utility from mutually agreeing to different timeframes or other procedures for the approval of interconnected operation of a Generating Facility, so long as the project moves along in a fair and reasonable manner. Nothing in this process precludes the Customer from starting construction prior to contacting the Utility; however, the Customer accepts the risk of potentially needing to modify or substantially change the installation.

The Level 1 Process steps are as follows:

- (a) **Customer Submits Application.** The Customer completes the Interconnection Application and submits it to the Utility along with all required supplemental information which shall be noted on the Application form. The Customer may submit a pre-executed Interconnection Agreement together with the Interconnection Application, if permitted by the Utility. No initial application fee or processing fee will be charged.
- (b) **Application is Received and is Complete or Incomplete.** The Utility notifies the Customer within five (5) business days of receipt of the Application as to whether it is complete or incomplete.
 - (i) If the Application is incomplete, the Utility will specify what information or material is necessary to complete the Application.
 - (ii) The Customer has thirty (30) business days after receipt of such notification to submit the required information or materials (or request an extension), or the Application may be considered withdrawn.
- (c) **Utility Reviews Application.** Within ten (10) business days following the receipt of a complete Interconnection Application, the Utility reviews the proposed Interconnection and notifies the Customer of one of the following determinations:
 - (i) The proposed Generating Facility design appears to meet all Interconnection requirements and the Interconnection Application is approved as submitted. An Interconnection Agreement (if not already pre-executed) will be prepared by the Utility and forwarded to the Customer for review and signature in accordance with Step (d) below; or
 - (ii) The proposed Generating Facility design has failed to meet one or more of the Interconnection requirements, and the Interconnection Application is denied. The Utility provides an explanation of the reason(s) for the denial (in writing, if requested by the Customer), and specifies what additional information and/or modifications to the Customer's Generating Facility or Utility system are required in order to obtain approval of the proposed design.

If the Application is denied, the Customer notifies the Utility within twenty (20) business days whether or not it wishes to proceed with the project. If the Customer does not wish to proceed with the project, or the Utility is not notified within the specified time frame, the

Application may be considered withdrawn. If the Customer wishes to proceed with the project, then a new Application shall be submitted to the Utility for review and processing (Step (a) above is re-initiated), along with any additional information and/or modifications to the Customer's Generating Facility. Alternatively, the Customer may request processing under Level 2 or Level 3 and shall provide any additional information requested by the Utility and necessary to process the request under Levels 2 or 3.

(d) **Interconnection Agreement.** If the Generating Facility meets all of the applicable interconnection requirements and the Application is approved, then:

- (i) Within five (5) business days after the notice of Application approval, or following receipt of any "as built" or final diagrams from the Customer, the Utility sends to the Customer the appropriate Interconnection Agreement for review and signature. (This step may be omitted if the Utility has received a pre-executed Interconnection Agreement).
- (ii) The Customer reviews, signs, and returns the Interconnection Agreement to the Utility.
- (iii) The Customer then completes installation of the Generating Facility within 180 days after execution of the Interconnection Agreement, unless an extension is mutually agreed to by the parties, which extension shall not be unreasonably withheld. The Utility has the right to terminate any Agreements, and the Interconnection Application may be considered withdrawn, in the event that this timeframe is exceeded without extension.

(e) **Inspection and Testing.** The Customer will give the Utility at least five (5) business days notice to schedule the Utility site inspection and inverter shutdown testing. The Utility may schedule metering replacement, if necessary, and labeling of Utility equipment to occur at the same time. There will be no charge for one initial site inspection by the Utility.

The Utility performs the site inspection as arranged and verifies that the Generating Facility, as best as can be determined, is in compliance with all applicable interconnection and safety requirements. At a minimum, it is suggested that the Utility shall verify the following:

- (i) An electrical permit and/or clearance has been issued by the authority having jurisdiction, if required;
- (ii) All Generating Facility equipment is properly labeled;
- (iii) Generating Facility system layout is in accordance with the plant location and site plan(s) submitted to the Utility;
- (iv) Inverter nameplate ratings are consistent with the information submitted to the Utility;
- (v) Utility has unrestricted 24-hour access to the Disconnect Switch (if required), and the switch meets all applicable requirements;

- (vi) The inverter shuts down as required upon simulated loss of Utility voltage; and
- (vii) The Generating Facility is wired, as best as can be determined, in accordance with the electrical diagrams submitted to the Utility.

The Utility will normally before or at the time of the site inspection:

- (i) Install appropriate metering if required;
- (ii) Label all Utility equipment; and
- (iii) Ensure that the Generating Facility is properly incorporated onto Utility operating maps and identified as a backfeed source.

The Utility does not have the right to fail a site inspection in the event that any of the above three requirements (metering, Utility equipment labeling, and the identification of the Generating Facility on the operating maps) are not in place at the time of the Site Inspection. The Utility does have the right to fail any Generating Facility that does not meet the applicable Interconnection requirements, is not installed substantially in accordance with the documentation submitted to the Utility, or as a result of any safety or protection violation.

- (f) **Notification.** Immediately following completion of the site inspection (and upon receipt of all final applicable signed interconnection documents), the Utility shall determine whether or not the Generating Facility meets all applicable requirements, and notify the Customer that:
 - (i) The Generating Facility is approved for parallel operation with the Utility's distribution system per the agreed terms and conditions. Within one (1) business day, following such oral notification, the Utility shall provide the Customer with such notice in writing; or
 - (ii) The Generating Facility has failed to meet one or more of the applicable requirements or a safety or protection violation has been identified, and the Generating Facility is not approved for parallel operation. The Utility must provide the reason(s) (in writing, if requested by the Customer) for not approving parallel operation. Furthermore, the Utility has the right to take any reasonable steps (including locking open the Disconnect Switch) to prevent the Generating Facility from parallel operation. Operation of a generator in parallel without Utility approval may result in immediate termination of electric service to the Customer.
- (g) **Corrections (if necessary).** In the event that the Generating Facility does not pass the initial Utility site inspection:
 - (i) The Customer must correct any outstanding issues and schedule a re-inspection. The Utility shall re-inspect upon five (5) business days notice from the Customer to verify that the deficiencies have been remedied. A fee not exceeding one hundred dollars (\$100) may be assessed for each re-inspection conducted by the Utility. Within one (1)

business day following any site re-inspection, where the Utility approves parallel operation of the Generating Facility, the Utility will provide written notification to the Customer that the Generation Facility is approved for parallel operation.

- (ii) If updated diagrams are required to reflect "as-built" conditions, the Customer must submit these to the Utility for review and approval within ten (10) business days following the site inspection. The Utility will process and mail an amendment to the Interconnection Agreement within five (5) business days after receipt and acceptance of the revised diagrams for Customer review and signature.

4.4 Level 2 Fast Track Process

The Level 2 Process is available to Customers interconnecting a Generating Facility with a continuous output power nameplate rating of 2 MW or less to the Utility's distribution system. In order to qualify for Level 2, the Generating Facility must meet screens (a) through (i) in subsection 4.2 above. The Generating Facility must also meet all applicable codes and standards, as well as comply with the Utility Interconnection and contractual requirements.

Nothing in this process precludes the Customer and Utility from mutually agreeing to different timeframes or other procedures for the approval of interconnected operation of a Generating Facility, so long as the project moves along in a fair and reasonable manner. Also, nothing in this process precludes the Customer from starting construction prior to contacting the Utility; however, in such case the Customer accepts the risk of potentially needing to modify or substantially change the installation.

The Level 2 Process steps are as follows:

- (a) **Prior to applying.** The Customer is encouraged to contact and work closely with the Utility at the conceptual stages of the design to discuss the proposed design, installation, and operation. A preliminary electrical one-line diagram would be very helpful at this stage. This step will ensure that proposed projects proceed in a smooth and timely manner, and that the Utility and Customer understand whether any special considerations, protective equipment, system modifications, or studies may be required. Upon the Customer's request, the Utility shall meet with the Customer prior to submission of an Application.
- (b) **Customer Submits Application.** The Customer completes the standard Interconnection Application and submits it to the Utility along with all required supplemental information which shall be noted on the Application form. A Utility may charge an application fee, if a tariff containing such a fee is approved by the Commission.
- (c) **Application is Received and is Complete or Incomplete.** The Utility notifies the Customer within five (5) business days of receipt of the Application as to whether it is complete or incomplete.
 - (i) If the Application is incomplete, the Utility will specify what information or material is necessary to complete the Application.

- (ii) The Customer has thirty (30) business days after receipt of such notification to submit the required information or materials (or request an extension), or the Application may be considered withdrawn.
- (d) **Utility Reviews Application.** Within fifteen (15) business days following the receipt of a complete Interconnection Application, the Utility reviews the proposed Interconnection and notifies the Customer of one of the following determinations:
- (i) The proposed Generating Facility design appears to meet all Interconnection requirements and the Interconnection Application is approved as submitted. An Interconnection Agreement will be prepared by the Utility and forwarded to the Customer for review and signature in accordance with Step (e) below; or
 - (ii) The proposed Generating Facility has failed to meet one or more of the screens, but the initial review indicates that Additional Review may enable the Utility to determine that the Customer's Generating Facility can be interconnected consistent with safety, reliability, and power quality. In such case, the Utility shall offer to perform Additional Review (typically about 3 hours of study) to determine whether minor modifications to the electric distribution system (for example, changing meters, fuses, or relay settings) would enable the Interconnection to be made consistent with safety, reliability and power quality. The Utility shall provide to the Customer a non-binding, good faith estimate of the costs of such Additional Review, and/or such minor modifications. The Utility shall undertake the Additional Review or minor modifications only after the Customer consents to pay for the review and/or modifications. Such Additional Review shall take place within 20 business days after the Customer has submitted payment for the estimated costs; or
 - (iii) The proposed Generating Facility design has failed to meet one or more of the Interconnection requirements, and the Interconnection Application is denied. The Utility provides an explanation of the reason(s) for the denial (in writing, if requested by the Customer), and specifies what additional information and/or modifications to the Customer's Generating Facility or Utility system are required in order to obtain approval of the proposed design.

If the Application is denied, the Customer notifies the Utility within twenty (20) business days whether or not it wishes to proceed with the project. If the Customer does not wish to proceed with the project, or the Utility is not notified within the specified time frame, the Application may be considered withdrawn. If the Customer wishes to proceed with the project, then a new Application shall be submitted to the Utility for review and processing (Step (a) above is re-initiated), along with any additional information and/or modifications to the Customer's Generating Facility. Alternatively, the Customer may request processing under Level 3 and shall provide any additional information requested by the Utility and necessary to process the request under Level 3.

(e) **Interconnection Agreement.** If the Generating Facility meets all of the applicable Interconnection requirements and the Application is approved, then:

- (i) Within normally not more than ten (10) business days after the notice of Application approval, or following receipt of any "as built" or final diagrams from the Customer, the Utility sends to the Customer the appropriate Interconnection Agreement for review and signature.
- (ii) The Customer reviews, signs, and returns the Interconnection Agreement to the Utility.
- (iii) The Customer then completes installation of the Generating Facility within 180 days after execution of the Interconnection Agreement, unless an installation schedule has been submitted with an alternative in-service date, or the parties have mutually agreed to an extension. The Utility has the right to terminate any Agreements, and the Interconnection Application may be considered withdrawn, in the event that this timeframe is exceeded without extension.

(f) **Inspection and Testing.** The Customer will contact the Utility to schedule the Utility site inspection and witness of the testing of the protective devices. The Utility site inspection and witness of the testing of the protective devices will normally occur within ten (10) business days of request from the Customer. The Utility may schedule metering replacement, if necessary, and labeling of Utility equipment to occur at the same time. A Utility may charge for the initial site inspection, if a tariff containing such a fee is approved by the Commission.

The Utility performs the site inspection as arranged and verifies that the Generating Facility, as best as can be determined, is in compliance with all applicable interconnection and safety requirements. At a minimum, it is suggested that the Utility shall verify the following:

- (i) An electrical permit and/or clearance has been issued by the authority having jurisdiction, if required;
- (ii) All Generating Facility equipment is properly labeled;
- (iii) Generating Facility system layout is in accordance with the plant location and site plan(s) submitted to the Utility;
- (iv) Generator nameplate ratings are consistent with the information submitted to the Utility;
- (v) Utility has unrestricted 24-hour access to the Disconnect Switch (if required), and the switch meets all applicable requirements;
- (vi) The Utility will witness the required protective relay calibration and functional tests. (The Utility may accept a certified test report in lieu of witnessing the tests); and

- (vii) The Generating Facility is wired, as best as can be determined, in accordance with the electrical diagrams submitted to the Utility.

The Utility will normally, before or at the time of the site inspection:

- (i) Install appropriate metering if required;
- (ii) Label all Utility equipment; and
- (iii) Ensure that the Generating Facility is properly incorporated onto Utility operating maps and identified as a backfeed source.

The Utility does not have the right to fail a site inspection in the event that any of the above three requirements (metering, Utility equipment labeling, and the identification of the Generating Facility on the operating maps) are not in place at the time of the site inspection. The Utility does have the right to fail any Generating Facility that does not meet the applicable Interconnection requirements, is not installed substantially in accordance with the documentation submitted to the Utility, or as a result of any safety or protection violation.

- (h) **Notification.** Immediately following completion of the site inspection (and upon receipt of all final applicable signed Interconnection documents) the Utility shall determine whether or not the Generating Facility meets all applicable requirements. The Utility shall provide the Customer oral notification within twenty-four (24) hours and written notification within three (3) business days that:

- (i) The Generating Facility is approved for parallel operation with the Utility's distribution system per the agreed terms and conditions; or
- (ii) The Generating Facility has failed to meet one or more of the applicable requirements or a safety or protection violation has been identified, and the Generating Facility is not approved for parallel operation. The Utility must provide the reason(s) (in writing, if requested by the Customer) for not approving parallel operation. Furthermore, the Utility has the right to take any reasonable steps (including locking open the Disconnect Switch) to prevent the Generating Facility from parallel operation. Operation of a generator in parallel without Utility approval may result in immediate termination of electric service to the Customer.

- (i) **Corrections (if necessary).** In the event that the Generating Facility does not pass each Utility site inspection:

- (i) The Customer must correct any outstanding issues and schedule a re-inspection. The Utility shall re-inspect upon ten (10) business days notice from the Customer to verify that the deficiencies have been remedied. A Utility may charge a fee for a re-inspection, if a tariff containing such a fee is approved by the Commission. Following any site re-inspection where the Utility approves parallel operation of the Generation Facility, the Utility will provide to the Customer such oral notification within twenty-

four (24) hours and such written notification within three (3) business days that the Generation Facility is approved for parallel operation.

- (ii) If updated diagrams are required to reflect "as-built" conditions, the Customer must submit these to the Utility for review and approval within ten (10) business days following the site inspection. The Utility will process and mail an amendment to the Interconnection Agreement within five (5) business days after acceptance of the revised diagrams for Customer review and signature.

Customer Timeframes. The Utility timeframes contained herein do not include the time for the Customer to execute agreements or submit needed documentation. If at any point in the Level 2 Fast Track process, the Customer does not submit requested materials necessary to process the interconnection Application, or submit applicable executable agreements within thirty (30) business days, or request an extension, the Application may be considered withdrawn.

Fees for Level 2 Additional Review. A Utility may charge a fee for an Additional Review, if a tariff containing the hourly rate for Additional Review is approved by the Commission. In addition, costs for Utility facilities and/or equipment modifications necessary to accommodate the Customer's generator interconnection will be the responsibility of the Customer.

4.5 Level 3 Study Track Process

Level 3, also called the Study Track, is the interconnection procedure to be used for all Generating Facilities that do not meet the screening requirements for Level 1 Super Fast Track or Level 2 Fast Track. It is an in-depth engineering review of whatever aspects of generator performance and/or grid interaction the Utility deems necessary to study. More details are available in each Utility's Interconnection Manual. For generators that are certified, no review of the generator's protection equipment is required, although the Utility may study the interface between the Generating Facility and the Utility. The Generating Facility is required to meet applicable local electric codes and standards, as well as comply with all terms and conditions of the Utility's Interconnection Manual and Interconnection Agreement.

Nothing in these procedures shall preclude the Customer and Utility from mutually agreeing to different timeframes or other procedures for the approval of interconnected operation of a Generating Facility, so long as the project moves along in a fair and reasonable manner.

The Level 3 Study Track interconnection process is as follows:

- (a) **Prior to applying.** The Customer is encouraged to contact and work closely with the Utility at the conceptual stages of the design to discuss the proposed design, installation, and operation. A preliminary electrical one-line diagram would be very helpful at this stage. This step will ensure that proposed projects proceed in a smooth and timely manner, and that the Utility and the Customer understand whether any special considerations, protective equipment, system modifications, or studies may be required. Upon the Customer's request, the Utility shall meet with the Customer prior to submission of an Application.

- (b) **Customer Submits Application.** The Customer completes the Interconnection Application and submits it to the Utility along with all required supplemental information (which shall be noted on the Application form). A Utility may charge an application fee, if a tariff containing such a fee is approved by the Commission.
- (c) **Application is Received and is Complete or Incomplete.** The Utility notifies the Customer in normally not more than ten (10) business days of receipt of the Application (or transfer from Level 1 or 2) as to whether it is complete or incomplete.
- (i) If the Application is incomplete, the Utility will specify what information or material is necessary to complete the Application.
 - (ii) The Customer has normally not more than thirty (30) business days after receipt of such notification to submit the missing information or materials (unless other mutually agreeable arrangements are made); otherwise the Application may be considered withdrawn.
 - (iii) Once the Customer submits any missing information, the Utility has normally not more than another ten (10) business days to determine if the Application is complete or incomplete and notify the Customer.
- (d) **Utility Reviews Application.** Normally within ten (10) business days following the receipt of a complete Interconnection Application, the Utility reviews the proposed interconnection and notifies the Customer of one of the following determinations:
- (i) The Generating Facility design as submitted appears to meet all of the applicable Interconnection requirements and no further studies, special protective requirements, or system modifications are required. An Interconnection Agreement will be prepared by the Utility and forwarded to the Customer for review and signature in accordance with Step (j) below; or
 - (ii) The Generating Facility cannot be interconnected without further information, data, engineering studies, and/or modifications to the Utility system or Generating Facility. In this case, the Interconnection proceeds according to the following meeting and study process, as deemed necessary by the Utility. All itemized costs and timelines for the studies are to be disclosed and agreed upon by the Utility and Customer prior to the start of each one. In addition, all studies are to be made available to the Customer directly after their completion.
- (e) **Scoping Meeting.** This is a high-level, initial review meeting between the Utility and the Customer, where the Customer describes the proposed Generating Facility design and the Utility talks about system conditions at the proposed Point of Interconnection. This meeting can also allow the Utility and Customer to discuss which of the following study elements are needed. The Utility and the Customer will bring to the meeting personnel, including system engineers and other resources as may be reasonably required to accomplish the purpose of

the meeting. This meeting shall be held in normally not more than ten (10) business days after an Application is deemed complete unless other mutual agreements are made.

- (f) **Acknowledgement Letter.** The Utility will provide an Acknowledgement Letter following the Scoping Meeting upon request from the Customer. The letter will describe the project scope and include a good faith cost estimate by the Utility. If requested, the Acknowledgement Letter will be sent out normally within 10 business days following the Scoping Meeting.
- (g) **Interconnection Feasibility Study.** If requested by the Customer, the Utility shall undertake an Interconnection Feasibility Study. The Utility shall provide the Customer, as soon as possible, but in normally not more than ten (10) business days after the Scoping Meeting, an Interconnection Feasibility Study Agreement including an outline of the scope of the study and a non-binding, good faith, detailed estimate of the materials and labor costs to perform the study. Once the interconnecting Customer executes the Interconnection Feasibility Study Agreement, provides all requested Customer information necessary to complete the Study, and pays pursuant to the good faith estimate contained therein, the Utility will conduct the Interconnection Feasibility Study.

The Feasibility Study will be completed in normally not more than twenty (20) business days, unless other mutually agreeable terms are made.

The Interconnection Feasibility Study provides a preliminary review of the potential impacts on the distribution system that will result from the proposed Interconnection. The Interconnection Feasibility Study will review short circuit currents including contribution from the proposed generator as well as coordination of and potential overloading of distribution circuit protection devices. This study principally benefits the Customer by providing initial details and ideas on the complexity and likely costs to interconnect prior to commitment of costly engineering review. The Interconnection Feasibility Study may also be used to focus or eliminate some or all of the more intensive System Impact study.

- (h) **System Impact Study.** If deemed necessary by either party, the Utility shall undertake a System Impact Study. The Utility shall provide the Customer as soon as possible, but in normally not more than fifteen (15) business days after completing the previous study or meeting, a System Impact Study Agreement including an outline of the scope of the study and a non-binding, good faith, detailed estimate of the materials and labor costs to perform the study. Once the Customer executes the System Impact Study Agreement, provides all requested Customer information necessary to complete the Study, and pays any required deposit pursuant to the good faith estimate contained therein, the Utility will conduct the Impact Study.

The System Impact Study will be completed in normally not more than thirty (30) business days, unless other mutually agreeable terms are made.

The System Impact Study is a full engineering review of all aspects of the generator's impact on the Utility system, including power flow, Utility system protective device coordination,

generator protection schemes (if not certified), stability, voltage collapse, frequency impacts, and short circuit duty. The System Impact Study reveals all areas where the Utility system would need to be upgraded to allow the generator to be built and interconnected as designed. It may include discussions with the Customer about potential alterations to generator design, including downsizing to limit grid impacts.

If the Utility determines, in accordance with Good Utility Practice, that the Utility electric system modifications required to accommodate the proposed Interconnection are not substantial, the System Impact Study shall identify the scope and detailed cost of the modifications.

If the Utility determines, in accordance with Good Utility Practice, that the system modifications to the Utility electric system are substantial, a Facilities Study shall be performed.

Each Utility shall include in its Interconnection Manual a description of the various elements of a System Impact Study it would typically undertake pursuant to this Section including:

- (i) Load Flow Study;
 - (ii) Short-Circuit Study;
 - (iii) Circuit Protection and Coordination Study;
 - (iv) Impact on System Operation;
 - (v) Stability Study (and the conditions that would justify including this element in the Impact Study); and
 - (vi) Voltage Collapse Study (and the conditions that would justify including this element in the Impact Study).
- (i) **Facilities Study.** If deemed necessary by the Utility, the Utility shall undertake a Facilities Study. The Utility shall provide the Customer as soon as possible, but in normally not more than five (5) business days after completing the previous study or meeting, a Facilities Study Agreement including an outline of the scope of the study and a non-binding, good faith, detailed estimate of the materials and labor cost to perform the study. Once the interconnecting Customer executes the Facilities Study Agreement, provides all requested Customer information necessary to complete the Study, and pays pursuant to the good faith estimate contained therein, the Utility will conduct the Facilities Study. The Facilities Study will be completed in normally not more than thirty (30) business days, unless other mutually agreeable terms are made.

The Facilities Study is a comprehensive analysis of the actual construction needed to take place based on the outcome of the Impact Study. It delineates the detailed costs of construction and milestones. Construction may include new circuit breakers, relocation of reclosers, new construction of Utility grid extensions, reconductoring lines, new

transformers, protection requirements and interaction. Where no Utility construction is required there would be no Facilities Study.

- (j) **Interconnection Agreement.** If the Generating Facility meets all of the applicable Interconnection requirements, all items identified in any Meeting or Study have been resolved and agreed to (if applicable), and the Utility has received the final design drawings, then:
- (i) The Utility shall send to the Customer in normally not more than ten (10) business days an executable Interconnection Agreement, which shall include as an exhibit the cost for any required Utility system modifications.
 - (ii) The Customer reviews, signs, and returns the signed Interconnection Agreement and any balance due for Interconnection studies or required deposit for facilities.
 - (iii) The Customer then completes installation of the Generating Facility and the Utility completes any utility system modifications, according to the milestones set forth in the Interconnection Agreement. The Utility shall employ best reasonable efforts to complete such system upgrades in the shortest time reasonably practical.
- (k) **Inspection and Testing.** The Customer will contact the Utility to schedule the Utility site inspection and witness of the testing of the protective devices. The Utility site inspection and witness of the testing of the protective devices will normally occur within ten (10) business days of notice from the Customer. The Utility may schedule metering replacement, if necessary, and labeling of Utility equipment to occur at the same time.

The Utility performs the site inspection as arranged and verifies that the Generating Facility, as best as can be determined, is in compliance with all applicable Interconnection and code requirements. At a minimum, it is suggested that the Utility verify the following:

- (i) An electrical permit and/or clearance has been issued by the authority having jurisdiction, if required;
- (ii) All Generating Facility equipment is properly labeled;
- (iii) Generating Facility system layout is in accordance with the plant location and site plan(s) submitted to the Utility;
- (iv) Generator nameplate ratings are consistent with the information submitted to the Utility;
- (v) The Utility has unrestricted access to the Disconnect Switch (if required), and the switch meets all requirements;
- (vi) The Utility will witness the required protective relay calibration and functional tests. (The Utility may accept a certified test report in lieu of witnessing the tests); and

- (vii) The Generating Facility is wired, as best can be determined, in accordance with the electrical diagrams submitted to the Utility.

The Utility will normally, before or at the time of the site inspection:

- (i) Install all appropriate metering, if required;
- (ii) Label all Utility equipment; and
- (iii) Ensure that Generating Facility is properly incorporated onto Utility operating maps and identified as a backfeed source.

The Utility shall not have the right to fail a site inspection in the event that any of the above three requirements (metering, Utility equipment labeling, and the identification of the Generating Facility on the operating maps) are not in place at the time of the site inspection.

The Utility does have the right to fail any Generating Facility that does not meet the applicable Interconnection requirements, is not installed substantially in accordance with the documentation submitted to the Utility, or as a result of any safety or protection violation.

- (l) **Notification.** Immediately following completion of the site inspection (and upon receipt of all final applicable signed Interconnection documents) the Utility shall determine whether or not the Generating Facility meets all applicable requirements. The Utility shall provide the Customer oral notification normally within twenty-four (24) hours and written notification normally within three (3) business days that:

- (i) The Generating Facility is approved for parallel operation with the Utility's distribution system per the Interconnection Agreement. The Utility shall provide the Customer with such notification in writing in normally not more than three (3) business day following the Utility inspection under (k) above; or
- (ii) The Generating Facility has failed to meet one or more of the applicable requirements or a safety violation has been identified, and the Generating Facility is not approved for parallel operation. The Utility shall provide the reason(s) (in writing, if requested by the Customer) for not approving parallel operation. Furthermore, the Utility has the right to disconnect and lock out the Generating Facility to prevent the Generating Facility from parallel operation, and the Customer must reschedule the site inspection with the Utility. The Customer may not operate in parallel until it receives written approval from the Utility, and violation of this condition may result in immediate termination of electric service to the Customer.

- (m) **Correction (if necessary).** In the event that the Generating Facility does not pass the initial Utility site inspection:

- (i) The Customer must correct the deficiencies identified by the Utility and schedule a re-inspection. The Utility shall re-inspect normally not more than ten (10) business days

notice from the Customer to verify that the deficiencies have been remedied. Following any site re-inspection where the utility approves parallel operation of the Generation Facility, the Utility will provide to the Customer such oral notification normally within twenty-four (24) hours and such written notification normally within three (3) business days that the Generation Facility is approved for parallel operation.

- (ii) If updated documentation is required to reflect "as-built" conditions, the Customer must submit these to the Utility for review and approval within ten (10) business days following the site inspection. The Utility may charge a fee, if a tariff containing such a fee is approved by the Commission. The Utility will process and mail an amendment to the Interconnection Agreement normally not more than five (5) business days after receipt and acceptance of the revised diagrams for Customer review and signature.

Customer Timeframes. The Utility timeframes contained herein do not include the time for the Customer to execute agreements or submit needed documentation. If at any point in the Level 3 Study Track process, the Customer does not submit requested materials necessary to process the Interconnection Application, or submit applicable executable agreements in normally not more than thirty (30) business days, or request an extension, the Application may be considered withdrawn.

Fees for Level 3 Interconnection. A Utility may charge a fee for an engineering review, if a tariff containing the hourly rate for engineering review is approved by the Commission. In addition, costs for Utility facilities and/or equipment modifications necessary to accommodate the Customer's generator interconnection will be the responsibility of the Customer. The Customer may not be charged for the review of a certified generator's protection equipment. The utility may charge a fee for an initial inspection or for a re-inspection, if a tariff containing such a fee is approved by the Commission.

4.6 Interconnection to Secondary Spot Network Systems

The requirements for interconnecting generating facilities to Secondary Spot Network Systems are different than those for Interconnection to radial distribution systems. In the Secondary Spot Network System, there are technical requirements to be considered particularly with the design and operational aspects of network protectors that are not required on radial systems.

Currently, Arizona Public Service ("APS") is the only Utility in Arizona that has Secondary Spot Networks. As such, APS has developed the following interim criteria for interconnecting a small amount of inverter-based customer generation to a Secondary Spot Network System. Because the maximum level of generation that could be interconnected to a Secondary Spot Network System is unknown at this time, this "Pilot" effort should be viewed as a trial basis only. APS reserves the right to suspend it at any time. APS has initiated this Pilot effort in a proactive attempt to include distributed generation in the State of Arizona on Secondary Spot Network Systems.

The Pilot criteria require that the generation meet all of the following conditions simultaneously:

- (a) Inverter based units must be less than 10 kW;
- (b) Units must be "Certified" as prescribed in this Document, and must meet current IEEE 1547 and UL 1741 standards; and
- (c) Must be less than or equal to 10% of the interconnecting customer's verifiable minimum load during the operation of the inverter. (For photovoltaics, the minimum load refers to the daytime minimum.)

APS reserves the right to suspend, change, modify, or add to the above conditions based on the results from future test reports or guidelines as they become available.

Once the 1547.6 standards are completed, APS (and any other Arizona Utilities who have since added Secondary Spot Networks) will review the Pilot criteria for possible modification to include guidelines for Interconnection to the Secondary Spot Network Systems.

The process for interconnecting to a Secondary Spot Network System will be determined by the Utility.

5. UTILITY REPORTING REQUIREMENTS

Interconnection Manual. Each Utility shall file an Interconnection Manual for approval with the Commission no later than ninety (90) calendar days after adoption of this document. Each Interconnection Manual shall contain procedural and technical requirements necessary to interconnect a Generating Facility to each Utility's respective distribution system but shall not be inconsistent with this Document. An updated Interconnection Manual shall be provided to the Commission upon any substantive revision by the Utility and shall become effective within sixty (60) days unless otherwise acted upon by the Commission.

Documentation of projects. Each electric Utility shall maintain records concerning Applications received for Interconnection and parallel operation of distributed generation. Such records will include the date each Application is received, documents generated in the course of processing each Application, correspondence regarding each Application, the final disposition of each Application, and the date on which the Application was approved (if approved).

Annual Interconnection report to the Commission. By March 30 of each year, every Utility shall file with the Commission a distributed generation Interconnection report for the preceding calendar year that lists the new Generating Facilities interconnected with the system since the previous year's report, any distributed generation facilities no longer interconnected with the Utility's system since the previous report, and the capacity of each facility. The annual report shall include, for the reporting period, a summary of the number of complete Applications received, the number of complete Applications approved, the number of complete Applications denied by level, and the reasons for denial.

6. DEFINITIONS

ANSI: American National Standards Institute. See www.ansi.org.

Application: The standard form for applying to interconnect a Generating Facility with the Utility system.

Arizona Corporation Commission ("ACC" or "Commission"): The regulatory agency of the state of Arizona having jurisdiction over public service corporations operating in Arizona.

Backfeed: To energize a section of a Utility electric system that is supplied from a source other than its normal source.

Business Day: Monday through Friday, excluding Federal and Arizona State Holidays.

Certified Equipment: A specific generating and protective equipment system or systems that have been certified as meeting the requirements in subsection 3.4 relating to testing, operation, safety, and reliability by an entity approved by the Commission.

Customer: A electric consumer that generates electricity on the consumer's side of the Utility meter.

Disconnect Switch: A device that the Customer may be required to install and maintain that is a visible open, manual, gang operated, load break disconnect device, capable of being locked in a "visible open" position by a standard Utility padlock that will completely isolate the Customer's Generating Facility from the Utility grid. "Visible open" has the same definition as used in the National Electric Code. If the voltage is over 500 volts, it has to be capable of being grounded on the Utility side.

Distributed Generation ("DG"): Any type of Customer electrical generator, static inverter, or Generating Facility interconnected with the distribution system that either (a) has the capability of being operated in electrical parallel with the Utility's distribution system, or (b) can feed a customer load that can also be fed by the Utility's electrical system. A distributed generator is often referred to as a "Generating Facility" in this Document.

Distribution System: The infrastructure constructed, maintained, and operated by an electric Utility to deliver electric service to retail customers.

Electric Supply or Purchase Agreement: An agreement, together with appendices, signed between the Utility and the Customer covering the terms and conditions under which electrical power is supplied to and/or purchased from the Utility.

Equipment Package: A group of components connecting an electric generator with a Utility distribution system, and includes all interface equipment including switchgear, inverters, or other interface devices. An equipment package may include an integrated generator or electric source.

Fault Current: The level of current that can flow if a short circuit is applied to a voltage source.

Generating Facility: All or part of the Customer's electrical generator(s) or inverter(s) together with all protective, safety, and associated equipment necessary to produce electric power at the Customer's facility. A Generating Facility also includes any Qualifying Facility ("QF").

Good Utility Practice: Any of the practices, methods, and acts engaged in or approved by a significant portion of the electric industry during the relevant time period, or any of the practices, methods, and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety, and expedition. Good Utility Practice is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

IEEE: The Institute of Electrical and Electronic Engineers. See www.ieee.org.

Interconnection Agreement: An agreement, together with appendices, signed between the Utility and the Customer, covering the terms and conditions governing the Interconnection and operation of the Generating Facility with the Utility.

Interconnection: The physical connection of Customer's Generating Facility to the Utility system.

Interconnection Manual: A separate document developed and maintained by each Utility, made available on each Utility's website, and approved by the Commission, containing detailed technical, safety, and protection requirements necessary to interconnect a Generating Facility to each Utility's respective distribution system. The Interconnection Manual shall be consistent with this Document.

Interconnection Study: A study or studies that may be undertaken by a Utility (or a Utility-designated third party) in response to its receipt of a completed Application for Interconnection and parallel operation with the Utility system. Interconnection studies may include, but are not limited to, Interconnection Feasibility Studies, System Impact Studies, and Facilities Studies.

Island: A condition in which a portion of a Utility electric power system is energized solely by one or more local electric power systems throughout the associated Point of Interconnection while that portion of the Utility electric power system is electrically separated from the rest of the Utility electric power system. Islands can either be intentional (planned) or unintentional (unplanned).

Islandable System: A Generating Facility interconnected to a bus common with the Utility's system, where the Generating Facility is designed to serve part of the Utility grid that has become or is purposefully separated from the rest of the grid.

Minimum Protective Devices, Relays, and Interconnection Requirements: The minimum required protective relaying and/or safety devices or requirements specified in this Document, are for the purpose of protecting only the Utility and its other customer facilities from damage or disruptions caused by a fault, malfunction, or improper operation of the Customer's Generating Facility. Minimum Protective Relaying and Interconnection Requirements do not include relaying, protective, or safety devices as may be required by industry and/or government codes and standards, equipment manufacturing and prudent engineering design and practice to fully protect the Customer's Generating Facility; those are the sole responsibility of the Customer.

NEMA: National Electrical Manufacturers Association. See www.nema.org.

NFPA: National Fire Protection Association. See www.nfpa.org.

Parallel System: The operation of a Generating Facility that is electrically interconnected to a bus common with the Utility's electric distribution system, either on a momentary or continuous basis.

Point of Interconnection: The physical location where the Utility's service conductors are connected to the Customer's service conductors to allow parallel operation of the Customer's Generating Facility with the Utility's electric distribution system.

Primary Network: An AC power distribution system that uses two or more dedicated primary voltage feeders, connected in parallel, to simultaneously supply power to one customer. The system includes automatic protective devices intended to isolate faulted primary feeders, while maintaining uninterrupted service to the customer served from the other primary feeder circuit(s).

Qualifying Facility ("QF"): Any cogeneration or small power production facility that meets the criteria for size, fuel use, efficiency, and ownership as promulgated in 18 CFR, Chapter I, Part 292, Subpart B of the Federal Energy Regulatory Commission's Regulations.

Radial Line: A distribution line that originates from a substation and is normally not connected to another substation or another circuit sharing the common supply of electric power.

Relay: An electric device that is designed to interpret input conditions in a prescribed manner and after specified conditions are met to respond to cause contact operation or similar abrupt change in associated electric control circuits.

Secondary Spot Network System: An AC power distribution system in which a Customer is simultaneously served from three-phase, four-wire low-voltage (typically 480V) circuits supplied by two or more network transformers whose low-voltage terminals are connected to the low-voltage circuits through network protectors. The low voltage circuits do not have ties to adjacent or nearby secondary network systems. The secondary spot network system has two or more high-voltage primary feeders. These primary feeders are either dedicated network feeders that serve only other network transformers, or a non-dedicated network feeder that serves radial transformers in addition to the network transformer(s), depending on network size and design. The system includes automatic protective devices and fuses intended to isolate faulted primary

feeders, network transformers, or low-voltage cable sections while maintaining uninterrupted service to the customers served from the low-voltage circuits.

Separate System: The operation of a Generating Facility that has no possibility of operating in parallel with the Utility's system.

Transmission System: Utility-owned high-voltage lines (69 kVa or higher) and associated equipment for the movement or transfer of electric energy between power plants and the distribution system.

UL: Underwriters Laboratories Inc. See www.ul.com.

Utility: An electric distribution company that constructs, operates, and maintains the electrical distribution system for the receipt and/or delivery of power.