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A Touchstone Energy ® Cooperative

INTERCONNECTION MANUAL AND APPLICATION FORMS

Last Reviewed: August 21, 2018
Last Updated: August 21, 2018

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ATTACHMENT 1:

INTRODUCTION

Last Reviewed: September 19, 2017
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Introduction

The purpose of this book is to assist interested parties in evaluating, determining the requirements for, and applying for the interconnection of generation facilities not owned by Y-W Electric Association, Inc. (Y-WEA) to Y-WEA's distribution and/or transmission facilities within Y-WEA's service territory. This book sets forth the policies of Y-WEA as to the interconnection of consumer-owned generation as well as the requirements and regulations that the consumer's interconnecting generation will be subject to. This book also covers the rates that will be charged and/or paid by Y-WEA for any distributed generation projects.

In addition, this book contains relevant sections of Federal and Colorado State laws and regulations that are applicable to power generation by renewable sources, including the generator's responsibilities and the utility's (in this case Y-WEA and TSGT) responsibilities. Additional information relating to interconnection to TSGT's or Y-WEA's systems may also be included from time to time.

Parties interested in interconnecting to either Y-WEA's or TSGT's electric power systems should first read "Attachment 2: Applicability of Requirements and Generator Interconnection Procedure" for information as to what parts of this book may apply to their project as well as a summary of what interconnection procedures are available and what may be expected of each procedure. Based on the size and type of the project, that section will direct interested parties to additional sections of this book that apply to their project and explain which parts of the Interconnection Application will need to be completed for their project.

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ATTACHMENT 2:

APPLICABILITY OF REQUIREMENTS AND GENERATOR INTERCONNECTION PROCEDURE

Last Reviewed: September 19, 2017
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APPLICABILITY OF REQUIREMENTS

The sections of this book are applicable to different sizes and types of projects as follows:

		Applies to:						
Attachment	Title	Up to 25 kW*	25 kW – 10 MVA*	Over 10 MVA*	Inverter-based	Other	Connected up to 600 VAC	Connected over 600 VAC
1	Introduction	●	●	●	●	●	●	●
2	Applicability of Requirements	●	●	●	●	●	●	●
3	Federal Regulations Regarding Qualifying Facilities		●	●	●	●	●	●
4	Colorado Statutes Regarding Net Metering	●			●	●	●	●
5	Y-WEA Rules and Regulations for Purchases from Qualifying Facilities	●			●	●	●	●
6	Tri-State Board of Directors Policy for Purchases from Small Renewable Resources		●	●	●	●	●	●
7	Tri-State Standards for Interconnection and Protection of Qualifying Facilities		●		●	●		●
8	Y-WEA Generation Interconnection Standard – Less than 25 kW	●			●	●	●	
9	Y-WEA Generation Interconnection Standard – Up to 10,000 kW	●	●		●	●	●	●
10	Y-WEA Generation Interconnection Standard – Greater than 10 MVA			●	●	●		●
11	Relevant Codes and Standards	●	●	●	●	●	●	●
12	Colorado PUC Rule 3667	●	●	●	●	●	●	●
13	Y-WEA Rules and Regulations for Net Metering and Medium Distributed Generation Metering	●	●		●	●	●	●
14	Pre-Application Interconnection Data Form	●	●	●	●	●	●	●
15	Y-WEA Tariff for Distribution and Transmission Wheeling Service		●	●	●	●		●
16	Application for Operation of Customer-Owned Generation		●	●	●	●	●	●
17	Short-Form Interconnection Application for Inverters up to 10 kW	●			●		●	
18	Sample Interconnection Agreements	●	●	●	●	●	●	●

* See individual sections for more specific size limit applicability than broken down here

GENERATOR INTERCONNECTION PROCEDURE

The Generator Interconnection Procedure (GIP) is applicable to all generators interconnecting to the Y-WEA transmission or distribution system and is subject in all respects to the Y-WEA Generation Interconnection Service Rate Schedule that is in effect at the time. Detailed procedures and forms of agreement for an interconnection request, studies, and an interconnection agreement are set forth in policy.

The following sections of this procedure detail the requirements for three types of generator interconnections: Inverter Fast-Track Interconnection Requests for inverter-based generators up to 10 kW, Fast Track Interconnection Requests for generators of any type up to 2 MW, and Standard Interconnection Requests for generators up to 10 MW or for requests that fail the expedited screening processes of the two fast-track procedures. Each section contains instructions, guidance, and recommendations for successfully completing an interconnection request in that category.

Generator Interconnection Procedure – Inverter Fast-Track Interconnection Requests

for Inverter-based Generators up to 10 kW in Capacity

Procedures for Requesting and Arranging Interconnection Services

Customers desiring interconnection service should contact the following at Y-WEA and request such services or information.

Contact Person:
Director of Member Services
Y-W Electric Association, Inc.
26862 US Hwy 34
P.O. Box Y
Akron, CO 80720
Office: (970) 345-2291
Fax: (970) 345-2154

Submit Applications to:
System Engineer
Y-W Electric Association, Inc.
26862 US Hwy 34
P.O. Box Y
Akron, CO 80720
Office: (970) 345-2291
Fax: (970) 345-2154

Recommended for Prospective Net-Metering Interconnections

Prior to entering into any agreement for generating system design and/or installation, Y-WEA *recommends* that the prospective interconnection customer submit the Pre-Application Interconnection Data Form (Attachment TBD) so that Y-WEA personnel can accurately and efficiently guide the interconnection customer through the application process. There is also an option to submit a $100 processing fee with this data form in order to receive basic engineering data on Y-WEA's system at the proposed interconnection location. This data can prove to be useful for distributed generation system designers in determining what type and size of equipment can be installed at the proposed location. This data will not be provided without the $100 processing fee. If the interconnection customer elects to pay this fee with the data form, the deposit required with the Interconnection Application (should the customer proceed through the process) will be reduced by $100.

Requirements for ALL Interconnection Applications

To initiate any interconnection request under Y-WEA's GIP, the interconnection customer *must* submit either personally or via U.S. Mail or another delivery service all required materials for the interconnection request to Y-WEA in a sealed envelope or box with "Interconnection Application" prominently marked in red on the outside of the package so that the interconnection request can be readily identified and expediently handled according to the time frames outlined in this GIP. *Electronic submittals of the initial application will not be accepted.* Electronic submittals (either by fax or by email) will accordingly be rejected. Once the initial application has been received in hardcopy form, follow-up submissions may be requested and accepted electronically on an individual basis, depending on the type of submission required. If any such supporting documentation, data, or certifications are necessary, the interconnection applicant will be notified of the need for such additional submissions and the acceptable submission format, whether electronic or original hardcopy. Failure to comply with these requirements will result in processing delays for which Y-WEA will not be held responsible.

Basics of Interconnection Service

1. Interconnection Application

2. Feasibility Study
3. System Impact Study
4. Facilities Study
5. Generation Interconnection Agreement (GIA)

Inverter Fast-Track Interconnection Request

To initiate an interconnection request for a generator up to 10 kW that is connected to the electric system through an inverter under the PUC Level 1 Ten kW Inverter Process (referred to as the Inverter Fast-Track process here), the interconnection customer must submit all of the following: (i) $700 deposit; and (ii) a completed application in the form supplied by Y-WEA in Attachment 17: Short-Form Interconnection Application for Inverter up to 10 kW, including all generator data, certification information, and insurance documentation. This application, together with all supporting documentation such as manufacturer's certifications, data sheets, design drawings, and any other information submitted, must be submitted in accordance with the instructions contained in the "Requirements for ALL Interconnection Applications" section above. If the interconnection customer provided a Pre-Application Interconnection Data Form with a $100 processing fee to receive basic system data, the deposit required with the Short-Form Interconnection Application is reduced to $600. Y-WEA will provide written acknowledgement within three days of the receipt of the application package and will provide notification either that the package is complete or of what information is missing within ten days of Y-WEA's receipt of the application package. Once the original hardcopy interconnection application is submitted, much of the follow-up communication may be carried out electronically, especially in cases where the interconnection applicant has a consultant or manufacturer's representative working on the project, so that communications may be handled between many parties in a more effective manner.

Because inverter-based generators up to 10 kW that are UL-1741 certified are generally straightforward to integrate into Y-WEA's distribution system, simplifying any studies to determine the impact on Y-WEA's system, and because Y-WEA will net-meter accounts onto which these generators are installed, simplifying arrangements for purchase and transport of the generator's output, the Inverter Fast-Track process essentially combines the typical Feasibility Study, System Impact Study, and Facilities Study that are performed with a standard interconnection request. Therefore, the Inverter Fast-Track process contains a set of "screens" or tests to examine that determine the suitability of Y-WEA's system to handle the generator interconnection. These screens are found in PUC Rule 3667, Section f, part IV. Y-WEA will perform the Inverter Fast-Track analysis within fifteen days of its determination that the application package is complete. Because this process is rather brief and straightforward, a queue of interconnection requests will not generally be applicable here. In the event, however, that a large number of Inverter Fast-Track interconnection requests are received at approximately the same time, they will be handled sequentially in the order in which they were received.

If the proposed interconnection passes all of the screens in this process, Y-WEA will approve the application, execute the self-contained agreement, and notify the interconnection customer of their authorization to proceed with installing the generator. After the interconnection customer installs the equipment and returns the certificate of completion to Y-WEA, Y-WEA may inspect and witness testing of the generator. Once the generator has passed testing, Y-WEA will notify the interconnection customer that they are authorized to interconnect the generator to and operate it in parallel with Y-WEA's distribution system.

Three items here warrant additional discussion. First, the application should be completed and submitted *before* the generating equipment is purchased and installed. The vast majority of Y-WEA's distribution feeders meet the Colorado PUC definition of "Highly Seasonal Circuits" because they serve large amounts of irrigation load which is not running for most of the year, resulting in very low load levels on these circuits during the winter. This means that those feeders have little capacity to accommodate distributed generation without making significant and expensive upgrades to the equipment that operates and protects the feeder. The need for any such changes automatically disqualifies an application from this fast-track process. The interconnection customer assumes significant financial risk by purchasing or installing generating equipment before an

interconnection has been studied and approved. Y-WEA will not take any responsibility for generating equipment purchased or installed at a location that fails the Inverter Fast-Track screens and is determined to be infeasible due to technical limitations at the installation location, or where the installed capacity of distributed generation would require feeder upgrades at a higher cost than the interconnection customer is willing or able to bear. As a result, potential interconnection customers are strongly cautioned against purchasing or installing any equipment before securing a completed and approved interconnection application. Second, either a certificate of insurance meeting the requirements of paragraph VII on page 6 of the short-form application paperwork or a letter from the insurance carrier indicating that they will furnish the same upon installation of the generator must be submitted before the application can be determined to be complete. Failure to submit this documentation *will delay* an application package. Failure to provide the certificate of insurance with the certificate of completion *will delay* the final approval and authorization to operate the interconnected generator. And finally, written documentation on the OSHA-approved Nationally Recognized Testing Laboratory that has certified the proposed interconnection equipment must be provided. Equipment must be certified by an OSHA-approved Nationally Recognized Testing Laboratory, and documentation listing the actual company that performed this certification is required. Unless the proposed equipment has really been listed with Underwriters Laboratories, simply stating that it is UL-1741 listed is *not* sufficient and *will cause a delay or rejection* of an application package.

Operation during Contingency, Disturbances, Major Maintenance or Emergency

Y-WEA, in its sole judgment may interrupt transmission or distribution service during contingencies, system disturbances, or emergency conditions on Y-WEA's transmission and distribution system. Emergency condition means a condition or situation: (1) that in the judgment of Y-WEA is imminently likely to endanger life or property; or (2) that in the case of Y-WEA, is imminently likely to cause a material adverse effect on the security of, or damage to the transmission or distribution system, Y-WEA's interconnection facilities or the transmission systems of others to which the transmission system is directly connected; (3) that, in the case of the interconnection customer, is imminently likely to cause a material adverse effect on the security of, or damage to, the generating facility or the interconnection customer's interconnection facilities. Y-WEA may in its sole judgment during system disturbances and power outages, temporarily reconfigure the transmission or distribution line to restore service to Y-WEA customers. Transmission or distribution service will be restored or reconfigured to a normal operating state as soon as reasonably practicable following removal of contingency, disturbance or emergency condition. Y-WEA will make reasonable efforts to schedule with the interconnection customer for service interruptions required for major system and equipment maintenance. There shall be no liability on the part of Y-WEA to any party for transmission and distribution services so interrupted.

The interconnection customer shall notify Y-WEA promptly when it becomes aware of an emergency condition that may reasonably be expected to affect Y-WEA's transmission or distribution system or any affected systems. To the extent information is known, the notification shall describe the emergency condition, the extent of the damage or deficiency, the expected effect on the operation of both parties' facilities and operations, its anticipated duration, and the necessary corrective action.

Routine Maintenance, Construction, and Repair

Y-WEA may interrupt interconnection service or curtail the output of the generating facility and temporarily disconnect the generating facility from Y-WEA's transmission or distribution system when necessary for routine maintenance, construction, and repairs on Y-WEA's transmission or distribution system. Y-WEA will use reasonable efforts to coordinate such reduction or temporary disconnection with the interconnection customer.

Forced Outages

During any forced outage, Y-WEA may suspend interconnection service to effect immediate repairs on Y-WEA's transmission or distribution system. To the extent Y-WEA receives advance notice, Y-WEA will use reasonable efforts to provide the Interconnection Customer with prior notice.

Adverse Operating Effects

Y-WEA will notify the Interconnection Customer as soon as practicable if, based on good utility practice, operation of the generating facility may cause disruption or deterioration of service to other customers served from the same electric system, or if operating the generating facility could cause damage to Y-WEA's transmission or distribution system or affected systems. If, after notice, the Interconnection Customer fails to remedy the adverse operating effect within a reasonable time, Y-WEA may disconnect the generating facility.

Reactive Power

The Interconnection Customer shall design and operate its generating facility to maintain a composite power delivery at continuous rated power output at the point of interconnection at a power factor within the range of 0.95 leading to 0.95 lagging.

Interconnection Standard

The Interconnection Customer shall design and operate its generating facility to comply with the Y-WEA Generation Interconnection Standard – 25 kW or Less Connected at Secondary Voltages, which is included as Attachment 8 of this interconnection manual. This standard specifies the codes that the installation must adhere to as well as any required special equipment, including a manual disconnect switch, that may not be part of a distributed generation manufacturer's typical offering.

Generator Interconnection Procedure –Fast-Track Interconnection Requests

for Inverter-based Generators between 10 kW and 2 MW in Capacity or for Any Other Generator up to 2 MW in Capacity

Procedures for Requesting and Arranging Interconnection Services

Customers desiring interconnection service should contact the following at Y-WEA and request such services or information.

Contact Person:
Director of Member Services
Y-W Electric Association, Inc.
26862 US Hwy 34
P.O. Box Y
Akron, CO 80720
Office: (970) 345-2291
Fax: (970) 345-2154

Submit Applications to:
System Engineer
Y-W Electric Association, Inc.
26862 US Hwy 34
P.O. Box Y
Akron, CO 80720
Office: (970) 345-2291
Fax: (970) 345-2154

Recommended for Prospective Net-Metering Interconnections, Required for all non Net-Metering Interconnections

Prior to entering into any agreement for generating system design and/or installation, Y-WEA *recommends* that the prospective net-metering interconnection customer submit the Pre-Application Interconnection Data Form (Attachment TBD) so that Y-WEA personnel can accurately and efficiently guide the interconnection customer through the application process. *This form is required for all installations not proposing net metering* (residential installations over 10 kW or commercial installations over 25 kW or other installations not planning to use net metering). There is also an option to submit a $100 processing fee with this data form in order to receive basic engineering data on Y-WEA's system at the proposed interconnection location. This data can prove to be useful for distributed generation system designers in determining what type and size of equipment can be installed at the proposed location. This data will not be provided without the $100 processing fee. If the interconnection customer elects to pay this fee with the data form, the deposit required with the Interconnection Application (should the customer proceed through the process) will be reduced by $100.

Requirements for ALL Interconnection Applications

To initiate any interconnection request under Y-WEA's GIP, the interconnection customer *must* submit either personally or via U.S. Mail or another delivery service all required materials for the interconnection request to Y-WEA in a sealed envelope or box with "Interconnection Application" prominently marked in red on the outside of the package so that the interconnection request can be readily identified and expediently handled according to the time frames outlined in this GIP. *Electronic submittals of the initial application will not be accepted.* Electronic submittals (either by fax or by email) will accordingly be rejected. Once the initial application has been received in hardcopy form, follow-up submissions may be requested and accepted electronically on an individual basis, depending on the type of submission required. If any such supporting documentation, data, or certifications are necessary, the interconnection applicant will be notified of the need for such additional submissions and the acceptable submission format, whether electronic or original hardcopy.

Failure to comply with these requirements will result in processing delays for which Y-WEA will not be held responsible.

Basics of Interconnection Service

1. Interconnection Application
2. Feasibility Study
3. System Impact Study
4. Facilities Study
5. Generation Interconnection Agreement (GIA)

Fast-Track Interconnection Request

To initiate an interconnection request for a generator up to 2 MW under the PUC Level 2 Fast-Track Process (referred to as the Fast-Track process here), the interconnection customer must submit all of the following: (i) $2,500 deposit for generators up to fifty kilowatts (50 kW) or $7500 for generators in excess of fifty kilowatts (50 kW); and (ii) a completed application in the form supplied by Y-WEA in Attachment 16: Application for Customer-Owned Generation, including all generator data and the purchaser of the generator's output energy; and (iii) demonstration of site control or an additional deposit of $1,250. Site control can be demonstrated by submitting to Y-WEA proof of deed or lease to the project site or contract with the land owners extending an exclusive option to purchase or lease the site to the interconnection customer. Either of the options for demonstration site control should be accompanied by a parcel description detailed enough for Y-WEA to ascertain project location and size. Deposits will be applied toward the cost of required interconnection reviews. $1,250 of the $2,500 deposit shall be non-refundable. The application, together with all supporting documentation such as manufacturer's certifications, data sheets, design drawings, and any other information submitted, must be submitted in accordance with the instructions contained in the "Requirements for ALL Interconnection Applications" section above. If the interconnection customer provided a Pre-Application Interconnection Data Form with a $100 processing fee to receive basic system data, the deposit required with the Application for Customer-Owned Generation is reduced to $2,400. Y-WEA will provide written acknowledgement within three days of the receipt of this application package and will provide notification either that the package is complete or of what information is missing within ten days of Y-WEA's receipt of the application package. Once the original hardcopy interconnection application is submitted, much of the follow-up communication may be carried out electronically, especially in cases where the interconnection applicant has a consultant or manufacturer's representative working on the project, so that communications may be handled between many parties in a more effective manner.

Under Colorado law, Y-WEA is required to accept net-metering interconnections for residential services on generators up to 10 kW in size or for commercial services on generators up to 25 kW in size as long as the generator and Y-WEA's facilities meet the technical evaluation "screens" established by the PUC in Rule 3667. Beyond these limits, Y-WEA is allowed to reject net-metering interconnections if they can result in technical problems or negative financial impacts to Y-WEA. Due to the cooperative nature of Y-WEA's business of providing electricity to its customer-owners, larger net-metering installations generally cause financial harm to Y-WEA's customer-owners other than the interconnection customer. This harm is a result of the need to collect the interconnection customer's fair share of the costs to operate and maintain Y-WEA's electric system that serves the interconnection customer from all of Y-WEA's other customer-owners because the net metering credits for larger installations tend to offset this portion of the interconnection customer's electric bill rather than just offsetting their usage. In most cases Y-WEA will reject net-metering interconnections larger than the thresholds in Colorado state law for this reason.

Because generators up to 2 MW are generally straightforward to evaluate for integration into Y-WEA's distribution system, simplifying any studies to determine the impact on Y-WEA's system, the Fast-Track process combines the typical Feasibility Study, System Impact Study, and Facilities Study that are performed with a standard interconnection request into one abbreviated review. Therefore, the Fast-Track process contains a set of "screens" or tests to examine that determine the suitability of Y-WEA's system to handle the generator

interconnection. These screens are found in PUC Rule 3667, Section c, part II. Y-WEA will perform the Fast-Track analysis within fifteen days of its receipt of the application package. This process, while more in-depth and time-consuming than the Inverter Fast-Track process, is still rather brief and straightforward; however, a queue of interconnection requests may develop for this type of interconnection request from time to time. In this event, the interconnection requests will be handled sequentially in the order in which they were received. If the queue length for this type of interconnection request precludes Y-WEA from carrying out the above analysis within the prescribed time period, Y-WEA will notify the interconnection customer of the delay and include an estimated time frame when the analysis can be expected to be completed.

If the proposed interconnection passes all of the screens in this process, Y-WEA will approve the application and forward the interconnection customer an executable interconnection agreement within five days of Y-WEA's determination that the interconnection request meets the Fast-Track process screens. The interconnection agreement will contain all the terms for installation and operation of the generator in parallel with Y-WEA's electric system. If the proposed interconnection does not pass the Fast-Track process screens, Y-WEA will, within five days of this determination, notify the interconnection customer of such determination and will invite the customer to a customer options meeting to discuss the path forward, which will generally involve converting the application to a standard interconnection request, as outlined below.

In the interest of advance disclosure, prospective interconnection customers for the Fast-Track process should be advised that the vast majority of Y-WEA's distribution circuits as well as some of Y-WEA's transmission circuits are "Highly Seasonal Circuits" with very low winter load levels, greatly reducing the amount of generation that can be accommodated on these circuits. This will significantly limit the number of interconnection requests for generators of significant size that will be quickly approved under the Fast-Track process. Many of these Fast-Track requests will ultimately need to be converted to standard interconnection requests.

Ancillary Services

For service other than Y-WEA net metering service, the interconnection customer shall be responsible for all ancillary services (i.e. scheduling etc.) in regard to the generation facility required by other interconnected entities, regulatory bodies or governing agencies. Y-WEA's entire distribution system is located in the Western Area Power Administration, Colorado Missouri (WACM) balancing authority control area. Y-WEA's distribution system is fed from a combination of WACM transmission lines and Tri-State Generation & Transmission Association (TSGT) transmission lines. Any distributed generation resources will be subject to WACM and TSGT rules and regulations as far as ancillary services, metering requirements, and transmission system impact mitigation.

Operation during Contingency, Disturbances, Major Maintenance or Emergency

Y-WEA, in its sole judgment may interrupt transmission or distribution service during contingencies, system disturbances, or emergency conditions on Y-WEA's transmission and distribution system. Emergency condition means a condition or situation: (1) that in the judgment of Y-WEA is imminently likely to endanger life or property; or (2) that in the case of Y-WEA, is imminently likely to cause a material adverse effect on the security of, or damage to the transmission or distribution system, Y-WEA's interconnection facilities or the transmission systems of others to which the transmission system is directly connected; (3) that, in the case of the interconnection customer, is imminently likely to cause a material adverse effect on the security of, or damage to, the generating facility or the interconnection customer's interconnection facilities. Y-WEA may in its sole judgment during system disturbances and power outages, temporarily reconfigure the transmission or distribution line to restore service to Y-WEA customers. Transmission or distribution service will be restored or reconfigured to a normal operating state as soon as reasonably practicable following removal of contingency, disturbance or emergency condition. Y-WEA will make reasonable efforts to schedule with the interconnection customer for service interruptions required for major system and equipment maintenance. There shall be no liability on the part of Y-WEA to any party for transmission and distribution services so interrupted.

The interconnection customer shall notify Y-WEA promptly when it becomes aware of an emergency condition that may reasonably be expected to affect Y-WEA's transmission or distribution system or any affected systems. To the extent information is known, the notification shall describe the emergency condition, the extent of the damage or deficiency, the expected effect on the operation of both parties' facilities and operations, its anticipated duration, and the necessary corrective action.

Routine Maintenance, Construction, and Repair

Y-WEA may interrupt interconnection service or curtail the output of the generating facility and temporarily disconnect the generating facility from Y-WEA's transmission or distribution system when necessary for routine maintenance, construction, and repairs on Y-WEA's transmission or distribution system. Y-WEA will use reasonable efforts to coordinate such reduction or temporary disconnection with the interconnection customer.

Forced Outages

During any forced outage, Y-WEA may suspend interconnection service to effect immediate repairs on Y-WEA's transmission or distribution system. To the extent Y-WEA receives advance notice, Y-WEA will use reasonable efforts to provide the Interconnection Customer with prior notice.

Adverse Operating Effects

Y-WEA will notify the Interconnection Customer as soon as practicable if, based on good utility practice, operation of the generating facility may cause disruption or deterioration of service to other customers served from the same electric system, or if operating the generating facility could cause damage to Y-WEA's transmission or distribution system or affected systems. If, after notice, the Interconnection Customer fails to remedy the adverse operating effect within a reasonable time, Y-WEA may disconnect the generating facility.

Reactive Power

The Interconnection Customer shall design and operate its generating facility to maintain a composite power delivery at continuous rated power output at the point of interconnection at a power factor within the range of 0.95 leading to 0.95 lagging.

Interconnection Standard

The Interconnection Customer shall design and operate its generating facility to comply with either the Y-WEA Generation Interconnection Standard – 25 kW or Less Connected at Secondary Voltages (included as Attachment 8 of this interconnection manual) or the Y-WEA Generation Interconnection Standard – Up To 10,000 kW Connected at Any Voltage (included as Attachment 9 of this interconnection manual), whichever pertains to the capacity of the proposed distributed generation equipment. This standard specifies the codes that the installation must adhere to as well as any required special equipment, including a manual disconnect switch and protection equipment, that may not be part of a distributed generation manufacturer's typical offering.

Generator Interconnection Procedure –Standard Interconnection Requests

for Generators between 2 MW and 10 MW in Capacity or for Fast-Track Requests that Failed Screening

Procedures for Requesting and Arranging Interconnection Services

Customers desiring interconnection service should contact the following at Y-WEA and request such services or information.

Contact Person:
Director of Member Services
Y-W Electric Association, Inc.
26862 US Hwy 34
P.O. Box Y
Akron, CO 80720
Office: (970) 345-2291
Fax: (970) 345-2154

Submit Applications to:
System Engineer
Y-W Electric Association, Inc.
26862 US Hwy 34
P.O. Box Y
Akron, CO 80720
Office: (970) 345-2291
Fax: (970) 345-2154

Required for ALL non Net-Metering Interconnections

Y-WEA requires that the Pre-Application Interconnection Data Form (Attachment TBD) be submitted prior to initiating the application process for all prospective interconnection requests falling under the Standard Interconnection Request procedure so that Y-WEA personnel can accurately and efficiently guide the interconnection customer through the application process. There is also an option to submit a $100 processing fee with this data form in order to receive basic engineering data on Y-WEA's system at the proposed interconnection location. This data can prove to be useful for distributed generation system designers in determining what type and size of equipment can be installed at the proposed location. This data will not be provided without the $100 processing fee. If the interconnection customer elects to pay this fee with the data form, the deposit required with the Interconnection Application (should the customer proceed through the process) will be reduced by $100.

Requirements for ALL Interconnection Applications

To initiate any interconnection request under Y-WEA's GIP, the interconnection customer ***must*** submit either personally or via U.S. Mail or another delivery service all required materials for the interconnection request to Y-WEA in a sealed envelope or box with "Interconnection Application" prominently marked in red on the outside of the package so that the interconnection request can be readily identified and expediently handled according to the time frames outlined in this GIP. ***Electronic submittals of the initial application will not be accepted.*** Electronic submittals (either by fax or by email) will accordingly be rejected. Once the initial application has been received in hardcopy form, follow-up submissions may be requested and accepted electronically on an individual basis, depending on the type of submission required. If any such supporting documentation, data, or certifications are necessary, the interconnection applicant will be notified of the need for such additional submissions and the acceptable submission format, whether electronic or original hardcopy. Failure to comply with these requirements will result in processing delays for which Y-WEA will not be held responsible.

Basics of Interconnection Service

1. Interconnection Application
2. Feasibility Study
3. System Impact Study
4. Facilities Study
5. Generation Interconnection Agreement (GIA)

Standard Interconnection Request

To initiate an interconnection request for generation larger than 2 MW or for generation that failed the Inverter Fast-Track process or the Fast-Track process, the interconnection customer must submit all of the following: (i) a $10,000 deposit; (ii) a completed application in the form supplied by Y-WEA in either Attachment 16 or Attachment 17 of this manual, depending upon the size and type of generator interconnection desired; and (iii) demonstration of site control or an additional deposit of $10,000. Site control can be demonstrated by submitting to Y-WEA proof of deed or lease to the project site or a letter from land owners stating that the interconnection customer has development rights to the site. Either of the options for demonstration site control should be accompanied by a parcel description detailed enough for Y-WEA to ascertain project location and size. Deposits will be applied toward the cost of required interconnection studies. The application, together with all supporting documentation such as manufacturer's certifications, data sheets, design drawings, and any other information submitted, must be submitted in accordance with the instructions contained in the "Requirements for ALL Interconnection Applications" section above. $5,000 of the $10,000 deposit shall be non-refundable. If the interconnection customer provided a Pre-Application Interconnection Data Form with a $100 processing fee to receive basic system data, the deposit required with the Interconnection Application is reduced to $9,900. Within three days of Y-WEA's receipt of Interconnection Application and deposit, Y-WEA will provide written acknowledgement of the interconnection request, identify any deficiencies, and arrange to hold a scoping meeting with the customer in a reasonable time frame.

Under Colorado law, Y-WEA is required to accept net-metering interconnections for residential services on generators up to 10 kW in size or for commercial services on generators up to 25 kW in size as long as the generator and Y-WEA's facilities meet the technical evaluation "screens" established by the PUC in Rule 3667. Beyond these limits, Y-WEA is allowed to reject net-metering interconnections if they can result in technical problems or negative financial impacts to Y-WEA. Due to the cooperative nature of Y-WEA's business of providing electricity to its customer-owners, larger net-metering installations generally cause financial harm to Y-WEA's customer-owners other than the interconnection customer. This harm is a result of the need to collect the interconnection customer's fair share of the costs to operate and maintain Y-WEA's electric system that serves the interconnection customer from all of Y-WEA's other customer-owners because the net metering credits for larger installations tend to offset this portion of the interconnection customer's electric bill rather than just offsetting their usage. In most cases Y-WEA will reject net-metering interconnections larger than the thresholds in Colorado state law for this reason. Also of note is that Y-WEA is not obligated to provide interconnection and wheeling service to any market-based generating facility for power export off Y-WEA's system. Such requests will generally be denied because Y-WEA is not in the business of power transmission, but rather is in the business of distributing electricity to end-users only.

Queue Position

Y-WEA will maintain a listing of all generator interconnection requests at its corporate offices in Akron, Colorado. The listing will include all of the pertinent data concerning the interconnection request, including the status of each interconnection request. Y-WEA will identify Y-WEA generation interconnection projects, but will not disclose the identity of any third party interconnection requests. Y-WEA will not post notices of all meetings held to discuss matters pertaining to its own generation interconnection projects, nor will Y-WEA provide a transcript of those meetings to third parties. Y-WEA will assign a queue position based upon the date and time of receipt of the valid interconnection request. The queue position will be used to determine the order

of performing the interconnection studies and determination of cost responsibility for the transmission facilities necessary to accommodate the interconnection request.

Withdrawal of an Interconnection Request

The interconnection customer may withdraw its request at any time. If the interconnection customer fails to adhere to the Y-WEA generation interconnection procedure requirements, such as submittal of necessary information to conduct the studies, Y-WEA will deem the interconnection request to have been withdrawn. Any deposit associated with the interconnection request as described above in excess of the cost to perform the interconnection studies up to the date of withdrawal and in excess of the non-refundable portion, will be refunded. The interconnection request will be removed from the queue.

Request Completeness/Bona Fide Request:

Any request for interconnection services shall contain the information specified below, to be reviewed by Y-WEA in order to determine if it is a bona fide request:

(a) Identity of requesting entity.

(b) Interconnection Service Types:

i. Transmission System Interconnection Service
ii. Distribution Interconnection Service
iii. Transmission Network Resource Interconnection Service
iv. Distribution Network Resource Interconnection Service

(c) If Transmission or Distribution System Interconnection Service, point of delivery and point of receipt shall be furnished.

(d) Requested transmission service beginning date and termination date, if applicable.

Upon Y-WEA's determination that a request submitted is complete and is a bona fide request for interconnection service, such request shall be logged with respect to the date, requester, and nature of the request.

Response to Complete/Bona Fide Requests: Feasibility Study

Following receipt of an interconnection request that meets the criteria specified above, such request shall be judged by Y-WEA to be a bona fide request for interconnection service. Y-WEA shall notify interconnection requester as soon as practicable after submission of its request and deposit and Y-WEA's determination that the request is complete and a bona fide request, to inform the interconnection service requester if the requested service can be provided without performance of an Interconnection Feasibility Study or if such a study is necessary to evaluate the impact of the requester's project upon Y-WEA's transmission or distribution system. Upon determination by Y-WEA that a Feasibility Study is required, the interconnection customer will be required to execute an Interconnection Feasibility Study Agreement. Y-WEA shall perform the analysis to identify the availability of transmission or distribution capacity to support Y-WEA's ability to provide the requested interconnection service. The Feasibility Study will identify potential adverse system impacts and contain the following: (1) analysis of fault interruption equipment limit exceedance, (2) thermal overload and voltage limit violations under both system intact and contingency conditions, (3) review of grounding requirements and, (4) preliminary cost estimate to interconnect and correct adverse impacts. Y-WEA may at its option elect to forgo a Feasibility Study for a single specific interconnection request. A final written report will be provided to the interconnection customer. Y-WEA will make its best efforts to complete the Feasibility Study in a reasonable time frame.

Response to Complete/Bona Fide Requests: System Impact Study

After receiving a bona fide request for interconnection service, and based on the results of the Feasibility Study, if any, Y-WEA shall determine on a non-discriminatory basis whether or not a System Impact Study is required to respond to such request. If Y-WEA determines that there is inadequate capacity in its transmission or

distribution system to accommodate the requested service, Y-WEA shall inform the requester of the need for a System Impact Study. If the requester does not desire to withdraw the interconnection request, Y-WEA will provide a non-binding, good faith estimate of the cost and time frame to complete the System Impact Study.

Y-WEA will provide the interconnection customer an Interconnection System Impact Study Agreement. The interconnection customer must execute the agreement, and provide the following: (i) a $25,000 deposit and (ii) demonstration of site control as defined in the Y-WEA interconnection procedure. Such deposits will be applied toward the cost of the required interconnection study. The interconnection customer will be responsible for the actual cost to perform the study. The Interconnection Customer must pay any study costs that exceed the deposit without interest within 30 calendar days on receipt of the invoice or resolution of any dispute. If the deposit exceeds the invoiced fees, Y-WEA shall refund such excess within 30 calendar days of the invoice without interest.

The System Impact Study will evaluate the impact of the proposed generator interconnection on the reliability of the transmission or distribution system. A transmission System Impact Study shall consist of a short circuit analysis, a stability analysis, a power flow analysis, voltage drop and flicker studies, protection and set point coordination studies, and grounding reviews as necessary. A System Impact Study shall state the assumptions upon which it is based, state the results of the analyses, and provide the requirement or potential impediments to providing the requested interconnection service, including a preliminary indication of the cost and length of time that would be necessary to correct any problems identified in those analyses and implement the interconnection. A System Impact Study shall provide a list of facilities that are required as a result of the Interconnection Request and non-binding good faith estimates of cost responsibility and time to construct.

A distribution System Impact Study shall include a distribution load flow study, an analysis of equipment interrupting ratings, protection coordination study, voltage drop and flicker studies, protection and set point coordination studies, grounding reviews and the impact on electric system operation, as necessary.

A final written report will be provided to the interconnection customer. Y-WEA will make its best efforts to complete the System Impact Study in a reasonable time frame.

Interconnection Facilities Study

Upon completion of the System Impact Study, if the interconnection requester desires to continue with the Interconnection Request, Y-WEA will provide to the interconnection customer an Interconnection Facilities Study Agreement in the form provided by Y-WEA. The interconnection customer must execute the agreement, provide all the required technical data, and submit a deposit of $50,000. Such deposits will be applied toward the cost of the required interconnection study. The interconnection customer will be responsible for the actual cost to perform the study. The interconnection customer must pay any study costs that exceed the deposit without interest within 30 calendar days on receipt of the invoice or resolution of any dispute. If the deposit exceeds the invoiced fees, Y-WEA shall refund such excess within 30 calendar days of the invoice without interest. Y-WEA will provide the interconnection customer a non-binding, good faith estimate of the cost and time frame to complete the Facilities Study.

The Facilities Study shall specify and estimate the cost of the equipment, engineering, procurement and construction work (including overY-WEAds) needed to implement the conclusions of system impact studies. The Facilities Study shall also identify (1) the electrical system configuration of equipment, including without limitation, transformer, switchgear, meters, and other equipment, (2) the nature and estimated cost of Y-WEA's interconnection facilities and upgrades necessary to accomplish the interconnection and (3) an estimate of the time required to complete the construction and installation of such facilities.

Confirmed Interconnection Service

If Y-WEA (i) receives a bona fide request for interconnection service, (ii) determines through analysis of interconnection studies it has sufficient transmission or distribution capacity available to allow it to provide said

requested service and (iii) commits the requested transmission or distribution capacity to the requestor, then Y-WEA shall confirm the interconnection service reservation in writing. Interconnection requestor shall accept in writing an approved interconnection request within 30 days. If the requestor does not accept the approved interconnection request within the required time limit, the interconnection approval may be retracted by Y-WEA.

Upon acceptance of the approved interconnection request, the requester shall then receive and pay for the requested service in accordance with the Generation Interconnection Agreement and the Generation Interconnection Service Rate Schedule. Y-WEA will provide to the interconnection customer a written instrument to be executed by both parties setting forth any terms, provisions, and conditions governing a transmission or distribution capacity reservation.

The interconnection customer must execute the Generation Interconnection Agreement and show reasonable evidence that certain milestones as described by Y-WEA, toward the development of the generating facility have been met by the interconnection customer. The Generation Interconnection Agreement will identify the interconnection facilities which include both the Y-WEA-owned interconnection facilities and customer-owned interconnection facilities. Customer-owned interconnection facilities mean all facilities and equipment that are located between the generator and the point of change of ownership between Y-WEA and the interconnection customer. The interconnection customer will be responsible at its expense, to obtain regulatory approvals and permits, design, procure, construct, and operate and maintain all of the customer-owned interconnection facilities, subject to the approval of Y-WEA.

Y-WEA-owned interconnection facilities mean all facilities and equipment from the point of change of ownership to the point of interconnection to Y-WEA's transmission or distribution system. Interconnection facilities are sole-use facilities that must be paid for by the interconnection customer.

The Generation Interconnection Agreement will also identify system upgrades which mean additions, modifications and upgrades to Y-WEA's transmission or distribution system required at or beyond the point of interconnection. The cost of the system upgrades must be paid for by the interconnection customer.

The interconnection customer will be required to submit to Y-WEA a construction deposit in an amount determined by Y-WEA and dependent on the scope of the project before Y-WEA will initiate the planning, design and equipment procurement for the interconnection facilities or system upgrades required by the project. The construction deposit will be used to pay for the initial planning, design and equipment procurement costs for the Y-WEA interconnection facilities and system upgrades. Payment terms by the interconnection customer for the Y-WEA-owned interconnection facilities and system upgrades will be specified in the Generation Interconnection Agreement. Y-WEA will make reasonable efforts to complete the construction of the Y-WEA-owned interconnection facilities and system upgrades in accordance with the schedule identified in the agreement, but Y-WEA will not provide liquidated damage payments.

The Generation Interconnection Agreement will specify or reference required operating procedures and applicable standards to which the interconnecting customer must adhere to ensure the safe and reliable operation of Y-WEA's transmission and distribution system.

Unreserved Use of Transmission or Distribution Capacity

The terms of Y-WEA's current Generation Interconnection Service Rate Schedule shall govern adjustments, if any, which are greater than the maximum capacity specified in the interconnection service agreement. Y-WEA will assess a charge for unreserved use of transmission or distribution capacity at a rate equal to 150% of the maximum allowable rate for the service. The charge will be applied to use in excess of the reservation amount which shall be the difference between the maximum monthly integrated half hour amount of transmission or distribution capacity actually used by the customer less the amount of transmission or distribution capacity the customer has reserved. In addition, any unreserved transmission use fees assessed against Y-WEA by area

transmission system operators, when caused by an interconnection customer's incorrectly-served generating facility, will be passed through to the interconnection customer at a rate of the actual assessed penalty plus a 10% administrative service fee.

Loss Compensation

For service other than Y-WEA network interconnection service, Y-WEA shall calculate an appropriate loss factor to be used to compensate Y-WEA for transmission or distribution line and equipment losses beyond the point of interconnection.

Ancillary Services

For service other than Y-WEA net metering service, the interconnection customer shall be responsible for all ancillary services (i.e. scheduling etc.) in regard to the generation facility required by other interconnected entities, regulatory bodies or governing agencies. Y-WEA's entire distribution system is located in the Western Area Power Administration, Colorado Missouri (WACM) balancing authority control area. Y-WEA's distribution system is fed from a combination of WACM transmission lines and Tri-State Generation & Transmission Association (TSGT) transmission lines. Any distributed generation resources will be subject to WACM and TSGT rules and regulations as far as ancillary services, metering requirements, and transmission system impact mitigation.

Operation during Contingency, Disturbances, Major Maintenance or Emergency

Y-WEA, in its sole judgment may interrupt transmission or distribution service during contingencies, system disturbances, or emergency conditions on Y-WEA's transmission and distribution system. Emergency condition means a condition or situation: (1) that in the judgment of Y-WEA is imminently likely to endanger life or property; or (2) that in the case of Y-WEA, is imminently likely to cause a material adverse effect on the security of, or damage to the transmission or distribution system, Y-WEA's interconnection facilities or the transmission systems of others to which the transmission system is directly connected; (3) that, in the case of the interconnection customer, is imminently likely to cause a material adverse effect on the security of, or damage to, the generating facility or the interconnection customer's interconnection facilities. Y-WEA may in its sole judgment during system disturbances and power outages, temporarily reconfigure the transmission or distribution line to restore service to Y-WEA customers. Transmission or distribution service will be restored or reconfigured to a normal operating state as soon as reasonably practicable following removal of contingency, disturbance or emergency condition. Y-WEA will make reasonable efforts to schedule with the interconnection customer for service interruptions required for major system and equipment maintenance. There shall be no liability on the part of Y-WEA to any party for transmission and distribution services so interrupted.

The interconnection customer shall notify Y-WEA promptly when it becomes aware of an emergency condition that may reasonably be expected to affect Y-WEA's transmission or distribution system or any affected systems. To the extent information is known, the notification shall describe the emergency condition, the extent of the damage or deficiency, the expected effect on the operation of both parties' facilities and operations, its anticipated duration, and the necessary corrective action.

Routine Maintenance, Construction, and Repair

Y-WEA may interrupt interconnection service or curtail the output of the generating facility and temporarily disconnect the generating facility from Y-WEA's transmission or distribution system when necessary for routine maintenance, construction, and repairs on Y-WEA's transmission or distribution system. Y-WEA will use reasonable efforts to coordinate such reduction or temporary disconnection with the interconnection customer.

Forced Outages

During any forced outage, Y-WEA may suspend interconnection service to effect immediate repairs on Y-WEA's transmission or distribution system. To the extent Y-WEA receives advance notice, Y-WEA will use reasonable efforts to provide the Interconnection Customer with prior notice.

Adverse Operating Effects

Y-WEA will notify the Interconnection Customer as soon as practicable if, based on good utility practice, operation of the generating facility may cause disruption or deterioration of service to other customers served from the same electric system, or if operating the generating facility could cause damage to Y-WEA's transmission or distribution system or affected systems. If, after notice, the Interconnection Customer fails to remedy the adverse operating effect within a reasonable time, Y-WEA may disconnect the generating facility.

Reactive Power

The Interconnection Customer shall design and operate its generating facility to maintain a composite power delivery at continuous rated power output at the point of interconnection at a power factor within the range of 0.95 leading to 0.95 lagging.

Interconnection Standard

The Interconnection Customer shall design and operate its generating facility to comply with the Y-WEA Generation Interconnection Standard – 25 kW or Less Connected at Secondary Voltages (included as Attachment 8 of this interconnection manual), the Y-WEA Generation Interconnection Standard – Up To 10,000 kW Connected at Any Voltage (included as Attachment 9 of this interconnection manual), or the Y-WEA Generation Interconnection Standard – Greater than 10 MVA (included as Attachment 10 of this interconnection manual), whichever pertains to the capacity of the proposed distributed generation equipment. This standard specifies the codes that the installation must adhere to as well as any required special equipment, including a manual disconnect switch and protection equipment, that may not be part of a distributed generation manufacturer's typical offering.

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ATTACHMENT 3:

FEDERAL REQUIREMENTS REGARDING QUALIFYING FACILITIES

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Title 18: Conservation of Power and Water Resources

PART 292—REGULATIONS UNDER SECTIONS 201 AND 210 OF THE PUBLIC UTILITY REGULATORY POLICIES ACT OF 1978 WITH REGARD TO SMALL POWER PRODUCTION AND COGENERATION

Contents

AUTHORITY: 16 U.S.C. 791a-825r, 2601-2645; 31 U.S.C. 9701; 42 U.S.C. 7101-7352.

Subpart A—General Provisions

§292.101 Definitions.

(a) *General rule.* Terms defined in the Public Utility Regulatory Policies Act of 1978 (PURPA) shall have the same meaning for purposes of this part as they have under PURPA, unless further defined in this part.

(b) *Definitions.* The following definitions apply for purposes of this part.

(1) *Qualifying facility* means a cogeneration facility or a small power production facility that is a qualifying facility under Subpart B of this part.

(i) A qualifying facility may include transmission lines and other equipment used for interconnection purposes (including transformers and switchyard equipment), if:

(A) Such lines and equipment are used to supply power output to directly and indirectly interconnected electric utilities, and to end users, including thermal hosts, in accordance with state law; or

(B) Such lines and equipment are used to transmit supplementary, standby, maintenance and backup power to the qualifying facility, including its thermal host meeting the criteria set forth in *Union Carbide Corporation,* 48 FERC ¶61,130, *reh'g denied,* 49 FERC ¶61,209 (1989), *aff'd sub nom., Gulf States Utilities Company* v. *FERC,* 922 F.2d 873 (D.C. Cir. 1991); or

(C) If such lines and equipment are used to transmit power from other qualifying facilities or to transmit standby, maintenance, supplementary and backup power to other qualifying facilities.

(ii) The construction and ownership of such lines and equipment shall be subject to any applicable Federal, state, and local siting and environmental requirements.

(2) *Purchase* means the purchase of electric energy or capacity or both from a qualifying facility by an electric utility.

(3) *Sale* means the sale of electric energy or capacity or both by an electric utility to a qualifying facility.

(4) *System emergency* means a condition on a utility's system which is likely to result in imminent significant disruption of service to customers or is imminently likely to endanger life or property.

(5) *Rate* means any price, rate, charge, or classification made, demanded, observed or received with respect to the sale or purchase of electric energy or capacity, or any rule, regulation, or practice respecting any such rate, charge, or classification, and any contract pertaining to the sale or purchase of electric energy or capacity.

(6) *Avoided costs* means the incremental costs to an electric utility of electric energy or capacity or both which, but for the purchase from the qualifying facility or qualifying facilities, such utility would generate itself or purchase from another source.

(7) *Interconnection costs* means the reasonable costs of connection, switching, metering, transmission, distribution, safety provisions and administrative costs incurred by the electric utility directly related to the installation and maintenance of the physical facilities necessary to permit interconnected operations with a qualifying facility, to the extent such costs are in excess of the corresponding costs which the electric utility would have incurred if it had not engaged in interconnected operations, but instead generated an equivalent amount of electric energy itself or purchased an equivalent amount of electric energy or capacity from other sources. Interconnection costs do not include any costs included in the calculation of avoided costs.

(8) *Supplementary power* means electric energy or capacity supplied by an electric utility, regularly used by a qualifying facility in addition to that which the facility generates itself.

(9) *Back-up power* means electric energy or capacity supplied by an electric utility to replace energy ordinarily generated by a facility's own generation equipment during an unscheduled outage of the facility.

(10) *Interruptible power* means electric energy or capacity supplied by an electric utility subject to interruption by the electric utility under specified conditions.

(11) *Maintenance power* means electric energy or capacity supplied by an electric utility during scheduled outages of the qualifying facility.

(Public Utility Regulatory Policies Act of 1978, 16 U.S.C. 2601 *et seq.,* Energy Supply and Environmental Coordination Act, 15 U.S.C. 791 *et seq.* Federal Power Act, 16 U.S.C. 792 *et seq.,* Department of Energy Organization Act, 42 U.S.C. 7101 *et seq.,* E.O. 12009, 42 FR 46267)

[45 FR 12233, Feb. 25, 1980, as amended by Order 575, 60 FR 4856, Jan. 25, 1995]

Subpart B—Qualifying Cogeneration and Small Power Production Facilities

AUTHORITY: Public Utility Regulatory Policies Act of 1978, (16 U.S.C. 2601, *et seq.*), Energy Supply and Environmental Coordination Act, (15 U.S.C. 791 *et seq.*), Federal Power Act, as amended, (16 U.S.C. 792, *et seq.*), Department of Energy Organization Act, (42 U.S.C. 7101 *et seq.*), E.O. 12009, 42 FR 46267, Natural Gas Policy Act of 1978, (15 U.S.C. 3301, *et seq.*).

§292.201 Scope.

This subpart applies to the criteria for and manner of becoming a qualifying small power production facility and a qualifying cogeneration facility under sections 3(17)(C) and 3(18)(B), respectively, of the Federal Power Act, as amended by section 201 of the Public Utility Regulatory Policies Act of 1978 (PURPA).

[45 FR 17972, Mar. 20, 1980]

§292.202 Definitions.

For purposes of this subpart:

(a) *Biomass* means any organic material not derived from fossil fuels;

(b) *Waste* means an energy input that is listed below in this subsection, or any energy input that has little or no current commercial value and exists in the absence of the qualifying facility industry. Should a waste energy input acquire commercial value after a facility is qualified by way of Commission certification pursuant to §292.207(b), or self-certification pursuant to §292.207(a), the facility will not lose its qualifying status for that reason. *Waste* includes, but is not limited to, the following materials that the Commission previously has approved as waste:

(1) Anthracite culm produced prior to July 23, 1985;

(2) Anthracite refuse that has an average heat content of 6,000 Btu or less per pound and has an average ash content of 45 percent or more;

(3) Bituminous coal refuse that has an average heat content of 9,500 Btu per pound or less and has an average ash content of 25 percent or more;

(4) Top or bottom subbituminous coal produced on Federal lands or on Indian lands that has been determined to be waste by the United States Department of the Interior's Bureau of Land Management (BLM) or that is located on non-Federal or non-Indian lands outside of BLM's jurisdiction, provided that the applicant shows that the latter coal is an extension of that determined by BLM to be waste.

(5) Coal refuse produced on Federal lands or on Indian lands that has been determined to be waste by the BLM or that is located on non-Federal or non-Indian lands outside of BLM's jurisdiction, provided that applicant shows that the latter is an extension of that determined by BLM to be waste.

(6) Lignite produced in association with the production of montan wax and lignite that becomes exposed as a result of such a mining operation;

(7) Gaseous fuels, except:

(i) Synthetic gas from coal; and

(ii) Natural gas from gas and oil wells unless the natural gas meets the requirements of §2.400 of this chapter;

(8) Petroleum coke;

(9) Materials that a government agency has certified for disposal by combustion;

(10) Residual heat;

(11) Heat from exothermic reactions;

(12) Used rubber tires;

(13) Plastic materials; and

(14) Refinery off-gas.

(c) *Cogeneration facility* means equipment used to produce electric energy and forms of useful thermal energy (such as heat or steam), used for industrial, commercial, heating, or cooling purposes, through the sequential use of energy;

(d) *Topping-cycle cogeneration facility* means a cogeneration facility in which the energy input to the facility is first used to produce useful power output, and at least some of the reject heat from the power production process is then used to provide useful thermal energy;

(e) *Bottoming-cycle cogeneration facility* means a cogeneration facility in which the energy input to the system is first applied to a useful thermal energy application or process, and at least some of the reject heat emerging from the application or process is then used for power production;

(f) *Supplementary firing* means an energy input to the cogeneration facility used only in the thermal process of a topping-cycle cogeneration facility, or only in the electric generating process of a bottoming-cycle cogeneration facility;

(g) *Useful power output* of a cogeneration facility means the electric or mechanical energy made available for use, exclusive of any such energy used in the power production process;

(h) *Useful thermal energy output* of a topping-cycle cogeneration facility means the thermal energy:

(1) That is made available to an industrial or commercial process (net of any heat contained in condensate return and/or makeup water);

(2) That is used in a heating application (*e.g.,* space heating, domestic hot water heating); or

(3) That is used in a space cooling application (*i.e.,* thermal energy used by an absorption chiller).

(i) *Total energy output* of a topping-cycle cogeneration facility is the sum of the useful power output and useful thermal energy output;

(j) *Total energy input* means the total energy of all forms supplied from external sources;

(k) *Natural gas* means either natural gas unmixed, or any mixture of natural gas and artificial gas;

(l) *Oil* means crude oil, residual fuel oil, natural gas liquids, or any refined petroleum products; and

(m) Energy input in the case of energy in the form of natural gas or oil is to be measured by the lower heating value of the natural gas or oil.

(n) *Electric utility holding company* means a holding company, as defined in section 2(a)(7) of the Public Utility Holding Company Act of 1935, 15 U.S.C. 79b(a)(7) which owns one or more electric utilities, as defined in section 2(a)(3) of that Act, 15 U.S.C. 79b(a)(3), but does not include any holding company which is exempt by rule or order adopted or issued pursuant to sections 3(a)(3) or 3(a)(5) of the Public Utility Holding Company Act of 1935, 15 U.S.C. 79c(a)(3) or 79c(a)(5).

(o) *Utility geothermal small power production facility* means a small power production facility which uses geothermal energy as the primary energy resource and of which more than 50 percent is owned either:

(1) By an electric utility or utilities, electric utility holding company or companies, or any combination thereof.

(2) By any company 50 percent or more of the outstanding voting securities of which of which are directly or indirectly owned, controlled, or held with power to vote by an electric utility, electric utility holding company, or any combination thereof.

(p) *New dam or diversion* means a dam or diversion which requires, for the purposes of installing any hydroelectric power project, any construction, or enlargement of any impoundment or diversion structure (other than repairs or reconstruction or the addition of flashboards of similar adjustable devices);

(q) *Substantial adverse effect on the environment* means a substantial alteration in the existing or potential use of, or a loss of, natural features, existing habitat, recreational uses, water quality, or other environmental resources. Substantial alteration of particular resource includes a change in the environment that substantially reduces the quality of the affected resources; and

(r) *Commitment of substantial monetary resources* means the expenditure of, or commitment to expend, at least 50 percent of the total cost of preparing an application for license or exemption for a hydroelectric project that is accepted for filing by the Commission pursuant to §4.32(e) of this chapter. The total cost includes (but is not limited to) the cost of agency consultation, environmental studies, and engineering studies conducted pursuant to §4.38 of this chapter, and the Commission's requirements for filing an application for license exemption.

(s) *Sequential use* of energy means:

(1) For a topping-cycle cogeneration facility, the use of reject heat from a power production process in sufficient amounts in a thermal application or process to conform to the requirements of the operating standard; or

(2) For a bottoming-cycle cogeneration facility, the use of reject heat from a thermal application or process, at least some of which is then used for power production.

(Energy Security Act, Pub. L. 96-294, 94 Stat. 611 (1980) Public Utility Regulatory Policies Act of 1978, 16 U.S.C. 2601, *et seq.,* Energy Supply and Environmental Coordination Act, 15 U.S.C. 791 *et seq.,* Federal Power Act, as amended, 16 U.S.C. 792 *et seq.,* Department of Energy Organization Act, 42 U.S.C. 7101 *et seq.,* E.O. 12009, 42 FR 46267)

[45 FR 17972, Mar. 20, 1980, as amended at 45 FR 33958, May 21, 1980; 45 FR 66789, Oct. 8, 1980; Order 135, 46 FR 19231, Mar. 30, 1981; 46 FR 32239, June 22, 1981; Order 499, 53 FR 27002, July 18, 1988; Order 575, 60 FR 4857, Jan. 25, 1995]

§292.203 General requirements for qualification.

(a) *Small power production facilities.* Except as provided in paragraph (c) of this section, a small power production facility is a qualifying facility if it:

(1) Meets the maximum size criteria specified in §292.204(a);

(2) Meets the fuel use criteria specified in §292.204(b); and

(3) Unless exempted by paragraph (d), has filed with the Commission a notice of self-certification, pursuant to §292.207(a); or has filed with the Commission an application for Commission certification, pursuant to §292.207(b)(1), that has been granted.

(b) *Cogeneration facilities.* A cogeneration facility, including any diesel and dual-fuel cogeneration facility, is a qualifying facility if it:

(1) Meets any applicable standards and criteria specified in §§292.205(a), (b) and (d); and

(2) Unless exempted by paragraph (d), has filed with the Commission a notice of self-certification, pursuant to §292.207(a); or has filed with the Commission an application for Commission certification, pursuant to §292.207(b)(1), that has been granted.

(c) *Hydroelectric small power production facilities located at a new dam or diversion.* (1) A hydroelectric small power production facility that impounds or diverts the water of a natural watercourse by means of a new dam or diversion (as that term is defined in §292.202(p)) is a qualifying facility if it meets the requirements of:

(i) Paragraph (a) of this section; and

(ii) Section 292.208.

(2) [Reserved]

(d) *Exemptions and waivers from filing requirement.* (1) Any facility with a net power production capacity of 1 MW or less is exempt from the filing requirements of paragraphs (a)(3) and (b)(2) of this section.

(2) The Commission may waive the requirement of paragraphs (a)(3) and (b)(2) of this section for good cause. Any applicant seeking waiver of paragraphs (a)(3) and (b)(2) of this section must file a petition for declaratory order describing in detail the reasons waiver is being sought.

[Order 732, 75 FR 15965, Mar. 30, 2010]

§292.204 Criteria for qualifying small power production facilities.

(a) *Size of the facility*—(1) *Maximum size.* Except as provided in paragraph (a)(4) of this section, the power production capacity of a facility for which qualification is sought, together with the power production capacity of any other small power production facilities that use the same energy resource, are owned by the same person(s) or its affiliates, and are located at the same site, may not exceed 80 megawatts.

(2) *Method of calculation.* (i) For purposes of this paragraph, facilities are considered to be located at the same site as the facility for which qualification is sought if they are located within one mile of the facility for which qualification is sought and, for hydroelectric facilities, if they use water from the same impoundment for power generation.

(ii) For purposes of making the determination in clause (i), the distance between facilities shall be measured from the electrical generating equipment of a facility.

(3) *Waiver.* The Commission may modify the application of paragraph (a)(2) of this section, for good cause.

(4) *Exception.* Facilities meeting the criteria in section 3(17)(E) of the Federal Power Act (16 U.S.C. 796(17)(E)) have no maximum size, and the power production capacity of such facilities shall be excluded from consideration when determining the maximum size of other small power production facilities within one mile of such facilities.

(b) *Fuel use.* (1)(i) The primary energy source of the facility must be biomass, waste, renewable resources, geothermal resources, or any combination thereof, and 75 percent or more of the total energy input must be from these sources.

(ii) Any primary energy source which, on the basis of its energy content, is 50 percent or more biomass shall be considered biomass.

(2) Use of oil, natural gas and coal by a facility, under section 3(17)(B) of the Federal Power Act, is limited to the minimum amounts of fuel required for ignition, startup, testing, flame stabilization, and control uses, and the minimum amounts of fuel required to alleviate or prevent unanticipated equipment outages, and emergencies, directly affecting the public health, safety, or welfare, which would result from electric power outages. Such fuel use may not, in the aggregate, exceed 25 percent of the total energy input of the

facility during the 12-month period beginning with the date the facility first produces electric energy and any calendar year subsequent to the year in which the facility first produces electric energy.

(Energy Security Act, Pub. L. 96-294, 94 Stat. 611 (1980) Public Utility Regulatory Policies Act of 1978, 16 U.S.C. 2601, *et seq.,* Energy Supply and Environmental Coordination Act, 15, U.S.C. 791, *et seq.,* Federal Power Act, as amended, 16 U.S.C. 792 *et seq.,* Department of Energy Organization Act, 42 U.S.C. 7101, *et seq.;* E.O. 12009, 42 FR 46267)

[45 FR 17972, Mar. 20, 1980, as amended by Order 135, 46 FR 19231, Mar. 30, 1981; Order 575, 60 FR 4857, Jan. 25, 1995; Order 732, 75 FR 15966, Mar. 30, 2010]

§292.205 Criteria for qualifying cogeneration facilities.

(a) *Operating and efficiency standards for topping-cycle facilities*—(1) *Operating standard.* For any topping-cycle cogeneration facility, the useful thermal energy output of the facility must be no less than 5 percent of the total energy output during the 12-month period beginning with the date the facility first produces electric energy, and any calendar year subsequent to the year in which the facility first produces electric energy.

(2) *Efficiency standard.* (i) For any topping-cycle cogeneration facility for which any of the energy input is natural gas or oil, and the installation of which began on or after March 13, 1980, the useful power output of the facility plus one-half the useful thermal energy output, during the 12-month period beginning with the date the facility first produces electric energy, and any calendar year subsequent to the year in which the facility first produces electric energy, must:

(A) Subject to paragraph (a)(2)(i)(B) of this section be no less than 42.5 percent of the total energy input of natural gas and oil to the facility; or

(B) If the useful thermal energy output is less than 15 percent of the total energy output of the facility, be no less than 45 percent of the total energy input of natural gas and oil to the facility.

(ii) For any topping-cycle cogeneration facility not subject to paragraph (a)(2)(i) of this section there is no efficiency standard.

(b) *Efficiency standards for bottoming-cycle facilities.* (1) For any bottoming-cycle cogeneration facility for which any of the energy input as supplementary firing is natural gas or oil, and the installation of which began on or after March 13, 1980, the useful power output of the facility during the 12-month period beginning with the date the facility first produces electric energy, and any calendar year subsequent to the year in which the facility first produces electric energy must be no less than 45 percent of the energy input of natural gas and oil for supplementary firing.

(2) For any bottoming-cycle cogeneration facility not covered by paragraph (b)(1) of this section, there is no efficiency standard.

(c) *Waiver.* The Commission may waive any of the requirements of paragraphs (a) and (b) of this section upon a showing that the facility will produce significant energy savings.

(d) *Criteria for new cogeneration facilities.* Notwithstanding paragraphs (a) and (b) of this section, any cogeneration facility that was either not a qualifying cogeneration facility on or before August 8, 2005, or that had not filed a notice of self-certification or an application for Commission certification as a qualifying cogeneration facility under §292.207 of this chapter prior to February 2, 2006, and which is seeking to sell electric energy pursuant to section 210 of the Public Utility Regulatory Policies Act of 1978, 16 U.S.C. 824a-1, must also show:

(1) The thermal energy output of the cogeneration facility is used in a productive and beneficial manner; and

(2) The electrical, thermal, chemical and mechanical output of the cogeneration facility is used fundamentally for industrial, commercial, residential or institutional purposes and is not intended fundamentality for sale to an electric utility, taking into account technological, efficiency, economic, and variable thermal energy requirements, as well as state laws applicable to sales of electric energy from a qualifying facility to its host facility.

(3) Fundamental use test. For the purpose of satisfying paragraph (d)(2) of this section, the electrical, thermal, chemical and mechanical output of the cogeneration facility will be considered used fundamentally for industrial, commercial, or institutional purposes, and not intended fundamentally for sale to an electric utility if at least 50 percent of the aggregate of such output, on an annual basis, is used for industrial, commercial, residential or institutional purposes. In addition, applicants for facilities that do not meet this safe harbor standard may present evidence to the Commission that the facilities should nevertheless be certified given state laws applicable to sales of electric energy or unique technological, efficiency, economic, and variable thermal energy requirements.

(4) For purposes of paragraphs (d)(1) and (2) of this section, a new cogeneration facility of 5 MW or smaller will be presumed to satisfy the requirements of those paragraphs.

(5) For purposes of paragraph (d)(1) of this section, where a thermal host existed prior to the development of a new cogeneration facility whose thermal output will supplant the thermal source previously in use by the thermal host, the thermal output of such new cogeneration facility will be presumed to satisfy the requirements of paragraph (d)(1).

[45 FR 17972, Mar. 20, 1980, as amended by Order 478, 52 FR 28467, July 30, 1987; Order 575, 60 FR 4857, Jan. 25, 1995; Order 671, 71 FR 7868, Feb. 15, 2006; Order 732, 75 FR 15966, Mar. 30, 2010; 76 FR 50663, Aug. 16, 2011]

§292.207 Procedures for obtaining qualifying status.

(a) *Self-certification.* The qualifying facility status of an existing or a proposed facility that meets the requirements of §292.203 may be self-certified by the owner or operator of the facility or its representative by properly completing a Form No. 556 and filing that form with the Commission, pursuant to §131.80 of this chapter, and complying with paragraph (c) of this section.

(b) *Optional procedure*—(1) *Application for Commission certification.* In lieu of the self-certification procedures in paragraph (a) of this section, an owner or operator of an existing or a proposed facility, or its representative, may file with the Commission an application for Commission certification that the facility is a qualifying facility. The application must be accompanied by the fee prescribed by part 381 of this chapter, and the applicant for Commission certification must comply with paragraph (c) of this section.

(2) *General contents of application.* The application must include a properly completed Form No. 556 pursuant to §131.80 of this chapter.

(3) *Commission action.* (i) Within 90 days of the later of the filing of an application or the filing of a supplement, amendment or other change to the application, the Commission will either: Inform the applicant that the application is deficient; or issue an order granting or denying the application; or toll the time for issuance of an order. Any order denying certification shall identify the specific requirements which were not met. If the Commission does not act within 90 days of the date of the latest filing, the application shall be deemed to have been granted.

(ii) For purposes of paragraph (b) of this section, the date an application is filed is the date by which the Office of the Secretary has received all of the information and the appropriate filing fee necessary to comply with the requirements of this Part.

(c) *Notice requirements*—(1) *General.* An applicant filing a self-certification, self-recertification, application for Commission certification or application for Commission recertification of the qualifying status of its

facility must concurrently serve a copy of such filing on each electric utility with which it expects to interconnect, transmit or sell electric energy to, or purchase supplementary, standby, back-up or maintenance power from, and the State regulatory authority of each state where the facility and each affected electric utility is located. The Commission will publish a notice in the FEDERAL REGISTER for each application for Commission certification and for each self-certification of a cogeneration facility that is subject to the requirements of §292.205(d).

(2) *Facilities of 500 kW or more.* An electric utility is not required to purchase electric energy from a facility with a net power production capacity of 500 kW or more until 90 days after the facility notifies the facility that it is a qualifying facility or 90 days after the utility meets the notice requirements in paragraph (c)(1) of this section.

(d) *Revocation of qualifying status.* (1)(i) If a qualifying facility fails to conform with any material facts or representations presented by the cogenerator or small power producer in its submittals to the Commission, the notice of self-certification or Commission order certifying the qualifying status of the facility may no longer be relied upon. At that point, if the facility continues to conform to the Commission's qualifying criteria under this part, the cogenerator or small power producer may file either a notice of self-recertification of qualifying status pursuant to the requirements of paragraph (a) of this section, or an application for Commission recertification pursuant to the requirements of paragraph (b) of this section, as appropriate.

(ii) The Commission may, on its own motion or on the motion of any person, revoke the qualifying status of a facility that has been certified under paragraph (b) of this section, if the facility fails to conform to any of the Commission's qualifying facility criteria under this part.

(iii) The Commission may, on its own motion or on the motion of any person, revoke the qualifying status of a self-certified or self-recertified qualifying facility if it finds that the self-certified or self-recertified qualifying facility does not meet the applicable requirements for qualifying facilities.

(2) Prior to undertaking any substantial alteration or modification of a qualifying facility which has been certified under paragraph (b) of this section, a small power producer or cogenerator may apply to the Commission for a determination that the proposed alteration or modification will not result in a revocation of qualifying status. This application for Commission recertification of qualifying status should be submitted in accordance with paragraph (b) of this section.

[45 FR 17972, Mar. 20, 1980]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting §292.207, see the List of CFR Sections Affected, which appears in the Finding Aids section of the printed volume and at *www.fdsys.gov.*

§292.208 Special requirements for hydroelectric small power production facilities located at a new dam or diversion.

(a) A hydroelectric small power production facility that impounds or diverts the water of a natural watercourse by means of a new dam or diversion (as that term is defined in §292.202(p)) is a qualifying facility only if it meets the requirements of:

(1) Paragraph (b) of this section;

(2) Section 292.203(c); and

(3) Part 4 of this chapter.

(b) A hydroelectric small power production described in paragraph (a) is a qualifying facility only if:

(1) The Commission finds, at the time it issues the license or exemption, that the project will not have a substantial adverse effect on the environment (as that term is defined in §292.202(q)), including recreation and water quality;

(2) The Commission finds, at the time the application for the license or exemption is accepted for filing under §4.32 of this chapter, that the project is not located on any segment of a natural watercourse which:

(i) Is included, or designated for potential inclusion in, a State or National wild and scenic river system; or

(ii) The State has determined, in accordance with applicable State law, to possess unique natural, recreational, cultural or scenic attributes which would be adversely affected by hydroelectric development; and

(3) The project meets the terms and conditions set by the appropriate fish and wildlife agencies under the same procedures as provided for under section 30(c) of the Federal Power Act.

(c) For the Commission to make the findings in paragraph (b) of this section an applicant must:

(1) Comply with the applicable hydroelectric licensing requirements in Part 4 of this chapter, including:

(i) Completing the pre-filing consultation process under §4.38 of this chapter, including performing any environmental studies which may be required under §§4.38(b)(2)(i)(D) through (F) of this chapter; and

(ii) Submitting with its application an environmental report that meets the requirements of §4.41(f) of this chapter, regardless of project size;

(2) State whether the project is located on any segment of a natural watercourse which:

(i) Is included in or designated for potential inclusion in:

(A) The National Wild and Scenic River System (28 U.S.C. 1271-1278 (1982)); or

(B) A State wild and scenic river system;

(ii) Crosses an area designated or recommended for designation under the Wilderness Act (16 U.S.C. 1132) as:

(A) A wilderness area; or

(B) Wilderness study area; or

(iii) The State, either by or pursuant to an act of the State legislature, has determined to possess unique, natural, recreational, cultural, or scenic attributes that would be adversely affected by hydroelectric development.

(d) If the project is located on any segment of a natural watercourse that meets any of the conditions in paragraph (c)(2) of this section, the applicant must provide the following information in its application:

(1) The date on which the natural watercourse was protected;

(2) The statutory authority under which the natural watercourse was protected; and

(3) The Federal or state agency, or political subdivision of the state, that is in charge of administering the natural watercourse.

[Order 499, 53 FR 27003, July 18, 1988]

§292.209 Exceptions from requirements for hydroelectric small power production facilities located at a new dam or diversion.

(a) The requirements in §§292.208(b)(1) through (3) do not apply if:

(1) An application for license or exemption is filed for a project located at a Government dam, as defined in section 3(10) of the Federal Power Act, at which non-Federal hydroelectric development is permissible; or

(2) An application for license or exemption was filed and accepted before October 16, 1986.

(b) The requirements in §§292.208(b) (1) and (3) do not apply if an application for license or exemption was filed before October 16, 1986, and is accepted for filing by the Commission before October 16, 1989.

(c) The requirements in §292.208(b)(3) do not apply to an applicant for license or exemption if:

(1) The applicant files a petition pursuant to §292.210; and

(2) The Commission grants the petition.

(d) Any application covered by paragraph (a), (b), or (c) of this section is excepted from the moratorium imposed by section 8(e) of the Electric Consumers Protection Act of 1986, Pub. L. No. 99-495.

[Order 499, 53 FR 27003, July 18, 1988]

§292.210 Petition alleging commitment of substantial monetary resources before October 16, 1986.

(a) An applicant covered by §292.203(c) whose application for license or exemption was filed on or after October 16, 1986, but before April 16, 1988, may file a petition for exception from the requirement in §292.208(b)(3) and the moratorium described in §292.203(c)(2). The petition must show that prior to October 16, 1986, the applicant committed substantial monetary resources (as that term is defined in §292.202(r)) to the development of the project.

(b) Subject to rebuttal under paragraph (d)(7)(ii) of this section, a showing of the commitment of substantial monetary resources will be presumed if the applicant held a preliminary permit for the project and had completed environmental consultations pursuant to §4.38 of this chapter before October 16, 1986.

(c) *Time of filing petition*—(1) *General rule.* Except as provided in paragraph (c)(2) of this section, the applicant must:

(i) File the petition with the application for license or exemption; or

(ii) Submit with the application for license or exemption a request for an extension of time, not to exceed 90 days or April 16, 1988, whichever occurs first, in which to file the petition.

(2) *Exception.* If the application for license or exemption was filed on or after October 16, 1986, but before March 23, 1987, the petition must have been filed by June 22, 1987.

(d) *Filing requirements.* A petition filed under this section must include the following information or refer to the pages in the application for license or exemption where it can be found:

(1) A certificate of service, conforming to the requirements set out in §385.2010(h) of this chapter, certifying that the applicant has served the petition on the Federal and State agencies required to be consulted by the applicant pursuant to §4.38 of this chapter;

(2) Documentation of any issued preliminary permits for the project;

(3) An itemized statement of the total costs expended on the application;

(4) An itemized schedule of costs the applicant expended, or committed to be expended, before October 16, 1986, on the application, accompanied by supporting documentation including but not limited to:

(i) Dated invoices for maps, surveys, supplies, geophysical and geotechnical services, engineering services, legal services, document reproduction, and other items related to the preparation of the application, and

(ii) Written contracts and other written documentation demonstrating a commitment made before October 16, 1986, to expend monetary resources on the preparation of the application, together with evidence that those monetary resources were actually expended; and

(5) Correspondence or other documentation to support the items listed in paragraphs (d)(3) and (d)(4) of this section to show that the expenses presented were directly related to the preparation of the application.

(6) The applicant must include in its total cost statement and in its schedule of the costs expended or committed to be expended before October 16, 1986, the value of services that were performed by the applicant itself instead of contracted out.

(7)(i) If the applicant held a preliminary permit for the project and had completed pre-filing consultation pursuant to §4.38 of this chapter prior to October 16, 1986, the applicant may, instead of submitting the information listed in paragraphs (d)(3), (d)(4), and (d)(5) of this section, submit a statement identifying the preliminary permit by project number.

(ii) If any interested person objects (pursuant to §385.211 of this chapter) to the presumption in paragraph (b) of this section, the applicant must supply the information listed in paragraphs (d)(3), (d)(4), and (d)(5) of this section.

(8) If the application is deficient pursuant to §4.32(e) of this chapter, the applicant must include with the information correcting those deficiencies a statement of the costs expended to make the corrections.

(e) *Processing of petition.* (1) The Commission will issue a notice of the petition filed under this section and publish the notice in the FEDERAL REGISTER. The petition will be available for inspection and copying during regular business hours in the Public Reference Room maintained by the Division of Public Information.

(2) *Comments on the petition.* The Commission will provide the public 45 days from the date the notice of the petition is issued to submit comments. The applicant for license or exemption has 15 days after the expiration of the public comment period to respond to the comments filed with the Commission.

(3) *Commission action on petition.* The Director of the Office of Energy Projects will determine whether or not the applicant for license or exemption has made the showing required under this section.

[Order 499, 53 FR 27003, July 18, 1988, as amended by Order 699, 72 FR 45325, Aug. 14, 2007]

§292.211 Petition for initial determination on whether a project has a substantial adverse effect on the environment (AEE petition).

(a) An applicant that has filed a petition under §292.210 may also file an AEE petition with the Commission for an initial determination on whether the project satisfies the requirement that it has no substantial adverse effect on the environment as specified in §292.208(b)(1).

(b) The filing of the AEE petition does not relieve the applicant of the filing requirements of §292.208(c).

(c) The Commission will act on the AEE petition only if the Commission has granted the applicant's commitment of resources petition under §292.210.

(d) *Time of filing petition.* The applicant may file the AEE petition with the application for license or exemption or at any time before the Commission issues the license or exemption.

(e) *Contents of petition.* The AEE petition must identify the project and request that the Commission make an initial determination on the adverse environmental effects requirements in §292.208(b)(1).

(f) The Director of the Office of Energy Projects will make the initial determination on the AEE petition. In making this determination, the Director will consider the following:

(1) Any proposed mitigative measures;

(2) The consistency of the proposal with local, regional, and national resource plans and programs;

(3) The mandatory terms and conditions of fish and wildlife agencies under section 210(j) of PURPA, or section 30(c) of the Federal Power Act; or the recommended terms and conditions of fish a wildlife agencies under Section 10(j) of the Federal Power Act, whichever is appropriate; and

(4) Any other information which the Director believes is relevant to consider.

(g) *Initial finding on the petition.* The Director of the Office of Energy Projects will make the initial determination on the AEE petition after the close of the public notice period for the accepted application. If the Director's initial determination finds:

(1) No substantial adverse effect on the environment, the Commission must wait at least 45 days before making a final determination that the project satisfies the requirements of §292.208(b)(1).

(2) A substantial adverse effect on the environment, the applicant may file, within 90 days of the initial finding that the project does not satisfy the requirements in §292.208(b)(1), proposed measures to mitigate the adverse environmental effects found.

(3)(i) The Commission will provide written notice of the Director's initial finding on the petition to the applicant, to the federal and state agencies that the applicant must consult under §4.38 of this chapter and to any intervenors in the proceeding.

(ii) The Commission will publish notice of the Director's initial finding in the FEDERAL REGISTER.

(h) *Notice and comment on the mitigative measures.* (1) The Commission will issue notice of the mitigative measures filed by an applicant under paragraph (g)(2) of this section and will publish the notice in the FEDERAL REGISTER. The mitigative measures will be on file and available for inspection or copying during regular business hours in the Public Reference Room maintained by the Division of Public Information;

(2) The Commission will provide the State and interested persons within 90 days from the date the notice is issued to review and submit comments on the mitigative measures. The applicant for license or exemption has 15 days after the expiration of the public comment period to respond to the comments filed with the Commission.

(i) *Material amendments to application.* The proposed mitigative measures filed under paragraph (g)(2) of this section will not be considered a material amendment to the application unless the Commission finds that the proposed measures are unnecessary to, or exceed the scope of, mitigating substantial adverse effects. If the Commission finds the proposed mitigative measures constitute a material amendment, the application will be considered filed with the Commission on the date on which the applicant filed the proposed mitigative measures, and all other provisions of §4.35(a) of this chapter will apply.

(j) *Final determination on the petition.* The Commission will make a final determination on the petition at the time the Commission issues a license or exemption for the project.

(k) *Presumption.* (1) If, between the Commission's initial and final findings on the AEE petition, the State does not take any action under §292.208(b)(2), the failure to take action can be the basis for a presumption that there is not substantial adverse effect on the environment (as that term is defined in §292.202(q)).

(2) If the presumption in paragraph (k)(1) of this section comes into effect, it:

(i) Is only available for those adverse effects related to the natural, recreational, cultural, or scenic attributes of the environment;

(ii) Can only operate during the time between the Commission's initial and final findings on the AEE petition; and

(iii) Has no affect on the Commission's independent obligation to find that the project will not have a substantial adverse effect on the environment under §292.208(b)(1).

(3) The presumption in paragraph (k)(1) of this section does not take effect if the State, the Commission or an interested person demonstrates that the State has acted to protect the natural watercourse under §292.208(b)(2).

(4) The presumption in paragraph (k)(1) of this section can be rebutted if:

(i) The Commission determines that the project will have a substantial adverse effect on the environment related to the environmental attributes listed in paragraph (k)(2)(i) of this section; or

(ii) Any interested person, including a State, demonstrates that the project will have a substantial adverse effect on the environment related to the environmental attributes listed in paragraph (k)(2)(i) of this section.

[Order 499, 53 FR 27004, July 18, 1988, as amended by Order 499-A, 53 FR 40724, Oct. 18, 1988; Order 699, 72 FR 45325, Aug. 14, 2007]

Subpart C—Arrangements Between Electric Utilities and Qualifying Cogeneration and Small Power Production Facilities Under Section 210 of the Public Utility Regulatory Policies Act of 1978

AUTHORITY: Public Utility Regulatory Policies Act of 1978, 16 U.S.C. 2601 *et seq.,* Energy Supply and Environmental Coordination Act, 15 U.S.C. 791 *et seq.* Federal Power Act, 16 U.S.C. 792 *et seq.,* Department of Energy Organization Act, 42 U.S.C. 7101 *et seq.,* E.O. 12009, 42 FR 46267.

SOURCE: Order 69, 45 FR 12234, Feb. 25, 1980, unless otherwise noted.

§292.301 Scope.

(a) *Applicability.* This subpart applies to the regulation of sales and purchases between qualifying facilities and electric utilities.

(b) *Negotiated rates or terms.* Nothing in this subpart:

(1) Limits the authority of any electric utility or any qualifying facility to agree to a rate for any purchase, or terms or conditions relating to any purchase, which differ from the rate or terms or conditions which would otherwise be required by this subpart; or

(2) Affects the validity of any contract entered into between a qualifying facility and an electric utility for any purchase.

§292.302 Availability of electric utility system cost data.

(a) *Applicability.* (1) Except as provided in paragraph (a)(2) of this section, paragraph (b) applies to each electric utility, in any calendar year, if the total sales of electric energy by such utility for purposes other than resale exceeded 500 million kilowatt-hours during any calendar year beginning after December 31, 1975, and before the immediately preceding calendar year.

(2) Each utility having total sales of electric energy for purposes other than resale of less than one billion kilowatt-hours during any calendar year beginning after December 31, 1975, and before the immediately preceding year, shall not be subject to the provisions of this section until June 30, 1982.

(b) *General rule.* To make available data from which avoided costs may be derived, not later than November 1, 1980, June 30, 1982, and not less often than every two years thereafter, each regulated electric utility described in paragraph (a) of this section shall provide to its State regulatory authority, and shall maintain for public inspection, and each nonregulated electric utility described in paragraph (a) of this section shall maintain for public inspection, the following data:

(1) The estimated avoided cost on the electric utility's system, solely with respect to the energy component, for various levels of purchases from qualifying facilities. Such levels of purchases shall be stated in blocks of not more than 100 megawatts for systems with peak demand of 1000 megawatts or more, and in blocks equivalent to not more than 10 percent of the system peak demand for systems of less than 1000 megawatts. The avoided costs shall be stated on a cents per kilowatt-hour basis, during daily and seasonal peak and off-peak periods, by year, for the current calendar year and each of the next 5 years;

(2) The electric utility's plan for the addition of capacity by amount and type, for purchases of firm energy and capacity, and for capacity retirements for each year during the succeeding 10 years; and

(3) The estimated capacity costs at completion of the planned capacity additions and planned capacity firm purchases, on the basis of dollars per kilowatt, and the associated energy costs of each unit, expressed in cents per kilowatt hour. These costs shall be expressed in terms of individual generating units and of individual planned firm purchases.

(c) *Special rule for small electric utilities.* (1) Each electric utility (other than any electric utility to which paragraph (b) of this section applies) shall, upon request:

(i) Provide comparable data to that required under paragraph (b) of this section to enable qualifying facilities to estimate the electric utility's avoided costs for periods described in paragraph (b) of this section; or

(ii) With regard to an electric utility which is legally obligated to obtain all its requirements for electric energy and capacity from another electric utility, provide the data of its supplying utility and the rates at which it currently purchases such energy and capacity.

(2) If any such electric utility fails to provide such information on request, the qualifying facility may apply to the State regulatory authority (which has ratemaking authority over the electric utility) or the Commission for an order requiring that the information be provided.

(d) *Substitution of alternative method.* (1) After public notice in the area served by the electric utility, and after opportunity for public comment, any State regulatory authority may require (with respect to any electric utility over which it has ratemaking authority), or any non-regulated electric utility may provide, data different than those which are otherwise required by this section if it determines that avoided costs can be derived from such data.

(2) Any State regulatory authority (with respect to any electric utility over which it has ratemaking authority) or nonregulated utility which requires such different data shall notify the Commission within 30 days of making such determination.

(e) *State Review.* (1) Any data submitted by an electric utility under this section shall be subject to review by the State regulatory authority which has ratemaking authority over such electric utility.

(2) In any such review, the electric utility has the burden of coming forward with justification for its data.

[45 FR 12234, Feb. 25, 1980; 45 FR 24126, Apr. 9, 1980]

§292.303 Electric utility obligations under this subpart.

(a) *Obligation to purchase from qualifying facilities.* Each electric utility shall purchase, in accordance with §292.304, unless exempted by §292.309 and §292.310, any energy and capacity which is made available from a qualifying facility:

(1) Directly to the electric utility; or

(2) Indirectly to the electric utility in accordance with paragraph (d) of this section.

(b) *Obligation to sell to qualifying facilities.* Each electric utility shall sell to any qualifying facility, in accordance with §292.305, unless exempted by §292.312, energy and capacity requested by the qualifying facility.

(c) *Obligation to interconnect.* (1) Subject to paragraph (c)(2) of this section, any electric utility shall make such interconnection with any qualifying facility as may be necessary to accomplish purchases or sales under this subpart. The obligation to pay for any interconnection costs shall be determined in accordance with §292.306.

(2) No electric utility is required to interconnect with any qualifying facility if, solely by reason of purchases or sales over the interconnection, the electric utility would become subject to regulation as a public utility under part II of the Federal Power Act.

(d) *Transmission to other electric utilities.* If a qualifying facility agrees, an electric utility which would otherwise be obligated to purchase energy or capacity from such qualifying facility may transmit the energy or capacity to any other electric utility. Any electric utility to which such energy or capacity is transmitted shall purchase such energy or capacity under this subpart as if the qualifying facility were supplying energy or capacity directly to such electric utility. The rate for purchase by the electric utility to which such energy is transmitted shall be adjusted up or down to reflect line losses pursuant to §292.304(e)(4) and shall not include any charges for transmission.

(e) *Parallel operation.* Each electric utility shall offer to operate in parallel with a qualifying facility, provided that the qualifying facility complies with any applicable standards established in accordance with §292.308.

[Order 688, 71 FR 64372, Nov. 1, 2006; 71 FR 75662, Dec. 18, 2006]

§292.304 Rates for purchases.

(a) *Rates for purchases.* (1) Rates for purchases shall:

(i) Be just and reasonable to the electric consumer of the electric utility and in the public interest; and

(ii) Not discriminate against qualifying cogeneration and small power production facilities.

(2) Nothing in this subpart requires any electric utility to pay more than the avoided costs for purchases.

(b) *Relationship to avoided costs.* (1) For purposes of this paragraph, "new capacity" means any purchase from capacity of a qualifying facility, construction of which was commenced on or after November 9, 1978.

(2) Subject to paragraph (b)(3) of this section, a rate for purchases satisfies the requirements of paragraph (a) of this section if the rate equals the avoided costs determined after consideration of the factors set forth in paragraph (e) of this section

(3) A rate for purchases (other than from new capacity) may be less than the avoided cost if the State regulatory authority (with respect to any electric utility over which it has ratemaking authority) or the nonregulated electric utility determines that a lower rate is consistent with paragraph (a) of this section, and is sufficient to encourage cogeneration and small power production.

(4) Rates for purchases from new capacity shall be in accordance with paragraph (b)(2) of this section, regardless of whether the electric utility making such purchases is simultaneously making sales to the qualifying facility.

(5) In the case in which the rates for purchases are based upon estimates of avoided costs over the specific term of the contract or other legally enforceable obligation, the rates for such purchases do not violate this subpart if the rates for such purchases differ from avoided costs at the time of delivery.

(c) *Standard rates for purchases.* (1) There shall be put into effect (with respect to each electric utility) standard rates for purchases from qualifying facilities with a design capacity of 100 kilowatts or less.

(2) There may be put into effect standard rates for purchases from qualifying facilities with a design capacity of more than 100 kilowatts.

(3) The standard rates for purchases under this paragraph:

(i) Shall be consistent with paragraphs (a) and (e) of this section; and

(ii) May differentiate among qualifying facilities using various technologies on the basis of the supply characteristics of the different technologies.

(d) *Purchases "as available" or pursuant to a legally enforceable obligation.* Each qualifying facility shall have the option either:

(1) To provide energy as the qualifying facility determines such energy to be available for such purchases, in which case the rates for such purchases shall be based on the purchasing utility's avoided costs calculated at the time of delivery; or

(2) To provide energy or capacity pursuant to a legally enforceable obligation for the delivery of energy or capacity over a specified term, in which case the rates for such purchases shall, at the option of the qualifying facility exercised prior to the beginning of the specified term, be based on either:

(i) The avoided costs calculated at the time of delivery; or

(ii) The avoided costs calculated at the time the obligation is incurred.

(e) *Factors affecting rates for purchases.* In determining avoided costs, the following factors shall, to the extent practicable, be taken into account:

(1) The data provided pursuant to §292.302(b), (c), or (d), including State review of any such data;

(2) The availability of capacity or energy from a qualifying facility during the system daily and seasonal peak periods, including:

(i) The ability of the utility to dispatch the qualifying facility;

(ii) The expected or demonstrated reliability of the qualifying facility;

(iii) The terms of any contract or other legally enforceable obligation, including the duration of the obligation, termination notice requirement and sanctions for non-compliance;

(iv) The extent to which scheduled outages of the qualifying facility can be usefully coordinated with scheduled outages of the utility's facilities;

(v) The usefulness of energy and capacity supplied from a qualifying facility during system emergencies, including its ability to separate its load from its generation;

(vi) The individual and aggregate value of energy and capacity from qualifying facilities on the electric utility's system; and

(vii) The smaller capacity increments and the shorter lead times available with additions of capacity from qualifying facilities; and

(3) The relationship of the availability of energy or capacity from the qualifying facility as derived in paragraph (e)(2) of this section, to the ability of the electric utility to avoid costs, including the deferral of capacity additions and the reduction of fossil fuel use; and

(4) The costs or savings resulting from variations in line losses from those that would have existed in the absence of purchases from a qualifying facility, if the purchasing electric utility generated an equivalent amount of energy itself or purchased an equivalent amount of electric energy or capacity.

(f) *Periods during which purchases not required.* (1) Any electric utility which gives notice pursuant to paragraph (f)(2) of this section will not be required to purchase electric energy or capacity during any period during which, due to operational circumstances, purchases from qualifying facilities will result in costs greater than those which the utility would incur if it did not make such purchases, but instead generated an equivalent amount of energy itself.

(2) Any electric utility seeking to invoke paragraph (f)(1) of this section must notify, in accordance with applicable State law or regulation, each affected qualifying facility in time for the qualifying facility to cease the delivery of energy or capacity to the electric utility.

(3) Any electric utility which fails to comply with the provisions of paragraph (f)(2) of this section will be required to pay the same rate for such purchase of energy or capacity as would be required had the period described in paragraph (f)(1) of this section not occurred.

(4) A claim by an electric utility that such a period has occurred or will occur is subject to such verification by its State regulatory authority as the State regulatory authority determines necessary or appropriate, either before or after the occurrence.

§292.305 Rates for sales.

(a) *General rules.* (1) Rates for sales:

(i) Shall be just and reasonable and in the public interest; and

(ii) Shall not discriminate against any qualifying facility in comparison to rates for sales to other customers served by the electric utility.

(2) Rates for sales which are based on accurate data and consistent systemwide costing principles shall not be considered to discriminate against any qualifying facility to the extent that such rates apply to the utility's other customers with similar load or other cost-related characteristics.

(b) *Additional services to be provided to qualifying facilities.* (1) Upon request of a qualifying facility, each electric utility shall provide:

(i) Supplementary power;

(ii) Back-up power;

(iii) Maintenance power; and

(iv) Interruptible power.

(2) The State regulatory authority (with respect to any electric utility over which it has ratemaking authority) and the Commission (with respect to any nonregulated electric utility) may waive any requirement of paragraph (b)(1) of this section if, after notice in the area served by the electric utility and after opportunity for public comment, the electric utility demonstrates and the State regulatory authority or the Commission, as the case may be, finds that compliance with such requirement will:

(i) Impair the electric utility's ability to render adequate service to its customers; or

(ii) Place an undue burden on the electric utility.

(c) *Rates for sales of back-up and maintenance power.* The rate for sales of back-up power or maintenance power:

(1) Shall not be based upon an assumption (unless supported by factual data) that forced outages or other reductions in electric output by all qualifying facilities on an electric utility's system will occur simultaneously, or during the system peak, or both; and

(2) Shall take into account the extent to which scheduled outages of the qualifying facilities can be usefully coordinated with scheduled outages of the utility's facilities.

§292.306 Interconnection costs.

(a) *Obligation to pay.* Each qualifying facility shall be obligated to pay any interconnection costs which the State regulatory authority (with respect to any electric utility over which it has ratemaking authority) or nonregulated electric utility may assess against the qualifying facility on a nondiscriminatory basis with respect to other customers with similar load characteristics.

(b) *Reimbursement of interconnection costs.* Each State regulatory authority (with respect to any electric utility over which it has ratemaking authority) and nonregulated utility shall determine the manner for payments of interconnection costs, which may include reimbursement over a reasonable period of time.

§292.307 System emergencies.

(a) *Qualifying facility obligation to provide power during system emergencies.* A qualifying facility shall be required to provide energy or capacity to an electric utility during a system emergency only to the extent:

(1) Provided by agreement between such qualifying facility and electric utility; or

(2) Ordered under section 202(c) of the Federal Power Act.

(b) *Discontinuance of purchases and sales during system emergencies.* During any system emergency, an electric utility may discontinue:

(1) Purchases from a qualifying facility if such purchases would contribute to such emergency; and

(2) Sales to a qualifying facility, provided that such discontinuance is on a nondiscriminatory basis.

§292.308 Standards for operating reliability.

Any State regulatory authority (with respect to any electric utility over which it has ratemaking authority) or nonregulated electric utility may establish reasonable standards to ensure system safety and reliability of interconnected operations. Such standards may be recommended by any electric utility, any qualifying facility, or any other person. If any State regulatory authority (with respect to any electric utility over which it has ratemaking authority) or nonregulated electric utility establishes such standards, it shall specify the need for such standards on the basis of system safety and reliability.

§292.309 Termination of obligation to purchase from qualifying facilities.

(a) After August 8, 2005, an electric utility shall not be required, under this part, to enter into a new contract or obligation to purchase electric energy from a qualifying cogeneration facility or a qualifying small power production facility if the Commission finds that the qualifying cogeneration facility or qualifying small power facility production has nondiscriminatory access to:

(1)(i) Independently administered, auction-based day ahead and real time wholesale markets for the sale of electric energy; and

(ii) Wholesale markets for long-term sales of capacity and electric energy; or

(2)(i) Transmission and interconnection services that are provided by a Commission-approved regional transmission entity and administered pursuant to an open access transmission tariff that affords nondiscriminatory treatment to all customers; and

(ii) Competitive wholesale markets that provide a meaningful opportunity to sell capacity, including long-term and short-term sales, and electric energy, including long-term, short-term and real-time sales, to buyers other than the utility to which the qualifying facility is interconnected. In determining whether a meaningful opportunity to sell exists, the Commission shall consider, among other factors, evidence of transactions within the relevant market; or

(3) Wholesale markets for the sale of capacity and electric energy that are, at a minimum, of comparable competitive quality as markets described in paragraphs (a)(1) and (a)(2) of this section.

(b) For purposes of §292.309(a), a renewal of a contract that expires by its own terms is a “new contract or obligation” without a continuing obligation to purchase under an expired contract.

(c) For purposes of §292.309(a)(1), (2) and (3), with the exception of paragraph (d) of this section, there is a rebuttable presumption that a qualifying facility has nondiscriminatory access to the market if it is eligible for service under a Commission-approved open access transmission tariff or Commission-filed reciprocity tariff, and Commission-approved interconnection rules. If the Commission determines that a market meets the criteria of §292.309(a)(1), (2) or (3), and if a qualifying facility in the relevant market is eligible for service under a Commission-approved open access transmission tariff or Commission-filed reciprocity tariff, a qualifying facility may seek to rebut the presumption of access to the market by demonstrating, *inter alia,* that it does not have access to the market because of operational characteristics or transmission constraints.

(d)(1) For purposes of §292.309(a)(1), (2), and (3), there is a rebuttable presumption that a qualifying facility with a capacity at or below 20 megawatts does not have nondiscriminatory access to the market.

(2) For purposes of implementing paragraph (d)(1) of this section, the Commission will not be bound by the one-mile standard set forth in §292.204(a)(2).

(e) Midwest Independent Transmission System Operator (Midwest ISO), PJM Interconnection, L.L.C. (PJM), ISO New England, Inc. (ISO-NE), and New York Independent System Operator (NYISO) qualify as markets described in §292.309(a)(1)(i) and (ii), and there is a rebuttable presumption that qualifying facilities with a capacity greater than 20 megawatts have nondiscriminatory access to those markets through Commission-approved open access transmission tariffs and interconnection rules, and that electric utilities that are members of such regional transmission organizations or independent system operators (RTO/ISOs) should be relieved of the obligation to purchase electric energy from the qualifying facilities. A qualifying facility may seek to rebut this presumption by demonstrating, *inter alia,* that:

(1) The qualifying facility has certain operational characteristics that effectively prevent the qualifying facility's participation in a market; or

(2) The qualifying facility lacks access to markets due to transmission constraints. The qualifying facility may show that it is located in an area where persistent transmission constraints in effect cause the qualifying facility not to have access to markets outside a persistently congested area to sell the qualifying facility output or capacity.

(f) The Electric Reliability Council of Texas (ERCOT) qualifies as a market described in §292.309(a)(3), and there is a rebuttable presumption that qualifying facilities with a capacity greater than 20 megawatts have nondiscriminatory access to that market through Public Utility Commission of Texas (PUCT) approved open access protocols, and that electric utilities that operate within ERCOT should be relieved of the obligation to purchase electric energy from the qualifying facilities. A qualifying facility may seek to rebut this presumption by demonstrating, *inter alia,* that:

(1) The qualifying facility has certain operational characteristics that effectively prevent the qualifying facility's participation in a market; or

(2) The qualifying facility lacks access to markets due to transmission constraints. The qualifying facility may show that it is located in an area where persistent transmission constraints in effect cause the

qualifying facility not to have access to markets outside a persistently congested area to sell the qualifying facility output or capacity.

(g) The California Independent System Operator and Southwest Power Pool, Inc. satisfy the criteria of §292.309(a)(2)(i).

(h) No electric utility shall be required, under this part, to enter into a new contract or obligation to purchase from or sell electric energy to a facility that is not an existing qualifying cogeneration facility unless the facility meets the criteria for new qualifying cogeneration facilities established by the Commission in §292.205.

(i) For purposes of §292.309(h), an “existing qualifying cogeneration facility” is a facility that:

(1) Was a qualifying cogeneration facility on or before August 8, 2005; or

(2) Had filed with the Commission a notice of self-certification or self-recertification, or an application for Commission certification, under §292.207 prior to February 2, 2006.

(j) For purposes of §292.309(h), a “new qualifying cogeneration facility” is a facility that satisfies the criteria for qualifying cogeneration facilities pursuant to §292.205.

[Order 688, 71 FR 64372, Nov. 1, 2006; 71 FR 75662, Dec. 18, 2006]

§292.310 Procedures for utilities requesting termination of obligation to purchase from qualifying facilities.

(a) An electric utility may file an application with the Commission for relief from the mandatory purchase requirement under §292.303(a) pursuant to this section on a service territory-wide basis. Such application shall set forth the factual basis upon which relief is requested and describe why the conditions set forth in §292.309(a)(1), (2) or (3) have been met. After notice, including sufficient notice to potentially affected qualifying cogeneration facilities and qualifying small power production facilities, and an opportunity for comment, the Commission shall make a final determination within 90 days of such application regarding whether the conditions set forth in §292.309(a)(1), (2) or (3) have been met.

(b) Sufficient notice shall mean that an electric utility must identify with names and addresses all potentially affected qualifying facilities in an application filed pursuant to paragraph (a).

(c) An electric utility must submit with its application for each potentially affected qualifying facility: The docket number assigned if the qualifying facility filed for self-certification or an application for Commission certification of qualifying facility status; the net capacity of the qualifying facility; the location of the qualifying facility depicted by state and county, and the name and location of the substation where the qualifying facility is interconnected; the interconnection status of each potentially affected qualifying facility including whether the qualifying facility is interconnected as an energy or a network resource; and the expiration date of the energy and/or capacity agreement between the applicant utility and each potentially affected qualifying facility. All potentially affected qualifying facilities shall include:

(1) Those qualifying facilities that have existing power purchase contracts with the applicant;

(2) Other qualifying facilities that sell their output to the applicant or that have pending self-certification or Commission certification with the Commission for qualifying facility status whereby the applicant will be the purchaser of the qualifying facility's output;

(3) Any developer of generating facilities with whom the applicant has agreed to enter into power purchase contracts, as of the date of the application filed pursuant to this section, or are in discussion, as of the date of the application filed pursuant to this section, with regard to power purchase contacts;

(4) The developers of facilities that have pending state avoided cost proceedings, as of the date of the application filed pursuant to this section; and

(5) Any other qualifying facilities that the applicant reasonably believes to be affected by its application filed pursuant to paragraph (a) of this section.

(d) The following information must be filed with an application:

(1) Identify whether applicant seeks a finding under the provisions of §292.309(a)(1), (2), or (3).

(2) A narrative setting forth the factual basis upon which relief is requested and describing why the conditions set forth in §292.309(a)(1), (2), or (3) have been met. Applicant should also state in its application whether it is relying on the findings or rebuttable presumptions contained in §292.309(e), (f) or (g). To the extent applicant seeks relief from the purchase obligation with respect to a qualifying facility 20 megawatts or smaller, and thus seeks to rebut the presumption in §292.309(d), applicant must also set forth, and submit evidence of, the factual basis supporting its contention that the qualifying facility has nondiscriminatory access to the wholesale markets which are the basis for the applicant's filing.

(3) Transmission Studies and related information, including:

(i) The applicant's long-term transmission plan, conducted by applicant, or the RTO, ISO or other relevant entity;

(ii) Transmission constraints by path, element or other level of comparable detail that have occurred and/or are known and expected to occur, and any proposed mitigation including transmission construction plans;

(iii) Levels of congestion, if available;

(iv) Relevant system impact studies for the generation interconnections, already completed;

(v) Other information pertinent to showing whether transfer capability is available; and

(vi) The appropriate link to applicant's OASIS, if any, from which a qualifying facility may obtain applicant's available transfer capability (ATC) information.

(4) Describe the process, procedures and practices that qualifying facilities interconnected to the applicant's system must follow to arrange for the transmission service to transfer power to purchasers other than the applicant. This description must include the process, procedures and practices of all distribution, transmission and regional transmission facilities necessary for qualifying facility access to the market.

(5) If qualifying facilities will be required to execute new interconnection agreements, or renegotiate existing agreements so that they can effectuate wholesale sales to third-party purchasers, explain the requirements, charges and the process to be followed. Also, explain any differences in these requirements as they apply to qualifying facilities compared to other generators, or to applicant-owned generation.

(6) Applicants seeking a Commission finding pursuant to §292.309(a)(2) or (3), except those applicants located in ERCOT, also must provide evidence of competitive wholesale markets that provide a meaningful opportunity to sell capacity, including long-term and short-term sales, and electric energy, including long-term, short-term and real-time sales, to buyers other than the utility to which the qualifying facility is interconnected. In demonstrating that a meaningful opportunity to sell exists, provide evidence of transactions within the relevant market. Applicants must include a list of known or potential purchasers, *e.g.*, jurisdictional and non-jurisdictional utilities as well as retail energy service providers.

(7) Signature of authorized individual evidencing the accuracy and authenticity of information provided by applicant.

(8) Person(s) to whom communications regarding the filed information may be addressed, including name, title, telephone number, and mailing address.

[Order 688, 71 FR 64372, Nov. 1, 2006, as amended by Order 688-A, 72 FR 35892, June 29, 2007]

§292.311 Reinstatement of obligation to purchase.

At any time after the Commission makes a finding under §§292.309 and 292.310 relieving an electric utility of its obligation to purchase electric energy, a qualifying cogeneration facility, a qualifying small power production facility, a State agency, or any other affected person may apply to the Commission for an order reinstating the electric utility's obligation to purchase electric energy under this section. Such application shall set forth the factual basis upon which the application is based and describe why the conditions set forth in §292.309(a), (b) or (c) are no longer met. After notice, including sufficient notice to potentially affected electric utilities, and opportunity for comment, the Commission shall issue an order within 90 days of such application reinstating the electric utility's obligation to purchase electric energy under this section if the Commission finds that the conditions set forth in §292.309(a), (b), or (c) which relieved the obligation to purchase, are no longer met.

[Order 688, 71 FR 64372, Nov. 1, 2006]

§292.312 Termination of obligation to sell to qualifying facilities.

(a) Any electric utility may file an application with the Commission for relief from the mandatory obligation to sell under this section on a service territory-wide basis or a single qualifying facility basis. Such application shall set forth the factual basis upon which relief is requested and describe why the conditions set forth in paragraphs (b)(1) and (b)(2) of this section have been met. After notice, including sufficient notice to potentially affected qualifying facilities, and an opportunity for comment, the Commission shall make a final determination within 90 days of such application regarding whether the conditions set forth in paragraphs (b)(1) and (b)(2) of this section have been met.

(b) After August 8, 2005, an electric utility shall not be required to enter into a new contract or obligation to sell electric energy to a qualifying small power production facility, an existing qualifying cogeneration facility, or a new qualifying cogeneration facility if the Commission has found that;

(1) Competing retail electric suppliers are willing and able to sell and deliver electric energy to the qualifying cogeneration facility or qualifying small power production facility; and

(2) The electric utility is not required by State law to sell electric energy in its service territory.

[Order 688, 71 FR 64372, Nov. 1, 2006; 71 FR 75662, Dec. 18, 2006]

§292.313 Reinstatement of obligation to sell.

At any time after the Commission makes a finding under §292.312 relieving an electric utility of its obligation to sell electric energy, a qualifying cogeneration facility, a qualifying small power production facility, a State agency, or any other affected person may apply to the Commission for an order reinstating the electric utility's obligation to purchase electric energy under this section. Such application shall set forth the factual basis upon which the application is based and describe why the conditions set forth in Paragraph (b)(1) and (b)(2) of this section are no longer met. After notice, including sufficient notice to potentially affected utilities, and opportunity for comment, the Commission shall issue an order within 90 days of such application reinstating the electric utility's obligation to sell electric energy under

this section if the Commission finds that the conditions set forth in paragraphs (b)(1) and (b)(2) of this section are no longer met.

[Order 688, 71 FR 64372, Nov. 1, 2006]

§292.314 Existing rights and remedies.

Nothing in this section affects the rights or remedies of any party under any contract or obligation, in effect or pending approval before the appropriate State regulatory authority or non-regulated electric utility on or before August 8, 2005, to purchase electric energy or capacity from or to sell electric energy or capacity to a qualifying cogeneration facility or qualifying small power production facility under this Act (including the right to recover costs of purchasing electric energy or capacity).

[Order 688, 71 FR 64372, Nov. 1, 2006]

Subpart D—Implementation

AUTHORITY: Public Utility Regulatory Policies Act of 1978, 16 U.S.C. 2601 *et seq.,* Energy Supply and Environmental Coordination Act, 15 U.S.C. 791 *et seq.,* Federal Power Act, 16 U.S.C. 792 *et seq.,* Department of Energy Organization Act, 42 U.S.C. 7101 *et seq.,* E.O. 12009, 42 FR 46267.

SOURCE: Order 69, 45 FR 12236, Feb. 25, 1980, unless otherwise noted.

§292.401 Implementation of certain reporting requirements.

Any electric utility which fails to comply with the requirements of §292.302(b) shall be subject to the same penalties to which it may be subjected for failure to comply with the requirements of the Commission's regulations issued under section 133 of PURPA.

[45 FR 12236, Feb. 25, 1980. Redesignated by Order 541, 57 FR 21734, May 22, 1992]

§292.402 Waivers.

(a) *State regulatory authority and nonregulated electric utility waivers.* Any State regulatory authority (with respect to any electric utility over which it has ratemaking authority) or nonregulated electric utility may, after public notice in the area served by the electric utility, apply for a waiver from the application of any of the requirements of subpart C (other than §292.302 thereof).

(b) *Commission action.* The Commission will grant such a wavier only if an applicant under paragraph (a) of this section demonstrates that compliance with any of the requirements of subpart C is not necessary to encourage cogeneration and small power production and is not otherwise required under section 210 of PURPA.

[45 FR 12236, Feb. 25, 1980. Redesignated by Order 541, 57 FR 21734, May 22, 1992]

Subpart E [Reserved]

Subpart F—Exemption of Qualifying Small Power Production Facilities and Cogeneration Facilities from Certain Federal and State Laws and Regulations

§292.601 Exemption to qualifying facilities from the Federal Power Act.

(a) *Applicability.* This section applies to qualifying facilities, other than those described in paragraph (b) of this section. This section also applies to qualifying facilities that meet the criteria of section 3(17)(E) of the Federal Power Act (16 U.S.C. 796(17)(E)), notwithstanding paragraph (b).

(b) *Exclusion.* This section does not apply to a qualifying small power production facility with a power production capacity which exceeds 30 megawatts, if such facility uses any primary energy source other than geothermal resources.

(c) *General rule.* Any qualifying facility described in paragraph (a) of this section shall be exempt from all sections of the Federal Power Act, except:

(1) Sections 205 and 206; however, sales of energy or capacity made by qualifying facilities 20 MW or smaller, or made pursuant to a contract executed on or before March 17, 2006 or made pursuant to a state regulatory authority's implementation of section 210 the Public Utility Regulatory Policies Act of 1978, 16 U.S.C. 824a-1, shall be exempt from scrutiny under sections 205 and 206;

(2) Section 1-18, and 21-30;

(3) Sections 202(c), 210, 211, 212, 213, 214, 215, 220, 221 and 222;

(4) Sections 305(c); and

(5) Any necessary enforcement provision of part III of the Federal Power Act (including but not limited to sections 306, 307, 308, 309, 314, 315, 316 and 316A) with regard to the sections listed in paragraphs (c)(1), (2), (3) and (4) of this section.

(Energy Security Act, Pub. L. 96-294, 94 Stat. 611 (1980) Public Utility Regulatory Policies Act of 1978, 16 U.S.C. 2601, *et seq.,* Energy Supply and Environmental Coordination Act, 15 U.S.C. 791, *et seq.,* Federal Power Act, as amended, 16 U.S.C. 792 *et seq.,* Department of Energy Organization Act, 42 U.S.C. 7101, *et seq.;* E.O. 12009, 42 FR 46267)

[Order 135, 46 FR 19232, Mar. 30, 1981, as amended by Order 569, 59 FR 40470, Aug. 9, 1994; Order 671, 71 FR 7868, Feb. 15, 2006; 72 FR 29063, May 24, 2007; Order 732, 75 FR 15966, Mar. 30, 2010]

§292.602 Exemption to qualifying facilities from the Public Utility Holding Company Act of 2005 and certain State laws and regulations.

(a) *Applicability.* This section applies to any qualifying facility described in §292.601(a), and to any qualifying small power production facility with a power production capacity over 30 megawatts if such facility produces electric energy solely by the use of biomass as a primary energy source.

(b) *Exemption from the Public Utility Holding Company Act of 2005.* A qualifying facility described in paragraph (a) of this section or a utility geothermal small power production facility shall be exempt from the Public Utility Holding Company Act of 2005, 42 U.S.C. 16,451-63.

(c) *Exemption from certain State laws and regulations.* (1) Any qualifying facility described in paragraph (a) of this section shall be exempted (except as provided in paragraph (c)(2) of this section) from State laws or regulations respecting:

(i) The rates of electric utilities; and

(ii) The financial and organizational regulation of electric utilities.

(2) A qualifying facility may not be exempted from State laws and regulations implementing subpart C.

(3) Upon request of a state regulatory authority or nonregulated electric utility, the Commission may consider a limitation on the exemptions specified in paragraph (b)(1) of this section.

(4) Upon request of any person, the Commission may determine whether a qualifying facility is exempt from a particular State law or regulation.

(Energy Security Act, Pub. L. 96-294, 94 Stat. 611 (1980) Public Utility Regulatory Policies Act of 1978, 16 U.S.C. 2601, *et seq.,* Energy Supply and Environmental Coordination Act, 15 U.S.C. 791, *et seq.,* Federal Power Act, as amended, 16 U.S.C. 792 *et seq.,* Department of Energy Organization Act, 42 U.S.C. 7101, *et seq.;* E.O. 12009, 42 FR 46267)

[45 FR 12237, Feb. 25, 1980, as amended by Order 135, 46 FR 19232, Mar. 30, 1981; Order 671, 71 FR 7869, Feb. 15, 2006; Order 671-A, 71 FR 30589, May 30, 2006; Order 732, 75 FR 15966, Mar. 30, 2010; 77 FR 9842, Feb. 21, 2012]

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ATTACHMENT 4:

COLORADO STATUTES REGARDING NET METERING

Last Reviewed: September 19, 2017
Last Updated: September 19, 2017

C.R.S. 40-2-124

COLORADO REVISED STATUTES

*** This document reflects changes current through all laws passed at the Second Regular Session of the Seventieth General Assembly of the State of Colorado (2016) and changes approved by the electorate at the General Election on November 8, 2016 ***

TITLE 40. UTILITIES
PUBLIC UTILITIES
ARTICLE 2. PUBLIC UTILITIES COMMISSION - RENEWABLE ENERGY STANDARD

C.R.S. 40-2-124 (2016)

40-2-124. Renewable energy standard - definitions - net metering

(1) Each provider of retail electric service in the state of Colorado, other than municipally owned utilities that serve forty thousand customers or fewer, is a qualifying retail utility. Each qualifying retail utility, with the exception of cooperative electric associations that have voted to exempt themselves from commission jurisdiction pursuant to section 40-9.5-104 and municipally owned utilities, is subject to the rules established under this article by the commission. No additional regulatory authority is provided to the commission other than that specifically contained in this section. In accordance with article 4 of title 24, C.R.S., the commission shall revise or clarify existing rules to establish the following:

(a) Definitions of eligible energy resources that can be used to meet the standards. "Eligible energy resources" means recycled energy and renewable energy resources. In addition, resources using coal mine methane and synthetic gas produced by pyrolysis of municipal solid waste are eligible energy resources if the commission determines that the electricity generated by those resources is greenhouse gas neutral. The commission shall determine, following an evidentiary hearing, the extent to which such electric generation technologies utilized in an optional pricing program may be used to comply with this standard. A fuel cell using hydrogen derived from an eligible energy resource is also an eligible electric generation technology. Fossil and nuclear fuels and their derivatives are not eligible energy resources. For purposes of this section:

(I) "Biomass" means:

(A) Nontoxic plant matter consisting of agricultural crops or their byproducts, urban wood waste, mill residue, slash, or brush;

(B) Animal wastes and products of animal wastes; or

(C) Methane produced at landfills or as a by-product of the treatment of wastewater residuals.

(II) "Coal mine methane" means methane captured from active and inactive coal mines where the methane is escaping to the atmosphere. In the case of methane escaping from active mines, only methane vented in the normal course of mine operations that is naturally escaping to the atmosphere is coal mine methane for purposes of eligibility under this section.

(III) "Distributed renewable electric generation" or "distributed generation" means:

(A) Retail distributed generation; and

(B) Wholesale distributed generation.

(IV) "Greenhouse gas neutral", with respect to electricity generated by a coal mine methane or synthetic gas facility, means that the volume of greenhouse gases emitted into the atmosphere from the conversion of fuel to electricity is no greater than the volume of greenhouse gases that would have been emitted into the atmosphere over the next five years, beginning with the planned date of operation of the facility, if the fuel had not been converted to electricity, where greenhouse gases are measured in terms of carbon dioxide equivalent.

(V) "Pyrolysis" means the thermochemical decomposition of material at elevated temperatures without the participation of oxygen.

(VI) "Recycled energy" means energy produced by a generation unit with a nameplate capacity of not more than fifteen megawatts that converts the otherwise lost energy from the heat from exhaust stacks or pipes to electricity and that does not combust additional fossil fuel. "Recycled energy" does not include energy produced by any system that uses energy, lost or otherwise, from a process whose primary purpose is the generation of electricity, including, without limitation, any process involving engine-driven generation or pumped hydroelectricity generation.

(VII) "Renewable energy resources" means solar, wind, geothermal, biomass, new hydroelectricity with a nameplate rating of ten megawatts or less, and hydroelectricity in existence on January 1, 2005, with a nameplate rating of thirty megawatts or less.

(VIII) "Retail distributed generation" means a renewable energy resource that is located on the site of a customer's facilities and is interconnected on the customer's side of the utility meter. In addition, retail distributed generation shall provide electric energy primarily to serve the customer's load and shall be sized to supply no more than one hundred twenty percent of the average annual consumption of electricity by the customer at that site. For purposes of this subparagraph (VIII), the customer's "site" includes all contiguous property owned or leased by the customer without regard to interruptions in contiguity caused by easements, public thoroughfares, transportation rights-of-way, or utility rights-of-way.

(IX) "Wholesale distributed generation" means a renewable energy resource with a nameplate rating of thirty megawatts or less and that does not qualify as retail distributed generation.

(b) Standards for the design, placement, and management of electric generation technologies that use eligible energy resources to ensure that the environmental impacts of such facilities are minimized.

(c) Electric resource standards:

(I) Except as provided in subparagraph (V) of this paragraph (c), the electric resource standards shall require each qualifying retail utility to generate, or cause to be generated, electricity from eligible energy resources in the following minimum amounts:

(A) Three percent of its retail electricity sales in Colorado for the year 2007;

(B) Five percent of its retail electricity sales in Colorado for the years 2008 through 2010;

(C) Twelve percent of its retail electricity sales in Colorado for the years 2011 through 2014, with distributed generation equaling at least one percent of its retail electricity sales in 2011 and 2012 and one and one-fourth percent of its retail electricity sales in 2013 and 2014;

(D) Twenty percent of its retail electricity sales in Colorado for the years 2015 through 2019, with distributed generation equaling at least one and three-fourths percent of its retail electricity sales in 2015 and 2016 and two percent of its retail electricity sales in 2017, 2018, and 2019; and

(E) Thirty percent of its retail electricity sales in Colorado for the years 2020 and thereafter, with distributed generation equaling at least three percent of its retail electricity sales.

(II) (A) Of the amounts of distributed generation in sub-subparagraphs (C), (D), and (E) of subparagraph (I), sub-subparagraph (D) of subparagraph (V), and subparagraph (V.5) of this paragraph (c), at least one-half must be derived from retail distributed generation; except that this sub-subparagraph (A) does not apply to a qualifying retail utility that is a municipal utility.

(A.5) Notwithstanding sub-subparagraph (A) of this subparagraph (II), a qualifying retail utility that is a cooperative electric association may subtract industrial retail sales from total retail sales in calculating its minimum retail distributed generation requirement.

(B) Solar generating equipment located on-site at customers' facilities shall be sized to supply no more than one hundred twenty percent of the average annual consumption of electricity by the consumer at that site. For purposes of this sub-subparagraph (B), the consumer's "site" shall include all contiguous property owned or leased by the consumer, without regard to interruptions in contiguity caused by easements, public thoroughfares, transportation rights-of-way, or utility rights-of-way.

(C) Distributed generation amounts in the electric resource standard for the years 2015 and thereafter may be changed by the commission for the period after December 31, 2014, if the commission finds, upon application by a qualifying retail utility, that these percentage requirements are no longer in the public interest. If such a finding is made, the commission may set the lower distributed generation requirements, if any, that shall apply after December 31, 2014. If the commission finds that the public interest requires an increase in the distributed generation requirements, the commission shall report its findings to the general assembly.

(D) For purposes of a cooperative electric association's compliance with the retail distributed generation requirement set forth in sub-subparagraph (A) of this subparagraph (II), an electric generation facility constitutes retail distributed generation if it uses only renewable energy resources; has a nameplate rating of two megawatts or less; is located within the service territory of a cooperative electric association; generates electricity for the beneficial use of subscribers who are members of the cooperative electric association in the service territory in which the facility is located; and has at least four subscribers if the facility has a nameplate rating of fifty kilowatts or less and at least ten subscribers if the facility has a nameplate rating of more than fifty kilowatts. A subscriber's share of the production from the facility may not exceed one hundred twenty percent of the subscriber's average annual consumption. Each cooperative electric association may establish, in the manner it deems appropriate, the: Subscriber; subscription; pricing, including consideration of low-income members; metering; accounting; renewable energy credit ownership; and other requirements and terms associated with electric generation facilities described in this sub-subparagraph (D).

(III) Each kilowatt-hour of electricity generated from eligible energy resources, other than retail distributed generation and other than eligible energy resources beginning operation on or after January 1, 2015, counts as one and one-fourth kilowatt-hours for the purposes of compliance with this standard.

(IV) To the extent that the ability of a qualifying retail utility to acquire eligible energy resources is limited by a requirements contract with a wholesale electric supplier, the qualifying retail utility shall acquire the maximum amount allowed by the contract. For any shortfalls to the amounts established by the commission pursuant to subparagraph (I) of this paragraph (c), the qualifying retail utility shall acquire an equivalent amount of either renewable energy credits; documented and verified energy savings through energy efficiency and conservation programs; or a combination of both. Any contract entered into by a qualifying retail utility after December 1, 2004, shall not conflict with this section.

(V) Notwithstanding any other provision of law but subject to subsection (4) of this section, the electric resource standards must require each cooperative electric association that is a qualifying retail utility and that provides service to fewer than one hundred thousand meters, and each municipally owned utility that is a qualifying retail utility, to generate, or cause to be generated, electricity from eligible energy resources in the following minimum amounts:

(A) One percent of its retail electricity sales in Colorado for the years 2008 through 2010;

(B) Three percent of retail electricity sales in Colorado for the years 2011 through 2014;

(C) Six percent of retail electricity sales in Colorado for the years 2015 through 2019; and

(D) Ten percent of retail electricity sales in Colorado for the years 2020 and thereafter.

(V.5) Notwithstanding any other provision of law, each cooperative electric association that provides electricity at retail to its customers and serves one hundred thousand or more meters shall generate or cause to be generated at least twenty percent of the energy it provides to its customers from eligible energy resources in the years 2020 and thereafter.

(VI) Each kilowatt-hour of electricity generated from eligible energy resources at a community-based project must be counted as one and one-half kilowatt-hours. For purposes of this subparagraph (VI), "community-based project" means a project:

(A) That is owned by individual residents of a community, by an organization or cooperative that is controlled by individual residents of the community, or by a local government entity or tribal council;

(B) The generating capacity of which does not exceed thirty megawatts; and

(C) For which there is a resolution of support adopted by the local governing body of each local jurisdiction in which the project is to be located.

(VII) (A) For purposes of compliance with the standards set forth in subparagraphs (V) and (V.5) of this paragraph (c), each kilowatt-hour of renewable electricity generated from solar electric generation technologies shall be counted as three kilowatt-hours.

(B) For each qualifying retail utility that is a cooperative electric association, sub-subparagraph (A) of this subparagraph (VII) applies only to solar electric technologies that begin producing electricity prior to July 1, 2015, and for solar electric technologies that begin producing electricity on or after July 1, 2015, each kilowatt-hour of renewable electricity shall be counted as one kilowatt-hour for purposes of compliance with the renewable energy standard.

(C) For each qualifying retail utility that is a municipally owned utility, sub-subparagraph (A) of this subparagraph (VII) applies only to solar electric technologies that are under contract for development prior to August 1, 2015, and begin producing electricity prior to December 31, 2016, and for solar electric technologies that are not under contract for development prior to August 1, 2015, and begin producing electricity on or after December 31, 2016, each kilowatt-hour of renewable electricity shall be counted as one kilowatt-hour for purposes of compliance with the renewable energy standard.

(VIII) Electricity from eligible energy resources shall be subject to only one of the methods for counting kilowatt-hours set forth in subparagraphs (III), (VI), and (VII) of this paragraph (c).

(IX) For purposes of stimulating rural economic development and for projects up to thirty megawatts of nameplate capacity that have a point of interconnection rated at sixty-nine kilovolts or less, each kilowatt hour of electricity generated from renewable energy resources that interconnects to electric transmission or distribution facilities owned by a cooperative electric association or municipally owned utility may be counted for the life of the project as two kilowatt hours for compliance with the requirements of this paragraph (c) by qualifying retail utilities. This multiplier shall not be claimed for interconnections that first occur after December 31, 2014, and shall not be used in conjunction with another compliance multiplier. For qualifying retail utilities other than investor-owned utilities, the benefits described in this subparagraph (IX) apply only to the aggregate first one hundred megawatts of nameplate capacity of projects statewide that report having achieved commercial operations to the commission pursuant to the procedure described in this subparagraph (IX). To the extent that a

qualifying retail utility claims the benefit described in this subparagraph (IX), those kilowatt-hours of electricity do not qualify for satisfaction of the distributed generation requirement of subparagraph (I) of this paragraph (c). The commission shall analyze the implementation of this subparagraph (IX) and submit a report to the senate local government and energy committee and the house of representatives committee on transportation and energy, or their successor committees, by December 31, 2011, regarding implementation of this subparagraph (IX), including how many megawatts of electricity have been installed or are subject to a power purchase agreement pursuant to this subparagraph (IX) and whether the commission recommends that the multiplier established by this subparagraph (IX) should be changed either in magnitude or expiration date. Any entity that owns or develops a project that will take advantage of the benefits of this subparagraph (IX) shall notify the commission within thirty days after signing a power purchase agreement and within thirty days after beginning commercial operations of an applicable project.

(X) Of the minimum amounts of electricity required to be generated or caused to be generated by qualifying retail utilities in accordance with subparagraph (V.5) and sub-subparagraph (D) of subparagraph (V) of this paragraph (c), one-tenth, or one percent of total retail electricity sales, must be from distributed generation; except that:

(A) For a cooperative electric association that is a qualifying retail utility and that provides service to fewer than ten thousand meters, the distributed generation component may be three-quarters of one percent of total retail electricity sales; and

(B) This subparagraph (X) does not apply to a qualifying retail utility that is a municipal utility.

(d) A system of tradable renewable energy credits that may be used by a qualifying retail utility to comply with this standard. The commission shall also analyze the effectiveness of utilizing any regional system of renewable energy credits in existence at the time of its rule-making process and determine whether the system is governed by rules that are consistent with the rules established for this article. The commission shall not restrict the qualifying retail utility's ownership of renewable energy credits if the qualifying retail utility complies with the electric resource standard of paragraph (c) of this subsection (1), uses definitions of eligible energy resources that are limited to those identified in paragraph (a) of this subsection (1), as clarified by the commission, and does not exceed the retail rate impact established by paragraph (g) of this subsection (1). Once a qualifying retail utility either receives a permit pursuant to article 7 or 8 of title 25, C.R.S., for a generation facility that relies on or is affected by the definitions of eligible energy resources or enters into a contract that relies on or is affected by the definitions of eligible energy resources, such definitions apply to the contract or facility notwithstanding any subsequent alteration of the definitions, whether by statute or rule. For purposes of compliance with the renewable energy standard, if a generation system uses a combination of fossil fuel and eligible renewable energy resources to generate electricity, a qualified retail utility that is not an investor-owned utility may count as eligible renewable energy only the proportion of the total electric output of the generation system that results from the use of eligible renewable energy resources.

(e) A standard rebate offer program, under which:

(I) (A) Each qualifying retail utility, except for cooperative electric associations and municipally owned utilities, shall make available to its retail electricity customers a standard rebate offer of a specified amount per watt for the installation of eligible solar electric generation on customers' premises up to a maximum of one hundred kilowatts per installation.

(B) The standard rebate offer shall allow the customer's retail electricity consumption to be offset by the solar electricity generated. To the extent that solar electricity generation exceeds the customer's consumption during a billing month, such excess electricity shall be carried forward as a credit to the following month's consumption. To the extent that solar electricity generation exceeds the customer's consumption during a calendar year, the customer shall be reimbursed by the qualifying retail utility at its average hourly incremental cost of electricity supply over the prior twelve-month period unless the customer makes a one-time election, in writing, to request that the excess electricity be carried

forward as a credit from month to month indefinitely until the customer terminates service with the qualifying retail utility, at which time no payment shall be required from the qualifying retail utility for any remaining excess electricity supplied by the customer. The qualifying retail utility shall not apply unreasonably burdensome interconnection requirements in connection with this standard rebate offer. Electricity generated under this program shall be eligible for the qualifying retail utility's compliance with this article.

(I.5) The amount of the standard rebate offer shall be two dollars per watt; except that the commission may set the rebate at a lower amount if the commission determines, based upon a qualifying retail utility's renewable resource plan or application, that market changes support the change.

(II) Sales of electricity to a consumer may be made by the owner or operator of the solar electric generation facilities located on the site of the consumer's property if the solar generating equipment is sized to supply no more than one hundred twenty percent of the average annual consumption of electricity by the consumer at that site. For purposes of this subparagraph (II), the consumer's site shall include all contiguous property owned or leased by the consumer, without regard to interruptions in contiguity caused by easements, public thoroughfares, transportation rights-of-way, or utility rights-of-way. If the solar electric generation facility is not owned by the consumer, then the qualifying retail utility shall not be required by the commission to pay for the renewable energy credits generated by the facility on any basis other than a metered basis. The owner or operator of the solar electric generation facility shall pay the cost of installing the production meter.

(III) The qualifying retail utility may establish one or more standard offers to purchase renewable energy credits generated from the eligible solar electric generation on the customer's premises so long as the generation meets the size and location requirements set forth in subparagraph (II) of this paragraph (e) and so long as the generation is five hundred kilowatts or less in size. When establishing the standard offers, the prices for renewable energy credits should be set at levels sufficient to encourage increased customer-sited solar generation in the size ranges covered by each standard offer, but at levels that will still allow the qualifying retail utility to comply with the electric resource standards set forth in paragraph (c) of this subsection (1) without exceeding the retail rate impact limit in paragraph (g) of this subsection (1). The commission shall encourage qualifying retail utilities to design solar programs that allow consumers of all income levels to obtain the benefits offered by solar electricity generation and shall allow programs that are designed to extend participation to customers in market segments that have not been responding to the standard offer program.

(f) Policies for the recovery of costs incurred with respect to these standards for qualifying retail utilities that are subject to rate regulation by the commission. These policies must provide incentives to qualifying retail utilities to invest in eligible energy resources and must include:

(I) Allowing a qualifying retail utility to develop and own as utility rate-based property up to twenty-five percent of the total new eligible energy resources the utility acquires from entering into power purchase agreements and from developing and owning resources after March 27, 2007, if the new eligible energy resources proposed to be developed and owned by the utility can be constructed at reasonable cost compared to the cost of similar eligible energy resources available in the market. The qualifying retail utility shall be allowed to develop and own as utility rate-based property more than twenty-five percent but not more than fifty percent of total new eligible energy resources acquired after March 27, 2007, if the qualifying retail utility shows that its proposal would provide significant economic development, employment, energy security, or other benefits to the state of Colorado. The qualifying retail utility may develop and own these resources either by itself or jointly with other owners, and, if owned jointly, the entire jointly owned resource shall count toward the percentage limitations in this subparagraph (I). For the resources addressed in this subparagraph (I), the qualifying retail utility shall not be required to comply with the competitive bidding requirements of the commission's rules; except that nothing in this subparagraph (I) shall preclude the qualifying retail utility from bidding to own a greater percentage of new eligible energy resources than permitted by this subparagraph (I). In addition, nothing in this subparagraph (I) shall prevent the commission from waiving, repealing, or revising any commission rule in a manner otherwise consistent with applicable

law.

(II) Allowing qualifying retail utilities to earn an extra profit on their investment in eligible energy resource technologies if these investments provide net economic benefits to customers as determined by the commission. The allowable extra profit in any year shall be the qualifying retail utility's most recent commission authorized rate of return plus a bonus limited to fifty percent of the net economic benefit.

(III) Allowing qualifying retail utilities to earn their most recent commission authorized rate of return, but no bonus, on investments in eligible energy resource technologies if these investments do not provide a net economic benefit to customers.

(IV) Considering, when the qualifying retail utility applies for a certificate of public convenience and necessity under section 40-5-101, rate recovery mechanisms that provide for earlier and timely recovery of costs prudently and reasonably incurred by the qualifying retail utility in developing, constructing, and operating the eligible energy resource, including:

(A) Rate adjustment clauses until the costs of the eligible energy resource can be included in the utility's base rates; and

(B) A current return on the utility's capital expenditures during construction at the utility's weighted average cost of capital, including its most recently authorized rate of return on equity, during the construction, startup, and operation phases of the eligible energy resource.

(V) If the commission approves the terms and conditions of an eligible energy resource contract between the qualifying retail utility and another party, the contract and its terms and conditions shall be deemed to be a prudent investment, and the commission shall approve retail rates sufficient to recover all just and reasonable costs associated with the contract. All contracts for acquisition of eligible energy resources shall have a minimum term of twenty years; except that the contract term may be shortened at the sole discretion of the seller. All contracts for the acquisition of renewable energy credits from solar electric technologies located on site at customer facilities shall also have a minimum term of twenty years; except that such contracts for systems of between one hundred kilowatts and one megawatt may have a different term if mutually agreed to by the parties.

(VI) A requirement that qualifying retail utilities consider proposals offered by third parties for the sale of renewable energy or renewable energy credits. The commission may develop standard terms for the submission of such proposals.

(VII) A requirement that all distributed renewable electric generation facilities with a nameplate rating of one megawatt or more be registered with a renewable energy generation information tracking system designated by the commission.

(g) Retail rate impact rule:

(I) (A) Except as otherwise provided in subparagraph (IV) of this paragraph (g), for each qualifying utility, the commission shall establish a maximum retail rate impact for this section for compliance with the electric resource standards of two percent of the total electric bill annually for each customer. The retail rate impact shall be determined net of new alternative sources of electricity supply from noneligible energy resources that are reasonably available at the time of the determination.

(B) If the retail rate impact does not exceed the maximum impact permitted by this paragraph (g), the qualifying utility may acquire more than the minimum amount of eligible energy resources and renewable energy credits required by this section. At the request of the qualifying retail utility and upon the commission's approval, the qualifying retail utility may advance funds from year to year to augment the amounts collected from retail customers under this paragraph (g) for the acquisition of more eligible energy resources. Such funds shall be repaid from future retail rate collections, with interest calculated at the qualifying retail utility's after-tax weighted average cost of capital, so long as

the retail rate impact does not exceed two percent of the total annual electric bill for each customer.

(C) As between residential and nonresidential retail distributed generation, the commission shall direct the utility to allocate its expenditures according to the proportion of the utility's revenue derived from each of these customer groups; except that the utility may acquire retail distributed generation at levels that differ from these group allocations based upon market response to the utility's programs.

(II) Each wholesale energy provider shall offer to its wholesale customers that are cooperative electric associations the opportunity to purchase their load ratio share of the wholesale energy provider's electricity from eligible energy resources. If a wholesale customer agrees to pay the full costs associated with the acquisition of eligible energy resources and associated renewable energy credits by its wholesale provider by providing notice of its intent to pay the full costs within sixty days after the wholesale provider extends the offer, the wholesale customer shall be entitled to receive the appropriate credit toward the renewable energy standard as well as any associated renewable energy credits. To the extent that the full costs are not recovered from wholesale customers, a qualifying retail utility shall be entitled to recover those costs from retail customers.

(III) Subject to the maximum retail rate impact permitted by this paragraph (g), the qualifying retail utility shall have the discretion to determine, in a nondiscriminatory manner, the price it will pay for renewable energy credits from on-site customer facilities that are no larger than five hundred kilowatts.

(IV) (A) For cooperative electric associations, the maximum retail rate impact for this section is two percent of the total electric bill annually for each customer.

(B) Notwithstanding subparagraph (I) of this paragraph (g), the commission may ensure that customers who install distributed generation continue to contribute, in a nondiscriminatory fashion, their fair share to their utility's renewable energy program fund or equivalent renewable energy support mechanism even if such contribution results in a charge that exceeds two percent of such customers' annual electric bills.

(h) Annual reports. Each qualifying retail utility shall submit to the commission an annual report that provides information relating to the actions taken to comply with this article including the costs and benefits of expenditures for renewable energy. The report shall be within the time prescribed and in a format approved by the commission.

(i) Rules necessary for the administration of this article including enforcement mechanisms necessary to ensure that each qualifying retail utility complies with this standard, and provisions governing the imposition of administrative penalties assessed after a hearing held by the commission pursuant to section 40-6-109. The commission shall exempt a qualifying retail utility from administrative penalties for an individual compliance year if the utility demonstrates that the retail rate impact cap described in paragraph (g) of this subsection (1) has been reached and the utility has not achieved full compliance with paragraph (c) of this subsection (1). The qualifying retail utility's actions under an approved compliance plan shall carry a rebuttable presumption of prudence. Under no circumstances shall the costs of administrative penalties be recovered from Colorado retail customers.

(1.5) Notwithstanding any provision of law to the contrary, paragraph (e) of subsection (1) of this section shall not apply to a municipally owned utility or to a cooperative electric association.

(2) (Deleted by amendment, L. 2007, p. 257, § 1, effective March 27, 2007.)

(3) Each municipally owned electric utility that is a qualifying retail utility shall implement a renewable energy standard substantially similar to this section. The municipally owned utility shall submit a statement to the commission that demonstrates such municipal utility has a substantially similar renewable energy standard. The statement submitted by the municipally owned utility is for informational purposes and is not subject to approval by the commission. Upon filing of the certification statement, the municipally owned utility shall have no further obligations under subsection (1) of this

section. The renewable energy standard of a municipally owned utility shall, at a minimum, meet the following criteria:

(a) The eligible energy resources shall be limited to those identified in paragraph (a) of subsection (1) of this section;

(b) The percentage requirements shall be equal to or greater in the same years than those identified in subparagraph (V) of paragraph (c) of subsection (1) of this section, counted in the manner allowed by said paragraph (c); and

(c) The utility must have an optional pricing program in effect that allows retail customers the option to support through utility rates emerging renewable energy technologies.

(4) For municipal utilities that become qualifying retail utilities after December 31, 2006, the percentage requirements identified in subparagraph (V) of paragraph (c) of subsection (1) of this section shall begin in the first calendar year following qualification as follows:

(a) Years one through three: One percent of retail electricity sales;

(b) Years four through seven: Three percent of retail electricity sales;

(c) Years eight through twelve: Six percent of retail electricity sales; and

(d) Years thirteen and thereafter: Ten percent of retail electricity sales.

(5) Procedure for exemption and inclusion - election.

(a) (Deleted by amendment, L. 2007, p. 257, § 1, effective March 27, 2007.)

(b) The board of directors of each municipally owned electric utility not subject to this section may, at its option, submit the question of its inclusion in this section to its consumers on a one meter equals one vote basis. Approval by a majority of those voting in the election shall be required for such inclusion, providing that a minimum of twenty-five percent of eligible consumers participates in the election.

(5.5) Each cooperative electric association that is a qualifying retail utility shall submit an annual compliance report to the commission no later than June 1 of each year in which the cooperative electric association is subject to the renewable energy standard requirements established in this section. The annual compliance report shall describe the steps taken by the cooperative electric association to comply with the renewable energy standards and shall include the same information set forth in the rules of the commission for jurisdictional utilities. Cooperative electric associations shall not be subject to any part of the compliance report review process as provided in the rules for jurisdictional utilities. Cooperative electric associations shall not be required to obtain commission approval of annual compliance reports, and no additional regulatory authority of the commission other than that specifically contained in this subsection (5.5) is created or implied by this subsection (5.5).

(6) (Deleted by amendment, L. 2007, p. 257, § 1, effective March 27, 2007.)

(7) (a) Definitions. For purposes of this subsection (7), unless the context otherwise requires:

(I) "Customer-generator" means an end-use electricity customer that generates electricity on the customer's side of the meter using eligible energy resources.

(II) "Municipally owned utility" means a municipally owned utility that serves five thousand customers or more.

(b) Each municipally owned utility shall allow a customer-generator's retail electricity consumption to

be offset by the electricity generated from eligible energy resources on the customer-generator's side of the meter that are interconnected with the facilities of the municipally owned utility, subject to the following:

(I) Monthly excess generation. If a customer-generator generates electricity in excess of the customer-generator's monthly consumption, all such excess energy, expressed in kilowatt-hours, shall be carried forward from month to month and credited at a ratio of one to one against the customer-generator's energy consumption, expressed in kilowatt-hours, in subsequent months.

(II) Annual excess generation. Within sixty days after the end of each annual period, or within sixty days after the customer-generator terminates its retail service, the municipally owned utility shall account for any excess energy generation, expressed in kilowatt-hours, accrued by the customer-generator and shall credit such excess generation to the customer-generator in a manner deemed appropriate by the municipally owned utility.

(III) Nondiscriminatory rates. A municipally owned utility shall provide net metering service at nondiscriminatory rates.

(IV) Interconnection standards. Each municipally owned utility shall adopt and post small generation interconnection standards and insurance requirements that are functionally similar to those established in the rules promulgated by the public utilities commission pursuant to this section; except that the municipally owned utility may reduce or waive any of the insurance requirements. If any customer-generator subject to the size specifications specified in subparagraph (V) of this paragraph (b) is denied interconnection by the municipally owned utility, the utility shall provide a written technical or economic explanation of such denial to the customer.

(V) Size specifications. Each municipally owned utility may allow customer-generators to generate electricity subject to net metering in amounts in excess of those specified in this subparagraph (V), and shall allow:

(A) Residential customer-generators to generate electricity subject to net metering up to ten kilowatts; and

(B) Commercial or industrial customer-generators to generate electricity subject to net metering up to twenty-five kilowatts.

(8) Qualifying wholesale utilities - definition - electric resource standard - tradable credits - reports. (a) Definition. Each generation and transmission cooperative electric association that provides wholesale electric service directly to Colorado electric associations that are its members is a qualifying wholesale utility. Commission rules adopted under subsections (1) to (7) of this section do not apply directly to qualifying wholesale utilities, and this subsection (8) does not provide the commission with additional regulatory authority over qualifying wholesale utilities.

(b) Electric resource standard. Notwithstanding any other provision of law, each qualifying wholesale utility shall generate, or cause to be generated, at least twenty percent of the energy it provides to its Colorado members at wholesale from eligible energy resources in the year 2020 and thereafter. If, and to the extent that, the purchase of energy generated from eligible energy resources by a Colorado member from a qualifying wholesale utility would cause an increase in rates for the Colorado member that exceeds the retail rate impact limitation in sub-subparagraph (A) of subparagraph (IV) of paragraph (g) of subsection (1) of this section, the obligation imposed on the qualifying wholesale utility is reduced by the amount of such energy necessary to enable the Colorado member to comply with the rate impact limitation.

(c) A qualifying wholesale utility may count the energy generated or caused to be generated from eligible energy resources by its Colorado members or by the qualifying wholesale utility on behalf of its Colorado members pursuant to subparagraph (V) of paragraph (c) of subsection (1) of this section toward compliance with the energy resource standard established in this subsection (8).

(d) Preferences for certain eligible energy resources and the limit on their applicability established in subparagraph (VIII) of paragraph (c) of subsection (1) of this section may be used by a qualifying wholesale utility in meeting the energy resource standard established in this subsection (8).

(e) Tradable renewable energy credits. A qualifying wholesale utility shall use a system of tradable renewable energy credits to comply with the electric resource standard established in this subsection (8); except that a renewable energy credit acquired under this subsection (8) expires at the end of the fifth calendar year following the calendar year in which it was generated.

(f) In implementing the electric resource standard established in this subsection (8), a qualifying wholesale utility shall assure that the costs, both direct and indirect, attributable to compliance with the standard are recovered from its Colorado members. The qualifying wholesale utility shall employ such cost allocation methods as are required to assure that any direct or indirect costs attributable to compliance with the standard established in this subsection (8) do not affect the cost or price of the qualifying wholesale utility's sales to customers outside of Colorado.

(g) Reports. Each qualifying wholesale utility shall submit an annual report to the commission no later than June 1, 2014, and June 1 of each year thereafter. In addition, the qualifying wholesale utility shall post an electronic copy of each report on its website and shall provide the commission with an electronic copy of the report. In each report, the qualifying wholesale utility shall:

(I) Describe the steps it took during the immediately preceding twelve months to comply with the electric resource standard established in this subsection (8);

(II) In the years before 2020, describe whether it is making sufficient progress toward meeting the standard in 2020 or is likely to meet the 2020 standard early. If it is not making sufficient progress toward meeting the standard in 2020, it shall explain why and shall indicate the steps it intends to take to increase the pace of progress; and

(III) In 2020 and thereafter, describe whether it has achieved compliance with the electric resource standard established in this subsection (8) and whether it anticipates continuing to do so. If it has not achieved such compliance or does not anticipate continuing to do so, it shall explain why and shall indicate the steps it intends to take to meet the standard and by what date.

(h) Nothing in this subsection (8) amends or waives any provision of subsections (1) to (7) of this section.

HISTORY: Source: Initiated 2004: Entire section added, see L. 2005, p. 2337, effective December 1, 2004, proclamation of the Governor issued December 1, 2004.L. 2005: Entire section amended, p. 234, § 1, effective August 8; (6) added by revision, see L. 2005, p. 2340, § 3.L. 2007: Entire section amended, p. 257, § 1, effective March 27.L. 2008: (7) added, p. 190, § 3, effective August 5.L. 2009: (1)(c)(II), (1)(e), and (1)(f)(V) amended and (1.5) added, (SB 09-051), ch. 157, p. 678, § 11, effective September 1.L. 2010: IP(1), (1)(a), (1)(c)(I), (1)(c)(II), (1)(c)(III), (1)(c)(IV), (1)(c)(VIII), (1)(e)(I), (1)(f)(IV), (1)(g)(I), (1)(g)(III), (1)(g)(IV), and (1)(i) amended and (1)(e)(I.5) and (1)(f)(VII) added, (HB 10-1001), ch. 37, pp. 144, 147, 148, § § 1, 2, 3, effective August 11; (1)(c)(VI)(A) amended and (1)(c)(IX) added, (HB 10-1418), ch. 406, p. 2007, § 1, effective August 11; (1)(d) amended, (SB 10-177), ch. 392, p. 1864, § 7, effective August 11.L. 2013: IP(1), (1)(a), (1)(c)(II)(A), (1)(c)(III), IP(1)(c)(V), IP(1)(c)(VI), (1)(c)(VII)(A), IP(1)(f), (1)(g)(I)(A), and (1)(g)(IV)(A) amended and (1)(c)(V.5), (1)(c)(X), and (8) added, (SB 13-252), ch. 414, p. 2452, § 1, effective July 1.L. 2015: (1)(c)(VII) amended, (SB 15-254), ch. 257, p. 934, § 1, effective May 29; (1)(c)(II)(A.5) added, (SB 15-046), ch. 142, p. 433, § 1, effective August 5; (1)(c)(II)(D) added, (HB 15-1377), ch. 200, p. 691, § 1, effective August 5.

Editor's note: (1) A declaration of intent was contained in the initiated measure, Amendment 37, and is

reproduced below:

SECTION 1.Legislative declaration of intent:
Energy is critically important to Colorado's welfare and development, and its use has a profound impact on the economy and environment. Growth of the state's population and economic base will continue to create a need for new energy resources, and Colorado's renewable energy resources are currently underutilized.

Therefore, in order to save consumers and businesses money, attract new businesses and jobs, promote development of rural economies, minimize water use for electricity generation, diversify Colorado's energy resources, reduce the impact of volatile fuel prices, and improve the natural environment of the state, it is in the best interests of the citizens of Colorado to develop and utilize renewable energy resources to the maximum practicable extent.

(2) This initiated measure was approved by a vote of the registered electors of the state of Colorado on November 2, 2004. The vote count for the measure was as follows:

:u360 FOR: :u1080 1,066,023

:u360 AGAINST: :u1080 922,577

ANNOTATION

Law reviews. For comment, "Compromise in Colorado: Solar Net Metering and the Case for "Renewable Avoided Cost"", see 86 U. Colo. L. Rev. 1095 (2015).

The requirement that Colorado utility companies obtain an increasing proportion of their electricity from renewable sources does not violate the commerce clause of the United States constitution. Energy & Env't Legal Inst. v. Epel, 43 F. Supp. 3d 1171 (D. Colo. 2014), aff'd, 793 F. 3d 1169 (10th Cir.), cert. denied, -- U.S. --, 136 S. Ct. 595, 193 L. Ed. 2d 487 (2015).

C.R.S. 40-9.5-118

COLORADO REVISED STATUTES

*** This document reflects changes current through all laws passed at the Second Regular Session of the Seventieth General Assembly of the State of Colorado (2016) and changes approved by the electorate at the General Election on November 8, 2016 ***

TITLE 40. UTILITIES
PUBLIC UTILITIES
ARTICLE 9.5. COOPERATIVE ELECTRIC ASSOCIATIONS
PART 1. GENERALLY

C.R.S. 40-9.5-118 (2016)

40-9.5-118. Net metering - rules

(1) Definitions. For purposes of this section, unless the context otherwise requires:

(a) "Customer-generator" means an end-use electricity customer that generates electricity on the customer's side of the meter using eligible energy resources.

(b) "Eligible energy resources" has the meaning established in section 40-2-124.

(2) Each cooperative electric association shall allow a customer-generator's retail electricity consumption to be offset by the electricity generated from eligible energy resources on the customer-generator's side of the meter that are interconnected with the facilities of the cooperative electric association, subject to the following:

(a) Monthly excess generation. If a customer-generator generates electricity in excess of the customer-generator's monthly consumption, all such excess energy, expressed in kilowatt-hours, shall be carried forward from month to month and credited at a ratio of one to one against the customer-generator's energy consumption, expressed in kilowatt-hours, in subsequent months.

(b) Annual excess generation. Within sixty days after the end of each annual period, or within sixty days after the customer-generator terminates its retail service, the cooperative electric association shall account for any excess energy generation, expressed in kilowatt-hours, accrued by the customer-generator and shall credit such excess generation to the customer-generator in a manner deemed appropriate by the cooperative electric association.

(c) Nondiscriminatory rates. A cooperative electric association shall provide net metering service at nondiscriminatory rates.

(d) Interconnection standards. A cooperative electric association and a customer-generator shall comply with the interconnection standards and insurance requirements established in the rules promulgated by the public utilities commission pursuant to section 40-2-124; except that the cooperative electric association may reduce or waive any of the insurance requirements, and except that the public utilities commission shall initiate a rule-making proceeding no later than October 1, 2008, for the purpose of addressing cooperative electric association system issues in its small generator interconnection procedures. A cooperative electric association shall not prevent or unreasonably burden the installation of a net metering system if such system includes protective equipment that prevents any export of customer-generated electricity from the customer's side of the meter.

(e) (I) Size specifications. Each cooperative electric association shall allow:

(A) Residential customer-generators to generate electricity subject to net metering up to ten kilowatts; and

(B) Commercial or industrial customer-generators to generate electricity subject to net metering up to twenty-five kilowatts.

(II) Each cooperative electric association may allow customer-generators to generate electricity subject to net metering in amounts in excess of the minimum amounts specified in subparagraph (I) of this paragraph (e). If the cooperative electric association denies interconnection to a customer-generator that has requested interconnection of a system with a capacity of twenty-five kilowatts or larger, the association shall provide a written technical or economic explanation of such denial to the customer.

(3) The cooperative electric association and the customer-generator shall indemnify, defend, and save the other party harmless from any and all damages, losses, or claims, including claims and actions relating to injury to or death of any person or damage to property, demand, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the other party's action or failure to act in relation to any obligations under this section, except in cases of gross negligence or intentional wrongdoing by the indemnified party.

HISTORY: Source: L. 2008: Entire section added, p. 188, § 2, effective August 5.

ATTACHMENT 5:

Y-WEA RULES AND REGULATIONS FOR PURCHASES FROM QUALIFYING FACILITIES

Last Reviewed: August 24, 2007
Last Updated: August 24, 2007

Rules, Regulations or Extension Policy

Rules and Regulations

(N)

Standard Service for Purchase of Power, Energy, or Both from Qualifying Facilities of 100 kW or Less Maximum Generating Capacity

These Rules and Regulations shall apply to all qualifying facilities (QFs) generally defined as small power production or cogeneration facilities interconnecting with the Association's electric distribution systems and making available power, energy, or both to the Association.

Definition

Standard service for purchase from qualifying facilities (QFs) of 100 kW or less maximum generating capacity is defined for purposes herein as the purchase of all power, energy, or both made available to the Association by QFs interconnected with the Association's electric distribution system.

1.0 General Definitions

1.1 "Biomass" means any organic material not derived from fossil fuels.

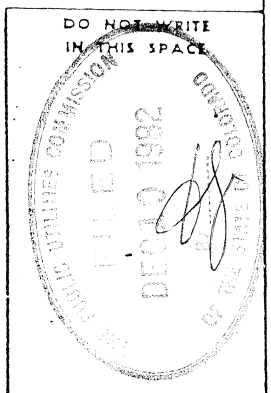
1.2 "Waste" means by-product materials other than biomass.

1.3 "Purchase" means the purchase of electric energy or capacity or both from a qualifying facility by an electric utility.

1.4 "Sale" means the sale of electric energy or capacity or both by an electric utility to a qualifying facility.

1.5 "System emergency" means a condition on a utility's system which is likely to result in imminent significant disruption of service to customers or is imminently likely to endanger life or property.

1.6 "Rate" means any price, rate, charge, or classification made, demanded, observed or received with respect to the sale or purchase of electric energy or capacity, or any rule, regulation, or practice respecting any such rate, charge, or classification, and any contract pertaining to the sale or purchase of electric energy or capacity.



Advice Letter No. 35 — Issue Date December 10, 1982

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1.7 "Avoided costs" means the incremental or marginal costs to an electric utility of electric energy or capacity or both which, but for the purchase of such energy and/or capacity from qualifying facility or qualifying facilities, such utility would generate itself or purchase from another source. (N)

1.8 "Interconnection costs" means the reasonable costs of connection, switching, metering, transmission, distribution, safety provisions and administrative costs incurred by the electric utility directly caused by the installation and maintenance of the physical facilities necessary to permit interconnected operations with a qualifying facility, including the costs of installing equipment elsewhere on the utility's system necessitated by the interconnection, to the extent such costs are in excess of the corresponding costs which the electric utility would have incurred if it had not engaged in interconnected operations, but instead generated or purchased an equivalent amount of electric energy itself.

1.9 "Supplementary power" means any electric energy or capacity supplied by an electric utility and regularly used by a qualifying facility.

1.10 "Backup-power" means electric energy or capacity supplied by an electric utility to replace energy ordinarily generated by a facility's own generation equipment during an unscheduled outage of the facility.

1.11 "Interruptible power" means electric energy or capacity supplied by an electric utility subject to interruption by the electric utility under specified conditions.

1.12 "Maintenance power" means electric energy or capacity supplied by an electric utility to a qualifying facility during scheduled outages of the qualifying facility.

1.13 "Supplementary firing" means an energy input to the cogeneration facility used only in the thermal process of a topping-cycle cogeneration facility, or only in the electric generating process of a bottoming-cycle cogeneration facility.

1.14 "Useful power output" of a cogeneration facility means the electric or mechanical energy made available for use, exclusive of any such energy used in the power production process.

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1.15 "Useful thermal energy output" of a topping-cycle cogeneration facility means the thermal energy made available for use in any industrial or commercial process, or used in any heating or cooling application. (N)

1.16 "Total energy output" of a topping-cycle cogeneration facility is the sum of the useful power output and useful thermal energy output.

1.17 "Total energy input" means the total energy of all forms supplied from external sources other than supplementary firing to the facility.

1.18 "Natural gas" means either natural gas unmixed, or any mixture of natural gas and artificial gas.

1.19 "Oil" means crude oil, residual fuel oil, natural gas liquids, or any refined petroleum products; and

1.20 Energy input in the case of energy in the form of natural gas or oil is to be measured by the lower heating value of the natural gas or oil.

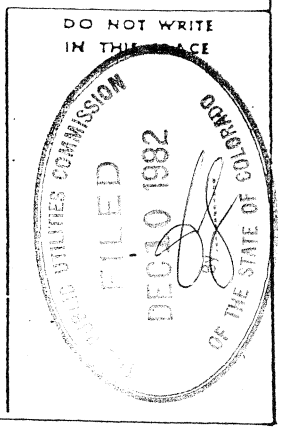
1.21 "Utility geothermal small power production facility" means a small power production facility which uses geothermal energy as the primary energy resource and of which more than 50% is owned either:

(1) By an electric utility, electric utility holding company, or any combination thereof; or

(2) By any company 50% or more of the outstanding voting securities of which are directly or indirectly owned, controlled, or held with power to vote by an electric utility, electric utility holding company, or any combination thereof.

1.22 "Cogeneration facility" means equipment used to produce electric energy and forms of useful thermal energy (such as heat or steam), used for industrial, commercial, heating or cooling purposes, through the sequential use of energy.

1.23 "Topping-cycle cogeneration facility" means a cogeneration facility in which the energy input to the facility is first used to produce useful power output, and the reject heat from the power production is then used to provide useful thermal energy.



Advice Letter No. 35 — Signature of Issuing Officer — Issue Date December 10, 1982

Decision or Authority No. C82-1438 — General Manager (Title) — Effective Date February 3, 1983

Rules, Regulations or Extension Policy

1.24 "Bottoming-cycle cogeneration facility" means a cogeneration facility in which the energy input to the system is first applied to a useful thermal energy process, and the reject heat emerging from the process is then used for power production. (N)

1.25 "Small power production facility" means equipment used to produce electrical energy and meets the requirements and criteria contained in these rules for small power production facilities.

2.0 Definitions of Qualifying Facilities

A "qualifying facility" (QF) is any small power production facility or cogeneration facility which is a qualifying facility under Subpart B of 18 CFR 292, Sections 201, 203, 204, 205, and 206 FERC Rules, and Section 201 of the Public Utility Regulatory Policies Act of 1978 (PURPA).

2.1 Small Power Production Facilities:

2.1.1 Maximum Size Criteria

A facility where the power production capacity of the facility for which qualification is sought, together with the capacity of all other facilities which use the same energy resource, are owned by the same person, and are located at the same site, may not exceed 80 megawatts.

For purposes herein, facilities are considered to be located at the same site as the facility for which qualification is sought if they are located within one mile of the facility for which qualification is sought and, for hydroelectric facilities, if they use water from the same impoundment for power generation. The distance between facilities shall be measured from the electrical generating equipment of each facility.

If any qualifying facility obtains a waiver of the criteria of this paragraph 2.1.1 from the FERC, a copy of such written waiver shall be filed with the Association within 20 days of receipt of such by the qualifying facility.

2.1.2 Fuel Use Criteria

The primary energy source of the facility must be biomass, waste, renewable resources, geothermal resources, or any combination thereof, and 75% or more of the total energy input must be from these sources. The use of oil, natural gas, and coal by a facility may not in the aggregate, exceed 25% of its total energy input during any calendar year.

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(N)

Any primary energy source which, on the basis of its energy content, is 50% or more biomass shall be considered biomass.

2.1.3 Ownership Criteria

A qualifying small power production facility may not be owned by a person primarily engaged in the generation or sale of electric power (other than electric power solely from cogeneration or small power production facilities).

A qualifying small power production facility shall be considered to be owned by a person primarily engaged in the generation or sale of electric power, if more than 50% of the equity interest in the facility is held by an electric utility or utilities, or by a public utility holding company, or companies, or any combination thereof. If a wholly or partially owned subsidiary of an electric utility or public utility holding company has an ownership interest in a facility, the subsidiary's ownership interest shall be considered as ownership by an electric utility or public utility holding company.

2.1.4 Exceptions

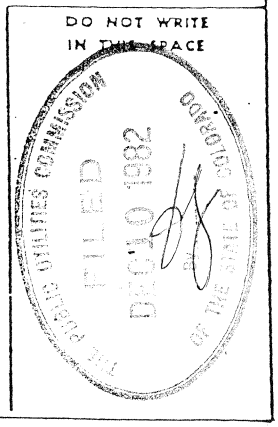
For purposes herein, a company shall not be considered to be an "electric utility" company if it:

a) Is a subsidiary of an electric utility holding company which is exempt by rule or order adopted or issued pursuant to Section 3(a)(3) or 3(a)(5) of the Public utility Holding Company Act of 1935, 15 U.S.C. 79c(a)(3), 79c(a)(5); or

b) Is declared not to be an electric utility company by rule or order of The Securities and Exchange Commission pursuant to Section 2(a)(3)(A) of the Public Utility Holding Company Act of 1935, 15 U.S.C. subsection 79 b (a)(3)(A).

2.2 Cogeneration Facilities

"Cogeneration facility" means equipment which is used to produce electric energy and forms of useful thermal energy (such as heat or steam), used for industrial, commercial, heating, or cooling purposes, through the sequential use of energy. Both topping-cycle and bottoming-cycle cogeneration facilities may qualify.



Signature of Issuing Officer

General Manager

Title

Rules, Regulations or Extension Policy

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2.2.1 Operating and Efficiency Standards For Topping and Bottoming-Cycle Facilities

Any cogeneration facility must, in order to qualify, meet the following operating and efficiency standards:

2.2.1.1 Topping-Cycle Cogeneration Facilities

Operating Standard

For any topping-cycle cogeneration facility, the useful thermal energy output of the facility must, during any calendar year, be no less than 5% of the total energy output.

Efficiency Standard

For any topping-cycle cogeneration facility for which any of the energy input is natural gas or oil, and the installation of which began on or after March 13, 1980, the useful power output of the facility plus 1/2 the useful thermal energy output, during any calendar year period, must, subject to the remaining requirements of this paragraph, be no less than 42.5% of the total energy input of natural gas and oil to the facility; or if the useful thermal energy output is less than 15% of the total energy output of the facility, be no less than 45% of the total energy input of natural gas and oil to the facility. For any topping-cycle cogeneration facility not subject to the above provisions of this paragraph, there is no efficiency standard.

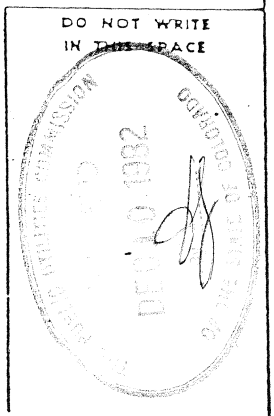
2.2.1.2 Bottoming-Cycle Cogeneration Facilities

Efficiency Standards For Bottoming-Cycle Facilities

For any bottoming-cycle cogeneration facility for which any of the energy input as supplementary firing is natural gas or oil, and the installation of which began on or after March 13, 1980, the useful power output of the facility must, during any calendar year period, be no less than 45% of the energy input of the natural gas and oil for supplementary firing. For any bottoming-cycle cogeneration facility not covered by the above provisions, there is no efficiency standard.

2.2.1.3 Waiver

The qualifying facility may apply to the Colorado Public Utilities Commission for a waiver of the operations or efficiency standards upon a showing that the facility will produce sufficient energy savings. If such waiver is obtained, a copy shall be delivered to the Association within 20 days of its receipt.



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2.2.2 Ownership Criteria

A cogeneration facility may not be owned by a person primarily engaged in the generation or sale of electric power (other than electric power solely from cogeneration or small power production facilities).

A cogeneration facility shall be considered to be owned by a person primarily engaged in the generation or sale of electric power, if more than 50% of the equity interest in the facility is held by an electric utility or utilities, or by a public utility holding company, or companies, or any combination thereof. If a wholly or partially owned subsidiary of an electric utility or public utility holding company has an ownership interest of a facility, the subsidiary's ownership interest shall be considered as ownership by an electric utility or public utility holding company.

2.2.3 Exceptions

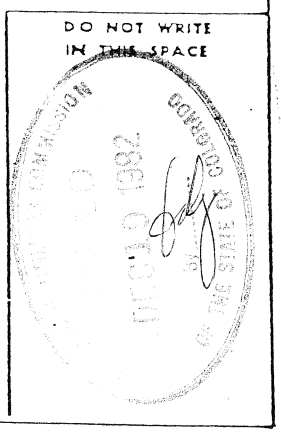
For purposes of these Rules and Regulations, a company shall not be considered to be an "electric utility" company if it:

a) Is a subsidiary of an electric utility holding company which is exempt by rule or order adopted or issued pursuant to section 3(a)(3) or 3(a)(5) of The Public Utility Holding Company Act of 1935, 15 U.S.C. 79c(a)(3), 79c(a)(5); or

b) Is declared not to be an electric utility company by rule or order of the Securities and Exchange Commission pursuant to Section 2(a)(3)(A) of the Public Utility Holding Company Act of 1935, 15 U.S.C. subsection 79b(a)(3)(A). Copies of such declarations shall be delivered to the Association.

3.0 Procedures For Obtaining Qualifying Status

A small power production or cogeneration facility which meets the requirements and criteria for qualification set forth above and in Exhibit A of the Colorado Public Utilities Commission Decision Number C82-1438, and Section 292.203 FERC and Section 2.0 of these rules is a qualifying facility.



3.1 Information To Be Filed

The owner of any facility qualifying under these rules shall file the following information with the Colorado Public Utilities Commission and the Association:

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(N)

- The name and address of all owners and operators, and location of the facility;
- A brief description of the facility, including a statement indicating whether the facility is a small power production or cogeneration facility. If a cogeneration facility, whether it is a topping-cycle or bottoming-cycle facility;
- The primary energy source used or proposed to be used by the facility, and the energy source mix of the facility;
- The power production capacity of the facility; and
- The percentage of ownership of the facility by any electric utility or by any public utility holding company or by any person, corporation or entity owned by either.

3.1.1 Additional Information Required from Small Power Production Facilities

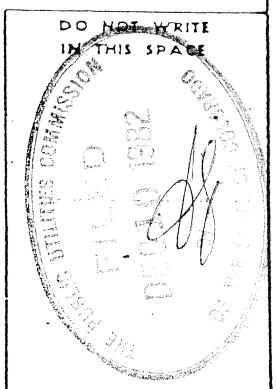
In addition to the information required in 3.1 above, small power production facilities shall file the following information with the Colorado Public Utilities Commission and the Association:

- The location of the facility in relation to any other small power production facilities located within one mile of the facility, owned by the facility which use the same energy source; and
- Information identifying any planned usage of natural gas, oil, or coal.

3.1.2 Additional Information Required from Cogeneration Facilities

In addition to the information required in paragraph 3.1 above, cogeneration facilities shall file the following additional information with the Colorado Public Utilities Commission and the Association:

- A description of the cogeneration system, including whether the facility is a topping or bottoming-cycle and sufficient information to determine that any applicable operating and efficiency rules and criteria set forth in 2.2.1 and in Section 292.205, FERC



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Decision or Authority No. C82-1438

Signature of Issuing Officer

General Manager
Title

Effective Date February 3, 1983

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regulations, will be met; and (N)

- o The date installation of the facility began or will begin.

3.1.3 Notification Requirements for Qualifying Facilities of 500 kW or Larger Design Capacity

The Association is not required to purchase electric power, energy, or both from a facility with a design capacity of 500 kW or more until 90 days after the facility notifies the Association that it is a qualifying facility, or until 90 days after the facility has applied to the Federal Energy Regulatory Commission for certification that the facility is a qualifying facility pursuant to Section 292.207(d), FERC rules. The Association and the qualifying facility may alter the above time periods by mutual agreement.

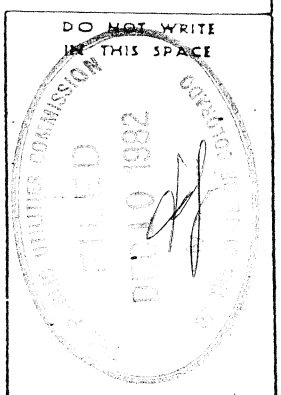
3.1.4 Revocation of Qualifying Status

In the event that any QF has its qualifying status revoked by the Federal Energy Regulatory Commission, in accordance with Section 292.207(d) of the FERC rules, the QF owner shall notify the Association within 30 days of receipt of such notification from the FERC.

3.1.5 Substantial Alteration or Modification of the Qualifying Facility

Any small power production or cogeneration facility which applies to the FERC, pursuant to Section 292.207(d)(2) FERC rules, for a determination that any proposed alteration or modification will not result in a revocation of qualifying status, shall file the FERC determination of the application with the Association within 30 days after receipt thereof. Any qualifying facility owner who incorporates changes in the QF design shall provide the Association with a revised informational filing (defined in Section 3.1) within twenty-five (25) days after such changes are incorporated.

Any alteration or modification of a small power production or cogeneration facility may result in revocation of qualifying status, as a consequence of a formal complaint or show cause proceeding before the Colorado Public Utilities Commission or if it is established that the facility, from the alteration of modification, is not operating in compliance with these Rules and Regulations, other applicable laws, or in accordance with the required contract for service.



Signature of Issuing Officer

General Manager

Title

Rules, Regulations or Extension Policy (N)

3.1.6 Transmission of Qualifying Facility Power Energy, or Both to Other Electric Utilities

If the QF owner agrees, the Association, which is otherwise obligated to purchase power, energy, or both from the qualifying facility, may transmit such power, energy, or both to any other electric utility. However, the rate for purchase of QF output by the electric utility to which such power, energy, or both, is transmitted shall be adjusted up or down to reflect line losses. Such adjustments shall be determined on a case-by-case basis by computation and shall reflect whether the energy and capacity displaces other energy and capacity. Charges, if any, for such transmission services, shall be subject to agreement between the transmitting utility and the qualifying facility owner and incorporated by reference into the associated contract for service required herein. Any adjustments determined necessary for line losses over the Association's system shall be billed or credited to the qualifying facility owner by the Association.

3.1.7 Resale of Power, Energy, or Both Provided by the Association to the Qualifying Facility

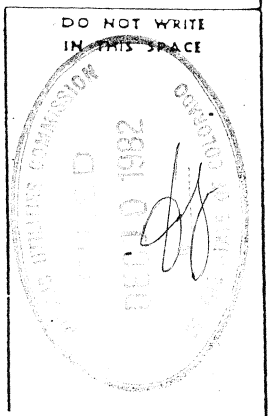
The qualifying facility owner shall not resell any power, energy, or both provided by the Association to the qualifying facility back to the Association. The Association may inspect the qualifying facility in accordance with these Rules and Regulations at any time to determine if any such power, energy, or both resales are occurring or have occurred.

3.1.8 No Purchases Required When Excessive Costs Would Result

The Association, giving notice in accordance with the paragraphs below, shall not be required to purchase electric power, energy, or both during any period which, due to operational circumstances, purchases from the qualifying facility will result in costs greater than those which the Association would incur if it did not make such purchases, but instead generated itself or purchased at wholesale an equivalent amount of energy or capacity.

3.1.9 Notice

The Association, upon effecting a cessation of purchase due to operational circumstances causing increased costs, will use its best efforts to notify the interconnected qualifying facility owner in sufficient time for the qualifying facility owner to cease the delivery of power, energy, or both to the Association. Such notification will be by telephone and in written form to all known qualifying facilities affected. The Association will use its best efforts to make a telephone notification in advance of



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the proposed stoppage of purchases. Written notification will also be provided by the Association after the cessation of purchases and will specify the operational circumstances causing the situation. Such written notification shall be within one business day after the cessation of purchases.

4.0 Interconnection Costs

Each qualifying facility owner shall be obligated to pay the costs of interconnecting with the Association necessary to effectuate purchases of any power, energy, or both made available by the qualifying facility. The Association will establish, prior to the interconnection, to the extent possible, the total costs of interconnection necessary to effectuate such purchases from the qualifying facility and will advise the qualifying facility owner in writing of such costs. Where total interconnection costs cannot be determined in advance of interconnection, the Association will advise the qualifying facility owner promptly of such costs on a case-by-case basis. Unless otherwise set forth in the associated contract required by these Rules and Regulations, the qualifying facility owner shall make payment of such interconnection costs within 30 days of the invoice date.

4.1 Payment Schedule for Interconnection Costs

Interconnection costs necessary by the Association prior to the agreed interconnection date shall be paid to the Association in full prior to interconnection equipment installation and receipt of service under this schedule unless agreed otherwise in the associated contract required in Section 5.22. Payment for interconnection costs incurred after the date of interconnection shall be paid within 30 days of the qualifying facility owner's receipt of invoice for same unless agreed otherwise in the associated contract.

4.2 Typical Interconnection Costs

Interconnection costs are generally defined as any costs which, but for the interconnection of the qualifying facility, would not have been incurred by the Association to accommodate the interconnection. Interconnection costs will typically include, but not be limited to the following:

- o On-site inspections prior to construction to verify safe setback and physical clearance distances
- o Pre-engineering costs accrued prior to interconnection to evaluate circuit protection equipment

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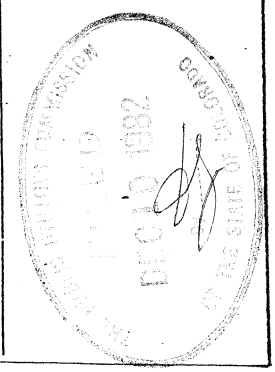

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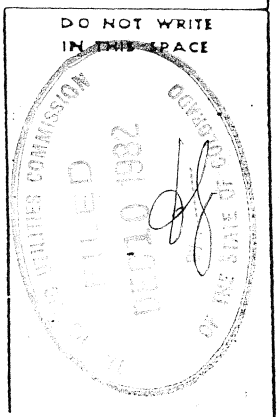
- Specific evaluations of qualifying facility interactions with the Association's installed regulation and circuit protection equipment
- Replacement and recoordination costs associated with the Association's equipment
- The cost of performing any requested measurements to establish baseline quality of service or for subsequent measurements
- Modifications to electrical grounding necessary to correct any operational or safety problems on the Association's system caused by the qualifying facility
- Modifications of grounding to reduce electromagnetic interferences, improve radio and television reception, or operation of other electrical devices affected by the qualifying facility
- The cost for interconnection at any secondary voltage other than presently established levels
- Corrections of abnormal power factor caused by the qualifying facility. Such corrections shall be made by the Association on its system at the expense of the qualifying facility. Deleterious effects on power factor shall be corrected by the qualifying facility on its own system at the qualifying facility's expense
- Required disconnection equipment installed by the qualifying facility.
- Fused protection of switched interconnections between major components of equipment in the qualifying facility
- The cost of protective relaying to confine the effects of faults, lightning strikes, or other abnormalities shall be installed by the QF at its expense
- The cost of any equipment to correct phase voltage or load imbalances caused by the qualifying facility is an interconnection cost
- Cost of meters to measure total qualifying facility generation required for billing purposes



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- o Liability insurance coverage for the qualifying facility in the amount the Association determines to be adequate and reasonable

5.0 Standards for Operating Reliability

Qualifying facilities interconnecting with the Association's system shall comply with the following minimum standards, except for facilities of less than 10 kW design capacity which shall, as a minimum, comply with items 5.4, 5.5, 5.11, 5.13, 5.15, 5.20, 5.21, and 5.23.

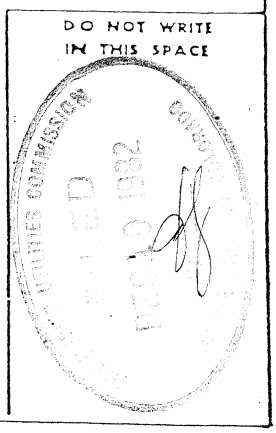
5.1 Filing of Design Information

Any person seeking to establish interconnected operations of the qualifying facility shall first file detailed design information of the proposed facility with the Association to which it proposes to interconnect at least 150 days prior to the interconnection. In addition, the qualifying facility owner shall file one copy each of all available manufacturer's literature, equipment operating instructions, and recommendations for installation. If the information filed is not adequate for the Association to assess the impact of the proposed interconnection on its operations and/or system expansion, the Association will notify the qualifying facility owner (in writing) within 25 days of any additional information required. The qualifying facility owner shall submit any such additional information requested by the Association within 25 days after receiving the request.

5.2 Conference

At the earliest possible time after the prospective qualifying facility owner's filing of the required design information, a conference shall be held at the Association's facility at which time the Association will inform the proposed qualifying facility in its opinion of those governmental agencies and departments having requirements for interconnection of the qualifying facility. Also, at the time of the conference, the Association will inform the proposed QF owner in its opinion of the interconnection requirements needed to assure a safe interconnection and operation. After the conference and review of the design information, the Association may agree to an interconnection sooner than 150 days after the conference. If such is the case, the Association will notify the qualifying facility owner of such finding in writing.

5.3 No Interconnection Until Compliance



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The proposed qualifying facility shall not be interconnected with the Association's system until it has established, to the satisfaction of the Association, that it complies with and has met all applicable rules set forth herein. In the event of a disagreement regarding the applicability of certain standards, the qualifying facility may file a pleading using appropriate procedures with the Colorado Public Utilities Commission.

5.4 Code Certification

Each prospective qualifying facility owner shall obtain, at no cost to the Association, all appropriate certifications and present them to the Association to establish that the QF has met all applicable codes and construction standards. If, in the Association's opinion, additional inspections or certifications must be obtained for the qualifying facility, the Association will notify the qualifying facility owner in writing within 25 days of such needed additional certifications. In expressing its opinion regarding such certification, the Association makes no warranty, either express or implied, as to the adequacy of such codes or certifications and accepts no liability for any deficiencies on the part of the qualifying facility owner, his or her agents, representatives, or assigns.

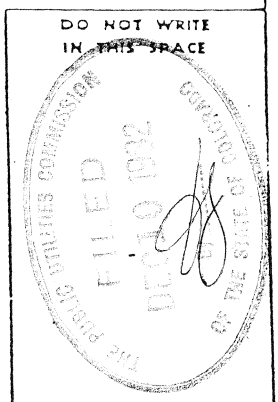
5.5 Inspection and Access

The Association may perform on-site inspection(s) on the site of the proposed qualifying facility prior to its construction to determine that minimum setback distances and physical clearances have been established. (Cost of these inspections shall be included as a qualifying facility interconnection cost.)

The Association's personnel shall have rights of access to the qualifying facility owner's premises to repair, maintain, or retrieve any of the Association's equipment which may be affected by the failure of either the Association's or the qualifying facility's equipment, or to make inspections at any time.

5.6 Coordination of Circuit Protection Equipment

Prior to the interconnection and at the time of filing complete design information, each qualifying facility owner shall submit to the Association a detailed electrical and mechanical plan so that the Association may determine the safety and adequacy of the Association's installed service drops and installed circuit protection equipment. Additional interconnection protective equipment needed shall be communicated in writing by the Association to the qualifying facility within 25 days.



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.7 Potential Effects of Operations of the Association's Equipment on the Qualifying Facility's Equipment

The Association shall not be liable for the operational effects of the Association's equipment on equipment and/or systems of the qualifying facility. The Association will advise each potential qualifying facility owner within 25 days after receiving the qualifying facility's proposed design information of the necessity to install appropriate protection equipment to accommodate typical known operations of the Association's equipment.

5.8 Quality of Service

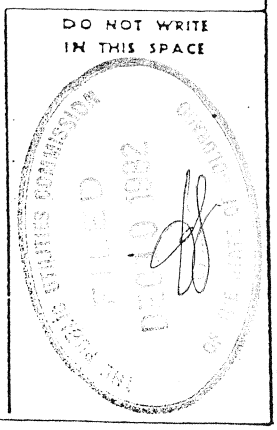
The Association, at the request of the qualifying facility owner, may measure the quality of service available on the premises of the proposed qualifying facility prior to interconnection. Cost of such measurements shall be included as interconnection costs. The Association will provide a quality of service after the interconnection equivalent to that existing prior to the interconnection. However, the costs for any changes requested by the qualifying facility owner to improve the quality of service shall be paid to the Association as interconnection costs in accordance with the contract for service.

5.9 Grounding of Qualifying Facility Equipment

The Association requires that the qualifying facility owner show that certificates establishing compliance with all appropriate grounding codes (subject to the Association's approval) have been obtained prior to the interconnection. Upon request, the Association will provide the qualifying facility owner with information and guidelines regarding grounding requirements, such to be made within 25 days of the qualifying facility's request for same. In the event that improper grounding of any of the qualifying facility equipment contributes to interferences or safety hazards of any kind, it shall be the responsibility of the qualifying facility owner to incorporate the necessary modifications at no expense to the Association.

5.10 Standards for Harmonics and Frequency

The Association will notify the qualifying facility owner in writing regarding limitations on any harmonic content of the voltage and current waveforms produced by the qualifying facility. Such notification will be in writing within 25 days after the Association receives the required design information specified in 3.1.



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No interconnected qualifying facility shall generate power at frequencies other than 60 Hz plus or minus .1 Hz.

The Association shall not be responsible or liable for the effects of any on-site interferences caused by harmonics produced by the qualifying facility. The costs for any off-site system equipment needed to neutralize the effects of on-site harmonic production by the qualifying facility shall be paid by the qualifying facility owner to the Association as interconnection costs.

5.11 Interconnected Voltage Levels

The qualifying facility shall be interconnected only at presently available secondary voltage levels on the Association's system unless all costs for modified interconnections are paid as a cost of interconnection.

5.12 Types of Generators and Inverting Equipment

The Association encourages the use of induction generators, line-commutated inverters, or other equipment which provide for a power factor of at least 0.90 leading or lagging.

Any deleterious effects caused by the qualifying facility on the Association's system due to QF equipment power factor being less than 0.90 (lead or lag) will be corrected by the Association on its system at the expense of the qualifying facility. Deleterious effects on the qualifying facility's system caused by abnormal power factor of the qualifying facility's equipment shall be corrected by the qualifying facility owner at no expense to the Association.

5.13 Disconnection Equipment

Prior to interconnection, each qualifying facility owner shall install suitable disconnection equipment which will automatically and reliably disconnect the generating equipment of the qualifying facility from the Association's lines in the event of a line outage or failure of the generating equipment of the qualifying facility. As a minimum this equipment shall include a lockable disconnect switch which can be locked open by the Association. The Association may require additional protection devices which will be determined on a case-by-case basis.

The disconnection devices shall be accessible to both the Association and the qualifying facility owner. Either the Association or the qualifying facility owner shall have the right to operate the disconnection devices whenever, in the judgment of either party, that it is necessary to maintain the safe operating

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nditions and whenever the operations of the qualifying facility Association adversely affects the equipment of either party. These isolating devices shall be lockable only by the Association in the open position for isolation of the qualifying facility's generation and the device which isolates the Association's supply shall be lockable only by the qualifying facility owner in the open position. Such devices shall be installed so that visual verification of the locking of the device in the open position can be accomplished by the Association and the qualifying facility owner.

5.14 Fused Protection and Relaying Equipment

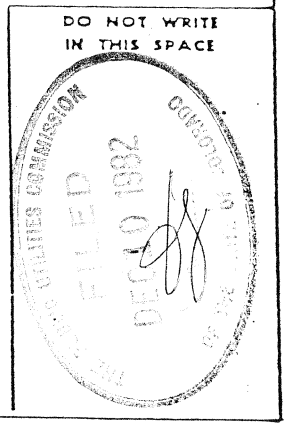
The qualifying facility owner shall install fused protection devices between major components of the equipment of the qualifying facility. Each qualifying facility owner shall install sufficient protective relaying equipment to confine the effects of faults, lightning strikes, or other abnormalities within the equipment of the qualifying facility and to protect the equipment of both the qualifying facility and the Association.

5.15 Phasing

The interconnections of the qualifying facility shall be at e present phasing available at the interconnection point unless ne qualifying facility owner pays for the cost of any equipment to correct or modify circuit phasing at the point of interconnection. In the event that phase voltage unbalances greater than 7% (phase-phase), or phase power unbalances exceeding 15% from phase to phase are caused by the qualifying facility, the qualifying facility will modify its equipment to maintain phase loadings within 15% of each other at all times.

5.16 Meters

The Association will specify, supply, install, and maintain meters (at cost) suitable for the service rate schedule determined for the qualifying facility. The cost of such meters and their installation is an interconnection cost to be paid prior to interconnection. Costs for maintenance and calibration of the meters shall be paid by the qualifying facility owner as they are incurred and billed by the Association. Meter seals will be affixed by the Association and can be removed or reaffixed only by the Association. Service under this service schedule will be provided only while proper meter seals are installed and intact. The costs for specialized meter reading or data processing needed to provide service under the appropriate schedule shall be paid to the Association as they are incurred. Standard metering plans are shown in Exhibit 1.



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5.17 Maintenance Schedule

Prior to the interconnection of the qualifying facility, its owner shall file a planned maintenance schedule with the Association specifying the dates, times, means, and procedures planned. No interconnection will be allowed until the Association approves the proposed maintenance schedule.

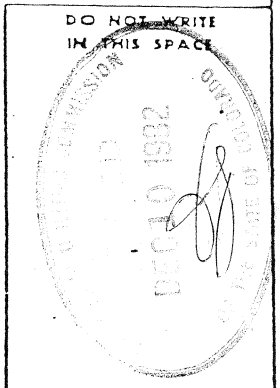
The Association may inspect the qualifying facility from time to time at the Association's convenience to insure compliance by the qualifying facility owner with the approved maintenance schedule and to verify proper operation of all protective equipment, including relays, circuit breakers at the interconnection, and tripping breakers at the protective relays.

If, from inspection, the Association finds that the qualifying facility owner has not complied with its maintenance schedule, has been reselling Association energy or capacity to the Association, or protective equipment is not operating properly, the Association may immediately disconnect the qualifying facility, or may give the qualifying facility a 30 day notice of disconnection.

All QF inspections, other than for safety reasons or to check for resale of Association power, energy, or both, shall be witnessed by the Association's and the qualifying facility's personnel at mutually agreeable times. However, Association inspections to determine whether the qualifying facility as been reselling Association energy or capacity to the Association, or for safety, may be accomplished without prior notice and without the presence of the QF owner. At an inspection to determine safety, or if the qualifying facility owner is reselling energy or capacity, the Association will invite the qualifying facility owner to witness the inspection, but such inspections may also be conducted without the presence of the qualifying facility owner should he or she decline to participate.

The qualifying facility owner shall maintain complete maintenance records, and the Association shall maintain complete inspection records. The qualifying facility owner and the Association shall provide copies of such records to the other party.

Any disconnection notice which the Association may issue shall specify the required maintenance to be performed, operational practices to be modified or terminated, and all repairs to be made to the protective equipment, prior to the impending disconnection. The qualifying facility owner shall perform the specified maintenance, modify or stop the stated dangerous operational practices, or repair the specified



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General Manager
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protective equipment, prior to the date of the proposed disconnection. Upon completion of all such maintenance, proof of modified or terminated operational practices, or protective equipment repairs, the qualifying facility owner shall notify the Association which shall reinspect the facility. If the Association finds compliance with the specified requirements, scheduled disconnection shall be cancelled. If the Association finds noncompliance with the specified requirements, the qualifying facility shall be disconnected as provided in the initial disconnection notice.

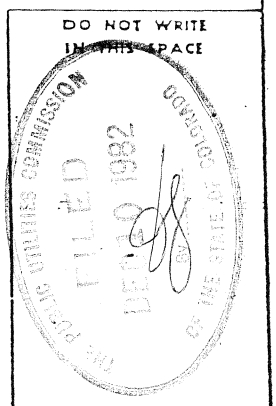
The Association and the qualifying facility owner may agree to a reasonable continuance of disconnection, or reconnection if the qualifying facility has been disconnected pursuant to these Rules and Regulations or if the Association determines that the qualifying facility is making bona fide efforts to perform the specified maintenance, modify or stop the specified operational practices, or repair the protective equipment. Where the qualifying facility owner has been served with notice of disconnection, or has been disconnected for reselling power, energy, or both to the Association, the agreement for reasonable continuance of disconnection or reconnection can be conditioned on the agreement of the qualifying facility owner to repay the Association for such resales.

5.18 Qualifying Facility Generation Schedules

For all qualifying facilities other than those depending on intermittent sources of energy the QF owner shall file a planned generation schedule with the Association for its use in coordinating normal maintenance of the distribution facilities and for coordination with the Association's power supplier. This schedule shall be received by the Association prior to the qualifying facility's first interconnected operations.

5.19 Siting of Qualifying Facility Equipment

All QF equipment (including interconnection devices) shall be located such that the failure of any component will not cause abnormal or unsafe electrical contact with any of the Association's transmission, distribution, transformation, service drop, meters, or other utility equipment. The Association may inspect the qualifying facility equipment at any time to verify compliance with this requirement.



5.20 Insurance

The QF owner agrees, at no cost to the Association, to secure and maintain in effect during the life of this Agreement the following insurance to protect the QF owner and the

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Association during the performance of the qualifying facility operation hereunder:

Comprehensive General Liability Insurance including Contractual Liability coverage for liability assumed by the QF owner in the amount of not less than $1 million Combined Single Limit for Bodily Injury and Property Damage. Such liability insurance shall name the Association as additional insured and shall contain severability of interest or cross-liability clauses.

Property loss insurance in the amount of $250,000 or greater.

Certificates of Insurance evidencing such coverages and provisions required above shall be furnished to the Association by the QF owner prior to te execution of this Agreement and shall provide that written notice be given to the Association at least thirty (30) days prior to cancellation or reduction of any coverage. The QF owner agrees to provide the Association with copies of renewals of the insurance coverage required hereunder. The Association shall have the right, but not the obligation, to inspect the original policies of such insurance.

5.21 Indemnification

The QF owner shall indemnify and hold harmless the Association and its directors, officers, and employees or authorized agents from any and all liability, damages, costs, losses, claims, demand, action and causes of action, including attorney's fees and expenses for damage to the property of any person or entity, and liability arising from the death of or injury to any person or entity which is attributable in whole or in part, to the negligence or willful action of the QF owner in which directly or indirectly results from or arises out of or in connection with the operation of the qualifying facility operating in parallel with the Association's electrical systems.

5.22 Contract

The owner of the qualifying facility shall execute the standard Electric Service Agreement Contract prepared by the Association and applicable for electric service to qualifying facilities prior to interconnecting and receiving service under this schedule, and receiving payments for power, energy or both provided to the Association.

5.23 System Emergencies

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THE PUBLIC UTILITIES COMMISSION OF THE STATE OF COLORADO

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Advice Letter No. 35 Issue Date December 10, 1982

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5.23.1 Qualifying Facility Energy or Capacity During an Emergency

The qualifying facility is required to provide power, energy, or both to the Association during a system emergency only to the extent:

- o Provided by agreement between the qualifying facility and the Association; or
- o Ordered under Section 202(c) of the Federal Power Act.

A system emergency means a condition on the Association's system which is likely to result in imminent significant disruption of service to customers or is imminently likely to endanger life or property.

5.23.2 Emergency Disconnections

During any system emergency, as defined above, the Association may discontinue:

- o Purchases from a qualifying facility if such purchases would contribute to the emergency
- o Sales to the qualifying facility, if such sales would contribute to the emergency and provided that the discontinuance is on a nondiscriminatory basis

5.23.3 Notification During Emergency Discontinuances

Should a discontinuance of purchases or sales to the qualifying facility be necessary due to an emergency, the Association will use its best and reasonable efforts to notify the qualifying facility owner prior to the discontinuance. The qualifying facility owner shall be entitled to telephone notification under this rule only if a current telephone number is provided to the Association. The Association will also provide written notice of the emergency discontinuance no later than three business days subsequent to the termination of the emergency causing the discontinuance. The written notice shall describe the emergency, and its duration, and the reasons for the discontinuance. If the Association is unable to give telephone notice to the qualifying facility owner prior to the emergency discontinuance, the Association will notify the qualifying facility owner by telephone by no later than the end of the next business day subsequent to the termination of the emergency, if the emergency occurs during after normal business hours. If the emergency is terminated during normal business hours, the Association will use its best efforts to notify the qualifying

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COLORADO PUBLIC UTILITIES COMMISSION

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facility owner by telephone no later than 2 hours subsequent to the termination of the emergency. (N)

Any qualifying facility owner discontinuing sales or purchases to the Association shall make reasonable efforts to notify the Association by telephone prior to such discontinuance. The written notification by the qualifying facility owner shall also be provided to the Association no later than 3 business days subsequent to the termination of the emergency causing the discontinuance.

The written notice provided by the qualifying facility owner to the Association shall describe the emergency, its duration, and the reasons for discontinuance of operation. If the qualifying facility owner was unable to give prior telephone notice to the Association of such discontinuance, the qualifying facility owner shall notify the utility by telephone no later than 2 hours subsequent to the termination of the emergency during normal business hours, and by the end of and no later than one business day after the termination of the emergency, if the emergency occurs during outside of normal business hours.

5.23.4 Other Discontinuances

Prior to any other temporary discontinuance of purchases or sales, the Association or the qualifying facility owner shall notify the other party in the manner set forth in the paragraphs above. Such notification shall not be required if the discontinuance has been previously agreed upon by the parties, or is less than 15 minutes in duration. When discontinuances are 15 minutes or less, the Association or qualifying facility owner shall provide the information required above in this rule to the other party only upon written request.

In the process of restoring service during an unforeseen emergency due to, for example, acts of nature, vehicular accidents, or equipment failure, the Association may exercise its right to open the disconnect switch to the qualifying facility. If so, the Association will, to the best of its ability, notify the qualifying facility owner within 2 hours after the termination of the service discontinuance by telephone that the causes for the emergency have been remedied, and the Association will return its portion of the disconnect switch to the closed position.

In the event that the Association plans a service discontinuance of greater than 15 minutes in duration associated with scheduled maintenance, line improvements, construction, or other common utility operations, the Association will use its best efforts to advise all known qualifying facility owners in

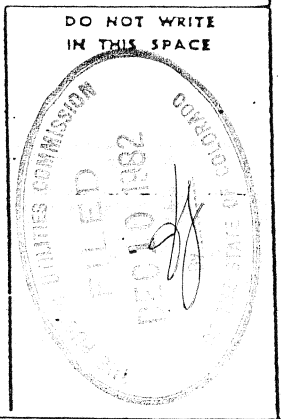

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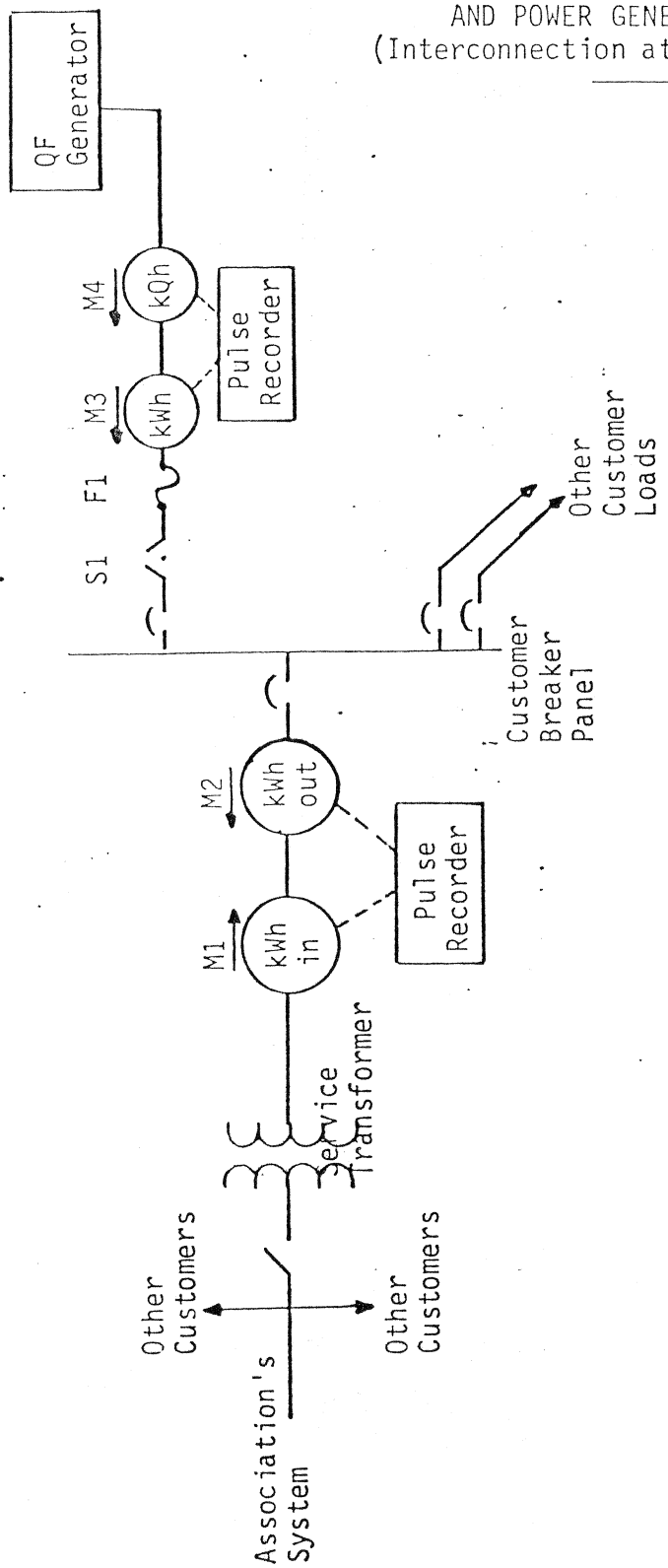
EXHIBIT 1-B STANDARD METERING REQUIREMENT FOR QUALIFYING FACILITIES OF 100 kW OR LESS MAXIMUM GENERATING CAPACITY PROVIDING BOTH ENERGY AND POWER GENERATING CAPACITY

(Interconnection at 600 Volts or Less)

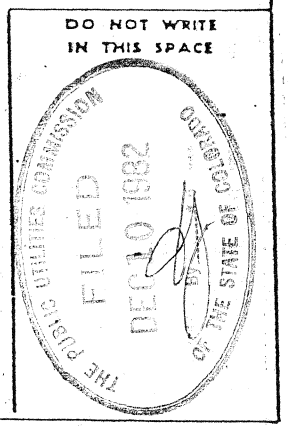


M1, M2, M3: Detented kWh meters with pulse initiators and detents as indicated

F1: Fuse(s) rated at no more than 125% of maximum in-rush current

S1: Accessible disconnect switch lockable by either party.

M1: Detented KQH Meter for measurement of power factor



Advice Letter No. 35 — Issue Date December 10, 1982

Signature of Issuing Officer

Decision or Authority No. C82-1438 — General Manager — Effective Date February 3, 1983

Title

Y-W ELECTRIC ASSOCIATION, INC.
P.O. BOX Y • 26862 U.S. HWY 34 • AKRON • COLORADO • 80720
(970) 345-2291 • 800-660-2291 • Fax (970) 345-2154 • www.ywelectric.coop
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ATTACHMENT 6:

TRI-STATE BOARD OF DIRECTORS POLICY FOR PURCHASES FROM SMALL RENEWABLE RESOURCES

Last Reviewed: September 19, 2017
Last Updated: September 19, 2017

TRI-STATE Generation and Transmission Association, Inc.

Board of Directors Policy

Subject: QUALIFYING FACILITY CAPACITY AND ENERGY PURCHASE POLICY			Policy No.: 101
Original Issue : 7-7-00	Last Revised: 3-2-16	Last Reviewed: 9-8-16	Page 1 of 3

OBJECTIVES

Tri-State is dedicated to assuring an adequate and reliable long-term supply of electricity to its Member Systems at the lowest possible cost, consistent with sound business practices. Accordingly, and as a cooperative dedicated to consumer well-being and the public interest, Tri-State is committed to the conservation of natural resources by offsetting generation produced from non-renewable energy resources with generation produced from renewable energy resources, to the extent that such offset is cost-effective, efficient and practical.

ACCOUNTABILITY

The Chief Executive Officer.

SCOPE

Tri-State has the obligation under the regulations implementing the Public Utilities Regulatory Policies Act of 1978 (PURPA) to purchase capacity and energy from Qualifying Facilities (QFs), as defined in Section 201 of PURPA. This policy establishes the implementation provisions to fulfill this obligation.

IMPLEMENTATION

Tri-State QF Purchases

This section details provisions that apply when Tri-State purchases capacity and/or energy from a QF:

Except where applicable law dictates otherwise, the price for capacity and energy for QFs shall be calculated annually by Tri-State through system production cost modeling of the Tri-State generation fleet, and will be used for the following calendar year. The results of the avoided cost calculations will be made available to developers of QFs upon request. This modeling will involve hourly chronological production cost methods to determine the hourly decremental cost of the Tri-State generation fleet. The decremental cost analysis will form the foundation of the standard price offering for QFs that are 1 MW nameplate capacity or smaller. For larger QFs, avoided cost calculations will be performed on a case-by-case basis. Pricing may be adjusted as appropriate for effects including, but not limited to, losses and intermittency. Capacity payments will be established based on avoided capacity costs, however when Tri-State is forecasting excess capacity, no capacity payments will be offered.

_____, Chairman and President	Date: 9-8-16

Member System QF Purchases

This section details provisions that apply when a Member System purchases capacity and/or energy from a QF:

The Member System will ensure that any such QF project will have metering and telemetering equipment installed and operational that is satisfactory to Tri-State in conformance with the Tri-State Distributed Generation Metering Requirements. Tri-State will be granted access to the metering data and Tri-State, its employees, agents and contractors, will be granted a non-exclusive license to provide access to the metering installation for the purposes of verification and validation of the metering, and to install and maintain any additional metering that Tri-State may choose to install at the QF project point of interconnection with the Member System.

In the event that a Member System purchases capacity and/or energy from a QF and to the extent the total capacity and/or energy purchased from QFs and non-QFs does not result in the Member System purchasing less than 95% of its requirements from Tri-State (as established in the Wholesale Electric Service Contract and defined in Board Policy 115), then the pricing, terms and conditions of such transaction as between Tri-State and the Member System, shall be implemented pursuant to Board Policy 115.

In the event a Member System purchases capacity and/or energy from a QF pursuant to 18 C.F.R section 292, (or any successor requirement) and that purchase results in the Member System purchasing less than 95% of its requirements from Tri-State (as established in the Wholesale Electric Service Contract and defined in Board Policy 115), then Tri-State will bill that Member System an amount equal to Tri-State's lost revenue minus Tri-State's avoided cost that is associated with the Member System purchasing less than 95% of its requirements from Tri-State.

Transmission and Interconnection

To the extent that a QF interconnects with or takes transmission service from Tri-State, or power generated by the QF flows from the Member System onto the Tri-State transmission system, the transmission customer must request and obtain appropriate service from Tri-State under the terms of the Tri-State Open Access Transmission Tariff.

Waiver

Tri-State, together with any individual Tri-State Member System or Member Systems may apply to the Federal Energy Regulatory Commission (FERC) for a waiver of Tri-State's obligation to sell retail power to QFs, and the Tri-State Member System's obligation to purchase capacity and/or energy from QFs. Any Tri-State Member System may elect to join Tri-State in any such

waiver application. If FERC grants the waiver, subject to any FERC conditions, Tri-State shall purchase the capacity and/or energy from the QF and the Tri-State Member System shall sell retail power to the QF.

✧ ✧ ✧

_____, Chairman and President	Date: 9-8-16

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P.O. BOX Y • 26862 U.S. HWY 34 • AKRON • COLORADO • 80720
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ATTACHMENT 7:

TRI-STATE STANDARDS FOR INTERCONNECTION AND PROTECTION OF QUALIFYING FACILITIES

Last Reviewed: September 19, 2017
Last Updated: September 19, 2017

Interconnection Standards for Member Generation Projects

(500 kW and greater)

A. System Impact Study

New Member Generation Projects (MGP) which are cumulatively 500 kW and greater in nameplate capacity at any Member Delivery Point (MDP) require Tri-State review and approval of their System Impact Studies (SIS). Member shall provide the SIS to assess the impact of the proposed generation on the distribution network as well as possible impacts on the MDP. The areas of study concern to Tri-State are defined in this document. Appendix A contains a list of the Industry standards and guides applicable to this interconnection standard.

1. Equipment Description

The SIS shall describe the type of generation used at the MGP. Equipment data sheets should also be provided with the SIS. Equipment shall meet the IEEE and UL standards identified in Appendix A.

2. Generation Export

Power export onto the transmission network can occur during periods of high generation and low distribution loading. It can also occur during contingency or planned load transfers. Unauthorized export onto the network can have severe economic penalties as well as operational consequences. Transmission Operators can disconnect generation facilities on an emergency basis with limited notification. Generation facilities with periodic misoperation can be removed from service until the matter is acceptably resolved.

The SIS shall determine if cumulative MGP has the potential to export power through the substation transformer during high generation-low load periods with the single contingency loss of the heaviest loaded feeder on the same transformer as the MGP. Cumulative MGP is defined as all existing and proposed MGP on one substation transformer. Hourly historical load data and estimated MGP production data will be used in the study. Tri-State metering data for each Member Billing Point is available through the Customer Portal or can be obtained upon request. The SIS should address the actions which will be taken to prevent unauthorized transmission

use prior to MGP operation. Some acceptable alternative actions include Direct Transfer Trip (DTT) of the MGP, MGP load-following operation with backup DTT or additional load transfer.

MGPs desiring transmission service shall file a Transmission Service Request (TSR) with the applicable Transmission Owners (TO). Credit worthiness, scheduling, energy tagging, energy imbalance netting and settlement and facility study requirements shall all be met by the MGP in accordance with the TO's Open Access Transmission Tariffs (OATT). Contractual rights for use of additional facilities not included in the OATT shall be procured prior to MGP commercial operation.

3. Voltage Regulation

The SIS shall specify the proposed MGP volt/var control methods and the expected impact on voltage regulation performance at the MDP. Modeled voltage levels shall be provided under minimum/maximum transformer loading levels as well as minimum/maximum generation levels. Proposed MGP constant power factor, voltage or var control setpoints shall be specified in the study. The proposed control method and the contractual operating range specified in the Purchase Power Agreement shall be provided in the study. Location of remotely regulated busses shall also be identified if remote bus voltage control is selected.

Intermittent MGP can have severe output swings over extended time periods. This can cause excessive voltage regulator or load tap changer operation. The SIS shall identify any "smoothing" capabilities provided by proposed inverter-based MGP. Revisions to substation regulation settings may need to be made based on actual MGP operating characteristics.

4. Voltage Flicker

Voltage flicker shall be addressed in the SIS. Maximum values of the expected voltage deviation caused by the plant shall be calculated as well as the frequency of such deviations. Voltage flicker shall not exceed the limits specified in IEEE Standard Std. 1547.

5. Protection Evaluation

The SIS shall evaluate the impact of the MGP on the substation protection schemes and settings. Fault current levels at the MDP busses shall be calculated with the proposed MGP. Substation transformer and line protection relaying shall be examined for inadvertent directional element trips during maximum possible

generation export. Maximum export shall be determined assuming generation load following control failure. The SIS needs to examine existing distribution line protection and operating practice at the MDP to prevent out-of-synch reclosing with MGP present. Any recommended protection changes shall include normal maintenance and switching needs. The SIS shall model the dynamic impact of DERs 10 MW and above on local area transmission undervoltage protective remedial action schemes under the appropriate WECC scenarios.

6. **Harmonic Analysis**

   The SIS shall perform a harmonic analysis of the MGP impact at the MDP distribution bus. The analysis shall include existing current harmonic sources and existing voltage distortion levels. Distortion levels at the MDP distribution bus shall comply with IEEE Std. 519.

7. **Anti-islanding**

   The SIS shall evaluate the possibility of an islanded condition for a loss of a distribution or radial transmission element during high generation, low load conditions. Aggregated generation in the area shall be included in the analysis. The SIS shall detail the protective measures needed to disconnect the MGP should this contingency arise. The MGP will comply with the unintentional islanding requirements of IEE Std. 1547 including the Area EPS abnormal conditions frequency and voltage response in IEEE Std. 1547A.

8. **Power Factor**

   The SIS shall evaluate the maintenance of power factor requirements at the MDP with the MGP in-service. Generally a power factor of .95 lagging to .95 leading is required. Tri-State Member System Planning should be contacted as there are areas with more stringent requirements. The SIS shall address the specific distribution improvements or MGP operational limits needed to maintain the required power factor.

B. Site Information

1. **One-Line Diagram**

   A one-line diagram shall be provided which includes the substation layout, interconnection feeder and Point of Interconnection (POI) equipment. The length of the feeder and the quantity, size and type of conductors shall be designated.

Medium voltage recloser(s) and stepdown transformer shall also be shown. Stepdown transformer size, winding connection and impedance shall be included.

2. **Site Location**

   The GPS site coordinates and site plan shall be provided.

3. **Expected Operation Periods**

   The SIS shall describe the expected operating periods of the MGP. Examples include seasonal operations for hydro plants and approximate daily operating hours for solar plants. The type of tracking anticipated for solar plants should also be included.

4. **Detailed Short Circuit Study**

   A model of the MGP's short circuit capability shall be provided for MGPs 10 MW and greater at the POI. The impedance data contained in the model shall be used by Tri-State to create the power flow model required by WECC. Collector-based MGPs shall submit equivalent model data as defined in WECC's Wind Plant Power Flow Modeling Guide or WECC's Guide for Representation of Photovoltaic Systems in Large-Scale Load Flow Simulations.

5. **Metering Requirements**

   MGP metering shall comply with Tri-State Distribution Voltage Level Distributed Generator Metering Requirements.

C. Post Study Documentation

1. **Commissioning Tests**

   Load following performance testing shall be witnessed by Tri-State during MGP commissioning. Minimum maintained load level and generator response times shall comply with BA and Tri-State requirements. Harmonic measurements shall be taken at the MDP and the POI before and after the MGP is commissioned.

2. **Contact Information**

   Twenty-four hour contact information shall be provided for MGP 10 MW and above to respond to BA emergency curtailment directives.

3. WECC Dynamic Model

WECC requires Tri-State to provide a model of the MGP's dynamic response for MGP's 10 MW and larger. The model must be WECC- approved. A list of WECC-approved models can be found at https://www.wecc.biz/Pages/home.aspx. The model must contain the parameters specific to each MGP.

4. Notification of Changes

Member shall notify Tri-State Member System Planning of any significant planned permanent load transfers or load loss from a transformer serving MGPs which would increase the possibility of generation export onto the transmission network.

The Member shall also notify Tri-State of any modifications to the protection or MGP Operating Controls including any schemes removed from service for maintenance or unusual operating conditions.

Transfer of MGP to another substation transformer will require a new System Impact Study and Tri-State approval.

Appendix A – Industry Standards and Guides

IEEE Standard 1547 2003 – IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems

IEEE Standard 1547A – IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems Amendment 1

IEEE Standard 519 – IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems

UL 1741 - Standard for Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources

IEEE Standard 1547.1 – IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems

IEEE Standard 1547.1a – IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems Amendment 1

WECC Guide for Representation of Photovoltaic Systems in Large-Scale Load Flow Simulations August 2010

WECC PV Power Plant Dynamic Modeling Guide April 2014

WECC Wind Plant Power Flow Modeling Guide May 2008

WECC Wind Power Plant Dynamic Modeling Guide November 2010

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ATTACHMENT 8:

Y-WEA GENERATION INTERCONNECTION STANDARD – 25 KW OR LESS CONNECTED AT SECONDARY VOLTAGES

Last Reviewed: September 19, 2017
Last Updated: February 2, 2009

Y-W Electric Association
26862 US Hwy 34
Akron, CO

Interconnection Standard for Small Generating Facilities No Larger Than 25kW and 600VAC

January 27, 2009
Rev. 2

Exponential Engineering Company

328 Airpark Drive
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1.0 Introduction

This document provides a standard for interconnection of distributed resources within the Y-W Electric Association (YWEA) electric power system with aggregate capacity that is no larger than 25kW and 600VAC. It provides requirements relevant to the performance, operation, testing, safety considerations, and maintenance of the interconnection.

This standard is established to assist the generating facility in understanding the requirements involved in planning and designing an electrical interconnection with the YWEA electric system. This standard is a general guideline and may not cover all of the details of the installation. If deviations occur from this standard the changes must be approved by YWEA or their designated representative.

All costs associated with the interconnection will be paid by the generating facility including, but not limited to, technical review and analysis by YWEA and/or their designated representative.

2.0 General Requirements for Interconnection

2.1 Codes and Standards

The generating facility and its associated equipment must meet all applicable national, state and local construction and safety codes.

The interconnection shall conform to latest revision but not limited to the following:

- Colorado Department of Regulatory Agencies Public Utilities Commission's 4 Code of Colorado Regulations (CCR) 723-3, Part 3, "Rules Regulating Electric Utilities," Section 3665, "Small Generation Interconnection Procedures."
- IEEE Standard 1547, "IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems."
- IEEE Standard 1453, "IEEE Recommended Practice for Measurement and Limits of Voltage Fluctuations and Associated Light Flicker on AC Power Systems."
- IEEE Standard 519, "IEEE Recommended Practices and Requirements for Harmonic Control in Electric Power Systems."
- IEEE Standard 141(Red Book), "IEEE Recommended Practice for Electric Power Distribution for Industrial Plants."
- IEEE Standard 142 (Green Book), "IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems."
- IEEE STD 929-2000, "Recommended Practice for Utility Interface of Photovoltaic Systems."
- UL 1741, "Inverters, Converters, Controllers, and Interconnection System Equipment for Use with Distributed Energy Resources."
- IEEE C-2 (NESC), "National Electric Safety Code."
- NFPA-70 (NEC), "National Electrical Code."

In the event of conflict between these documents, the requirements of this Specification shall take precedence or the more stringent requirement shall be followed. If clarification is necessary, YWEA shall be notified for resolution.

2.2 Interconnection Review

The small generating facility should provide YWEA with electrical drawings for review prior to equipment procurement. As a minimum a single-line diagram is required indicating the point-of-interconnection, size/type/rating of power conversion device (generator, inverter/kW, kVA, etc.), voltage (single-phase or three-phase), frequency, size/type/rating of fault interrupting device, size/type/rating of manual disconnecting switch, and energy source (solar, wind, hydro, diesel, natural gas, propane, fuel oil, etc.) being used.

If protective relays are used, the drawing package should consist of meter and relay diagrams; three-line diagrams (AC) showing connectivity of relays; and, schematics (DC) indicating tripping schemes for any relays. The single-line meter and relay diagram listing major equipment should be provided to YWEA prior to ordering relays. The three-line diagrams and DC schematics should be provided before fabricating panels with protective relays. These may come from the manufacturer and need not be re-drawn.

If protective relays are used, relay settings for the interconnection are to be submitted to YWEA for review. YWEA will review the settings and may include changes or additions to the settings as warranted by the application.

Within three business days YWEA will notify by email or fax provided by the small generating facility that the interconnection request was received.

Within ten business days YWEA will notify the small generating facility as to whether the interconnection request is complete or incomplete. If the interconnection request is incomplete a notice that the interconnection request is incomplete will be provided by YWEA. The notice will contain a written list detailing information that must be provided to complete the interconnection request. The small generating facility will have ten business days after receipt of the notice to submit the listed information or to request an extension. If the information or a request for extension is not received within the ten business days the interconnection request will be deemed withdrawn.

Within 15 days YWEA will conduct an initial review and determine which screening criteria will be used in accordance with CCR 723-3, Part 3, Section 3665, "Small Generation Interconnection Procedures."

Prior to parallel operation, YWEA may inspect the small generating facility for compliance with standards, which may include a witness test, and may schedule appropriate metering replacement, if necessary.

2.3 Connection Voltage

Under this standard, small generating units shall be connected on the secondary low voltage (600VAC and less) side of the YWEA electrical system, and shall not be connected directly onto the distribution circuit. On the YWEA system this is typically 480VAC and less.

A transformer is used by YWEA to step-down the distribution voltage to the utilization voltage of the facility. The transformer also allows isolation between the generating facility and other YWEA customers when a three-phase inverter is installed. The impedance of the step-down transformer limits fault currents on the generator bus from the YWEA electric power system and limits fault currents on the YWEA electric power system from the generator. Hence, it reduces the potential damage to both parties due to faults.

Lightning arrestors may be required at the point of interconnection.

2.4 Fault-Interrupting Devices

A low voltage (less than 600VAC) three-phase/single-phase circuit breaker or contactor at the point of interconnection shall automatically separate the small generation facility from the YWEA electric power system upon detection of a circuit fault. Additional breakers and protective relays may be installed in the small generation facility for ease in operating and protecting the facility, but they are not required for the purpose of interconnection. The interconnection breaker or contactor shall have sufficient capacity to interrupt the maximum available fault current at its location.

Generally, the interconnection must meet the requirements and latest version of NEC, Article 705, "Interconnected Electric Power Production Sources" and the following specifications apply:

- Normally a low voltage thermal-magnetic circuit breaker is all that is required, however, it is up to the small generating facility to size and determine the fault interrupting capability for the application.
- A fused disconnect switch may be used and will be reviewed on a case by case basis.
- Contactors may be installed and will be reviewed on a case by case basis.

- An external trip signal (shunt trip) may be required to trip the breaker and will be reviewed on a case by case basis.
- For three-phase interconnections, a three-pole device is required due to its simultaneous three-phase operation and ability to coordinate with YWEA transformer high-side protection.

2.5 Manual Disconnect Switch

A manual disconnect switch is required for the small generation facility. An YWEA-operated disconnect device must be provided as a means of electrically isolating the YWEA electric power system from the generator. This device shall be used to establish visually open working clearance for maintenance and repair work in accordance with YWEA safety rules and practices. A separate disconnect device must be located at any and all points of interconnection with YWEA. The disconnect switch shall be a gang-operated, single-pole, double-pole or three-pole lockable switch as determined by the type of interconnection: single-phase or three-phase. All switch devices must be approved by YWEA. YWEA will inspect and approve the installation before parallel operation is permitted.

In general, the following specifications apply:

- Disconnect switches shall be furnished and installed by the small generation facility.
- Disconnect switches shall be physically located for ease of access and visibility to YWEA personnel.
- Disconnect switches shall be rated for the voltage and current requirements of the particular installation.
- Disconnect switches shall be gang-operated (for other than single-pole switches).
- Disconnect switches shall be weatherproof and designed to withstand exposure to weather and ice.
- Disconnect switches shall be lockable in both the open/closed positions with a standard YWEA pad lock.
- Disconnect switches may be fused and will be reviewed on a case by case basis.
- Disconnect switches shall not be used to make or break parallel operation between the YWEA electric power system and the generator(s).

2.6 Protective Equipment

Protective Equipment specified in this standard, 4 CCR 723-3, and IEEE 1547 must be installed at locations where the generating facility wishes to operate in parallel with the YWEA electric power system. This equipment is used to ensure safe and reliable power system operation and to allow disconnection of the facility's generation in the event of a short circuit or other malfunction. The protection equipment for a small generation facility must protect against faults within that facility and faults on the YWEA electric power system. A small generation facility must also trip off-line (disconnect from the YWEA electric power system automatically) when power is disconnected from the line into which the unit is generating. YWEA uses line-protective equipment to either; 1) automatically clear a fault and restore power, or 2) rapidly isolate only the faulted section so that a minimum number of customers are affected by any outages.

YWEA protection requirements are designed and intended to protect the YWEA electric power system only. As a general rule, neither party should depend on the other for the protection of its own equipment.

Additional protective relays may be needed to protect the generating facility adequately. It is the generating facility's responsibility to protect its own system and equipment from faults or interruptions originating on both YWEA side and the small generating facility's side of the Interconnection. The small generating facility's system protection shall be designed, operated, and maintained to isolate any fault or abnormality that would adversely affect the YWEA electric power system or the systems of other entities connected to the YWEA electric power system.

The protective relays used for isolating the small generation facility from the YWEA electric power system at the Point of Interconnection must be reviewed and approved by YWEA. Additional requirements, as to the exact type and style of the protective devices, may be imposed on the generating facility based on the proposed configuration or the type of interrupting device closest to the point of common coupling on the YWEA system. Any additional protective equipment required will be at the generating facility's cost. A summary of protective relaying that may be required by the small generating facility is included in Appendix 1.

Note: Inverters that comply with IEEE STD 929-2000, "Recommended Practice for Utility Interface of Photovoltaic Systems," and UL 1741, "Inverters, Converters, Controllers, and Interconnection System Equipment for Use with Distributed Energy Resources," have built-in protective relay functions and may not require additional protection. These systems will be reviewed on case by case basis. See Appendix 2 for more information on inverter based systems.

YWEA recommends that the generating facility acquire the services of a qualified electrical engineer to review the electrical design of the proposed small generation facility and ensure that it will be adequately protected.

2.7 Safety, Reliability and Power Quality

The small generating facility must design, construct and operate its equipment in a manner that will not degrade the quality of electric service to other YWEA customers. YWEA reserves the right to specify the quality and determine the adequacy of the small generating facility's equipment, installation and operation in any respect that affects safety, reliability and quality of service.

The generating facility is expected to operate within the limits of voltage, frequency and harmonic distortion outlined in the latest revision of IEEE Standard 1547, IEEE Standard 1453, IEEE Standard 519 and IEEE Standard 141 (Red Book).

Studies, such as a System Impact Study and associated excitation equipment settings shall be at the generating facility's expense.

2.8 Isolated Operation

YWEA does not allow isolated operation of the YWEA distribution system by a distributed resource under any circumstances. To prevent isolated operation, YWEA requires devices to detect and disconnect the distributed resource in the event of a loss of electrical power at the point of interconnection. If the control system of the small generating facility is not capable of detecting faults on the utility system, relays may be required so that the distributed resource can be disconnected when the YWEA breaker or recloser opens. In rare cases, transfer tripping equipment may be required and will be reviewed on a case by case basis.

The small generating system is allowed to disconnect and operate independent of the YWEA distribution system. Proper synchronizing devices must be in place when the small generating facility parallels back to the YWEA electrical system while energized.

2.9 Facility System Disturbances

The small generating facility must disconnect in the event of a disturbance or malfunction of facility equipment to prevent loss of service to other YWEA customers.

2.10 Utility System Disturbances

The small generating facility must promptly disconnect from the YWEA electric power system in the event of a utility system disturbance. YWEA protective relaying will act to promptly disconnect the affected line. The small generating facility on this affected line represents an additional source of power to energize the line. Therefore the generating facility must provide a means to automatically disconnect its generator to avoid isolated operation and protect equipment and personnel.

3.0 Commissioning Test

3.1 Commissioning Testing

Commissioning testing shall be performed on-site to verify functionality and when used, protective relay settings. YWEA has the right to witness the commissioning test, and may also require written certification by the installer describing which tests were performed and their results.

In some cases testing may be verified by a certified factory test. In such cases copies of all factory tests shall be submitted for review by YWEA. YWEA will review the factory test reports and determine if they are acceptable commissioning tests or if more testing is required. Test reports will be reviewed on case by case basis.

Testing shall include visual inspections of the interconnection equipment and when used, protective settings to confirm compliance with the interconnection requirements. The generating facility shall provide YWEA with copies of test reports for the particular types of protective devices applied before the generating facility will be allowed to parallel. The cost of performing commissioning testing is the responsibility of the generating facility. Once complete and accepted the commissioning tests do not have to be repeated unless set points are changed.

3.2 Scheduled Testing

After commissioning, the generating facility should perform periodic testing to demonstrating the functionality of the system. The interval between testing is usually specified by the manufacturer of the equipment. Copies of any testing shall be kept by the small generating facility and made available to YWEA if requested.

If used, protective relays should be checked and tested every five years. These tests shall demonstrate that the protective relays are functional and within calibration.

YWEA will not test the generating facility's equipment, but reserves the right to witness the testing performed by a qualified testing firm retained by the generating facility.

3.3 Testing Qualifications

Individuals qualified in testing protective equipment (professional engineer, factory-certified technician, or licensed electrician with experience in testing protective equipment) must perform commissioning and scheduled testing.

4.0 References

1) Interconnection Standards for Qualifying Facilities, Tri-State Generation and Transmission Association, Inc. September, 1992.
2) IEEE Standard 1547, "IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems".
3) Colorado Department of Regulatory Agencies, Public Utilities Commission, 4 Code of Colorado Regulations (CCR) 723-3, Part 3, "Rules Regulating Electric Utilities."
4) IEEE Standard P1547.2, "Draft Application Guide for IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems", Draft 9, September, 2007.
5) PG&E GENERATION INTERCONNECTION HANDBOOK, Section G2, Protection and Control Requirements for Generation Entities, August 6, 2007.
6) IEEE Standard 929-2000, "Recommended Practice for Utility Interface of Photovoltaic Systems."
7) UL 1741, "Inverters, Converters, Controllers, and Interconnection System Equipment for Use With Distributed Energy Resources,"

Appendix 1

A Summary of Protective Relaying

1.0 Protective Relaying

1.1 General requirements

As stated in Section 2.6 (Protective Equipment) of this standard, YWEA may require additional equipment if the individual application warrants the use of such equipment. The following is intended as a guide that represents the minimum requirements to provide a safe and reliable interconnection.

If required, protective relays shall be utility grade and must be submitted to YWEA for approval. Industrial grade protective relays for interconnection may be acceptable on a case by case basis; however, utility grade relays are preferred. Utility grade relays, used by electric utilities, have much higher reliability and accuracy than industrial grade relays. All utility grade relays must include resettable relay targets, and have 5A nominal AC input current. All utility grade relay power supplies should be powered by battery DC voltage, and the battery system should include a DC undervoltage detection device and alarm.

1.2 Line Protection

If required, line-protection relays must coordinate with the protective relays at the YWEA recloser/breaker for the line on which the generating facility is connected. YWEA operates a 12.47/7.2kV grounded-wye distribution system. Typical YWEA protection is for a long radial line where current can flow in one direction only; typical protective relays for this type of line need to be coordinated in only one direction and may not be directional elements. However, there may be instances where current may flow in either direction depending on system conditions. Relays on these portions of the YWEA electric power system must be directional. Such modifications to existing relays will be at the generating facility's cost.

The line protection schemes must be able to distinguish between generation, load, inrush and fault currents. YWEA's existing relay schemes may have to be reset, replaced, or augmented with additional relays at the small generation facility's expense, to coordinate with the new generation facility. The minimum protection that YWEA typically uses on its own installation is phase overcurrent, ground overcurrent, and reclosing.

If required, relays must be located so that a fault on any phase of YWEA's interconnected line(s) shall be detected. If transfer trip protection is required by YWEA, the small generation facility shall provide all required communication circuits at its expense.

Some portions of the YWEA electric power system have provisions for an alternate feed. In some of these locations, generation may not be allowed on line while being fed from an alternate source due to protection coordination issues. Whenever possible, the small generation facility will be given the option of:

1. Paying for any required upgrades so as to stay on line while transferred to the alternate source, or
2. Accepting shutdowns when transferred to the alternate source and not incurring costs for upgrades to the existing system.

1.3 Generator/Intertie Protection and Control

Single-phase generators should be connected in groups so that an equal amount of generation capacity is applied to each phase of a three-phase circuit. Synchronous generators of any size will require: a) synchronizing relays (Device 15/25), synch check (Device 25), or auto synchronizer to supervise generator breaker closing, and b) reclose blocking at the YWEA side of the line to which the generator is connected (applies to substation breaker/recloser and line reclosers).

The protection classes for generator interconnection under this standard are:

- 5 kW and below
- 6-25 kW

The following represents the minimum protection that should be used to provide a safe and reliable interconnection. YWEA may require additional equipment if the individual application warrants the use of such equipment. Additional generator protection may be determined by YWEA on a case-by-case basis.

- Protective Relaying, 5 kW and below:
    - Short Circuit Protection:
        - Thermal-magnetic circuit breaker
        - Devices 50/51 and 51V as applicable on case by case basis.
        - Device 51V not required on induction machines.
    - Isolation Protection:
        - Devices 27, 32, 59, 81O, 81U
        - Device 32 is required for peak shaving and no-sale applications where the generating facility is operating in parallel with the YWEA electric power system.
        - May be only protection required on inverters.
    - Breaker Closing/Reclosing Control:
        - Devices 25, 27R on any synchronous machine.
        - Device 25 not required on induction machines.
    - Ground Fault Protection:
        - Devices 51N or 51G as applicable on case by case basis.
    - Overspeed protection if applicable.

- Protective Relaying, 6-25 kW:
    - Short Circuit Protection
        - Thermal-magnetic circuit breaker
        - Devices 50/51 and 51V as applicable on case by case basis.
        - Device 51V not required on induction machines.
    - Isolation Protection
        - Devices 27, 59, 81O, 81U.
        - Device 32 is required for peak shaving and no-sale applications where the generating facility is operating in parallel with the YWEA electric power system.
        - Only protection required on inverters.
    - Breaker Closing/Reclosing Control
        - Devices 25, 27R on any synchronous machine.
        - Device 25 not required on induction machines.
    - Ground Fault Protection
        - Devices 51N or 51G as applicable on case by case basis.
    - Over/under-speed control for induction generators
        - Device 15

1.4 Circuit Breaker/Circuit Switcher (Device 52)

A three-phase, three-pole, single-phase one-or two-pole circuit breaker is the preferred fault-interruption device at the point of interconnection due to its simultaneous operation and ability to coordinate with YWEA line-side devices.

1.5 Phase Overcurrent (Device 50/51)

A phase overcurrent device provides tripping of the circuit breaker in the event of a phase fault. Phase overcurrent relays are to be coordinated with YWEA line-side devices. Overcurrent protection can also be used to detect a line-end fault condition. A phase instantaneous overcurrent relay that can see a line fault under sub-transient conditions may also be used. A phase instantaneous overcurrent relay is generally not required if a 51V relay is used.

1.6 Phase Overcurrent Relay with Voltage Restraint/Voltage Control (Device 51V)

These relays are used to detect multi-phase faults and initiate a generator circuit breaker trip. These relays are located on the individual generator feeder. An overcurrent relay with voltage control may also be acceptable if it can be set to adequately detect end-of-line faults as verified by YWEA protection studies.

- Phase Overcurrent with Voltage Restraint (51V) – suggested settings:
  - Pickup: 125-150% of generator FLA @ 100% Voltage Restraint.
  - Time: Above the knee of the generator decrement curve with constant excitation and coordinated with the downstream YWEA feeder relay setting.
- Phase Overcurrent with Voltage Control (51V) – suggested settings:
  - Pickup: 80-90% of generator $I_d = 1/X_d$.
  - Time: Above the knee of the generator decrement curve with constant excitation and coordinated with the downstream YWEA feeder relay setting.

  Note: The 51V function is not useful for induction generators since, if the voltage is low enough to enable overcurrent protection, the generator excitation will not be sustained.

1.7 Under/Overvoltage Relay (Device 27/59)

This protection is used to trip the circuit breaker when the voltage is above or below YWEA's normal operating level. Relays will operate for generator protection and backup protection in the event that the generator is carrying load that has become isolated from the YWEA electric power system.

- Overvoltage (59) – settings:
  - 110%< Voltage < 120% of nominal @ 1.0 sec (60 cycles)
  - Voltage > 120% of nominal @ 0.16 sec (9.6 cycles)
- Undervoltage (27) – settings:
  - Voltage < 50% of nominal @ 0.16 sec (9.6 cycles)
  - 50% < Voltage < 88% of nominal @ 2.0 sec (120 cycles)

  Note: Inverters that comply with IEEE STD 929-2000, "Recommended Practice for Utility Interface of Photovoltaic Systems," and UL 1741, "Inverters, Converters, Controllers, and Interconnection System Equipment for Use with Distributed Energy Resources," have built-in 27/59 functions. If an inverter lacks these functions, then 27/59 relay protection must be installed. See Appendix 2 for more information on inverter based systems.

1.8 Reverse Power Relay (Device 32)

The reverse power relay is used when the small generating facility is operating in parallel with the YWEA electric power system and power export is not allowed. A directional power element may be set to look either forward or reverse. When set to detect power export (reverse power), the relay may be set to trip at a level below the expected minimum utility feeder load that the small generating facility would supply if islanded. When set to detect power import (forward power), the relay may be set to trip at a level below the minimum expected power import level. This relay is not used for fault protection, but can prevent damage to other YWEA customers.

1.9 Over/Under Frequency Relay (Device 81 O/U)

This protection is used to trip the circuit breaker when the frequency is above or below YWEA's normal operating level. It is used for generator/turbine protection and backup protection. Generator underfrequency relay settings are

coordinated with other utilities in the Western Electricity Coordinating Council (WECC) to maintain generation on line during system disturbances. Relays shall not be set for a higher frequency or shorter time delay than specified without prior written approval by YWEA.

- Less than 25kW – settings:
    - Over Frequency (81O)
        - 60.5 Hz @ 0.16 sec (9.6 cycles).
    - Under Frequency (81U)
        - 59.3 Hz @ 0.16 sec (9.6 cycles).

  Note: Inverters that comply with IEEE STD 929-2000, "Recommended Practice for Utility Interface of Photovoltaic Systems," and UL 1741, "Inverters, Converters, Controllers, and Interconnection System Equipment for Use with Distributed Energy Resources," have built-in 81O/U functions. If an inverter lacks these functions, then 81O/U relay protection must be installed.

1.10 Synchronizing (Device 15/25) and Synch-Check (Device 25)

The application of synchronizing devices attempts to ensure that a synchronous generator will parallel with the utility electric system without causing a disturbance to other customers and facilities (present and in the future) connected to the same system. The protection also works to ensure that the generator itself will not be damaged due to an improper parallel action. Synchronous generators and other generators with stand-alone capability should use one of the following methods to synchronize with the YWEA electric power system:

- Automatic synchronization (Device 15/25) supervised by a synch-check relay (Device 25) to synchronize with the YWEA electric power system. The synch-check relay must have the characteristics listed below.

- Manual synchronization with supervision from a synch-check relay (Device 25) to synchronize with the YWEA electric power system. The synch-check relay must have the characteristics listed below.

- Manual synchronization with synchroscope and synch-check (Device 25) relay supervision. The synch-check relay must have the characteristics listed below.

- The synch-check relay must have all of the following characteristics:
    - Slip frequency matching window of 0.3 Hz or less
    - Voltage matching window of ± 10 percent or less
    - Phase angle acceptance window of ± 20 degrees or less

  Note: A synch-check function is not needed on induction generators. Unlike synchronous generators, induction generators are not synchronized before paralleling to the electric utility system.

1.11 Ground Fault Sensing Scheme (Device 51G)

The ground fault sensing scheme detects YWEA electric power system ground faults and trips the generator breaker or the generating facility's main circuit breaker, thus preventing the small generation facility's generator from continuously contributing to a ground fault. This scheme should detect faults between the YWEA system side of the dedicated transformer and the end of YWEA's line. The following transformer connections, along with appropriate relaying equipment, are commonly used to detect system ground faults:

- System side - grounded wye; generator side - delta
- System side - grounded wye; generator side - wye; tertiary - delta

In general, a ground overcurrent relay (Device 51G) is installed in the step-up transformer neutral (primary voltage side).

- Ground overcurrent (51G):
  - Pickup: must be set above the YWEA electric power system unbalance.
  - Time: set above feeder relays and coordinated with the slowest downstream feeder relay ground setting.

For induction generators less than 25kW covered under this standard, ground fault detection is not required.

Appendix 2

Generation and Power Conversion Technologies

1.0 Generation and Power Conversion Technologies

1.1 Synchronous Generators

The generating unit should meet all applicable American National Standards Institute (ANSI) and Institute of Electrical and Electronic Engineers (IEEE) standards. The prime mover and the generator should operate within the nominal range of voltage and frequency excursions that may occur on the YWEA electric power system without damage to them. The generating unit should be able to operate through the specified frequency ranges for the time durations in this standard, to enhance system stability during a system disturbance.

1.2 Asynchronous (Induction) Generators

Conventional induction generators and other generators with no inherent VAR (reactive power) control capability require an amount of reactive power to maintain power factor between 90 percent lagging and 95 percent leading to maintain the required voltage on the YWEA electric power system. They may also be required to follow a YWEA-specified voltage or VAR schedule on an hourly, daily or seasonal basis, depending on the location of the installation.

Note: Double-fed asynchronous machines, also known as double-fed induction generators (DFIGs), are a distinct class of asynchronous generators, employing wound rotor induction machines with static power converters to drive the rotor field currents. The physical rotational speed of the machine can be varied over a wide range, both faster and slower than the synchronous speed. Unlike an ordinary induction machine, a double-fed asynchronous generator can supply or absorb reactive power, which allows power factor or net reactive flow to be easily and quickly controlled. In general, DFIG technology is widely used in wind generation.

1.2.1 Excitation

Conventional induction machines will not be allowed to be self-excited by nearby distribution capacitors, or as the result of capacitive voltage on the distribution network. Entities utilizing conventional induction machines shall provide their own excitation VARs such that the generating facility will not normally demand reactive power from, nor supply reactive power to, the YWEA electric power system. Power factor correction capacitors (switched or fixed), power electronics designed to supply a level of reactive capability, or a combination of devices used for excitation shall be provided and installed at the generating facility's expense. The generating facility shall not disable power factor equipment while induction machines are in operation.

1.2.2 Voltage Regulation

Speed matching may be by any means such that voltage regulation and voltage flicker are held within tolerance.

1.2.3 Dynamic Voltage Support

Wind farms or other induction technologies shall also be able to provide sufficient dynamic voltage support and automatic voltage regulation at the generator excitation system if it is determined that voltage support is required for system safety and reliability.

1.2.4 Crowbar

In some double-fed induction generators (DFIG), a "crowbar" circuit can be added to the rotor side of the frequency converter to provide overcurrent protection and overvoltage control to the rotor winding. The crowbar circuit limits the transient current in the stator and the rotor to less than 1 per unit for close-in and multiple-phase faults. It consists of a protection circuit that rapidly short-circuits (or "crowbars") the supply line if the voltage or current exceeds defined limits.

1.3 DC Generators

Static power converters (inverters) convert DC electricity into AC electricity and offer additional electronic power conversion. They are sometimes referred to as power conditioning systems. Their fundamental role is to convert DC or non-synchronous AC electricity from a prime mover energy source into a synchronous AC system of voltages that can be smoothly and easily interconnected with the electric power system.

1.3.1 Inverters Capable of Stand-Alone Operation

Inverters capable of stand-alone operation are capable of islanding operation and shall have similar functional requirements as synchronous generators. For units less than 25 kW, usually it is acceptable to have the frequency and voltage functions built into the electronics of the inverter if the set points of these built-in protective functions are tamper-proof and can be easily and reliably tested. These relay functions must receive YWEA approval before they can be used to interconnect with the YWEA electric power system. The total harmonic distortion in the output current of the inverters will be required to meet ANSI/IEEE 519 requirements.

Inverter-type generators that have been pre-approved by YWEA can be connected to the YWEA electric power system. For units over 10 kW, a dedicated transformer may be required to minimize the harmonics entering into the YWEA electric power system.

1.4 Emergency Generator Requirements

There are two methods of transferring electric power supply between the YWEA source and the emergency generator system: open transition (break before make) and closed transition (make before break).

1.4.1 Break Before Make

This method can be accomplished via a double throw transfer switch or an interlock scheme that prevents the two systems from operating in parallel. The small generation facility's main breaker shall not be allowed to close until the generator breaker opens. This open transition method does not require any additional protection equipment; however, it does cause the small generation facility's load to experience an outage while transferring back to YWEA. The length of this transfer depends on the transfer equipment.

The "break before make" transfer switch must be of a design, or have an interlock, that prevents the transfer switch from closing and connecting the customer's system with YWEA unless the emergency generator is already removed from the system.

1.4.2 Make Before Break

This method is used when the customer wants to minimize any loss of power or disturbance to the electric load. With this scheme, the customer's generator and the YWEA electric power system are in parallel for a very short time interval during which the customer's load is being transferred between the YWEA source and the emergency generator. Both the transfer from YWEA to the emergency source and the transfer back can be accomplished without an outage.

"Make before break" transfer switches:

- The transfer switch is rated for the maximum available fault duty in the event that the transfer switch closes into a fault condition.
- Have an interlock that will trip the main breaker or generator in the event of a failure of the transfer switch so that the unit will not remain paralleled to the YWEA electric power system. One way to accomplish this function is with a "failure-to-open" timer.
- The controls for the transfer switch prevent a parallel condition of the customer generator and the YWEA electric power system from existing for an extended time period. Any system that allows a parallel condition to exist for greater than 100 milliseconds (6 cycles) on the distribution system will be subject to the additional parallel operation guidelines outlined in this standard.

Disconnect switches:

- The customer provided manual disconnect is located at the point of interconnection, which will establish a visually open safety clearance for YWEA personnel working on the YWEA electric power system.
- The disconnect is lockable in either the open or closed positions and operated only by YWEA.
- The disconnect is easily accessible, preferably located adjacent to the electric meter.
- The disconnect has full load break capability.

The make before break transfer scheme must have adequate control and protection to ensure the YWEA and customer electric systems are in synchronism prior to making the parallel connection. Synchronization is accomplished through the use of an auto-synchronizer (Device 15/25) or a synchronizing relay supervised by a synch-check relay (Device 25).

Since the emergency generators are paralleled with the YWEA electric power system, protective devices are installed that will prevent the customer's generator from remaining connected in the event of a fault on the YWEA electric power system during the transition.

In some installations, the protection requirement may be satisfied through the installation of the reverse power relay (Device 32R). This relay should be installed on the customer's side of the service transformer that is connected to the YWEA electric power system. The relay should trip the customer's main breaker and must be able to detect transformer core magnetizing power. In this manner, reverse power flow is detected before it actually enters the YWEA electric power system and other customers' equipment. This can be accomplished by setting the current level pick up equivalent to 60 percent of the transformer bank magnetizing current. Because this current value will be small, the current transformers associated with the relay must be capable of accurately providing these small currents to the relay.

When transferring the customer's load back to the YWEA electric power system, it is possible to have incidental power flow back to YWEA's system. By properly setting the synchronizing and/or generator control, this reverse flow can be avoided. However, a short time delay may be required on the reverse power relay to prevent it from tripping the generator unnecessarily each time a transfer is attempted. At no time should this time delay exceed 100 milliseconds (6 cycles).

Again, since the emergency generator is briefly connected in parallel with the YWEA electric power system, all transfer schemes of this type must have a dedicated transformer to reduce the possibility that any transfer activities will affect other YWEA customers. A dedicated transformer is also necessary to allow the installation of the reverse power relay scheme.

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ATTACHMENT 9:

Y-WEA GENERATION INTERCONNECTION STANDARD – UP TO 10,000 kW CONNECTED AT ANY VOLTAGE

Last Reviewed: August 21, 2018
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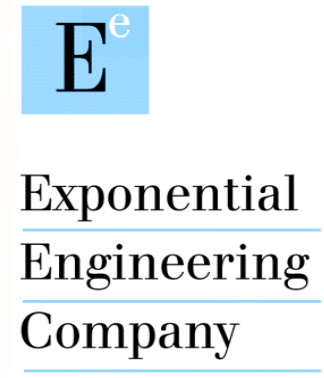
Interconnection Standard For
Generating Facilities No Larger Than 10MVA

Original October 26, 2007 (Rev. 2) Version drafted by:



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1.0 Introduction

This document provides a standard for interconnection of distributed resources within the Y-W Electric Association (YWEA) electric power system with aggregate capacity that is no larger than 10 MVA. It provides requirements relevant to the performance, operation, testing, safety considerations, and maintenance of the interconnection.

This standard is established to assist the generating facility in understanding the requirements involved in planning and designing an electrical interconnection with the YWEA electric system. This standard is a general guideline and may not cover all the details of the installation. If deviations occur from this standard the changes must be approved by YWEA or their designated representative.

All costs associated with the interconnection will be provided by the generating facility including, but not limited to, technical review and analysis by YWEA or their designated representative.

2.0 General Requirements for Interconnection

2.1 Codes and Standards

The generating facility and its associated equipment must meet all applicable national, state and local construction and safety codes. The installation is to comply with the applicable sections of the National Electrical Safety Code (NESC) and the National Electrical Code (NEC). Grounding shall conform to IEEE Standard 142, "IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems". The interconnection shall conform to the Colorado Department of Regulatory Agencies Public Utilities Commission's 4 Code of Colorado Regulations (CCR) 723-3, Part 3, "Rules Regulating Electric Utilities" and IEEE Standard 1547, "IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces".

In the event of conflict between these documents, the requirements of this Specification shall take precedence or the more stringent requirement shall be followed. If clarification is necessary, YWEA shall be notified for resolution.

2.2 Isolation Transformer

A dedicated isolation-transformer is required to step-up or step-down the generator voltage to the interconnection level and to isolate the generating facility from other YWEA customers. The impedance of the dedicated transformer limits fault currents on the generator bus from the YWEA electric power system and limits fault currents on the YWEA electric power system from the generator. Hence, it reduces the potential damage to both parties due to faults. The transformer must have a delta winding to reduce the generator harmonics entering the YWEA electric power system. The delta winding will also reduce the YWEA electric power system harmonics entering the generation facility. An interconnection level fault-interrupting device is required for transformer protection. Lightning arrestors must be installed between the transformer and the fault-interrupting devices and be encompassed by the generator's relay protection zone. This requirement may be waived at YWEA's sole discretion for generating facilities with a capacity of 500 kW or less.

2.3 Fault-Interrupting Devices

The fault-interrupting device selected by the generating facility must be reviewed and approved by YWEA for each particular application. There are two basic types of fault-interrupting devices allowed: Circuit Breakers and Circuit Switchers. YWEA will determine the type of fault-interrupting device required for a generation facility based on the size and type of generation, the available fault duty, the local circuit configuration, and the existing YWEA protection equipment.

A three-phase circuit breaker at the point of interconnection shall automatically separate the generation facility from the YWEA electric power system upon detection of a circuit fault. Additional breakers and protective relays may be installed in the generation facility for ease in operating and protecting the facility, but they are not required for the purpose of interconnection. The interconnection breaker shall have sufficient capacity to interrupt the maximum available fault current at its location and be equipped with accessories to:

- Trip the breaker with an external trip signal supplied through a battery (shunt trip).
- Telemeter the breaker status when required.
- Lockout if operated by protective relays required for interconnection

Generally, for generating facilities with a capacity exceeding 25 kW, a three-phase circuit breaker is the required fault-interruption device at the point of interconnection due to its simultaneous three-phase operation and ability to coordinate with YWEA line-side devices.

A circuit switcher is a three-phase fault-interrupter with limited fault interrupting capability. These devices have typically been used at voltages of 115 kV and below and may substitute for circuit breakers when the fault duty is within the interrupting rating of the circuit switcher. With YWEA approval, some circuit switchers with blades can function as the visual open disconnect switch between the metering transformers and the main transformer. Since circuit switchers do not have integral current transformers, they must be installed within 30 feet of the associated current transformers to minimize the length of the unprotected line/bus section.

2.4 Manual Disconnect Switch

A manual disconnect switch is required for a generation facility. An YWEA-operated disconnect device must be provided as a means of electrically isolating the YWEA electric power system from the generator. This device shall be used to establish visually open working clearance for maintenance and repair work in accordance with YWEA safety rules and practices. A separate disconnect device must be located at any and all points of interconnection with YWEA. The disconnect switch shall be a gang-operated, three-pole lockable switch.

The switch must be located between the interconnection level fault-interrupting device and the YWEA's electrical power system. The switch must be furnished and installed by the generation facility. All switch devices must be approved by YWEA. YWEA must inspect and approve the installation before parallel operation is permitted.

The disconnect device shall not be used to make or break parallel operation between the YWEA electric power system and the generator(s). The device enclosure (when present) and operating handle shall be kept locked at all times with an YWEA padlock.

The disconnect device shall be physically located for ease of access and visibility to YWEA personnel. The YWEA-operated disconnect shall be identified with an YWEA designated switch number plate.

In general, the following specifications apply:

- Disconnect switches shall be rated for the voltage and current requirements of the particular installation.
- Disconnect switches shall be gang-operated.
- Disconnect switches shall be weatherproof and designed to withstand exposure to weather and ice.
- Disconnect switches shall be lockable in both the open/closed positions with a standard YWEA lock.

2.5 Protective Equipment

Protective Equipment specified in this standard or in IEEE 1547 must be installed at locations where the generating facility wishes to operate in parallel with the YWEA electric power system. This equipment is used to ensure safe and reliable power system operation and to allow disconnection of the facilities generation in the event of a short circuit or other malfunction. The protection equipment for a generation facility must protect against faults within that facility and faults on the YWEA electric power system. A generation facility must also trip off-line (disconnect from the YWEA electric power system automatically) when power is disconnected from the line into which the unit is generating. YWEA requires line-protective equipment to either; 1) automatically clear a fault and restore power, or 2) rapidly isolate only the faulted section so that a minimum number of customers are affected by any outages.

High-speed fault clearing may also be required, to minimize equipment damage and potential impact to system stability. The requirement for high-speed fault clearing will be determined by YWEA on a case-by-case basis. Additional relays and protective devices may be required to achieve high-speed clearing, as outlined in the following paragraphs. Some protection requirements may be standardized; however, most line relaying will depend on generator size and type, number of generators, line characteristics (i.e., voltage, impedance, and ampacity), and the existing protection equipment connected to the YWEA electric power system.

Identical generator projects connected at different locations in the YWEA electric power system may have widely varying protection requirements and costs. These differences can be due to different line configurations, fault duties and existing relay schemes.

YWEA protection requirements are designed and intended to protect the YWEA electric power system only. As a general rule, neither party should depend on the other for the protection of its own equipment.

The generating facility shall install at the Point of Interconnection, at a minimum, a disconnecting device or switch with generation interrupting capability. Additional protective relays are typically needed to protect the generating facility adequately. It is the generating facility's responsibility to protect its own system and equipment from faults or interruptions originating on both YWEA side and the generating facility's side of the Interconnection. The generating facility's system protection shall be designed, operated, and maintained to isolate any fault or abnormality that would adversely affect the YWEA electric power system or the systems of other entities connected to the YWEA electric power system. The generation facility shall, at its expense, install, operate, and maintain system protection facilities in accordance with applicable WAPA, Tri-State, WECC and NERC requirements and in accordance with design and application requirements of this Standard.

The protective relays used for isolating the generation facility from the YWEA electric power system at the Point of Interconnection must be reviewed and approved by YWEA and must be set to coordinate with the protective relays at the YWEA line breaker terminals for the line on which the generation facility is connected. Additional requirements, as to the exact type and style of the protective devices, may be imposed on the generating facility based on the proposed station configuration or the type of interrupting device closest to the point of common coupling on the YWEA system. Any required additional protective equipment required will be at the generating facility's cost.

YWEA recommends that the generating facility acquire the services of a qualified electrical engineer to review the electrical design of the proposed generation facility and ensure that it will be adequately protected.

Generally, fault-interrupting equipment should be located as close to the interconnection point as possible - typically within one span of overhead line or 200 feet of un-spliced underground cable.

Protective relays shall be utility grade and must be submitted to YWEA for approval. Industrial grade protective relays for interconnection are not acceptable. Utility grade relays, used by electric utilities, have much higher reliability and

accuracy than industrial grade relays. All utility grade relays must include resettable relay targets, and have 5A nominal AC input current. All utility grade relay power supplies must be powered by station battery DC voltage, and the battery system shall include a DC undervoltage detection device and alarm.

2.6 Safety, Reliability and Quality of Service

The generating facility must design, construct and operate its equipment in a manner that will not degrade the quality of electric service to other YWEA customers. YWEA reserves the right to specify the quality and determine the adequacy of the generating facilities equipment, installation and operation in any respect that affects safety, reliability and quality of service.

The Generating facility shall design the protection system with sufficient redundancy that the failure of any one component will still permit the generating facility to be isolated from the YWEA electric power system under a fault condition. Multi-function three-phase protective relays must have redundant relay(s) for back-up. Recommended practice is to use two relays from different manufacturers or to use two relays of different models from the same manufacturer such that they do not share a common firmware in order to provide adequate redundancy and security and to avoid a single mode of failure for both levels of protection. Any customer interface protective devices that have potential impact on the YWEA electric power system will have to comply with this practice regardless of distribution or transmission line ownership (YWEA, WAPA or Tri-State). Protection of customer-owned equipment by two relays from the same vendor is acceptable as long as these relays utilize different operating principles or different firmware types. An example of relays requiring redundancy would be the intertie breaker and the main customer transformer protection.

2.7 Isolated Operation

YWEA does not allow isolated operation of the distributed resource under any circumstances without resubmitting a new interconnection request or unless specifically identified on the Interconnection Application. To prevent isolated operation YWEA requires devices to detect and disconnect the distributed resource in the event of a loss of electrical power at the point of interconnection. Relays will be required to detect faults on the utility system and transfer tripping equipment will be required so that the distributed resource can be disconnected when the YWEA breaker or recloser opens.

2.8 Facility System Disturbances

The generating facility must disconnect in the event of a disturbance or malfunction of facility equipment to prevent loss of service to other YWEA customers. The protective equipment must be coordinated with YWEA protective equipment to ensure proper operation in the event of a fault. YWEA will coordinate with the generating facility to provide proper protection equipment coordination.

2.9 Utility System Disturbances

Depending upon the type and location of disturbance affecting the YWEA electric power system, the generating facility will be required to either ride through the disturbance or promptly disconnect from the YWEA electric power system in the event of a utility system disturbance. YWEA protective relaying will act to promptly disconnect the affected line. The generating facility on this affected line represents an additional source of power to energize the line. Therefore the generating facility must provide a means to automatically disconnect its generator to avoid isolated operation and protect equipment and personnel. Direct transfer tripping schemes may need to be implemented to prevent damage to the generator during a reclosing operation. Ride-through capabilities of the generating facility for voltage disturbances and frequency disturbances are given in IEEE Std 1547. Generating facilities with a capacity of

500 kW or less will be required to meet Category A functional performance requirements for normal operating conditions and Category I functional performance requirements for abnormal operating conditions (system disturbances). Larger generating facilities will be required to meet Category B functional performance requirements for normal operating conditions and Category II functional performance requirements for abnormal operating conditions (system disturbances), unless YWEA determines that Category III performance is necessary for a specific installation.

2.10 Back-feed to the Utility System

Unless an agreement is in place allowing net metering service, bidirectional metering service, wheeling service through YWEA's facilities, or operation as a Qualifying Facility, the generating facility must never back-feed to the YWEA system and must provide protective means to give assurance that the generator will not be connected to a de-energized system. This requirement is to prevent injury to YWEA personnel during maintenance of the disconnected line.

2.11 Power Quality

The generating facility must not degrade the quality of service to other YWEA customers such that the service falls outside of YWEA power quality standards. When in parallel with the YWEA electric power system, the generating facility is expected to operate within the fallowing:

- Voltage, frequency and harmonic distortion outlined in IEEE STD 1547-2018, "IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces"
- Voltage limits per ANSI C84.1-2011, "Standard for Electric Power Systems and Equipment" – Voltage ratings (60 Hertz), Range A.
- Voltage flicker limits per IEEE STD 1453-2015, "IEEE Recommended Practice for the Analysis of Fluctuating Installations on Power Systems"
- Harmonic limits per IEEE STD 519-2014, "IEEE Recommended Practice and Requirements for Harmonic Control in Electric Power Systems"

The generating facility must not create objectionable flicker for other customers that are in violation of IEEE 1453 at any point on YWEA's electric power system.

2.12 Interconnection Review

The generating facility should provide YWEA with electrical drawings for review prior to equipment procurement. Drawings provided will consist of single-line meter and relay diagrams, three-line diagrams (AC) showing connectivity of relays, and schematic drawings (DC) indicating tripping schemes for all YWEA required relays. The single-line meter and relay diagram listing major equipment should be provided to YWEA prior to ordering relays. The three-line diagrams and DC schematics should be provided before fabricating relay panels.

Relay settings for the interconnection are to be submitted to YWEA for review. YWEA will review the settings and may include changes or additions to the settings as warranted by the application. It is the responsibility of the generating facility to have all relay settings tested by a certified testing agency. All cost for such testing will be at the generating facilities own expense. After commissioning, copies of the certified test reports are to be provided by the generating facility for YWEA.

3.0 Requirements for Interconnection

3.1 General requirements

The following represents the minimum requirements to provide a safe and reliable interconnection. YWEA may require additional equipment if the individual application warrants the use of such equipment.

- General Requirements:
    - A 3-pole disconnect device or a fused disconnect switch (only with YWEA written approval) that may be locked in the open position and provides visual indication of isolation.
    - A generator circuit breaker rated for the service to which it is applied.
    - A line voltage relay to prevent the generator from being connected to a de-energized source.
    - A dedicated delta-wye transformer when a three-phase inverter is installed.
    - Surge arrestors rated for the service to which it is applied.

- Demand Recording
    - Energy and Demand Metering to be supplied by YWEA at a cost to the facility.

3.2 Line Protection

Line-protection relays must coordinate with the protective relays at the YWEA recloser/breaker for the line on which the generating facility is connected. YWEA operates a 12.47/7.2kV grounded-wye distribution system. Typical YWEA protection is for a long radial line where current can flow in one direction only; typical protective relays for this type of line need to be coordinated in only one direction and may not be directional elements. However, there may be instances where current may flow in either direction depending on system conditions. Relays on these portions of the YWEA electric power system must be directional. Such modifications to existing relays will be at the generating facility's cost.

The generating facility relays must be connected to the breaker CTs in such a way that zones of protection overlap. The line protection schemes must be able to distinguish between generation, load, inrush and fault currents. YWEA's existing relay schemes may have to be reset, replaced, or augmented with additional relays at the generation facility's expense, to coordinate with the new generation facility. The minimum protection that YWEA typically uses on its own installation is: phase overcurrent, ground overcurrent, and reclosing.

Required relays must be located so that a fault on any phase of YWEA's interconnected line(s) shall be detected. If transfer trip protection is required by YWEA, either YWEA or the generation facility shall, at YWEA's discretion, provide all required communication circuits at the generating facility's expense. Communication circuits may be dedicated cable, microwave, radio, or a fiber optic circuit and shall be designed with sufficient levels of monitoring of critical communication channels and associated equipment. YWEA will determine the appropriate communication medium to be used on a case-by-case basis. The dedicated communication network may be required to have high-voltage protection equipment on the entrance cable so that the transfer trip equipment can operate properly during fault conditions.

Some portions of the YWEA electric power system have provisions for an alternate feed. In some of these locations, generation may not be allowed on line while being fed from an alternate source due to protection coordination issues. Whenever possible, the generation facility will be given the option of:

1. Paying for any required upgrades so as to stay on line while transferred to the alternate source, or
2. Accepting shutdowns when transferred to the alternate source and not incurring costs for upgrades to the existing system.

3.3 Generator/Intertie Protection and Control

Single-phase generators must be connected in groups so that an equal amount of generation capacity is applied to each phase of a three-phase circuit. All synchronous, induction and single-phase generators shall comply with the latest ANSI Standards C50.10 and C50.13, dealing with waveform and telephone interference. Synchronous generators of any size will require: a) synchronizing relays (Device 15/25), synch check (Device 25), or auto synchronizer to supervise generator breaker closing, and b) reclose blocking at the YWEA side of the line to which the generator is connected (applies to substation breaker/recloser and line reclosers).

The protection classes for generator interconnection are:

- 5 kW and below,
- 6-100 kW,
- 101-500 kW, and
- 501 kW to 10,000 kW

The following represents the minimum requirements to provide a safe and reliable interconnection. YWEA may require additional equipment if the individual application warrants the use of such equipment. Additional generator protection requirements may be determined by YWEA on a case-by-case basis.

- Protective Relaying, 5 kW and below:
    - Short Circuit Protection (Thermal overload protection: minimum requirement)
        - Devices 52, 50/51, 51V and 67 as applicable on case by case bases.
        - Device 51V not required on induction machines.
    - Isolation Protection (Devices 27, 59, 81O, 81U: minimum requirements)
        - Device 32 is required for peak shaving and no-sale applications where the generating facility is operating in parallel with the YWEA electric power system.
        - May be only protection required on inverters.
    - Breaker Closing/Reclosing Control (Devices 25, 27R: minimum requirements)
    - Ground Fault Protection (Devices 51N or 51G as applicable on a case by case bases)
    - Direct Transfer Trip (Recloser Operation as applicable on a case by case bases)
    - Overspeed protection if applicable.

- Protective Relaying, 6-100 kW:
    - Short Circuit Protection (Devices 52, 51V: minimum requirements).
        - Devices 50/51 and 67 as applicable on case by case bases.
        - Device 51V not required on induction machines.
    - Isolation Protection (Devices 27, 59, 81O, 81U: minimum requirements).
        - Device 32 is required for peak shaving and no-sale applications where the generating facility is operating in parallel with the YWEA electric power system.
        - Only protection required on inverters.
    - Breaker Closing/Reclosing Control (Devices 25, 27R, 47: minimum requirements).
        - Device 25 and 27R not required on induction machines.
    - Ground Fault Protection (Devices 51N or 51G as applicable on case by case bases).
    - Direct Transfer Trip (Recloser Operation as applicable on case by case bases).
    - Over/under-speed control for induction generators (Device 15).

- Protective Relaying, 101-500 kW:

    - Short Circuit Protection (Devices 52, 51V, or 67: minimum requirements).
        - Devices 50/51 as applicable on case by case bases.
        - Device 51V not required on induction machines.
    - Isolation Protection (Devices 27, 59, 81O, 81U: minimum requirements).
        - Device 32 is required for peak shaving and no-sale applications where the generating facility is operating in parallel with the YWEA electric power system.
    - Breaker Closing/Reclosing Control (Devices 25, 27R, 46, 47: minimum requirements).
        - Device 25 and 27R not required on induction machines.
    - Ground Fault Protection (Devices 64G, 59G or 51G as applicable on case by case bases).
    - Direct Transfer Trip (Recloser Operation as applicable on case by case bases).
    - Over/under-speed control for induction generators (Device 15).

- Protective Relaying, 500-10,000 kW:

    - Short Circuit Protection (Devices 52, 51V, or 67: minimum requirements)
        - Devices 50/51 and 67 as applicable on case by case bases.
        - Device 51V not required on induction machines.
    - Isolation Protection (Devices 27, 59, 81O, 81U: minimum requirements)
        - Device 32 is required for peak shaving and no-sale applications where the generating facility is operating in parallel with the YWEA electric power system.
    - Breaker Closing/Reclosing Control (Devices 25, 27R, 46, 47: minimum requirements)
        - Device 25 and 27R not required on induction machines.
    - Ground Fault Protection (Devices 64G, 59G, or 51G as applicable on case by case bases).
    - Direct Transfer Trip (Recloser Operation as applicable on case by case bases).
    - Over/under-speed control for induction generators (Device 15).

Figures 1-8 provide example protection diagrams illustrating the recommended protection schemes for a synchronous and induction generators connected through a Wye-Wye, Delta-Wye, or Wye-Delta transformer.

3.4 Circuit Breaker/Circuit Switcher (Device 52)

A three-phase, three-pole circuit breaker or circuit switcher is the required fault-interruption device at the point of interconnection, due to its simultaneous three-phase operation and ability to coordinate with YWEA line-side devices.

3.5 Phase Overcurrent (Device 50/51)

Provide tripping of the circuit breaker or circuit switcher in the event of a phase fault. Phase overcurrent relays must be coordinated with YWEA line-side devices. Overcurrent protection must be able to detect a line-end fault condition. A phase instantaneous overcurrent relay that can see a line fault under sub-transient conditions is required. A phase instantaneous overcurrent relay is not required if a 51V relay is used.

3.6 Phase Overcurrent Relay with Voltage Restraint/Voltage Control (Device 51V)

These relays are used to detect multi-phase faults and initiate a generator circuit breaker trip. The relays must be located on the individual generator feeder. A group of generators aggregating over 40 MW must have an overcurrent relay with voltage restraint located on each generator greater than 10 MW. Generators equal to or greater than 40MW must have an overcurrent relay with voltage restraint. An overcurrent relay with voltage control may also be acceptable if it can be set to adequately detect end-of-line faults as verified by YWEA protection studies.

- Phase Overcurrent with Voltage Restraint (51V) – suggested settings:
  - Pickup: 125-150% of generator FLA @ 100% Voltage Restraint.
  - Time: Above the knee of the generator decrement curve with constant excitation and coordinated with the slowest downstream feeder relay setting.
- Phase Overcurrent with Voltage Control (51V) – suggested settings:
  - Pickup: 80-90% of generator $I_d = 1/X_d$.
  - Time: Above the knee of the generator decrement curve with constant excitation and coordinated with the slowest downstream feeder relay setting.

Note: The 51V function is not useful for induction generators since, if the voltage is low enough to enable overcurrent protection, the generator excitation will not be sustained.

3.7 Under/Overvoltage Relay (Device 27/59)

This protection is used to trip the circuit breaker when the voltage is above or below YWEA's normal operating level. Relays will operate for generator protection and backup protection in the event that the generator is carrying load that has become isolated from the YWEA electric power system. Undervoltage and Overvoltage Relay settings shall be made in accordance with the default settings given in IEEE Std 1547, unless YWEA determines that different settings within the allowable ranges shown in IEEE Std 1547 are necessary for the specific installation.

Note: Inverters that comply with IEEE STD 929-2000, "Recommended Practice for Utility Interface of Photovoltaic Systems," and UL 1741, "Inverters, Converters, Controllers, and Interconnection System Equipment for Use with Distributed Energy Resources," have built-in 27/59 functions. If an inverter lacks these functions, then 27/59 relay protection must be installed.

3.8 Over/Under Frequency Relay (Device 81 O/U)

This protection is used to trip the circuit breaker when the frequency is above or below YWEA's normal operating level. It is used for generator/turbine protection and backup protection. Underfrequency and Overfrequency Relay settings shall be made in accordance with the default settings given in IEEE Std 1547.

Note: Inverters that comply with IEEE STD 929-2000, "Recommended Practice for Utility Interface of Photovoltaic Systems," and UL 1741, "Inverters, Converters, Controllers, and Interconnection System Equipment for Use with Distributed Energy Resources," have built-in 81O/U functions. If an inverter lacks these functions, then 81O/U relay protection must be installed.

3.9 Synchronizing (Device 15/25) and Synch-Check (Device 25)

The application of synchronizing devices attempts to assure that a synchronous generator will parallel with the utility electric system without causing a disturbance to other customers and facilities (present and in the future) connected to the same system. The protection also works to ensure that the generator itself will not be damaged due to an improper parallel action. Synchronous generators and other generators with stand-alone capability must use one of the following methods to synchronize with the YWEA electric power system:

- Automatic synchronization (Device 15/25) supervised by a synch-check relay (Device 25) to synchronize with the YWEA electric power system.

- Manual synchronization with supervision from a synch-check relay (Device 25) to synchronize with the YWEA electric power system.

- Manual synchronization with synchroscope and synch-check (Device 25) relay supervision (Only allowed for generators with less than 1000 kW aggregate nameplate rating).

The synch-check relay must have all of the following characteristics:

- Less than 500 kW – required settings:
    - Slip frequency matching window of 0.3 Hz or less
    - Voltage matching window of ±10 percent or less
    - Phase angle acceptance window of ± 20 degrees or less
- 500-1,500 kW – required settings:
    - Slip frequency matching window of 0.2 Hz or less
    - Voltage matching window of ±5 percent or less
    - Phase angle acceptance window of ± 15 degrees or less
    - Breaker closure time compensation
- 1,500-10,000 kW – required settings:
    - Slip frequency matching window of 0.1 Hz or less
    - Voltage matching window of ±3 percent or less
    - Phase angle acceptance window of ± 10 degrees or less
    - Breaker closure time compensation

Note: Generators with greater than 1,000 kW aggregate nameplate rating must have a synchronizing relay or automatic synchronizer with synch-check supervision.

Note: A synch-check function is not needed on induction generators. Unlike synchronous generators, induction generators are not synchronized before paralleling to the electric utility system.

3.10 Undervoltage Check (Device 27R)

An undervoltage check function, used along with a synch check relay (25), is used to check for a dead bus and prevents the breaker from closing unless the bus is dead.

Note: This function may not be needed on an induction generator provided the generator will not self-excite when interconnection breaker is open.

3.11 Current Unbalance (Device 46)

Generation facilities with three-phase generators should be aware that certain conditions on the YWEA electric power system may cause negative sequence currents to flow in the generator. It is the sole responsibility of the generating facility to protect their equipment from excessive negative sequence currents.

These unbalanced currents may be caused by open conductors or phase reversals on the YWEA electric power system and can subject the generating facility's generators to a high level of negative sequence current. This high negative sequence current results in rapid rotor heating which can damage the generator. Many generator protective relays provide a 46 function to protect against these unbalanced currents.

3.12 Voltage Unbalance (Device 47)

A negative sequence voltage (unbalance) relay can be installed to provide protection for phase reversals caused by inadvertent “phase swapping” after power restoration.

3.13 Ground Fault Sensing Scheme (Device 51G)

The ground fault sensing scheme detects YWEA electric power system ground faults and trips the generator breaker or the generating facility’s main circuit breaker, thus preventing the generation facility's generator from continuously contributing to a ground fault. This scheme must be able to detect faults between the YWEA system side of the dedicated transformer and the end of YWEA's line. The following transformer connections, along with appropriate relaying equipment, are commonly used to detect system ground faults:

- System side - grounded wye; generator side - delta
- System side - grounded wye; generator side - wye; tertiary - delta

In general, a ground overcurrent relay (Device 51G) is required to be installed in the step-up transformer neutral (primary voltage side).

- Ground overcurrent (51G):
    - Pickup: must be set above the YWEA electric power system unbalance.
    - Time: set above feeder relays and coordinated with the slowest downstream feeder relay ground setting.

For induction generators less than 100 kW, ground fault detection is not required. Ground fault detection is required for induction generators of 100kW or larger capacity. For synchronous generators aggregating over 40 kW, ground fault detection is required.

3.14 Phase Directional Overcurrent (Device 67)

AC directional overcurrent relay is a device that functions on a desired value of ac overcurrent flowing in a predetermined direction. In some applications a phase directional overcurrent relay (67) may be used for phase fault backfeed detection. The pickup setting must be set above the level of current being normally being supplied by the generating facility to the YWEA electric power system and may have to be set low enough to detect faults at the end of the line at the YWEA distribution substation.

3.15 Direct Transfer Trip (DTT) and Reclose Blocking

Transfer trip may be required on distribution-level interconnections depending on YWEA circuit configuration and loading, as determined by YWEA. Typically, transfer trip will be required if YWEA determines that a generation facility cannot detect and trip on YWEA end-of-line faults within an acceptable time frame, or if the generation facility may be capable of keeping an YWEA line energized with the YWEA source disconnected.

Direct transfer trip (DTT) refers to sending a trip signal from one location to another on the YWEA electric power system. For example, this is typically done where a distribution line recloser sends a trip signal to the generating facility’s main utility breaker to ensure that the generating facility does not energize an unintentional island. Various communication channels—including, but not limited to, dedicated cable, spread-spectrum radio, licensed radio, microwave, and fiber optic cable—can be used to provide the signal path.

3.16 Synchronous Generators

The generating unit must meet all applicable American National Standards Institute (ANSI) and Institute of Electrical and Electronic Engineers (IEEE) standards. The prime mover and the generator must also be able to operate within the nominal range of voltage and frequency excursions that may occur on the YWEA electric power system without damage to them. The generating unit must be able to operate through the specified frequency ranges for the time durations in this standard, to enhance system stability during a system disturbance.

3.16.1 Frequency/Speed Control

A governor shall be required on the prime mover to enhance system stability. Governor characteristics shall be set to provide a 5 percent droop characteristic. Governors on the prime mover must be operated unrestrained to help regulate YWEA electric power system frequency.

3.16.2 Excitation System

An excitation system is required to regulate generator output voltage. Excitation systems shall have a minimum ceiling voltage of 150 percent of rated full load field voltage and be classified as a "high initial response excitation system" as defined in IEEE 421.1. Static Systems shall meet these criteria with 70 percent of generator terminal voltage. The offline generator terminal voltage response shall have an overshoot limited to 20 percent and a bandwidth of at least 0.1 to 4 hertz. However, in no case shall the bandwidth upper limit be less than local mode frequency. All systems shall be suitable to utilize a Power System Stabilizer. Ceiling current shall have a transient time capability equal to or greater than the short time overload capability of the generator. See ANSI C50.12, 13, or 14. A means shall be provided to quickly remove excitation from the generator field to minimize contributions to faults. The preferred method is to reverse voltage the generator field to drive the current to zero. Excitation systems shall respond to system disturbances equally in both the buck and boost directions. All bridges that govern excitation response shall be full wave type. Bridges feeding a pilot exciter shall have negative forcing capability.

Under certain conditions YWEA may grant an exemption for generating facilities that have excitation systems not meeting these requirements. Requests for exemption must be sent to YWEA.

3.16.3 Power Factor Controller

The controller must be able to maintain a power factor setting within ±1 percent of the setting at full load at any set point within the capability of the generator. However, control limits shall be within the applicable range given in IEEE Std 1547. Power factor control is typically required for distribution level generator interconnections where the generator is put on a power factor schedule, rather than a voltage schedule. Generating facilities connected at the same YWEA service location with load will be required to regulate the power factor of the generator(s) in such a manner that the total service location power factor, as measured by the master meter, falls between 95% lagging and 95% leading.

3.17 Asynchronous (Induction) Generators

Conventional induction generators and other generators with no inherent VAR (reactive power) control capability shall provide an amount of reactive power to maintain power factor between 90 percent lagging and 95 percent leading to maintain the required voltage on the YWEA electric power system. They may also be required to follow an YWEA-specified voltage or VAR schedule on an hourly, daily or seasonal basis, depending on the location of the installation.

Note: Double-fed asynchronous machines, also known as double-fed induction generators (DFIGs), are a distinct class of asynchronous generators, employing wound rotor induction machines with static power converters to drive the rotor field currents. The physical rotational speed of the machine can be varied over a wide range, both faster and slower

than the synchronous speed. Unlike an ordinary induction machine, a double-fed asynchronous generator can supply or absorb reactive power, which allows power factor or net reactive flow to be easily and quickly controlled. In general, DFIG technology is widely used in wind generation.

3.17.1 Excitation

Conventional induction machines will not be allowed to be self-excited by nearby distribution capacitors, or as the result of capacitive voltage on the distribution network. Entities utilizing conventional induction machines shall provide their own excitation VARs such that the generating facility will not normally demand reactive power from, nor supply reactive power to, the YWEA electric power system. Power factor correction capacitors (switched or fixed), power electronics designed to supply a level of reactive capability, or a combination of devices used for excitation shall be provided and installed at the generating facility's expense. The generating facility shall not disable power factor equipment while induction machines are in operation.

3.17.2 Voltage Regulation

Speed matching may be by any means such that voltage regulation and voltage flicker are held within tolerance.

For conventional induction generators 100kW and larger a mechanical speed matching relay (Device 15) set to accept mechanical speed within ±5% of 60 hertz. The largest effect on the system of bringing an induction generator to synchronous speed is the voltage drop associated with the magnetizing inrush current.

3.17.3 Dynamic Voltage Support

Wind plants or other induction technologies shall also be able to provide sufficient dynamic voltage support and automatic voltage regulation at the generator excitation system if it is determined that voltage support is required for system safety and reliability. Studies, such as a System Impact Study and associated excitation equipment shall be at the generating facility's expense.

3.17.4 Crowbar

In some double-fed induction generators (DFIG), a "crowbar" circuit can be added to the rotor side of the frequency converter to provide overcurrent protection and overvoltage control to the rotor winding. The crowbar circuit limits the transient current in the stator and the rotor to less than 1 pu for close-in and multiple-phase faults. It consist of a protection circuit that rapidly short-circuits (or "crowbars") the supply line if the voltage or current exceeds defined limits.

3.18 DC Generators

Static power converters (inverters) convert DC electricity into AC electricity and offer additional electronic power conversion. They are sometimes referred to as power conditioning systems. Their fundamental role is to convert DC or non-synchronous AC electricity from a prime mover energy source into a synchronous AC system of voltages that can be smoothly and easily interconnected with the electric power system.

3.18.1 Inverters Capable of Stand-Alone Operation

Inverters capable of stand-alone operation are capable of islanding operation and shall have similar functional requirements as synchronous generators. For units less than 100 kW, usually it is acceptable to have the frequency and voltage functions built into the electronics of the inverter if the set points of these built-in protective functions are tamper-proof and can be easily and reliably tested. These relay functions must receive YWEA approval before they

can be used to interconnect with the YWEA electric power system. The total harmonic distortion in the output current of the inverters must meet ANSI/IEEE 519 requirements.

Inverter-type generators connected to the YWEA electric power system must be pre-approved by YWEA. For units over 10 kW, a dedicated transformer will be required to minimize the harmonics entering into the YWEA electric power system.

3.19 Emergency Generator Requirements

There are two methods of transferring electric power supply between the YWEA source and the emergency generator system: open transition (break before make) and closed transition (make before break).

3.19.1 Break Before Make

This method can be accomplished via a double throw transfer switch or an interlock scheme that prevents the two systems from operating in parallel. The generation facility's main breaker shall not be allowed to close until the generator breaker opens. This open transition method does not require any additional protection equipment; however, it does cause the generation facility's load to experience an outage while transferring back to YWEA. The length of this transfer depends on the transfer equipment.

The "break before make" transfer switch must be of a design, or have an interlock, that prevents the transfer switch from closing and connecting the customer's system with YWEA unless the emergency generator is already removed from the system.

3.19.2 Make Before Break

This method is used when the customer wants to minimize any loss of power or disturbance to the electric load. With this scheme, the customer's generator and the YWEA electric power system are in parallel for a very short time interval during which the customer's load is being transferred between the YWEA source and the emergency generator. Both the transfer from YWEA to the emergency source and the transfer back can be accomplished without an outage.

"Make before break" transfer switch requirements:

- The transfer switch must be rated for the maximum available fault duty in the event that the transfer switch closes into a fault condition.
- There must be an interlock that will trip the main breaker or generator in the event of a failure of the transfer switch so that the unit will not remain paralleled to the YWEA electric power system. One way to accomplish this function is with a "failure-to-open" timer.
- The controls for the transfer switch must prevent a parallel condition of the customer generator and the YWEA electric power system from existing for an extended time period. Any system that allows a parallel condition to exist for greater than 1 second (60 cycles) on the distribution system will be subject to the additional parallel operation requirements outlined in this standard.

Disconnect switch requirements:

- The customer shall provide a manual disconnect, located at the point of interconnection, which will establish a visually open safety clearance for YWEA personnel working on the YWEA electric power system.
- The disconnect must be lockable in either the open or closed positions and operated only by YWEA.
- The disconnect must be easily accessible, preferably located adjacent to the electric meter.
- The disconnect must have full load break capability.

The make before break transfer scheme must have adequate control and protection to ensure the YWEA and customer electric systems are in synchronism prior to making the parallel connection. Synchronization is accomplished through the use of an auto-synchronizer (Device 15/25) or a synchronizing relay supervised by a synch-check relay (Device 25).

Since the emergency generators are paralleled with the YWEA electric power system, protective devices must be installed that will prevent the customer's generator from remaining connected in the event of a fault on the YWEA electric power system during the transition.

In some installations, the protection requirement may be satisfied through the installation of the reverse power relay (Device 32R). This relay should be installed on the customer's side of the service transformer that is connected to the YWEA electric power system. The relay should trip the customer's main breaker and must be able to detect transformer core magnetizing power. In this manner, reverse power flow is detected before it actually enters the YWEA electric power system and other customers' equipment. This can be accomplished by setting the current level pick up equivalent to 60 percent of the transformer bank magnetizing current. Because this current value will be small, the current transformers associated with the relay must be capable of providing these small currents.

When transferring the customer's load back to the YWEA electric power system, it is possible to have incidental power flow back to YWEA's system. By properly setting the synchronizing and/or generator control, this reverse flow can be avoided. However, a short time delay may be required on the reverse power relay to prevent it from tripping the generator unnecessarily each time a transfer is attempted. At no time should this time delay exceed 1 second (60 cycles).

Again, since the emergency generator is briefly connected in parallel with the YWEA electric power system, all transfer schemes of this type must have a dedicated transformer to reduce the possibility that any transfer activities will affect other YWEA customers. A dedicated transformer is also necessary to allow the installation of the reverse power relay scheme. Also, YWEA's wholesale power provider and its balancing authority may require a standby service agreement and extensive metering capabilities for any generator which ever operates in parallel with YWEA's electric power system, including generators that only briefly make parallel before breaking parallel as discussed here.

4.0 Meters

YWEA and/or its wholesale power provider or its balancing authority will own, install, and maintain revenue meters and associated metering equipment to measure the generation output of the generating facility for all whole sale generation. The generating facility must supply a suitable location for the installation of the metering equipment at the generating facility's own expense. The cost of the meters and associated metering equipment, their installation, and their maintenance will be part of the interconnection cost of the generating facility.

The basic configuration will consist of bi-directional metering (in and out) at the interconnection point with the YWEA electric power system. In addition, the gross output of each generator will be metered. Depending upon the capacity of the generating facility, real-time communications equipment may also be required. If YWEA or its wholesale power provider or its balancing authority determine that real-time communications equipment is required, it will be provided by the requiring entity at the generating facility's cost.

Identical generator projects connected at different locations in the YWEA electric power system can have widely varying metering requirements and costs. All interconnections require a review and approval of the switchgear drawings showing overall electrical one-lines, physical construction and layout of the metering sections by the YWEA metering department.

5.0 Commissioning Test

5.1 Commissioning Testing

Commissioning testing will be performed on-site to verify protective settings and functionality. YWEA has the right to witness the commissioning test, and may also require written certification by the installer describing which tests where performed and their results. Commissioning testing shall include visual inspections of the interconnection equipment and protective settings to confirm compliance with the interconnection requirements. The cost of performing commissioning testing is the responsibility of the generating facility.

The generating facility shall provide YWEA with copies of test reports for the particular types of protective devices applied before the generating facility will be allowed to parallel. Where communication-dependent protection is utilized, the communication circuits must be tested and the scheme operation functionally verified prior to release for commercial operation.

5.2 Scheduled Testing

Every five years after commissioning, the generating facility must submit written test reports for qualified testing to YWEA demonstrating that the relays are operable and within calibration. YWEA will not test the generating facility's equipment, but reserves the right to witness the testing performed by a qualified testing firm retained by the generating facility. Circuit breakers shall be tested at least every five years after the initial commissioning tests. The generating facility shall obtain confirmation from service providers or by testing that all communication channels are functional at the same five-year interval as the relay testing.

5.3 Testing Qualifications

Individuals qualified in testing protective equipment (professional engineer, factory-certified technician, or licensed electrician with experience in testing protective equipment) must perform commissioning testing. All protective relay testing shall be done by a NETA certified testing firm.

6.0 References

1) Interconnection Standards for Qualifying Facilities, Tri-State Generation and Transmission, Inc. September, 1992.
2) IEEE Standard 1547-2018, "IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces"
3) IEEE Standard P1547.2, "Draft Application Guide for IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems", Draft 9, September, 2007.
4) Colorado Department of Regulatory Agencies, Public Utilities Commission, 4 Code of Colorado Regulations (CCR) 723-3, Part 3, "Rules Regulating Electric Utilities."
5) PG&E GENERATION INTERCONNECTION HANDBOOK, Section G2, Protection and Control Requirements for Generation Entities, August 6, 2007.
6) IEEE Standard 929-2000, "Recommended Practice for Utility Interface of Photovoltaic Systems."
7) UL 1741, "Inverters, Converters, Controllers, and Interconnection System Equipment for Use With Distributed Energy Resources,"

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ATTACHMENT 10:

Y-WEA GENERATION INTERCONNECTION STANDARD – GREATER THAN 10 MVA

Last Reviewed: September 19, 2017
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Interconnection Standard For
Generating Facilities Larger Than 10MVA

October 26, 2007
Rev. 1

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1.0 Introduction

This document provides a standard for interconnection of generating facilities within the Y-W Electric Association (YWEA) electric power system with aggregate capacity that is larger than 10 MVA. It provides requirements relevant to the performance, operation, testing, safety considerations, and maintenance of the interconnection.

This standard is established to assist the generating facility in understanding the requirements involved in planning and designing an electrical interconnection with the YWEA electric power system. This standard is a general guideline and may not cover all of the details of the installation. If deviations occur from this standard the changes must be approved by YWEA or their designated representative.

All costs associated with the interconnection shall be the responsibility of the generating facility including, but not limited to, technical review and analysis by YWEA or their designated representative.(Refer to 4 Code of Colorado Regulations (CCR) 723-3, Section 3900).

2.0 General Requirements for Interconnection

2.1 Codes and Standards

The generating facility and its associated equipment shall meet all applicable national, state and local construction and safety codes. The installation shall comply with the applicable sections of the National Electrical Safety Code (NESC) and the National Electrical Code (NEC). Grounding shall conform to IEEE Standard 142, "IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems". The interconnection shall conform to the Colorado Department of Regulatory Agencies Public Utilities Commission's 4 Code of Colorado Regulations (CCR) 723-3, Part 3, "Rules Regulating Electric Utilities."

2.2 Isolation Transformer

A dedicated isolation-transformer is required to step-up or step-down the generator voltage to the interconnection level and to isolate the generating facility from other YWEA customers. The impedance of the dedicated transformer limits fault currents on the generator bus from the YWEA electric power system and limits fault currents on the YWEA electric power system from the generator. Hence, it reduces the potential damage to both parties due to faults. The transformer must have a delta winding to reduce the generator harmonics entering the YWEA electric power system. The delta winding will also reduce the YWEA electric power system harmonics entering the generation facility. An interconnection level fault-interrupting device is required for transformer protection. Lightning arrestors must be installed between the transformer and the fault-interrupting devices and be encompassed by the generator's relay protection zone.

2.3 Fault-Interrupting Devices

The fault-interrupting device selected by the generating facility must be reviewed and approved by YWEA for each particular application. There are two basic types of fault-interrupting devices allowed: Circuit Breakers and Circuit Switchers. YWEA will determine the type of fault-interrupting device required for a generation facility based on the size and type of generation, the available fault duty, the local circuit configuration, and the existing YWEA protection equipment.

A three-phase circuit breaker at the point of interconnection shall automatically separate the generation facility from the YWEA electric power system upon detection of a circuit fault. Additional breakers and protective relays may be installed in the generation facility for ease in operating and protecting the facility, but they are not required for the

purpose of interconnection. The interconnection breaker shall have sufficient capacity to interrupt the maximum available fault current at its location and be equipped with accessories to:

- Trip the breaker with an external trip signal supplied through a battery (shunt trip).
- Telemeter the breaker status when required.
- Lockout if operated by protective relays required for interconnection

Generally, a three-phase circuit breaker is the required fault-interruption device at the point of interconnection, due to its simultaneous three-phase operation and ability to coordinate with YWEA line-side devices.

A circuit switcher is a three-phase fault-interrupter with limited fault interrupting capability. These devices have typically been used at voltages of 115 kV and below and may substitute for circuit breakers when the fault duty is within the interrupting rating of the circuit switcher. With YWEA approval, some circuit switchers with blades can function as the visual open disconnect switch between the metering transformers and the main transformer. Since circuit switchers do not have integral current transformers, they must be installed within 30 feet of the associated current transformers to minimize the length of the unprotected line/bus section.

2.4 Manual Disconnect Switch

A manual disconnect switch is required for a generation facility. An YWEA-operated disconnect device must be provided as a means of electrically isolating the YWEA electric power system from the generator. This device shall be used to establish visually open working clearance for maintenance and repair work in accordance with YWEA safety rules and practices. A separate disconnect device must be located at any and all points of interconnection with YWEA. The disconnect switch shall be a gang-operated, three-pole lockable switch.

The switch must be located between the interconnection level fault-interrupting device and the YWEA's electrical power system. The switch must be furnished and installed by the generation facility. All switch devices must be approved by YWEA. YWEA must inspect and approve the installation before parallel operation is permitted.

The disconnect device shall not be used to make or break parallel operation between the YWEA electric power system and the generator(s). The device enclosure (when present) and operating handle shall be kept locked at all times with an YWEA padlock.

The disconnect device shall be physically located for ease of access and visibility to YWEA personnel. The YWEA-operated disconnect shall be identified with an YWEA designated switch number plate.

In general, the following specifications apply:

- Disconnect switches shall be rated for the voltage and current requirements of the particular installation.
- Disconnect switches shall be gang-operated.
- Disconnect switches shall be weatherproof and designed to withstand exposure to weather and ice.
- Disconnect switches shall be lockable in both the open/closed positions with a standard YWEA lock.

2.5 Protective Equipment

Protective Equipment specified in this standard shall be installed at locations where the generating facility wishes to operate in parallel with the YWEA electric power system. The protection equipment for a generation facility must protect against faults within that facility and faults on the YWEA electric power system. A generation facility must also trip off-line (disconnect from the YWEA electric power system automatically) when power is disconnected from the line into which the unit is generating. YWEA requires line-protective equipment to either; 1) automatically clear a

fault and restore power, or 2) rapidly isolate only the faulted section so that a minimum number of customers are affected by any outages.

High-speed fault clearing may also be required, to minimize equipment damage and potential impact to system stability. The requirement for high-speed fault clearing will be determined by YWEA on a case-by-case basis. Additional relays and protective devices may be required to achieve high-speed clearing, as outlined in the following paragraphs. Some protection requirements may be standardized; however, most line relaying will depend on generator size and type, number of generators, line characteristics (i.e., voltage, impedance, and ampacity), and the existing protection equipment connected to the YWEA electric power system.

Identical generator projects connected at different locations in the YWEA electric power system may have widely varying protection requirements and costs. These differences can be due to different line configurations, fault duties and existing relay schemes.

YWEA protection requirements are designed and intended to protect the YWEA electric power system only. As a general rule, neither party should depend on the other for the protection of its own equipment.

The generating facility shall install at the Point of Interconnection, at a minimum, a disconnecting device or switch with generation interrupting capability. Additional protective relays are typically needed to protect the generating facility adequately. It is the generating facility's responsibility to protect its own system and equipment from faults or interruptions originating on both YWEA side and the generating facility's side of the Interconnection. The generating facility's system protection shall be designed, operated, and maintained to isolate any fault or abnormality that would adversely affect the YWEA electric power system or the systems of other entities connected to the YWEA electric power system. The generation facility shall, at its expense, install, operate, and maintain system protection facilities in accordance with applicable WAPA, Tri-State, WECC and NERC requirements and in accordance with design and application requirements of this Standard.

The protective relays used for isolating the generation facility from the YWEA electric power system at the Point of Interconnection must be reviewed and approved by YWEA and must be set to coordinate with the protective relays at the YWEA line breaker terminals for the line on which the generation facility is connected. Additional requirements, as to the exact type and style of the protective devices, may be imposed on the generating facility based on the proposed station configuration or the type of interrupting device closest to the point of common coupling on the YWEA system. Any required additional protective equipment required will be at the generating facility's cost.

YWEA recommends that the generating facility acquire the services of a qualified electrical engineer to review the electrical design of the proposed generation facility and ensure that it will be adequately protected.

Generally, fault-interrupting equipment should be located as close to the interconnection point as possible - typically within one span of overhead line or 200 feet of un-spliced underground cable.

Protective relays shall be utility grade and must be submitted to YWEA for approval. Industrial grade protective relays for interconnection are not acceptable. Utility grade relays, used by electric utilities, have much higher reliability and accuracy than industrial grade relays. All utility grade relays must include manually resettable relay targets, and have 5A nominal AC input current. All utility grade relay power supplies must be powered by station battery DC voltage, and the battery system shall include a DC undervoltage detection device and alarm.

2.6 Safety, Reliability Redundancy and Quality of Service

The generating facility must design, construct and operate its equipment in a manner that will not degrade the quality of electric service to other YWEA customers. YWEA reserves the right to specify the quality and determine the

adequacy of the generating facilities equipment, installation and operation in any respect that affects safety, reliability and quality of service.

The Generating facility shall design the protection system with sufficient redundancy that the failure of any one component will still permit the generating facility to be isolated from the YWEA electric power system under a fault condition. Multi-function three-phase protective relays must have redundant relay(s) for back-up. Recommended practice is to use two relays from different manufacturers in order to provide adequate redundancy and security and to avoid a single mode of failure for both levels of protection. Any customer interface protective devices that have potential impact on the YWEA electric power system will have to comply with this practice regardless of distribution or transmission line ownership (YWEA, WAPA or Tri-State). Protection of customer-owned equipment by two relays from the same vendor is acceptable as long as these relays utilize different operating principles. An example of relays requiring redundancy would be the intertie breaker and the main customer transformer protection.

2.7 Facility System Disturbances

The generating facility must disconnect in the event of a disturbance or malfunction of facility equipment to prevent loss of service to other YWEA customers. The protective equipment must be coordinated with YWEA protective equipment to ensure proper operation in the event of a fault. YWEA will work with the generating facility to provide proper protection equipment coordination.

2.8 Utility System Disturbances

The generating facility must promptly disconnect from the YWEA electric power system in the event of a utility system disturbance. YWEA protective relaying will act to promptly disconnect the affected line. The generating facility on this affected line represents an additional source of power to energize the line. Therefore the generating facility must provide a means to automatically disconnect its generator to avoid isolated operation and protect equipment and personnel. Direct transfer-tripping schemes will be implemented to prevent damage to the generator during a reclosing operation.

2.9 Back-feed to the Utility System

The generating facility must never back-feed to an isolated or de-energized portion of the YWEA electric power system and must provide protective means to ensure that the generator will not be connected to a de-energized system. This requirement is intended to prevent injury to YWEA personnel during maintenance of the disconnected line as well as protect YWEA customers on the disconnected line.

2.10 Power Quality

The generating facility must not degrade the quality of service to other YWEA customers such that the service falls outside of YWEA power quality standards. The generating facility is expected to operate within the following:

- Voltage limits per ANSI C84.1-1995, Standard for Electric Power Systems and Equipment – Voltage ratings (60 Hertz), Range A.
- Voltage flicker limits per IEEE STD 519-1992, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems, IEEE STD 141-1993, IEEE Recommended Practice for Electric Power Distribution for Industrial Plants, and IEEE STD 1453-2004, IEEE recommended Practice for Measurement and Limits of Voltage Flicker on AC Power Systems.
- Harmonic limits per IEEE STD 519-1992, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems.

The generating facility must not create objectionable flicker for other customers that are in violation of IEEE 519, 141 or 1453 on YWEA's electric power system.

Note: IEEE 519 provides recommended harmonic current limits at the interconnection point. The IEEE 519 limits are dependent on the ratio of the short circuit current at the interconnection point and the average current of the maximum demand at the interconnection point for the preceding 12 months. As this ratio becomes larger, the IEEE 519 harmonic current limits increase. However, a footnote in IEEE 519 recommends that the most restrictive limits should always apply to generators. IEEE 519 does not provide clear guidance for cases in which the electric power system contains both load and generation.

2.11 Interconnection Review

The generating facility shall provide YWEA with electrical drawings for review prior to equipment procurement. Drawings provided shall consist of single-line meter and relay diagrams, three-line diagrams (AC) showing connectivity of relays, and schematic drawings (DC) indicating tripping schemes for all YWEA required relays. The single-line meter and relay diagram listing major equipment shall be provided to YWEA prior to ordering relays. The three-line diagrams and DC schematics shall be provided before fabricating relay panels.

Relay settings for the interconnection shall be submitted to YWEA for review. YWEA will review the settings and may include changes or additions to the settings as warranted by the application. The generating facility is responsible for having all relay settings verified and functionally tested by a NETA certified testing agency. The generating facility shall bear all costs for such testing. The generating facility shall provide copies of the certified test reports to YWEA after commissioning.

3.0 Protection and Control Requirements for Interconnection

3.1 General requirements

The following represents the minimum requirements to provide a safe and reliable interconnection. YWEA may require additional equipment if the individual application warrants the use of such equipment.

- General Requirements:
  - A 3-pole disconnect device or a fused disconnect switch (only with YWEA written approval) that may be locked in the open position and provides visual indication of isolation.
  - A generator circuit breaker rated for the service to which it is applied.
  - A line voltage relay to prevent the generator from being connected to a de-energized source.
  - A dedicated delta-wye transformer when a three-phase inverter is installed.
  - Surge arrestors rated for the service to which it is applied.
- Demand Recording
  - Energy and Demand Metering to be supplied by YWEA at a cost to the facility)

3.2 Line Protection

Line-protection relays must coordinate with the protective relays at the YWEA recloser/breaker for the line on which the generating facility is connected. YWEA operates a 12.47/7.2kV grounded-wye distribution system. Typical YWEA protection is for a long radial line where current can flow in one direction only; typical protective relays for this type of line need to be coordinated in only one direction and may not be directional elements. However, there may be instances where current may flow in either direction depending on system conditions. Relays on these portions of the YWEA electric power system must be directional. Such modifications to existing relays will be at the generating facility's cost.

The generating facility relays must be connected to the breaker CTs in such a way that zones of protection overlap. The line protection schemes must be able to distinguish between generation, load, inrush and fault currents. YWEA's existing relay schemes may have to be reset, replaced, or augmented with additional relays at the generation facility's expense, to coordinate with the new generation facility. The minimum protection that YWEA typically uses on its own installation is: phase overcurrent, ground overcurrent, and reclosing.

Required relays must be located so that a fault on any phase of YWEA's interconnected line(s) shall be detected. If transfer trip protection is required by YWEA, the generation facility shall provide all required communication circuits at its expense. Communication circuits may be dedicated cable, microwave, radio, or a fiber optic circuit and shall be designed with sufficient levels of monitoring of critical communication channels and associated equipment. YWEA will determine the appropriate communication medium to be used on a case-by-case basis. The dedicated communication network may be required to have high-voltage protection equipment on the entrance cable so that the transfer trip equipment can operate properly during fault conditions.

Some portions of the YWEA electric power system have provisions for an alternate feed. In some of these locations, generation may not be allowed on line while being fed from an alternate source due to protection coordination issues. Whenever possible, the generation facility will be given the option of:

1. Paying for any required upgrades so as to stay on line while transferred to the alternate source, or
2. Accepting shutdowns when transferred to the alternate source and not incurring costs for upgrades to the existing system.

3.3 Generator Protection and Control

Single-phase generators must be connected in groups so that an equal amount of generation capacity is applied to each phase of a three-phase circuit. All synchronous, induction and single-phase generators shall comply with the latest ANSI Standards C50.10 and C50.13, dealing with waveform and telephone interference. Synchronous generators of any size will require: a) synchronizing relays (Device 15/25), synch check (Device 25), or auto synchronizer to supervise generator breaker closing, and b) reclose blocking at the YWEA side of the line to which the generator is connected (applies to substation breaker/recloser and line reclosers).

The following generator protection equipment is required to permit safe and reliable parallel operation of the generation facility's equipment with the YWEA electric power system. Additional generator protection requirements may be determined by YWEA on a case-by-case basis.

- Protective Relaying:
    - Short Circuit Protection (Devices 52, 50/51, 51V or 67)
        - Device 51V not required on induction machines.
    - Isolation Protection (Devices 27, 59, 81O, 81U)
    - Breaker Closing/Reclosing Control (Devices 25, 27, 46)
        - Device 25/27R not required on induction machines.
    - Ground Fault Protection (Devices 51N or 51G)
    - Direct Transfer Trip (Recloser Operation)

3.4 Circuit Breaker/Circuit Switcher (Device 52)

A three-phase, three-pole circuit breaker or circuit switcher is the required fault-interruption device at the point of interconnection, due to its simultaneous three-phase operation and ability to coordinate with YWEA line-side devices.

3.5 Phase Overcurrent (Device 50/51)

Provide tripping of the circuit breaker or circuit switcher in the event of a phase fault. Phase overcurrent relays must be coordinated with YWEA line-side devices. Overcurrent protection must be able to detect a line-end fault condition. A phase instantaneous overcurrent relay that can see a line fault under sub-transient conditions is required. A phase instantaneous overcurrent relay is not required if a 51V relay is used.

3.6 Phase Overcurrent Relay with Voltage Restraint/Voltage Control (Device 51V)

These relays are used to detect multi-phase faults and initiate a generator circuit breaker trip. The relays must be located on the individual generator feeder. A group of generators aggregating over 40 MW must have an overcurrent relay with voltage restraint located on each generator greater than 10 MW. Generators equal to or greater than 40MW must have an overcurrent relay with voltage restraint. An overcurrent relay with voltage control may also be acceptable if it can be set to adequately detect end-of-line faults as verified by YWEA protection studies.

- Phase Overcurrent with Voltage Restraint (51V) – suggested settings:
  - Pickup: 125-150% of generator FLA @ 100% Voltage Restraint.
  - Time: Above the knee of the generator decrement curve with constant excitation and coordinated with the slowest downstream feeder relay setting.
- Phase Overcurrent with Voltage Control (51V) – suggested settings:
  - Pickup: 80-90% of generator $I_d = 1/X_d$.
  - Time: Above the knee of the generator decrement curve with constant excitation and coordinated with the slowest downstream feeder relay setting.

Note: The 51V function is not useful for induction generators since, if the voltage is low enough to enable overcurrent protection, the generator excitation will not be sustained.

3.7 Over/Undervoltage Relay (Device 59/27)

This protection is used to trip the circuit breaker when the voltage is above or below YWEA's normal operating level. Relays will operate for generator protection and backup protection in the event that the generator is carrying load that has become isolated from the YWEA electric power system.

- Overvoltage (59) – required settings:
  - 110%< 59 < 120% of nominal @ 1 sec (60 cycles)
  - 59 > 120% of nominal @ 0.16 sec (9.6 cycles)
- Undervoltage (27) – required settings:
  - 27 < 50% of nominal @ 0.16 sec (9.6 cycles)
  - 50% < 27 < 80% of nominal @ 0.5 sec (30 cycles)

For generators 40 MW or less, the undervoltage requirement may be met by the contactor undervoltage release with YWEA approval.

3.8 Over/Under Frequency Relay (Device 81 O/U)

This protection is used to trip the circuit breaker when the frequency is above or below YWEA's normal operating level. It is used for generator/turbine protection and backup protection. Generator underfrequency relay settings are coordinated with other utilities in the Western Electricity Coordinating Council (WECC) to maintain generation on line during system disturbances. Relays shall not be set for a higher frequency or shorter time delay than specified without prior written approval by YWEA.

- Over Frequency (81O) – required settings:

  - 60.5 Hz @ 0.16 sec (9.6 cycles).
- Under Frequency (81U) – required settings:
  - 59.8 Hz @ 0.16 sec to 300s (9.6 to 1800 cycles) adjustable.
  - 57.0 Hz @ 0.16 sec (9.6 cycles)

3.9 Synchronizing (Device 15/25) and Synch-Check (Device 25)

The application of synchronizing devices attempts to assure that a synchronous generator will parallel with the utility electric system without causing a disturbance to other customers and facilities (present and in the future) connected to the same system. The protection also works to ensure that the generator itself will not be damaged due to an improper parallel action. Synchronous generators and other generators with stand-alone capability must use one of the following methods to synchronize with the YWEA electric power system:

- Automatic synchronization (Device 15/25) supervised by a synch-check relay (Device 25) to synchronize with the YWEA electric power system. The synch-check relay must have all of the following characteristics:
  - Slip frequency matching window of 0.1 Hz or less
  - Voltage matching window of ±10 percent or less
  - Phase angle acceptance window of ± 10 degrees or less
  - Breaker closure time compensation

- Manual synchronization with supervision from a synch-check relay (Device 25) to synchronize with the YWEA electric power system. The sync-check relay must have all of the following characteristics:
  - Slip frequency matching window of 0.1 Hz or less
  - Voltage matching window of ±10 percent or less
  - Phase angle acceptance window of ± 10 degrees or less
  - Breaker closure time compensation

- Manual synchronization with synchroscope and synch-check (Device 25) relay supervision (Only allowed for generators with less than 1000 kW aggregate nameplate rating). The synch-check relay must have the following characteristics:
  - Voltage matching window of ±10 percent or less.
  - Phase angle acceptance window of ± 10 degrees or less
  - Breaker closure time compensation

Note: Generators with greater than 1,000 kW aggregate nameplate rating must have a synchronizing relay or automatic synchronizer with synch-check supervision.

Note: A synch-check function is not needed on induction generators. Unlike synchronous generators, induction generators are not synchronized before paralleling to the electric utility system.

3.10 Undervoltage Check (Device 27R)

An undervoltage check function, used along with a synch check relay (25), is used to check for a dead bus and prevents the breaker from closing unless the bus is dead.

Note: This function may not be needed on an induction generator provided the generator will not self-excite when interconnection breaker is open.

3.11 Current Unbalance (Device 46)

Generation facilities with three-phase generators should be aware that certain conditions on the YWEA electric power system may cause negative sequence currents to flow in the generator. It is the sole responsibility of the generating facility to protect their equipment from excessive negative sequence currents.

These unbalanced currents may be caused by open conductors or phase reversals on the YWEA electric power system and can subject the generating facility's generators to a high level of negative sequence current. This high negative sequence current results in rapid rotor heating which can damage the generator. Many generator protective relays provide a 46 function to protect against these unbalanced currents.

3.12 Ground Fault Sensing Scheme (Device 51G)

The ground fault sensing scheme detects YWEA electric power system ground faults and trips the generator breaker or the generating facility's main circuit breaker, thus preventing the generation facility's generator from continuously contributing to a ground fault. This scheme must be able to detect faults between the YWEA system side of the dedicated transformer and the end of YWEA's line. The following transformer connections, along with appropriate relaying equipment, are commonly used to detect system ground faults:

- System side - grounded wye; generator side - delta
- System side - grounded wye; generator side - wye; tertiary - delta

In general, a ground overcurrent relay (Device 51G) is required to be installed in the step-up transformer neutral (primary voltage side).

- Ground overcurrent (51G):
    - Pickup: must be set above the YWEA electric power system unbalance.
    - Time: set above feeder relays and coordinated with the slowest downstream feeder relay ground setting.

For induction generators less than 100 kW, ground fault detection is not required. Ground fault detection is required for induction generators of 100kW or larger capacity. For synchronous generators aggregating over 40 kW, ground fault detection is required.

3.13 Phase Directional Overcurrent (Device 67)

AC directional overcurrent relay is a device that functions on a desired value of ac overcurrent flowing in a predetermined direction. In some applications a phase directional overcurrent relay (67) may be used for phase fault backfeed detection. The pickup setting must be set above the level of current being normally being supplied by the generating facility to the YWEA electric power system and may have to be set low enough to detect faults at the end of the line at the YWEA distribution substation.

3.14 Direct Transfer Trip (DTT) and Reclose Blocking

Transfer trip may be required on distribution-level interconnections depending on YWEA circuit configuration and loading, as determined by YWEA. Typically, transfer trip will be required if YWEA determines that a generation facility cannot detect and trip on YWEA end-of-line faults within an acceptable time frame, or if the generation facility may be capable of keeping an YWEA line energized with the YWEA source disconnected.

Direct transfer trip (DTT) refers to sending a trip signal from one location to another on the YWEA electric power system. For example, this is typically done where a distribution line recloser sends a trip signal to the generating facility's main utility breaker to ensure that the generating facility does not energize an unintentional island. Various

communication channels—including, but not limited to, dedicated cable, spread-spectrum radio, licensed radio, microwave, and fiber optic cable—can be used to provide the signal path.

3.15 Synchronous Generators

The generating unit must meet all applicable American National Standards Institute (ANSI) and Institute of Electrical and Electronic Engineers (IEEE) standards. The prime mover and the generator must also be able to operate within the nominal range of voltage and frequency excursions that may occur on the YWEA electric power system without damage to them. The generating unit must be able to operate through the specified frequency ranges for the time durations in this standard, to enhance system stability during a system disturbance.

3.15.1 Frequency/Speed Control

A governor shall be required on the prime mover to enhance system stability. Governor characteristics shall be set to provide a 5 percent droop characteristic. Governors on the prime mover must be operated unrestrained to help regulate YWEA electric power system frequency.

3.15.2 Excitation System

An excitation system is required to regulate generator output voltage. Excitation systems shall have a minimum ceiling voltage of 150 percent of rated full load field voltage and be classified as a “high initial response excitation system” as defined in IEEE 421.1. Static Systems shall meet these criteria with 70 percent of generator terminal voltage. The offline generator terminal voltage response shall have an overshoot limited to 20 percent and a bandwidth of at least 0.1 to 4 hertz. However, in no case shall the bandwidth upper limit be less than local mode frequency. All systems shall be suitable to utilize a Power System Stabilizer. Ceiling current shall have a transient time capability equal to or greater than the short time overload capability of the generator. See ANSI C50.12, 13, or 14. A means shall be provided to quickly remove excitation from the generator field to minimize contributions to faults. The preferred method is to reverse voltage the generator field to drive the current to zero. Excitation systems shall respond to system disturbances equally in both the buck and boost directions. All bridges that govern excitation response shall be full wave type. Bridges feeding a pilot exciter shall have negative forcing capability.

Under certain conditions YWEA may grant an exemption for generating facilities that have excitation systems not meeting these requirements. Requests for exemption must be sent to YWEA.

3.15.3 Automatic Voltage Regulator/Power System Stabilizer

Western Electricity Coordination Council (WECC) requires voltage control with a power system stabilizer (PSS) on all synchronous generators interconnected at transmission level voltages of 60 kV and greater. YWEA can assist in determining the suitability of or need for an AVR and PSS, at the generation facilities expense.

3.15.4 Power Factor Controller

The controller must be able to maintain a power factor setting within ±1 percent of the setting at full load at any set point within the capability of the generator. However, control limits shall be between 90 percent lagging and 95 percent leading. Power factor control is typically required for distribution level generator interconnections where the generator is put on a power factor schedule, rather than a voltage schedule.

3.16 Asynchronous (Induction) Generators

Conventional induction generators and other generators with no inherent VAR (reactive power) control capability shall provide an amount of reactive power to maintain power factor between 90 percent lagging and 95 percent leading to maintain the required voltage on the YWEA electric power system. They may also be required to follow an YWEA-specified voltage or VAR schedule on an hourly, daily or seasonal basis, depending on the location of the installation.

Note: Double-fed asynchronous machines, also known as double-fed induction generators (DFIGs), are a distinct class of asynchronous generators, employing wound rotor induction machines with static power converters to drive the rotor field currents. The physical rotational speed of the machine can be varied over a wide range, both faster and slower than the synchronous speed. Unlike an ordinary induction machine, a double-fed asynchronous generator can supply or absorb reactive power, which allows power factor or net reactive flow to be easily and quickly controlled. In general, DFIG technology is widely used in wind generation.

3.16.1 Excitation

Conventional induction machines will not be allowed to be self-excited by nearby distribution capacitors, or as the result of capacitive voltage on the distribution network. Entities utilizing conventional induction machines shall provide their own excitation VARs such that the generating facility will not normally demand reactive power from, nor supply reactive power to, the YWEA electric power system. Power factor correction capacitors (switched or fixed), power electronics designed to supply a level of reactive capability, or a combination of devices used for excitation shall be provided and installed at the generating facility's expense. The generating facility shall not disable power factor equipment while induction machines are in operation.

3.16.2 Voltage Regulation

Speed matching may be by any means such that voltage regulation and voltage flicker are held within tolerance.

For conventional induction generators 100kW and larger a mechanical speed matching relay (Device 15) set to accept mechanical speed within ±5% of 60 hertz. The largest effect on the system of bringing an induction generator to synchronous speed is the voltage drop associated with the magnetizing inrush current.

3.16.3 Dynamic Voltage Support

Wind plants or other induction technologies shall also be able to provide sufficient dynamic voltage support in lieu of a power system stabilizer (PSS) and automatic voltage regulation at the generator excitation system if it is determined that voltage support is required for system safety and reliability. Studies, such as a System Impact Study and associated excitation equipment shall be at the generating facility's expense.

3.16.4 Crowbar

In some double-fed induction generators (DFIG), a "crowbar" circuit can be added to the rotor side of the frequency converter to provide overcurrent protection and overvoltage control to the rotor winding. The crowbar circuit limits the transient current in the stator and the rotor to less than 1 pu for close-in and multiple-phase faults. It consist of a protection circuit that rapidly short-circuits (or "crowbars") the supply line if the voltage or current exceeds defined limits.

4.0 Meters

YWEA will own, install, and maintain revenue meters and associated metering equipment to measure the generation output of the generating facility. The generating facility must supply a suitable location for the installation of the

metering equipment at the generating facility's own expense. The cost of the meters and associated metering equipment, their installation, and their maintenance will be part of the interconnection cost of the generating facility.

The basic configuration will consist of bi-directional metering (in and out) at the interconnection point with the YWEA electric power system. In addition, the gross output of the generator(s) may also be metered for certain rates as determined by YWEA.

Identical generator projects connected at different locations in the YWEA electric power system can have widely varying metering requirements and costs. All interconnections require a review and approval of the switchgear drawings showing overall electrical one-lines, physical construction and layout of the metering sections by the YWEA metering department.

5.0 Testing

5.1 Commissioning Testing

Commissioning testing shall be performed on-site to verify protective relay settings and functionality. YWEA reserves the right to witness commissioning testing, and may also require written certification by the certified testing company describing which tests were performed and their results. Commissioning testing shall include visual inspections of the interconnection equipment and protective settings to confirm compliance with the interconnection requirements. The generating facility is responsible for all commissioning testing costs.

The generating facility shall provide YWEA with copies of test reports for the particular types of protective devices applied before the generating facility will be allowed to parallel. Where communication-dependent protection is utilized, the communication circuits must be tested and the scheme operation functionally verified prior to release for commercial operation.

5.2 Scheduled Testing

Every five years after commissioning, the generating facility must submit written test reports for qualified testing to YWEA demonstrating that the relays are operable and within calibration. YWEA will not test the generating facility's equipment, but reserves the right to witness the testing performed by a qualified testing firm retained by the generating facility. Circuit breakers shall be tested at least every five years after the initial commissioning tests. The generating facility shall obtain confirmation from service providers or by testing that all communication channels are functional at the same five-year interval as the relay testing.

5.3 Testing Qualifications

Individuals qualified in testing protective equipment (professional engineer, factory-certified technician, or licensed electrician with experience in testing protective equipment) must perform commissioning testing. All protective relay testing shall be done by a NETA certified testing firm.

6.0 References

1) Interconnection Standards for Qualifying Facilities, Tri-State Generation and Transmission, Inc. September, 1992.
2) IEEE Standard P1547.2, "Draft Application Guide for IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems", Draft 9, September, 2007.
3) Colorado Department of Regulatory Agencies, Public Utilities Commission, 4 Code of Colorado Regulations (CCR) 723-3, Part 3, "Rules Regulating Electric Utilities."
4) PG&E GENERATION INTERCONNECTION HANDBOOK, Section G2, Protection and Control Requirements for Generation Entities, August 6, 2007.

5) Western Electricity Coordination Standard (WECC), STD VAR-STD-002a-1, Automatic Voltage Regulators, Version 1, November 27, 2006.
6) Western Electricity Coordination Standard (WECC), STD VAR-STD-002b-1, Power System Stabilizer, Version 1, November 27, 2006.
7) Western Electricity Coordination Standard (WECC), Policy Statement on Power System Stabilizers, January 11, 2002.

End-of-Standard

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ATTACHMENT 11:

RELEVANT CODES AND STANDARDS

Last Reviewed: September 19, 2017
Last Updated: September 19, 2017

Relevant Codes and Standards

The various codes and standards apply to different sizes of generation systems as follows:

Title	Applies to:					
	Up to 10 kW Inverter-based, Net-Metered, Inverter Fast-Track Process*	Up to 25 kW, Net-Metered, Fast-Track Process*	Non-Net Metered, Up to 25 kW, Fast-Track Process*	Non-Net Metered, Up to 2 MW, Fast-Track Process*	2 MW – 10 MW, Standard Process*	Over 10 MVA, Standard Process*
Y-WEA Generation Interconnection Standard – Up to 25 kW Connected at Secondary Voltages (Attachment 8)	●	●	●			
Y-WEA Generation Interconnection Standard – Up to 10,000 kW Connected at Any Voltage (Attachment 9)				●	●	
Y-WEA Generation Interconnection Standard – Greater than 10 MVA (Attachment 10)						●

* See individual standards for more specific listings of safety codes required for each class of interconnection

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ATTACHMENT 12:

PUC RULE 3667

Last Reviewed: September 19, 2017
Last Updated: September 19, 2017

PUC Rule 3667

An excerpt from PUC Rule 723-3, Rules Regulating Electric Utilities is attached next in this Interconnection Resources Book. These rules regulate the interconnection of small generators to distribution systems. As of August 29, 2017, these rules are the most current rules in effect.

(III) CSG subscriber funds, collected by the CSG in advance of commercial operation of the CSG, shall be held in escrow. The escrow shall be maintained by its terms until such time as the CSG commences commercial operation as certified by QRU acceptance of energy from the CSG.

3666. Rural Renewable Projects.

(a) QRUs may take advantage of REC multiplier for rural renewable projects described in paragraph 3654(h) subject to the following restrictions.

(I) Interconnection must be completed and commercial operation achieved by December 31, 2014.

(II) For investor owned QRUs, rural renewable projects for which this REC multiplier is claimed may not be counted toward the distributed generation requirements in rule 3655.

(III) Any entity that owns or develops a rural renewable project that will take advantage of the aforementioned compliance multiplier, must notify the Commission on a Commission-provided form within 30 days after signing a power purchase agreement with a QRU and also within 30 days after beginning commercial operations. Such forms will minimally require the MW of nameplate electric capacity from installed rural renewable projects or the capacity that is subject to power purchase agreements, as applicable.

(IV) For QRUs that are not investor owned QRUs, the compliance multiplier may be applied only to the aggregate first 100 MW of nameplate capacity projects statewide that report having achieved commercial operation to the Commission.

(V) The Commission will maintain a publicly available listing of projects that have submitted notifications in accordance with subparagraph 3666(a)(III) and shall provide notice to the first 100 MW of projects that are providing energy and RECs to non-investor owned QRUs that they may take advantage of the compliance multiplier.

3667. Small Generation Interconnection Procedures.

The following small generator interconnection procedures (SGIP) shall apply to all small generation resources including eligible renewable energy resources connected to the utility. Each utility shall also provide, on its web site, interconnection standards not included in these procedures. This rule largely tracks FERC Order 2006.

(a) Definitions. The following definitions apply only to rule 3665.

(I) “Business day” means Monday through Friday, excluding Federal Holidays.

(II) “Distribution system” means the utility's facilities and equipment used to transmit electricity to ultimate usage points such as homes and industries directly from nearby generators or from interchanges with higher voltage transmission networks which transport bulk power over longer distances. The voltage levels at which distribution systems operate differ among areas.

(III) “Distribution upgrades” means the additions, modifications, and upgrades to the utility's distribution system at or beyond the point of interconnection to facilitate interconnection of the small generating facility and render the service necessary to effect the interconnection customer's operation of on-site generation. Distribution upgrades do not include interconnection facilities.

(IV) “Highly seasonal circuit” means a circuit with a ratio of annual peak load to off-season peak load greater than six.

(V) “Interconnection customer” or “IC” means any entity, including the utility, any affiliates or subsidiaries of either, that proposes to interconnect its small generating facility with the utility's system.

(VI) “Interconnection facilities” means the utility's interconnection facilities and the interconnection customer's interconnection facilities. Collectively, interconnection facilities include all facilities and equipment between the small generating facility and the point of interconnection, including any modification, additions or upgrades that are necessary to physically and electrically interconnect the small generating facility to the utility's system. Interconnection facilities are sole use facilities and shall not include distribution upgrades.

(VII) “Interconnection request” means the interconnection customer's request, in accordance with any applicable utility tariff, to interconnect a new small generating facility, or to increase the capacity of, or make a material modification to the operating characteristics of, an existing small generating facility that is interconnected with the utility’s system.

(VIII) “Minimum daytime loading” means the lowest daily peak in the year on the line section.

(IX) “Party” or “Parties” means the utility, interconnection customer, or any combination of the above.

(X) “Point of interconnection” means the point where the Interconnection facilities connect with the utility's system.

(XI) “Small generating facility” means the interconnection customer's device for the production of electricity identified in the interconnection request, but shall not include the interconnection facilities not owned by the interconnection customer.

(XII) “Study process” means the procedure for evaluating an interconnection request that includes the Level 3 scoping meeting, feasibility study, system impact study, and facilities study.

(XIII) “System” means the facilities owned, controlled, or operated by the utility that are used to provide electric service under the tariff.

(XIV) “Upgrades” means the required additions and modifications to the utility's system at or beyond the point of interconnection. Upgrades do not include interconnection facilities.

(b) General overview.

(I) Applicability.

(A) A request to interconnect a certified small generating facility no larger than two MW shall be evaluated under the Level 2 Process. A request to interconnect a certified inverter-based small generating facility no larger than ten kW shall be evaluated under the Level 1 Process. A request to interconnect a small generating facility larger than two MW but no larger than ten MW or a small generating facility that does not pass the Level 1 or Level 2 Process, shall be evaluated under the Level 3 Process.

(B) Defined terms used herein shall have the meanings specified in the paragraph (a) of this rule.

(C) Prior to submitting its interconnection request, the interconnection customer may ask the utility interconnection contact employee or office whether the proposed interconnection is subject to these procedures. The utility shall respond within 15 business days.

(D) Infrastructure security of electric system equipment and operations and control hardware and software is essential to ensure day-to-day reliability and operational security. The Commission expects all utilities, market participants, and Interconnection Customers interconnected with electric systems to comply with the recommendations offered by the President's Critical Infrastructure Protection Board and best practice recommendations from the electric reliability authority. All public utilities are expected to meet basic standards for electric system infrastructure and operational security, including physical, operational, and cyber-security practices.

(E) References in these procedures to interconnection agreement are to the Small Generator Interconnection Agreement (SGIA).

(II) Pre-application. The utility shall designate an employee or office from which information on the application process and on an affected system can be obtained through informal requests from the interconnection customer presenting a proposed project for a specific site. The name, telephone number, and e-mail address of such contact employee or office shall be made available on the utility's Internet web site. Electric system information for specific locations, feeders, or small areas shall be provided to the interconnection customer upon request and may include relevant system studies, interconnection studies, and other materials useful to an understanding of an interconnection at a particular point on the utility's system, to the extent such provision does not violate confidentiality provisions of prior agreements or critical infrastructure requirements. The utility shall comply with reasonable requests for such information unless such information is proprietary or confidential and cannot be provided pursuant to a confidentiality agreement.

(III) Interconnection request. The interconnection customer shall submit its interconnection request to the utility, together with the processing fee or deposit specified in the interconnection request. The interconnection request shall be date- and time-stamped upon receipt. The original date- and time-stamp applied to the interconnection request at the time of its original submission shall be accepted as the qualifying date- and time-stamp for the purposes of any timetable in these procedures. The interconnection customer shall be notified of receipt by the utility within three business days of receiving the interconnection request which notification may be to an e-mail address or fax number provided by IC. The utility shall notify the interconnection customer within ten business days of the receipt of the interconnection request as to whether the interconnection request is complete or incomplete. If the interconnection request is incomplete, the utility shall provide, along with the notice that the interconnection request is incomplete, a written list detailing all information that must be provided to complete the interconnection request. The interconnection customer will have ten business days after receipt of the notice to submit the listed information or to request an extension of time to provide such information. If the IC does not provide the listed information or a request for an extension of time within the deadline, the interconnection request will be deemed withdrawn. An interconnection request will be deemed complete upon submission of the listed information to the utility.

(IV) Modification of the interconnection request. Any modification to machine data or equipment configuration or to the interconnection site of the small generating facility not agreed to in writing by the utility and the IC may be deemed a withdrawal of the interconnection request and may require submission of a new interconnection request, unless proper notification of each party by the other and a reasonable time to cure the problems created by the changes are undertaken.

(V) Site control. Documentation of site control must be submitted with the interconnection request. Site control may be demonstrated through:

(A) ownership of, a leasehold interest in, or a right to develop a site for the purpose of constructing the small generating facility;

(B) an option to purchase or acquire a leasehold site for such purpose; or

(C) an exclusivity or other business relationship between the IC and the entity having the right to sell, lease, or grant the IC the right to possess or occupy a site for such purpose.

(VI) Queue position. The utility shall place interconnection requests in a first come, first served order per feeder and per substation based upon the date- and time-stamp of the interconnection request. The order of each interconnection request will be used to determine the cost responsibility for the upgrades necessary to accommodate the interconnection. At the utility's option, interconnection requests may be studied serially or in clusters for the purpose of the system impact study.

(VII) Assignment/Transfer of ownership of the facility. Interconnection agreements shall survive transfer of ownership of the generating facility to a new owner when the new owner agrees in writing to comply with the terms of the agreement and so notifies the utility.

(c) Level 2 - fast track process.

(I) Applicability. The fast track process is available to an IC proposing to interconnect its small generating facility with the utility's system if the small generating facility is no larger than two MW and if the IC's proposed small generating facility meets the codes, standards, and certification requirements of Attachments 3 and 4 of these procedures.

(II) Initial review. Within 15 business days after the utility notifies the interconnection customer it has received a complete interconnection request, the utility shall perform an initial review using the screens set forth below, shall notify the interconnection customer of the results, and include with the notification copies of the analysis and data underlying the utility's determinations under the screens.

(A) Screens.

(i) The proposed small generating facility's point of interconnection must be on a portion of the utility's distribution system that is subject to the tariff.

(ii) For interconnection of a proposed small generating facility to a radial distribution circuit, the aggregated generation, including the proposed small generating facility, on the line section shall not exceed 15 percent of the line section's annual peak load as most recently measured at the substation or calculated for the line section. For highly seasonal circuits only, the aggregate generation, including the proposed small generation facility, on the line section shall not exceed 15 percent of two times the minimum daytime loading. A line section is that portion of a utility's electric system connected to a customer bounded by automatic sectionalizing devices or the end of the distribution line. A fuse is not an automatic sectionalizing device.

(iii) The proposed small generating facility, in aggregation with other generation on the distribution circuit, shall not contribute more than ten percent to the distribution circuit's maximum fault current at the point on the distribution feeder voltage (primary) level nearest the proposed point of change of ownership.

(iv) The proposed small generating facility, in aggregate with other generation on the distribution circuit, shall not cause any distribution protective devices and equipment (including, but not limited to, substation breakers, fuse cutouts, and line reclosers), or Interconnection Customer equipment on the system to exceed 87.5 percent of the short circuit interrupting capability; nor shall the interconnection be proposed for a circuit that already exceeds 87.5 percent of the short circuit interrupting capability.

(v) The proposed small generating facility shall have a starting voltage dip less than five percent and meet the flicker requirements of IEEE 519, 1992 version. To meet this screen, the proposed generating facility must conform to the following two tests:

(1) For starting voltage dip, the utility has two options for determining whether starting voltage dip is acceptable. The option to be used is at the utility's discretion.

(a) Option 1: The utility may determine that the proposed generating facility's starting in-rush current is equal to or less than the continuous ampere rating of the Interconnection Customer's service equipment.

(b) Option 2: The utility may determine the impedances of the service distribution transformer (if present) and the secondary conductors to the Interconnection Customer's service equipment and perform a voltage dip calculation. Alternatively, the utility may use tables or nomographs to determine the voltage dip. Voltage dips caused by starting the proposed generation facility must be less than five percent when measured at the primary side (high side) of a dedicated distribution transformer serving the proposed generating facility, for primary interconnections. The five percent voltage dip limit applies to the distribution transformer low side if the low side is shared with other customers and to the high side if the transformer is dedicated to the Interconnection Customer.

(2) The second test is conformance with the relationship between voltage fluctuation and starting frequency presented in the table for flicker requirements in IEEE 519, 1992 version.

(vi) Using the table below, determine the type of interconnection to a primary distribution line. This screen includes a review of the type of electrical service provided to the IC, including line configuration and the transformer connection to limit the potential for creating over-voltages on the utility's electric power system due to a loss of ground during the operating time of any anti-islanding function.

Primary Distribution Line Type	**Type of Interconnection to Primary Distribution Line**	**Result/Criteria**
Three-phase, three wire	3-phase or single phase, phase-to-phase	Pass screen
Three-phase, four wire	Effectively-grounded 3 phase or Single-phase, line-to-neutral	Pass screen

(vii) If the proposed small generating facility is to be interconnected on single-phase shared secondary, the aggregate generation capacity on the shared secondary, including the proposed small generating facility, shall not exceed 20 kW.

(viii) If the proposed small generating facility is single-phase and is to be interconnected on a center tap neutral of a 240 volt service, its addition shall not create an imbalance between the two sides of the 240 volt service of more than 20 percent of the nameplate rating of the service transformer.

(ix) No construction of facilities by the utility on its own system shall be required to accommodate the small generating facility.

(x) Interconnections to distribution networks.

(1) For interconnection of a proposed small generating facility to the load side of spot network protectors serving more than a single customer, the proposed small generating facility must utilize an inverter-based equipment package and, together with the aggregated other inverter-based generation, shall not exceed the smaller of five percent of a spot network's maximum load or 300 kW. For spot networks serving a single customer, the small generator facility must use inverter-based equipment package and either meet the requirements above or shall use a protection scheme or operate the generator so as not to exceed on-site load or otherwise prevent nuisance operation of the spot network protectors.

(2) For interconnection of a proposed small generating facility to the load side of area network protectors, the proposed small generating facility must utilize an inverter-based equipment package and, together with the aggregated other inverter-based generation, shall not exceed the smaller of ten percent of an area network's minimum load or 500 kW.

(3) Notwithstanding sub-sections (1) or (2) above, each utility may incorporate into its interconnection standards, any change in interconnection guidelines related to networks pursuant to standards developed under IEEE 1547 for interconnections to networks. To the extent the new IEEE standards conflict with these existing guidelines, the new standards shall apply. In addition, and with the consent of the utility, a small generator facility may be interconnected to a spot or area network provided the facility uses a protection scheme that will prevent any power export from the customer's site including inadvertent export under fault conditions or otherwise prevent nuisance operation of the network protectors.

(B) If the proposed interconnection passes the screens, the interconnection request shall be approved and the utility will provide the IC an executable interconnection agreement within five business days after the determination.

(C) If the proposed interconnection fails the screens, but the utility determines that the small generating facility may nevertheless be interconnected consistent with safety, reliability, and power quality standards, the utility shall provide the IC an executable interconnection agreement within five business days after the determination.

(D) If the proposed interconnection fails the screens, but the utility does not or cannot determine from the initial review that the small generating facility may nevertheless be interconnected consistent with safety, reliability, and power quality standards unless the IC is willing to consider minor modifications or further study, the utility shall provide the IC with the opportunity to attend a customer options meeting.

(E) Customer options meeting. If the utility determines the interconnection request cannot be approved without minor modifications at minimal cost; or a supplemental study or other additional studies or actions; or at significant cost to address safety, reliability, or power quality problems, within the five business day period after the determination, the utility shall notify the IC and provide the data and analyses underlying its conclusion. Within ten business days of the utility's determination, the utility shall offer to convene a customer options meeting with the utility to review possible IC facility modifications or the screen analysis and related results, to determine what further steps are needed to permit the small generating facility to be connected safely and reliably. At the time of notification of the utility's determination, or at the customer options meeting, the utility shall:

(i) offer to perform facility modifications or minor modifications to the utility's electric system (e.g., changing meters, fuses, relay settings) and provide a non-binding good faith estimate of the limited cost to make such modifications to the utility's electric system;

(ii) offer to perform a supplemental review if the utility concludes that the supplemental review might determine that the small generating facility could continue to qualify for interconnection pursuant to the fast track process, and provide a non-binding good faith estimate of the costs and time of such review; or

(iii) obtain the interconnection customer's agreement to continue evaluating the interconnection request under the Level 3 Study Process.

(III) Supplemental Review. If the interconnection customer agrees to a supplemental review, the interconnection customer shall agree in writing within 15 business days of the offer, and submit a deposit for the estimated costs provided in subsection (c)(III)(A)(ii) of this rule. The IC shall be responsible for the utility's actual costs for conducting the supplemental review. The IC must pay any review costs that exceed the deposit within 20 business days of receipt of the invoice or resolution of any dispute. If the deposit exceeds the invoiced costs, the utility will return such excess within 20 business days of the invoice without interest.

(A) Within ten business days following receipt of the deposit for a supplemental review, the utility will determine if the Small Generating Facility can be interconnected safely and reliably.

(i) If so, the utility shall forward an executable interconnection agreement to the IC within five business days.

(ii) If so, and IC facility modifications are required to allow the small generating facility to be interconnected consistent with safety, reliability, and power quality standards under these procedures, the utility shall forward an executable interconnection agreement to the IC within five business days after confirmation that the interconnection customer has agreed to make the necessary changes at the interconnection customer's cost.

(iii) If so, and minor modifications to the utility's electric system are required to allow the small generating facility to be interconnected consistent with safety, reliability, and power quality standards under the Level 2 Fast Track Process, the utility shall forward an executable interconnection agreement to the IC within ten business days that requires the IC to pay the costs of such system modifications prior to interconnection.

(iv) If not, the interconnection request will continue to be evaluated under the Level 3 Study Process.

(d) Level 3 - Study Process.

(I) Applicability. The study process shall be used by an interconnection customer proposing to interconnect its small generating facility with the utility's system if the small generating facility is larger than two MW but no larger than ten MW; is not certified; or, is certified but did not pass the Fast Track Process or the ten kW Inverter Process.

(II) Scoping meeting.

(A) A scoping meeting will be held within ten business days after the interconnection request is deemed complete, or as otherwise mutually agreed to by the parties. The utility and the interconnection 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.

(B) The purpose of the scoping meeting is to discuss the interconnection request. The parties shall further discuss whether the utility should perform a feasibility study or proceed directly to a system impact study, or a facilities study, or an interconnection agreement. If the parties agree that a feasibility study should be performed, the utility shall provide the IC, as soon as possible, but not later than five business days after the scoping meeting, a feasibility study agreement including an outline of the scope of the study and a non-binding good faith estimate of the cost to perform the study.

(C) The scoping meeting may be omitted by mutual agreement. In order to remain in consideration for interconnection, an IC who has requested a feasibility study must return the executed feasibility study agreement within 15 business days. If the parties agree not to perform a feasibility study, the utility shall provide the IC, no later than five business days after the scoping meeting, a system impact study agreement including an outline of the scope of the study and a non-binding good faith estimate of the cost to perform the study.

(D) Feasibility studies, scoping studies, and facility studies may be combined for simpler projects by mutual agreement of the utility and the parties.

(III) Feasibility study.

(A) The feasibility study shall identify any potential adverse system impacts that would result from the interconnection of the small generating facility.

(B) A deposit of the lesser of 50 percent of the good faith estimated feasibility study costs or earnest money of $1,000 may be required from the interconnection customer.

(C) The scope of and cost responsibilities for the feasibility study are described in the attached feasibility study agreement.

(D) If the feasibility study shows no potential for adverse system impacts, the utility shall send the Interconnection Customer a facilities study agreement, including an outline of the scope of the study and a non-binding good faith estimate of the cost to perform the study.

(E) If the feasibility study shows the potential for adverse system impacts, the review process shall proceed to the appropriate system impact study(s).

(IV) System impact study.

(A) A system impact study shall identify and detail the electric system impacts that would result if the proposed small generating facility were interconnected without project modifications or electric system modifications, focusing on the adverse system impacts identified in the feasibility study, or to study potential impacts, including but not limited to those identified in the scoping meeting. A system impact study shall evaluate the impact of the proposed interconnection on the reliability of the electric system.

(B) If no transmission system impact study is required, but potential electric power distribution system adverse system impacts are identified in the scoping meeting or shown in the feasibility study, a distribution system impact study must be performed. The utility shall send the IC a distribution system impact study agreement within 15 business days of transmittal of the feasibility study report, including an outline of the scope of the study and a non-binding good faith estimate of the cost to perform the study, or following the scoping meeting if no feasibility study is to be performed.

(C) In instances where the feasibility study or the distribution system impact study shows potential for transmission system adverse system impacts, within five business days following transmittal of the feasibility study report, the utility shall send the IC a transmission system impact study agreement, including an outline of the scope of the study and a non-binding good faith estimate of the cost to perform the study, if such a study is required.

(D) If a transmission system impact study is not required, but electric power distribution system adverse system impacts are shown by the feasibility study to be possible and no distribution system impact study has been conducted, the utility shall send the IC a distribution system impact study agreement.

(E) If the feasibility study shows no potential for transmission system or distribution system adverse system impacts, the utility shall send the IC either a facilities study agreement, including an outline of the scope of the study and a non-binding good faith estimate of the cost to perform the study, or an executable interconnection agreement, as applicable.

(F) In order to remain under consideration for interconnection, the IC must return executed system impact study agreements, if applicable, within 30 business days.

(G) A deposit of the good faith estimated costs for each system impact study may be required from the IC.

(H) The scope of and cost responsibilities for a system impact study are described in the system impact study agreement.

(I) Where transmission systems and distribution systems have separate owners, such as is the case with transmission-dependent utilities (TDUs) – whether investor-owned or not – the IC may apply to the nearest utility (Transmission Owner, Regional Transmission Operator, or Independent utility) providing transmission service to the TDU to request project coordination. Affected systems shall participate in the study and provide all information necessary to prepare the study.

(V) Facilities study.

(A) Once the required system impact study(s) is completed, a system impact study report shall be prepared and transmitted to the IC along with a facilities study agreement within five business days, including an outline of the scope of the study and a non-binding good faith estimate of the cost to perform the facilities study. In the case where one or both impact studies are determined to be unnecessary, a notice of the fact shall be transmitted to the IC within the same timeframe.

(B) In order to remain under consideration for interconnection, or, as appropriate, in the utility's interconnection queue, the IC must return the executed facilities study agreement or a request for an extension of time within 30 business days.

(C) The facilities study shall specify and estimate the cost of the equipment, engineering, procurement, and construction work (including overheads) needed to implement the conclusions of the system impact study(s).

(D) Design for any required interconnection facilities and/or upgrades shall be performed under the facilities study agreement. The utility may contract with consultants to perform activities required under the facilities study agreement. The IC and the utility may agree to allow the IC to separately arrange for the design of some of the interconnection facilities. In such cases, facilities design will be reviewed and/or modified prior to acceptance by the utility, under the provisions of the facilities study agreement. If the parties agree to separately

arrange for design and construction, and provided security and confidentiality requirements can be met, the utility shall make sufficient information available to the IC in accordance with confidentiality and critical infrastructure requirements to permit the IC to obtain an independent design and cost estimate for any necessary facilities.

(E) A deposit of the good faith estimated costs for the facilities study may be required from the IC.

(F) The scope of and cost responsibilities for the facilities study are described in a facilities study agreement.

(G) Upon completion of the facilities study, and with the agreement of the IC to pay for interconnection facilities and upgrades identified in the facilities study, the utility shall provide the IC an executable interconnection agreement within five business days.

(e) Provisions that apply to all interconnection requests.

(I) Reasonable efforts. The utility shall make reasonable efforts to meet all time frames provided in these procedures unless the utility and the IC agree to a different schedule. If the utility cannot meet a deadline provided herein, it shall notify the IC explain the reason for the failure to meet the deadline, and provide an estimated time by which it will complete the applicable interconnection procedure in the process.

(II) Disputes.

(A) The parties agree to attempt to resolve all disputes arising out of the interconnection process according to the provisions of this article.

(B) In the event of a dispute, either party shall provide the other party with a written notice of dispute. Such notice shall describe in detail the nature of the dispute. If the dispute has not been resolved within five business days after receipt of the notice, either party may contact a mutually agreed upon third party dispute resolution service for assistance in resolving the dispute.

(C) The dispute resolution service will assist the parties in either resolving their dispute or in selecting an appropriate dispute resolution venue (e.g., mediation, settlement judge, early neutral evaluation, or technical expert) to assist the parties in resolving their dispute.

(D) Each party agrees to conduct all negotiations in good faith and will be responsible for one-half of any costs paid to neutral third-parties.

(E) If neither party elects to seek assistance from the dispute resolution service, or if the attempted dispute resolution fails, then either party may exercise whatever rights and remedies it may have in equity or law consistent with the terms of the agreements between the parties or it may seek resolution at the Commission.

(III) Interconnection metering. Except as otherwise required by rule 3664, any metering necessitated by the use of the small generating facility shall be installed at the IC's expense in accordance with Commission requirements or the utility's specifications.

(IV) Commissioning tests. Commissioning tests of the IC's installed equipment shall be performed pursuant to applicable codes and standards, including IEEE1547.1 2005 "IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems". The utility must be given at least five business days written notice, or as otherwise mutually agreed to by the parties, of the tests and may be present to witness the commissioning tests. The utility shall be compensated by the IC for its expense in witnessing level 2 and Level 3 commissioning tests. The utility shall provide to the IC an operational approval letter within three business days after notification that the commissioning test has been successfully completed. Such letter may be provided via e-mail.

(V) Confidentiality.

(A) Confidential information shall mean any confidential and/or proprietary information provided by one party to the other party that is clearly marked or otherwise designated "Confidential." All design, operating specifications, and metering data provided by the IC shall be deemed confidential information regardless of whether it is clearly marked or otherwise designated as such.

(B) Confidential information does not include information previously in the public domain, required to be publicly submitted or divulged by governmental authorities (after notice to the other party and after exhausting any opportunity to oppose such publication or release), or necessary to be divulged in an action to enforce an agreement between the parties. Each party receiving confidential information shall hold such information in confidence and shall not disclose it to any third party nor to the public without the prior written authorization from the party providing that information, except to fulfill obligations under agreements between the parties, or to fulfill legal or regulatory requirements.

(i) Each party shall employ at least the same standard of care to protect confidential information obtained from the other party as it employs to protect its own confidential information.

(ii) Each party is entitled to equitable relief, by injunction or otherwise, to enforce its rights under this provision to prevent the release of confidential information without bond or proof of damages, and may seek other remedies available at law or in equity for breach of this provision.

(C) Notwithstanding anything in this article to the contrary, if the Commission, during the course of an investigation or otherwise, requests information from one of the parties that is otherwise required to be maintained in confidence, the party shall provide the requested information to the Commission, within the time provided for in the request for information. In providing the information to the Commission, the party may request that the information be treated as confidential and non-public by the Commission and that the information be withheld from

public disclosure. Parties are prohibited from notifying the other party prior to the release of the confidential information to the Commission. The party shall notify the other party when it is notified by the Commission that a request to release confidential information has been received by the Commission, at which time either of the parties may respond before such information would be made public.

(VI) Comparability. The utility shall receive, process, and analyze all interconnection requests in a timely manner as set forth in this document. The utility shall use the same reasonable efforts in processing and analyzing interconnection requests from all interconnection customers, whether the small generating facility is owned or operated by the utility, its subsidiaries or affiliates, or others.

(VII) Record retention. The utility shall maintain for three years records, subject to audit, of all interconnection requests received under these procedures, the times required to complete Interconnection Request approvals and disapprovals, and justification for the actions taken on the interconnection requests.

(VIII) Interconnection agreement. After receiving an interconnection agreement from the utility, the IC shall have 30 business days or another mutually agreeable time-frame to sign and return the interconnection agreement, or request that the utility file an unexecuted interconnection agreement with the Commission. If the IC does not sign the interconnection agreement, or ask that it be filed unexecuted by the utility within 30 business days, the interconnection request shall be deemed withdrawn. After the interconnection agreement is signed by the parties, the interconnection of the small generating facility shall proceed under the provisions of the interconnection agreement.

(IX) Coordination with affected systems. The utility shall coordinate the conduct of any studies required to determine the impact of the interconnection request on affected systems with affected system operators and, if possible, include those results (if available) in its applicable interconnection study within the time frame specified in these procedures. The utility will include such affected system operators in all meetings held with the IC as required by these procedures. The IC will cooperate with the utility in all matters related to the conduct of studies and the determination of modifications to affected systems. A utility which may be an affected system shall cooperate with the utility with which interconnection has been requested in all matters related to the conduct of studies and the determination of modifications to affected systems.

(X) Capacity of the small generating facility.

(A) If the interconnection request is for an increase in capacity for an existing small generating facility, the interconnection request shall be evaluated on the basis of the new total capacity of the small generating facility.

(B) If the interconnection request is for a small generating facility that includes multiple energy production devices at a site for which the interconnection customer seeks a single point of interconnection, the interconnection request shall be evaluated on the basis of the aggregate capacity of the multiple devices.

(C) The interconnection request shall be evaluated using the maximum rated capacity of the small generating facility.

(XI) Insurance.

(A) For systems of ten kW or less, the customer, at its own expense, shall secure and maintain in effect during the term of the agreement liability insurance with a combined single limit for bodily injury and property damage of not less than $300,000 for each occurrence. For systems above ten kW and up to 500 kW, customer, at its own expense, shall secure and maintain in effect during the term of the agreement liability insurance with a combined single limit for bodily injury and property damage of not less than $1,000,000 for each occurrence. For systems above 500 kW and up to two MW, customer, at its own expense, shall secure and maintain in effect during the term of the agreement liability insurance with a combined single limit for bodily injury and property damage of not less than $2,000,000 for each occurrence. Insurance coverage for systems greater than two MW shall be determined on a case-by-case basis by the utility and shall reflect the size of the installation and the potential for system damage.

(B) For systems over 500 kW, the utility shall be named as an additional insured by endorsement to the insurance policy and the policy shall provide that written notice be given to the utility at least 30 days prior to any cancellation or reduction of any coverage. Such liability insurance shall provide, by endorsement to the policy, that the utility shall not by reason of its inclusion as an additional insured incur liability to the insurance carrier for the payment of premium of such insurance. For all solar systems, the liability insurance shall not exclude coverage for any incident related to the subject generator or its operation.

(C) Certificates of Insurance evidencing the requisite coverage and provision(s) shall be furnished to utility prior to the date of interconnection of the generation system. Utilities shall be permitted to periodically obtain proof of current insurance coverage form the generating customer in order to verify proper liability insurance coverage. Customer will not be allowed to commence or continue interconnected operations unless evidence is provided that satisfactory insurance coverage is in effect at all times.

(f) Level 1 ten kW inverter process. The procedure for evaluating an interconnection request for a certified inverter-based small generating facility no larger than ten kW. The application process uses an all-in-one document that includes a simplified Interconnection Request, simplified procedures, and a brief set of terms and conditions.

(I) The interconnection customer (customer) completes the interconnection request (Application) and submits it to the utility.

(II) The utility acknowledges to the customer receipt of the application within three business days of receipt.

(III) The utility evaluates the application for completeness and notifies the customer within ten business days of receipt that the application is or is not complete and, if not, advises what material is missing.

(IV) Within 15 days the utility shall conduct an initial review, which shall include the following screening criteria.

(A) For interconnection of a proposed small generating facility to a radial distribution circuit, the aggregated generation, including the proposed small generating facility, on the line section shall not exceed 15 percent of the line section annual peak load as most recently measured at the substation or calculated for the line section. For highly seasonal circuits only, the aggregate generation, including the proposed small generation facility, on the line section shall not exceed 15 percent of two times the minimum daytime loading. A line section is that portion of a utility's electric system connected to a customer bounded by automatic sectionalizing devices or the end of the distribution line. A fuse is not an automatic sectionalizing device.

(B) If the proposed small generating facility is to be interconnected on single-phase shared secondary, the aggregate generation capacity on the shared secondary, including the proposed small generating facility, shall not exceed 20 kW.

(C) If the proposed small generating facility is single-phase and is to be interconnected on a center tap neutral of a 240 volt service, its addition shall not create an imbalance between the two sides of the 240 volt service of more than 20 percent of the nameplate rating of the service transformer.

(D) No construction of facilities by the utility on its own system shall be required to accommodate the small generating facility.

(E) Provided all the criteria in paragraph (g) of this rule are met, unless the utility determines and demonstrates that the small generating facility cannot be interconnected safely and reliably, the utility approves and executes the application and returns it to the customer.

(F) After installation, the customer returns the certificate of completion to the utility. Prior to parallel operation, the utility may inspect the small generating facility for compliance with standards, which may include a witness test, and may schedule appropriate metering replacement, if necessary.

(G) The utility notifies the customer in writing or by fax or e-mail that interconnection of the small generating facility is authorized within five business days. If the witness test is not satisfactory, the utility has the right to disconnect the small generating facility. The customer has no right to operate in parallel until a witness test has been performed, or previously waived on the application. The utility is obligated to complete this witness test within ten business days of the receipt of the certificate of completion.

(H) Contact information. The customer must provide the contact information for the legal applicant (i.e., the interconnection customer). If another entity is responsible for interfacing with the utility, that contact information must be provided on the application.

(g) Level 1 10 kW Inverter Process. The following constitutes an application for interconnecting a certified inverter-based small generating facility no larger than ten KW. Application for Interconnecting a Certified Inverter-Based Small Generating Facility No Larger than 10kW

This Application is considered complete when it provides all applicable and correct information required below. Additional information to evaluate the application may be required.

Processing fee:

A fee of _____ must accompany this application.

Interconnection customer

Name:

Contact Person:

Address:

City: State: Zip:

Telephone (Day): (Evening):

Fax: E-Mail Address:

Engineering firm (If applicable):

Contact Person:

Address:

City: State: Zip:

Telephone:

Fax: E-Mail Address:

Contact (if different from Interconnection customer):

Name:

Address:

City: State: Zip:

Telephone (Day): (Evening):

Fax: E-Mail Address:

Owner of the facility (include percent ownership by any electric utility):

Small generating facility information:

Location (if different from above):

Electric service company:

Account number:

Small generator ten kW inverter process:

Inverter manufacturer: _____Model

Nameplate rating: (kW) (kVA) (AC Volts)

Single phase _____ Three phase_____

System design capacity: _____ (kW) _____ (kVA)

Prime mover: Photovoltaic Reciprocating Engine Fuel Cell Turbine Other

Energy source: Solar Wind Hydro Diesel Natural Gas Fuel Oil Other (describe)

Is the equipment UL1741 Listed? Yes ____ No ____

If Yes, attach manufacturer's cut-sheet showing UL1741 listing.

Estimated installation date: _____ Estimated in-service date: _____

The ten kW inverter process is available only for inverter-based small generating facilities no larger than ten kW that meet the codes, standards, and certification requirements of paragraphs (h) and (i) of this rule, or the QRU has reviewed the design or tested the proposed small generating facility and is satisfied that it is safe to operate.

List components of the small generating facility equipment package that are currently certified:

Equipment type certifying entity:

1.

2.

3.

4.

5.

Interconnection customer signature: _____

I hereby certify that, to the best of my knowledge, the information provided in this Application is true. I agree to abide by the Terms and Conditions for Interconnecting an Inverter-Based Small Generating Facility No Larger than 10kW and return the Certificate of Completion when the Small Generating Facility has been installed.

Signed: _____

Title: Date:

Contingent approval to interconnect the small generating facility.

(For company use only)

Interconnection of the small generating facility is approved contingent upon the terms and conditions for interconnecting an inverter-based small generating facility no larger than ten kW and return of the certificate of completion.

Company signature: _____

Title: Date:

Application ID number: _____

Company waives inspection/witness test? Yes ____ No ____

(h) Certification codes and standards.

ANSI C84.1-2011 Electric Power Systems and Equipment – Voltage Ratings (60 Hertz)

ANSI/NEMA MG 1--2011, Motors and Generators

IEEE Std C37.90.1-2002, IEEE Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems

IEEE Std C37.90.2-2004, IEEE Standard Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers

IEEE Std C37.108-2002, IEEE Guide for the Protection of Network Transformers

IEEE Std C57.12.44-2005, IEEE Standard Requirements for Secondary Network Protectors

IEEE Std C62.41.2-2002/Cor 1-2012, IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000V and Less) AC Power Circuits Corrigendum 1: Deletion of Table A.2 and Associated Text

IEEE Std C62.45-2002, IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000V and Less) AC Power Circuits

IEEE Std 100-2000, The Authoritative Dictionary of IEEE Standards Terms, Seventh Edition

IEEE Std 519-2014, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems

IEEE Std 929-2000 IEEE Recommended Practice for Utility Interface of Photovoltaic (PV) Systems

IEEE Std 1547-2003, IEEE Standard for Interconnecting Distributed Resources with Electric Power Systems

IEEE Std 547.1-2005, IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems

NFPA 70 (2014), National Electrical Code

UL 1741 Inverters, Converters, and Controllers for Use in Independent Power Systems

(i) Certification of small generator equipment packages.

(I) Small generating facility equipment proposed for use separately or packaged with other equipment in an interconnection system shall be considered certified for interconnected operation if it has been tested in accordance with industry standards for continuous utility interactive operation in compliance with the appropriate codes and standards referenced below by any Nationally Recognized Testing Laboratory (NRTL) recognized by the United States Occupational Safety and Health Administration to test and certify interconnection equipment pursuant to the relevant codes and standards listed in paragraph (h); it has been labeled and is publicly listed by such NRTL at the time of the interconnection application; and, 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.

(II) The interconnection 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.

(III) Certified equipment shall not require further type-test review, testing, or additional equipment to meet the requirements of this interconnection procedure; however, nothing herein shall preclude the need for an on-site commissioning test by the parties to the interconnection nor follow-up production testing by the NRTL.

(IV) If the certified equipment package includes only interface components (switchgear, inverters, or other interface devices), then an Interconnection Customer must show that the generator or other electric source being utilized with the equipment package is compatible with the equipment package and is consistent with the testing and listing specified for this type of interconnection equipment.

(V) Provided the generator or electric source, when combined with the equipment package, is within the range of capabilities for which it was tested by the NRTL, and does not violate the interface components' labeling and listing performed by the NRTL, no further design review, testing or additional equipment on the customer side of the point of common coupling shall be required to meet the requirements of this interconnection procedure.

(VI) An equipment package does not include equipment provided by the utility.

(j) Terms and conditions for Level 1 interconnections -- small generating facility no larger than ten kW.

(I) Construction of the facility. The interconnection customer may proceed to construct the small generating facility when the utility approves the interconnection request (the application) and returns it to the IC.

(II) Interconnection and operation. The IC may operate small generating facility and interconnect with the utility's electric system once all of the following have occurred:

(A) upon completing construction, the interconnection customer will cause the small generating facility to be inspected or otherwise certified by the appropriate local electrical wiring inspector with jurisdiction;

(B) the customer returns the certificate of completion to the utility; and

(C) the utility has completed its inspection of the small generating facility. All inspections must be conducted by the utility, at its own expense, within ten business days after receipt of the certificate of completion and shall take place at a time agreeable to the parties. The utility shall provide a written statement that the small generating facility has passed inspection or shall notify the customer of what steps it must take to pass inspection as soon as practicable after the inspection takes place.

(D) The utility has the right to disconnect the small generating facility in the event of improper installation or failure to return the certificate of completion.

(III) Safe operations and maintenance. The interconnection customer shall be fully responsible to operate, maintain, and repair the small generating facility as required to ensure that it complies at all times with the interconnection standards to which it has been certified.

(IV) Access. The utility shall have access to the disconnect switch and metering equipment of the small generating facility at all times. The utility shall provide reasonable notice to the customer when possible prior to using its right of access.

(V) Disconnection. The utility may temporarily disconnect the small generating facility upon the following conditions:

(A) for scheduled outages per notice requirements in the utility's tariff or Commission rules;

(B) for unscheduled outages or emergency conditions pursuant to the utility's tariff or Commission rules; or

(C) if the small generating facility does not operate in the manner consistent with these terms and conditions.

(D) The utility shall inform the interconnection customer in advance of any scheduled disconnection, or as is reasonable after an unscheduled disconnection.

(VI) Indemnification. The parties shall at all times indemnify, defend, and save the other party harmless from, any and all damages, losses, claims, including claims and actions relating to injury to or death of any person or damage to property, demand, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the other party's action or inactions of its obligations under this agreement on behalf of the indemnifying party, except in cases of gross negligence or intentional wrongdoing by the indemnified party.

(VII) Insurance. The interconnection customer, at its own expense, shall secure and maintain in effect during the term of this agreement, liability insurance with a combined single limit for bodily injury and property damage of not less than $300,000 each occurrence. Such liability insurance shall not exclude coverage for any incident related to the subject generator or its operation. The utility shall be named as an additional insured under the liability policy unless the system is a solar system installed on a premise using the residential tariff and has a design capacity of ten kW or less. The policy shall include that written notice be given to the utility at least 30 days prior to any cancellation or reduction of any coverage. A copy of the liability insurance certificate must be received by the utility prior to plant operation. Certificates of insurance evidencing the requisite coverage and provision(s) shall be furnished to utility prior to date of interconnection of the generation system. Utilities shall be permitted to periodically obtain proof of current insurance coverage from the generating customer in order to verify proper liability insurance coverage. The interconnection customer will not be allowed to commence or continue interconnected operations unless evidence is provided that satisfactory insurance coverage is in effect at all times.

(VIII) Limitation of liability. Each party's liability to the other party for any loss, cost, claim, injury, liability, or expense, including reasonable attorney's fees, relating to or arising from any act or omission in its performance of this agreement, shall be limited to the amount of direct damage actually incurred. In no event shall either party be liable to the other party for any indirect, incidental, special, consequential, or punitive damages of any kind whatsoever, except as allowed under subparagraph (i)(VI) of this rule.

(IX) Termination. The agreement to operate in parallel may be terminated under the following conditions.

(A) By the customer by providing written notice to the utility.

(B) By the utility if the small generating facility fails to operate for any consecutive 12 month period or the customer fails to remedy a violation of these terms and conditions.

(C) Permanent disconnection. In the event this agreement is terminated, the utility shall have the right to disconnect its facilities or direct the customer to disconnect its small generating facility.

(D) Survival rights. This agreement shall continue in effect after termination to the extent necessary to allow or require either party to fulfill rights or obligations that arose under the agreement.

(X) Assignment/Transfer of ownership of the facility. This agreement shall survive the transfer of ownership of the small generating facility to a new owner when the new owner agrees in writing to comply with the terms of this agreement and so notifies the utility.

3668. Environmental Impacts.

(a) Eligible energy resources must meet all applicable federal, state, and local environmental permitting requirements.

(b) For eligible energy resources larger than two MW that are not net-metered or any wind turbine structures extending over 50 feet in height, the QRU shall require project developers to include in the bid package written documentation that consultation occurred with appropriate governmental agencies (for example, the Colorado Division of Wildlife or the U.S. Fish and Wildlife Service) responsible for reviewing potential project development impacts to state and federally listed wildlife species, as well as species, habitats, and ecosystems of concern.

(c) For eligible energy resources larger than two MW that are not net-metered or any wind turbine structures extending over 50 feet in height, the QRU renewable energy supply contract shall require project developers to certify the following as a condition precedent to achieving commercial operation:

(I) the developer has performed site specific wildlife surveys (referred to herein as the Environmental Surveys) which are conducted on the facility's site prior to construction;

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ATTACHMENT 13:

Y-WEA RULES AND REGULATIONS FOR NET METERING AND MEDIUM DISTRIBUTED GENERATION METERING

Last Reviewed: August 19, 2017
Last Updated: February 2, 2009

I. Rules and Regulations
Rules, Regulations or Extension Policy

L. NET METERING:

(1) Availability
Available to Customer-Generators (C-G) that install an eligible energy resource consisting of qualifying recycled or renewable electric energy generation resources and interconnects subject to the Association's tariffs to the Association's electric distribution system. The C-G system's renewable resource may be: solar, wind, geothermal biomass, or hydropower, and much be limited to not more than 10 kilowatts or capacity for residential and 25 kilowatts of capacity for commercial or industrial. The C-G's recycled energy system may be any generation unit that converts the otherwise lost energy from the heat from exhaust stacks or pipes to electricity and that does not combust additional fossil fuel and must be limited to not more than 10 kilowatts of capacity for residential and 25 kilowatts of capacity for commercial or industrial accounts. The C-G system must conform to the Association's standards and tariffs for interconnectivity, safety, quality of service, liability, and indemnification.

(2) Applicability
Applicable to all consumers that locate an eligible energy resource on the consumer's property, owned, operated, leased, or otherwise controlled by the C-G. The C-G system must be determined to be capable of being operated safely and reliably in parallel with the Association's electrical distribution system. The C-G system shall offset part or all of the C-G's electric load requirements for electric energy at the same location. The system shall not be used to offset or provide credits for electric consumption at another meter of the C-G or for any other consumer.

(3) Description of Service
The type of service may be single-phase or three-phase 60 hertz at standard secondary voltages. The measurement of the difference between the electricity supplied to the C-G or through the Association at the Association's standard rate for the classification of service, and the electricity that is generated by the C-G and delivered to the Association at the same point of interconnection, shall be metered net of the energy supplied by the Association to the C-G for the same billing period. All costs over and above standard metering costs associated with the net metering system and any modifications required by the Association for purposes of interconnectivity, safety, and reliability shall be prepaid to the Association by the C-G.

(4) Monthly Rate
All electric power and energy delivered by the Association to the C-G shall be received and paid for at the Association's current applicable rate schedule for the Appropriate customer class. The Association shall determine the C-G's Energy consumption under the rate through the use of net metering.

Do Not Write In This Space

I. Rules and Regulations
Rules, Regulations or Extension Policy

Net metering shall be, for billing purposes, the net consumption as measured at the Association's service meter but shall not be less than zero. Any such negative amount shall be carried forward and applied against the subsequent month's billing. At the beginning of the month of April every year, any remaining unused credit balance accumulated during the previous year shall be paid to the C-G.

Within sixty (60) days of each annual period, the Association shall account for any accrued excess energy generation, expressed in kilowatt-hours, for the immediately preceding annual period (April through March) and pay the C-G for such energy at the wholesale energy rate as set by the Association's power supplier for the month in which the excess occurred.

(5) Contract Provisions

The C-G shall agree to the provisions of service stipulated by the Association in a written agreement, and the term of the contract shall be not less than one (1) year. Such contract shall, at a minimum, require the C-G to meet all safety and performance standards established by the most current edition of the *National Electric Code, The Institute of Electrical and Electronic Engineers, Underwriters Laboratories, Inc., the National Electric Safety Code,* and any other regulations or standards determined by the Association to be applicable.

The Association shall not be liable directly or indirectly for permitting or continuing to permit an attachment of a C-G's generation system or net metering system, or for acts or omissions of the C-G or any third party. The C-G shall indemnify and hold harmless the Association for any and all damage to persons or property and any and all damages or losses incurred by third parties, or the successors or assigns of such third parties that result from the installation or operation of the C-G's electric generation system or the net metering system.

The C-G shall, at its own expense, install a lockable isolation device capable of isolating the net-metering system from the Association's distribution system. All such equipment shall be approved by the Association and shall be accessible by the Association at all times.

Do Not Write In This Space

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ATTACHMENT 14:

Y-WEA TARIFF FOR DISTRIBUTION AND TRANSMISSION WHEELING SERVICE

Last Reviewed: September 19, 2017
Last Updated: September 19, 2017

Wheeling Tariff

At the current time, Y-WEA will determine wheeling rates for individual interconnections on a case-by-case basis.

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ATTACHMENT 15:

PRE-APPLICATION INTERCONNECTION DATA FORM

Last Reviewed: June 18, 2019
Last Updated: June 18, 2019

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PRE-APPLICATION INTERCONNECTION DATA FORM

When required, this application must be completed and returned to Y-W Electric Association's Engineer as per the requirements in *Attachment 2 – Applicability of Requirements and Generator Interconnection Procedure* in order to begin processing the request. Please refer to the Generator Interconnection Procedure for additional information.

This form is required for any proposed residential installation greater than 10 kW or for any commercial installation greater than 25 kW or for any installation not requesting net metering. This form is optional for any installation below these limits.

If a processing fee of $100 accompanies this form, the applicable system data shown at the end of the form will be completed for the proposed interconnection location and returned to the applicant in order to assist them in evaluating and/or designing their generation system. If this fee is paid with the pre-application interconnection data form, the application deposit required for an Interconnection Application will be reduced by $100. No Y-WEA system information will be provided to any party for any location until this form is completed and submitted. For requests where this form is required, Part 4 must be completed *in its entirety* for Y-WEA system data to be provided to the applicant.

PART 1 - INTERCONNECTION CUSTOMER DATA

If this is a Net Metering or self-generation installation, this section must contain the information for Y-WEA's Member. If this is an interconnection for the purposes of selling the generated energy to another party, this section must contain the information for the primary or principal owner of the generating facility.

Interconnection Customer Name:	Best Phone Number:		
Mailing Address:	City:	State:	ZIP Code:
Email Address:	Contact Person (if the customer is a company):		

By signing and submitting this Pre-Interconnection Data Form for a net metering installation, or for another self-generation arrangement where a generating facility is proposed to serve some or all of a load normally served by Y-W Electric Association, Inc. (the "Cooperative") distribution facilities, the Cooperative member listed above indicates that they have knowledge of this proposed installation and that they approve of the engineer's or installer's, as applicable, request for preliminary system data in support of the proposed interconnection. Whether signing and submitting this form for a net metering or self-generation installation, or for an energy-exporting proposed interconnection installation, the customer authorizes the Cooperative to share this data with and communicate with the Engineering Firm and/or the Installer listed below regarding this project. The customer further acknowledges that the data provided is subject to change without notice. These values are valid with the existing facilities to the point noted by the Cooperative's engineer below and under the normal operating conditions for both Cooperative's and its power supplier's system as of the date on this letter. The Cooperative will not inform the customer or any of the customer's representatives of any transformer or system changes, either temporary or permanent, that may affect the provided fault current or distributed energy resource interconnection capacity data. By providing the information in this form, the Cooperative does not assume responsibility for any damage to any of customer's, or customer's agents', successors' and assigns', property, and as consideration for Cooperative providing this information, **customer hereby releases Cooperative from any and all claims that may be legally released arising out of or relating to the furnishing of information in this Form.** Finally, the Cooperative member, by signing here, is authorizing the Cooperative's employees and/or agents to enter the member's property at the Cooperative's convenience for the purpose of accessing the Cooperative's equipment in order to acquire all necessary system information required to provide any data requested in Part 5 of this document and, in signing this document, the member certifies that they have the authority to permit the Cooperative's employees' and/or agents' access.

Y-WEA Member's/Interconnection Customer's Signature:	**Date:**

PART 2 – ENGINEERING FIRM DATA

This section must be filled out if an Engineering Firm is being retained for this project and will need to receive communication on behalf of the Interconnection Customer relating to this proposed project. The primary contact listed below may also designate additional personnel from the same firm to participate in communications regarding this project.

Engineering Firm Name:		Best Phone Number:	
Mailing Address:	City:	State:	ZIP Code:
Email Address:	Primary Contact Person:		

PART 3 – INSTALLER DATA

This section must be filled out if an Installer is being retained for this project and will need to receive communication on behalf of the Interconnection Customer relating to this proposed project. The primary contact listed below may also designate additional personnel from the same company to participate in communications regarding this project.

Engineering Firm Name:		Best Phone Number:	
Mailing Address:	City:	State:	ZIP Code:
Email Address:	Primary Contact Person:		

PART 4 – GENERATOR PROJECT INFORMATION

List all owners of the generating facility, if different from Part 1, including percent ownership by each owner:

Account or Service Location Number (if known) for the generator:	If Account or Service Location Number is not known, provide a detailed description of the location for fault current analysis. This request cannot be acted upon without adequate information to determine the exact service location.
Detailed Description of Generator Location:	

_____

_____

Is this a net metering installation? Check One: □ Yes □ No

Please note that net metering only applies to residential generators up to 10 kW or commercial generators up to 25 kW. Larger generators are not eligible for net metering.

Proposed Generator Size: _____kW	AC Volts: _____	*Check One:* □ Single Phase □ Three Phase

Generator Type *(check one)*: □ Solar □ Wind □ Hydropower □ Diesel Fuel
□ Natural Gas □ Fuel Oil □ Other: _____

Interconnection Type *(check one)*: □ Secondary □ 7.2/12.47 kV □ 69 kV □ 115 kV □ 230kV

IF THIS IS NOT A NET METERING OR SELF GENERATION INSTALLATION, COMPLETE THE FOLLOWING:

Anticipated Energy Purchaser: _____

Proposed Energy Delivery Location: _____

PART 5 – SIGN OFF AREA

This section may be completed and signed by the Interconnection Customer, the Engineering Firm, or the Installer.

I hereby *(check one)* □ request, or □ do not request, the attached basic system data from Y-W Electric Association, Inc. for my proposed interconnection as detailed above. If I am requesting the basic system data, I understand that a processing fee of $100 must accompany this form, and I understand that all data provided including available system capacity is subject to change until such time as I submit an Interconnection Application. I understand that submission of this form does not reserve my proposed project any capacity on Y-W Electric Association's or any transmission provider's system and that submission of this form does not enter me into any interconnection queue.

Authorized Signature:	**Date:**

SUBMISSION INSTRUCTIONS

Please complete as much of this form as possible and mail or deliver, together with the processing fee if basic system data is requested, to:

Y-W Electric Association, Inc.
ATTN: Interconnection Data Requests
26862 US Hwy 34
PO Box Y
Akron, CO 80720

This form may also be emailed to **interconnections@ywelectric.coop** except that payment must be received referencing this form in order for any data to be provided in return.

PART 6 – BASIC SYSTEM DATA

This section to be filled out by Y-WEA:

Account Number (if applicable):	Facilities Type: *(check all that apply)* □ Primary (7.2/12.47 kV) □ Secondary □ Single phase □ Three phase □ Transmission: □ 69kV □ 115kV □ 230kV

If Service Type is Secondary:	Transformer kVA:	Transformer Type □ Single phase □ Three phase
	Primary Voltage:	Transformer Configuration: □ Delta □ Wye
	Secondary Voltage:	%Z:

Expected fault current values below given at (check all that apply):
□ Transmission Level □ Primary Voltage (7.2/12.47 kV) □ Transformer Secondary Terminal □ Meter Point

Max LLL(G):	Max LLG:	Max LL:	Max LG:

If Interconnection Type is Net Metering:	System Element Description	DER Capacity (in kW)	Check line that constrains capacity to proposed location
	Substation: _____		□
	Feeder: _____		□
	Downline Recloser: _____		□
	Statutory Limit *(check one)* □Residential □Commercial		□
	Service Location Transformer		□
	Existing DER Capacity Connected to this Substation		

Part 6 continues on the next page.

PART 6 – BASIC SYSTEM DATA *(continued)*

If Interconnection Type is Net Metering *(continued)*:	Existing DER Capacity Connected to this Feeder		
	Existing DER Capacity Connected to this Line Section		
	Existing DER Capacity Connected to this Transformer		
	DER Applications Queued for this Substation		
	DER Applications Queued for this Feeder		
	DER Applications Queued for this Line Section		
	DER Applications Queued for this Transformer		
	DER Capacity Available at proposed location:		Obtained by subtracting applicable existing and queued DER capacity from constraining system element capacity
Dist from Substation (line mi):	Line Section Peak Load (kW):	Line Section Min. Daytime Load:	Line Sect Absolute Min. Load:
Line Section Off-Season Peak Load:		Peak : Off-Season Peak Ratio:	Circuit is Highly Seasonal: □ Yes □ No

Protective Devices installed upline of point of interconnection:	Device Name:	Current Rating:	Directional Capable?
	Main Feeder Recloser		□ Yes □ No
			□ Yes □ No
			□ Yes □ No
			□ Yes □ No
Voltage Regulating Devices installed upline of point of interconnection:	Device Name:	kVA Rating:	Bidirectional Capable?
	Sub: □ LTC □ Regulators		□ Yes □ No
			□ Yes □ No
			□ Yes □ No

Connection characteristic of facilities present at proposed point of interconnection: *(check all that apply)*
□ Radial Y-WEA Secondary, Distribution, or Transmission □ Radial Other Transmission □ Networked Other Transmission

List and explain any other capacity-constraining factors present which affect this proposed interconnection:

_____

_____

I hereby certify that this fault current and system analysis was prepared by me or under my direct supervision and that I am a duly registered Professional Engineer in the State of: □ Colorado □ Nebraska.	(Engineer's Seal)
Engineer's Signature:	
Date:	

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ATTACHMENT 16:

APPLICATION FOR OPERATION OF CUSTOMER-OWNED GENERATION

Last Reviewed: September 19, 2017
Last Updated: September 19, 2017

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Application for Operation of Customer-Owned Generation

This application should be completed and returned to the Y-W Electric Association's Engineer in order to begin processing the request. See *Generator Interconnection Procedure* for additional information.

INFORMATION: *This application is used by Y-W Electric Association to determine the required equipment configuration for the Customer interface. Every effort should be made to supply as much information as possible.*

PART 1
OWNER/APPLICANT INFORMATION

Owner/Customer

Name:_____

Mailing Address:_____

City:_____County:_____State:_____Zip Code:_____

Phone Number:_____Representative:_____

Email Address:_____ Fax Number:_____

PROJECT DESIGN/ENGINEERING (ARCHITECT) (as applicable)

Company:_____

Mailing Address:_____

City:_____County:_____State:_____Zip Code:_____

Phone Number:_____Representative:_____

Email Address:_____ Fax Number:_____

ELECTRICAL CONTRACTOR (as applicable)

Company:_____

Mailing Address:_____

City:_____County:_____State:_____Zip Code:_____

Phone Number:_____Representative:_____

Email Address:_____ Fax Number:_____

TYPE OF APPLICATION

□ Proposed New Generating Facility

□ Increase in the generating capacity or a Material Modification of an existing Generating Facility

TYPE OF INTERCONNECTION SERVICE REQUESTED

□ Transmission System Interconnection Service

□ Distribution System Interconnection Service

□ Transmission Network Resource Interconnection Service

□ Distribution Network Resource Interconnection Service

TYPE OF GENERATOR (as applicable)

□ Photovoltaic □ Wind □ Microturbine □ Steam Turbine

□ Diesel Engine □ Gas Engine □ Combustion Turbine □ Biomass/Digester

□ Other: _____

ESTIMATED LOAD, GENERATOR RATING AND MODE OF OPERATION INFORMATION

The following information is necessary to help properly design the Cooperative customer interconnection. This information is not intended as a commitment or contract for billing purposes.

Total Site Load _____ (kW)

Residential _____ Commercial _____ Industrial _____

Generator Nameplate Rating _____ (kVA) Annual Estimated Generation _____ (kWh)

Generator Maximum Expected Output _____ (kW)

Mode of Operation

Isolated _____ Paralleling _____ Power Export _____

DESCRIPTION OF PROPOSED INSTALLATION AND OPERATION

Give a general description of the proposed installation, including a detailed description of its planned location, the date you plan to operate the generator, the frequency with which you plan to operate it and whether you plan to operate it during on or off-peak hours.

_____

_____

_____

_____

_____

_____

_____

_____

_____

PART 2

(Complete all applicable items. Copy these pages as required for additional generators)

Location (if different from above):_____

Account Number (if applicable):_____

Evidence of Site Control: □ Is attached to this application

□ Is not provided. Interconnection customer elects to provide an additional deposit per the Generator Interconnection Procedure

SYNCHRONOUS GENERATOR DATA

Unit Number: _____Total number of units with listed specifications on site: _____
Manufacturer: _____
Type: _____Date of manufacture: _____
Serial Number (each):_____
Phases: Single Three R.P.M.: _____ Frequency (Hz): _____
Rated Output (for one unit): _____Kilowatt _____Kilovolt-Ampere
Rated Power Factor (%): _____Rated Voltage (Volts): _____Rated Amperes: _____
Field Volts: _____ Field Amps: _____ Motoring power (kW): _____

Reactances – Direct Axis
Synchronous saturated (X_{dv}): _____% on _____KVA base
Synchronous unsaturated (X_{di}): _____% on _____KVA base
Transient saturated (X'_{dv}): _____% on _____KVA base
Transient unsaturated (X'_{di}): _____% on _____KVA base
Subtransient saturated (X''_{dv}): _____% on _____KVA base
Subtransient unsaturated (X''_{di}): _____% on _____KVA base
Negative Sequence saturated ($X2_v$): _____% on _____KVA base
Negative Sequence unsaturated ($X2_i$): _____% on _____KVA base
Zero Sequence saturated ($X0_v$): _____% on _____KVA base
Zero Sequence saturated ($X0_i$): _____% on _____KVA base
Leakage Reactance (Xl_m): _____% on _____KVA base

Reactances – Quadrature Axis
Synchronous saturated (X_{qv}): _____% on _____KVA base
Synchronous unsaturated (X_{qi}): _____% on _____KVA base
Transient saturated (X'_{qv}): _____% on _____KVA base
Transient unsaturated (X'_{qi}): _____% on _____KVA base
Subtransient saturated (X''_{qv}): _____% on _____KVA base
Subtransient unsaturated (X''_{qi}): _____% on _____KVA base

Field Time Constant Data (sec)	Direct Axis	Quadrature Axis
Open Circuit	T'_{do} = _____	T'_{qo} = _____
Three-Phase Short Circuit Transient	T'_{d3} = _____	T'_{q} = _____
Line to Line Short Circuit Transient	T'_{d2} = _____	
Line to Neutral Short Circuit Transient	T'_{d1} = _____	
Short Circuit Subtransient	T''_{d} = _____	T''_{q} = _____
Open Circuit Subtransient	T''_{do} = _____	T''_{qo} = _____

Armature Time Constant Data (sec)
Three-Phase Short Circuit T_{a3} = _____
Line to Line Short Circuit T_{a2} = _____
Line to Neutral Short Circuit T_{a1} = _____

Armature Winding Resistance Data (per uni)
Positive R_1 = _____
Negative R_2 = _____
Zero R_0 = _____

Neutral Grounding Resistor (if applicable):_____
_____
I_2^2t or K (heating time constant): _____
Three Phase Armature Winding Capacitance_____
Field Winding Resistance: _____ ohms at _____°C
Armature Winding Resistance: _____ ohms at _____°C
Additional information: _____
_____
Provide Saturation, Vee, Reactive Capability, and Capacity Temperature Correction curves.

INDUCTION GENERATOR DATA

Rotor Resistance (Rr):_____ ohms
Stator Resistance (Rs): _____ ohms
Rotor Reactance (Xr):_____ ohms
Stator Reactance (Xs): _____ ohms
Magnetizing Reactance (Xm):_____ ohms
Short Circuit Reactance (Xd"): _____ ohms
Design letter:_____
Frame Size: _____
Exciting Current:_____
Temp Rise (deg C°): _____
Reactive Power Required:_____ Vars (no load), _____Vars (full load)
Additional information:_____
_____

PRIME MOVER (Complete all applicable items)

Unit Number: _____ Type: _____
Manufacturer: _____
Serial Number:_____ Date of manufacture: _____
H.P. Rated: _____ H.P. Max.: _____Inertia Constant: H=_____ kW sec/kVA
Moment of Intertia: WR^2=_____lb-ft^2
Energy Source (hydro, steam, wind, etc.) _____
_____
_____
Identify appropriate IEEE model block diagrams of (i) excitation system and power system stabilizer, and (ii) governor system for computer representation in power system stability simulations and the corresponding excitation system, power system stability, and governor system constants for use in the model.

GENERATOR TRANSFORMER (Complete all applicable items)

TRANSFORMER (between generator and utility system)
Generator unit number: _____ Date of manufacturer: _____
Manufacturer: _____
Serial Number: _____
High Voltage: _____ KV, Connection: delta wye, Neutral solidly grounded?_____
Low Voltage: _____ KV, Connection: delta wye, Neutral solidly g rounded? _____
Transformer Impedance(Z): _____% on _____ KVA base.
Transformer Resistance (R): _____% on _____ KVA base.
Transformer Reactance (X): _____% on _____ KVA base.
Neutral Grounding Resistor (if applicable): _____
_____

INVERTER DATA (if applicable)

Manufacturer: _____ Model: _____
Rated Power Factor (%): _____Rated Voltage (Volts): _____ Rated Amperes: _____
Inverter Type (ferroresonant, step, pulse-width modulation, etc): _____

Type commutation: forced line
Harmonic Distortion: Maximum Single Harmonic (%) _____
Maximum Total Harmonic (%) _____

Note: Attach all available calculations, test reports, and oscillographic prints showing inverter output voltage and current waveforms.

POWER CIRCUIT BREAKER (if applicable)

Manufacturer: _____Model: _____
Rated Voltage (*kilovolts):* _____Rated ampacity *(Amperes)*_____
Interrupting rating (Amperes): _____BIL Rating: _____
Interrupting medium / insulating medium (ex. Vacuum, gas, oil) _____ / _____
Control Voltage (Closing): _____ (Volts) AC DC
Control Voltage (Tripping): _____ (Volts) AC DC Battery Charged Capacitor
Close energy: Spring Motor Hydraulic Pneumatic Other: _____
Trip energy: Spring Motor Hydraulic Pneumatic Other: _____
Bushing Current Transformers: _____ (Max. ratio) Relay Accuracy Class: _____
Multi ratio? No Yes: (Available taps) _____

WIND GENERATORS (if applicable)

Number of generators to be interconnected pursuant to this Interconnection Request: _____
Elevation*:* _____
Note: A completed General Electric Company Power Systems Load Flow (PSLF) data sheet or other compatible formats, such as IEEE and PTI power flow models, must be supplied with the Interconnection Request. If other data sheets are more appropriate to the proposed device, then they shall be provided and discussed at the Scoping Meeting.

ADDITIONAL INFORMATION

In addition to the items listed above, please attach a detailed one-line diagram of the proposed facility, three-line diagram(s) showing connectivity of all protective relays, DC schematic drawings showing tripping schemes, all other applicable elementary diagrams, major equipment (generators, transformers, inverters, circuit breakers, protective relays, etc.) specifications, test reports, etc., and any other applicable drawings or documents necessary for the proper design of the interconnection. Also describe the project's planned operating mode (e.g., combined heat and power, peak shaving, etc.), and its address or grid coordinates.

END OF PART 2

SIGN OFF AREA

The customer agrees to provide the Cooperative with any additional information required to complete the interconnection. The customer shall operate his equipment within the guidelines set forth by the cooperative.

_____ _____
Applicant Date

_____ _____
Name (type or print) Title

CONTACT INFORMATION FOR APPLICATION SUBMISSION AND FOR MORE INFORMATION:

Information Contact:	Andy Molt	Applications Contact:	James A. Ziebarth
Title:	Director of Member Services	Title:	System Engineer
e-mail:	andym@ywelectric.coop	e-mail:	james@hea.coop

Address: 26862 US Hwy 34
PO Box Y
Akron, CO 80720
Phone: (970) 345-2291
Fax: (970) 345-2154

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ATTACHMENT 17:

SHORT-FORM INTERCONNECTION APPLICATION AND AGREEMENT FOR INVERTER UP TO 10 kW

Last Reviewed: September 19, 2017
Last Updated: September 19, 2017

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Short-Form Interconnection Application and Agreement for Inverter-based Systems up to 10 kW

This application must be completed and returned to Y-W Electric Association's Engineer as per the requirements in *Attachment 2 – Applicability of Requirements and Generator Interconnection Procedure* in order to begin processing the request. Please refer to the Generator Interconnection Procedure (in particular the sections entitled *Requirements for ALL Interconnection Applications* and *Inverter Fast-Track Interconnection Request*) for additional information. A processing fee of $700 must accompany this application unless a Pre-Application Interconnection Data Form was previously submitted with a payment of $100 to receive Y-WEA system data at the proposed interconnection location, in which case a processing fee of $600 must accompany this application.

INFORMATION: *This application is used by Y-W Electric Association to determine the required equipment configuration for the Customer interface. Every effort should be made to supply as much information as possible.*

PART 1

INTERCONNECTION CUSTOMER

Name:_____

Contact Person:_____

Mailing Address:_____

City:_____County:_____State:_____Zip Code:_____

Phone Number: Day:_____Evening:_____

Fax Number:_____ Email Address:_____

ENGINEERING FIRM (if applicable)

Company:_____

Contact Person:_____

Mailing Address:_____

City:_____State:_____Zip Code:_____

Phone Number:_____

Fax Number:_____ Email Address:_____

CONTACT (if different from Interconnection Customer)

Name:_____

Contact Person:_____

Mailing Address:_____

City:_____State:_____Zip Code:_____

Phone Number: Day:_____Evening:_____

Fax Number:_____ Email Address:_____

OWNER

Owner of the facility, including percent ownership by any electric utility:_____

_____

PART 2
SMALL GENERATING FACILITY INFORMATION

Location (if different from above):_____

Electric Service Company:_____

Account Number:_____

Small Generator 10 kW Inverter Process:_____

Manufacturer:_____Model:_____

Nameplate Rating:_____kW _____kVA _____AC Volts Check One: □ Single Phase □ Three Phase

System Design Capacity:_____kW _____kVA

PRIME MOVER (Check One)

□ Photovoltaic □ Reciprocating Engine □ Fuel Cell □ Turbine

□ Other: _____

ENERGY SOURCE (Check One)

□ Solar □ Wind □ Hydropower □ Diesel Fuel □ Natural Gas

□ Fuel Oil □ Other: _____

EQUIPMENT CERTIFICATIONS

Is the Equipment UL1741 Listed? Check One: □ Yes □ No

If Yes, attach manufacturer's cut-sheet showing UL1741 listing.

Estimated Installation Date:_____ Estimated In-Service Date:_____

The 10 kW Inverter Process is available only for inverter-based Small Generating Facilities no larger than 10 kW that meet the codes, standards, and certification requirements of of paragraphs (h) and (i) of Colorado PUC Rule 3665 (see Attachment 8: Y-WEA Generation Interconnection Standard – Less than 25 kW and Attachment 13: Colorado PUC Rule 3665), or the utility has reviewed the design or tested the proposed Small Generating Facility and is satisfied that it is safe to operate.

List components of the Small Generating Facility equipment package that are currently certified:

	Equipment Type	Certifying Entity
1.	_____	_____

2. _____ _____

3. _____ _____

4. _____ _____

5. _____ _____

6. _____ _____

Interconnection Customer Signature:_____

SIGN OFF AREA

I hereby certify that, to the best of my knowledge, the information provided in this Application is true. I agree to abide by the Terms And Conditions For Interconnecting an Inverter-Based Small Generating Facility No Larger Than Ten kW and return the Certificate of Completion when the Small Generating Facility has been installed. *(To be signed by interconnection customer or a legally authorized representative)*

Signed:_____

Title:_____Date:_____

CONTINGENT APPROVAL TO INTERCONNECT THE SMALL GENERATING FACILITY (For Company Use Only)

Interconnection of the Small Generating Facility is approved contingent upon the Terms and Conditions for Interconnecting an Inverter-Based Small Generating Facility No Larger than 10 kW and return of the Certificate of Completion.

Signed:_____

Title:_____Date:_____

Application ID Number:_____

Company Waives inspection/witness test? Check One: □ Yes □ No

CONTACT INFORMATION FOR APPLICATION SUBMISSION AND FOR MORE INFORMATION:

Information Contact:	Andy Molt	Applications Contact:	James A. Ziebarth
Title:	Director of Member Services	Title:	System Engineer
e-mail:	andym@ywelectric.coop	e-mail:	james@hea.coop

Address: 26862 US Hwy 34
PO Box Y
Akron, CO 80720
Phone: (970) 345-2291
Fax: (970) 345-2154

CERTIFICATION CODES AND STANDARDS:

- IEEE1547 Standard for Interconnecting Distributed Resources with Electric Power Systems (including use of IEEE 1547.1 testing protocols to establish conformity)
- UL 1741 Inverters, Converters, and Controllers for Use in Independent Power Systems

- IEEE Std 929-2000 IEEE Recommended Practice for Utility Interface of Photovoltaic (PV) Systems
- NFPA 70 (2011), National Electrical Code
- IEEE Std C37.90.1-1989 (R1994), IEEE Standard Surge Withstand Capability (SWC) Tests for Protective Relays and Relay Systems
- IEEE Std C37.90.2 (1995), IEEE Standard Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers
- IEEE Std C37.108-1989 (R2002), IEEE Guide for the Protection of Network Transformers
- IEEE Std C57.12.44-2000, IEEE Standard Requirements for Secondary Network Protectors
- IEEE Std C62.41.2-2002, IEEE Recommended Practice on Characterization of Surges in Low Voltage (1000V and Less) AC Power Circuits
- IEEE Std C62.45-1992 (R2002), IEEE Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage (1000V and Less) AC Power Circuits
- ANSI C84.1-1995 Electric Power Systems and Equipment – Voltage Ratings (60 Hertz)
- IEEE Std 100-2000, IEEE Standard Dictionary of Electrical and Electronic Terms
- NEMA MG 1-1998, Motors and Small Resources, Revision 3
- IEEE Std 519-1992, IEEE Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems
- NEMA MG 1-2003 (Rev 2004), Motors and Generators, Revision 1

Certification of small generator equipment packages.

(I) Small generating facility equipment proposed for use separately or packaged with other equipment in an interconnection system shall be considered certified for interconnected operation if (1) it has been tested in accordance with industry standards for continuous utility interactive operation in compliance with the appropriate codes and standards referenced below by any Nationally Recognized Testing Laboratory (NRTL) recognized by the United States Occupational Safety and Health Administration to test and certify interconnection equipment pursuant to the relevant codes and standards listed in paragraph (h), (2) it has been labeled and is publicly listed by such NRTL at the time of the interconnection application, and (3) 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.

(II) The interconnection 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.

(III) Certified equipment shall not require further type-test review, testing, or additional equipment to meet the requirements of this interconnection procedure; however, nothing herein shall preclude the need for an on-site commissioning test by the parties to the interconnection nor follow-up production testing by the NRTL.

(IV) If the certified equipment package includes only interface components (switchgear, inverters, or other interface devices), then an Interconnection Customer must show that the generator or other electric source being utilized with the equipment package is compatible with the equipment package and is consistent with the testing and listing specified for this type of interconnection equipment.

(V) Provided the generator or electric source, when combined with the equipment package, is within the range of capabilities for which it was tested by the NRTL, and does not violate the interface components' labeling and listing performed by the NRTL, no further design review, testing or additional equipment on the customer side of the point of common coupling shall be required to meet the requirements of this interconnection procedure.

(VI) An equipment package does not include equipment provided by the utility.

TERMS AND CONDITIONS FOR INTERCONNECTING AN INVERTER-BASED SMALL GENERATING FACILITY NO LARGER THAN TEN KW

(I) Construction of the facility. The interconnection customer may proceed to construct the small generating facility when the utility approves the interconnection request (the application) and returns it to the IC.

(II) Interconnection and operation. The IC may operate small generating facility and interconnect with the utility's electric system once all of the following have occurred:

(A) Upon completing construction, the interconnection customer will cause the small generating facility to be inspected or otherwise certified by the appropriate local electrical wiring inspector with jurisdiction, and

(B) The customer returns the certificate of completion to the utility, and

(C) The utility has completed its inspection of the small generating facility. All inspections must be conducted by the utility, at its own expense, within ten business days after receipt of the certificate of completion and shall take place at a time agreeable to the parties. The utility shall provide a written statement that the small generating facility has passed inspection or shall notify the customer of what steps it must take to pass inspection as soon as practicable after the inspection takes place.

(D) The utility has the right to disconnect the small generating facility in the event of improper installation or failure to return the certificate of completion.

(III) Safe operations and maintenance. The interconnection customer shall be fully responsible to operate, maintain, and repair the small generating facility as required to ensure that it complies at all times with the interconnection standards to which it has been certified.

(IV) Access. The utility shall have access to the disconnect switch and metering equipment of the small generating facility at all times. The utility shall provide reasonable notice to the customer when possible prior to using its right of access.

(V) Disconnection. The utility may temporarily disconnect the small generating facility upon the following conditions:

(A) For scheduled outages per notice requirements in the utility's tariff or Commission rules.

(B) For unscheduled outages or emergency conditions pursuant to the utility's tariff or Commission rules.

(C) If the small generating facility does not operate in the manner consistent with these terms and conditions.

(D) The utility shall inform the interconnection customer in advance of any scheduled disconnection, or as is reasonable after an unscheduled disconnection.

(VI) Indemnification. The parties shall at all times indemnify, defend, and save the other party harmless from, any and all damages, losses, claims, including claims and actions relating to injury to or death of any person or damage to property, demand, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting

from the other party's action or inactions of its obligations under this agreement on behalf of the indemnifying party, except in cases of gross negligence or intentional wrongdoing by the indemnified party.

(VII) Insurance. The interconnection customer, at its own expense, shall secure and maintain in effect during the term of this agreement, liability insurance with a combined single limit for bodily injury and property damage of not less than $300,000 each occurrence. Such liability insurance shall not exclude coverage for any incident related to the subject generator or its operation. The utility shall be named as an additional insured under the liability policy unless the system is a solar system installed on a premise using the residential tariff and has a design capacity of ten kW or less. The policy shall include that written notice be given to the utility at least 30 days prior to any cancellation or reduction of any coverage. A copy of the liability insurance certificate must be received by the utility prior to plant operation. Certificates of insurance evidencing the requisite coverage and provision(s) shall be furnished to utility prior to date of interconnection of the generation system. Utilities shall be permitted to periodically obtain proof of current insurance coverage from the generating customer in order to verify proper liability insurance coverage. The interconnection customer will not be allowed to commence or continue interconnected operations unless evidence is provided that satisfactory insurance coverage is in effect at all times.

(VIII) Limitation of liability. Each party's liability to the other party for any loss, cost, claim, injury, liability, or expense, including reasonable attorney's fees, relating to or arising from any act or omission in its performance of this agreement, shall be limited to the amount of direct damage actually incurred. In no event shall either party be liable to the other party for any indirect, incidental, special, consequential, or punitive damages of any kind whatsoever, except as allowed under subparagraph (i)(VI) of this rule.

(IX) Termination. The agreement to operate in parallel may be terminated under the following conditions:

(A) By the Customer by providing written notice to the utility.

(B) By the utility if the small generating facility fails to operate for any consecutive 12 month period or the customer fails to remedy a violation of these terms and conditions.

(C) Permanent disconnection. In the event this agreement is terminated, the utility shall have the right to disconnect its facilities or direct the customer to disconnect its small generating facility.

(D) Survival rights. This agreement shall continue in effect after termination to the extent necessary to allow or require either party to fulfill rights or obligations that arose under the agreement.

(X) Assignment/Transfer of ownership of the facility. This agreement shall survive the transfer of ownership of the small generating facility to a new owner when the new owner agrees in writing to comply with the terms of this agreement and so notifies the utility.

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Certificate of Completion for Inverter-based Systems up to 10 kW

This certificate must be completed and returned to the Y-W Electric Association's Engineer in order to operate the interconnected system and receive net-metering credit. See *Attachment 8 - Y-WEA Generation Interconnection Standard – 25 kW or Less Connected at Secondary Voltages and Attachment 13: Colorado PUC Rule 3665* for additional information.

PART 1
INTERCONNECTION CUSTOMER

Name:_____

Contact Person:_____

Mailing Address:_____

City:_____County:_____State:_____Zip Code:_____

Phone Number: Day:_____Evening:_____

Fax Number:_____ Email Address:_____

SIGN OFF AREA

I hereby certify that, to the best of my knowledge, the system referenced in the previously-submitted Short-Form Interconnection Application and Agreement up to 10 kW has been installed and conforms to the data provided on the Short-Form Interconnection Application and Agreement up to 10 kW and to all requirements contained on the Short-Form Interconnection Application and Agreement up to 10 kW.

Signed:_____

Title:_____Date:_____

INTERCONNECTION APPLICATION COMPLETION (For Company Use Only)

Installation of the Small Generating Facility is complete and approved contingent upon continued conformance to the Terms and Conditions for Interconnecting an Inverter-Based Small Generating Facility No Larger than 10 kW.

Signed:_____

Title:_____Date:_____

Application ID Number:_____

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ATTACHMENT 18:

SAMPLE STUDY AND INTERCONNECTION AGREEMENTS

Last Reviewed: November 18, 2011
Last Updated: November 18, 2011

Sample Study and Interconnection Agreements

The following agreements are samples only. Agreements similar to these may be used by Y-WEA when interconnecting systems that do not fall within the 10 kW inverter-based criteria as established by the PUC. In general, the short-form agreement would be used for smaller generators operated by individuals and/or smaller businesses, while the long-form agreement would be used for larger generators.

These sample agreements are provided so that potential interconnecting customers can have some idea what terms and conditions they may need to abide by when connecting generators to Y-WEA's electric system. Specific terms may be negotiated between Y-WEA and the interconnecting customer on a case-by-case basis, depending on the type and size of the generating resource.

Y-W ELECTRIC ASSOCIATION, INC.
INTERCONNECTION FEASIBILITY STUDY AGREEMENT

THIS AGREEMENT is made and entered into this___day of _____, 20___ by and between Y-W Electric Association, Inc., ("Y-WEA"), a Corporation organized and existing under the laws of the State of Colorado and _____ a _____ existing under the laws of the State of _____, ("Interconnection Customer "). Interconnection Customer and Y-W Electric Association, Inc. each may be referred to as a "Party," or collectively as the "Parties."

RECITALS

WHEREAS, Interconnection Customer is proposing to develop a Generating Facility or generating capacity addition to an existing Generating Facility consistent with the Interconnection Request submitted by Interconnection Customer dated _____ ; and

WHEREAS, Interconnection Customer desires to interconnect the Generating Facility with Y-WEA's Transmission or Distribution System; and

WHEREAS, Interconnection Customer has requested Y-WEA to perform an Interconnection Feasibility Study to assess the feasibility of interconnecting the proposed Generating Facility to the Transmission or Distribution System, and of any Affected Systems;

NOW, THEREFORE, in consideration of and subject to the mutual covenants contained herein the Parties agreed as follows:

1.0 When used in this Agreement, with initial capitalization, the terms specified shall have the meanings indicated in Y-WEA's approved Generator Interconnection Procedure (GIP).

2.0 Interconnection Customer elects and Y-WEA shall cause to be performed an Interconnection Feasibility Study.

3.0 The scope of the Interconnection Feasibility Study shall be subject to the assumptions set forth in Attachment A to this Agreement.

4.0 The Interconnection Feasibility Study shall be based on the technical information provided by Interconnection Customer in the Interconnection Request, as may be modified as the result of a Scoping Meeting. Y-WEA reserves the right to request additional technical information from Interconnection Customer as may reasonably become necessary consistent with Good Utility Practice during the course of the Interconnection Feasibility Study. If, after the designation of the Point of Interconnection, Interconnection Customer modifies its Interconnection

Request, the time to complete the Interconnection Feasibility Study may be extended at the distraction of Y-WEA.

5.0 In performing the study, the Y-WEA shall rely, to the extent reasonably practicable, on existing studies of recent vintage. The Interconnection Customer shall not be charged for such existing studies; however, the Interconnection Customer shall be responsible for charges associated with any new study or modifications to existing studies that are reasonably necessary to perform the feasibility study.

6.0 The feasibility study report shall provide the following analyses for the purpose of identifying any potential adverse system impacts that would result from the interconnection of the Generating Facility as proposed:

6.1 preliminary identification of system protection equipment short circuit capability limits exceeded as a result of the interconnection;

6.2 preliminary identification of any thermal overload or voltage limit violations resulting from the interconnection;

6.3 preliminary review of grounding requirements; and

6.4 preliminary description and non-binding estimated cost of facilities required to interconnect the Generating Facility to the Transmission or Distribution System and to address the identified short circuit and power flow issues.

7.0 The study shall include the feasibility of any interconnection at a proposed project site where there could be multiple potential Points of Interconnection, as requested by the Interconnection Customer and at the Interconnection Customer's cost.

8.0 Interconnection Customer shall provide a deposit with the Generator Interconnection Request for the performance of the Interconnection Feasibility Study. For Generation Facilities:

a. 100 kW or less a deposit of $4,000
b. greater than 100 kW a deposit of $10,000.

8.1 Upon receipt of the Interconnection Feasibility Study Y-WEA shall charge and Interconnection Customer shall pay the actual costs of the Interconnection Feasibility Study.

8.2 For Generation Facilities larger than 100 kW, $5,000 of the deposit shall be non-refundable but shall be applied towards Feasibility Study costs. For Generation Facilities 100 kW or smaller, $1000 shall be non-refundable. Any difference between the deposit and the actual cost of the

study shall be paid by or refunded to Interconnection Customer, as appropriate within 60 calendar days of the invoice without interest.

9.0 Governing Law, Regulatory Authority, and Rules

The validity, interpretation and enforcement of this Agreement and each of its provisions shall be governed by the laws of the state of_____ _____ (where the Point of Interconnection is located), without regard to its conflicts of law principles. This Agreement is subject to all Applicable Laws and Regulations. Each Party expressly reserves the right to seek changes in, appeal, or otherwise contest any laws, orders, or regulations of a Governmental Authority.

10.0 Amendment

The Parties may amend this Agreement by a written instrument duly executed by both Parties.

11.0 No Third-Party Beneficiaries

This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and where permitted, their assigns.

12.0 Waiver

12.1 The failure of a Party to this Agreement to insist, on any occasion, upon strict performance of any provision of this Agreement will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.

12.2 Any waiver at any time by either Party of its rights with respect to this Agreement shall not be deemed a continuing waiver or a waiver with respect to any other failure to comply with any other obligation, right, duty of this Agreement. Termination or default of this Agreement for any reason by Interconnection Customer shall not constitute a waiver of the Interconnection Customer's legal rights to obtain an interconnection from Y-WEA. Any waiver of this Agreement shall, if requested, be provided in writing.

13.0 Multiple Counterparts

This Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

14.0 No Partnership

This Agreement shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose

any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

15.0 Severability

If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other Governmental Authority, (1) such portion or provision shall be deemed separate and independent, (2) the Parties shall negotiate in good faith to restore insofar as practicable the benefits to each Party that were affected by such ruling, and (3) the remainder of this Agreement shall remain in full force and effect.

16.0 Subcontractors

Nothing in this Agreement shall prevent a Party from utilizing the services of any subcontractor as it deems appropriate to perform its obligations under this Agreement; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this Agreement in providing such services and each Party shall remain primarily liable to the other Party for the performance of such subcontractor.

16.1 The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under this Agreement. The hiring Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made; provided, however, that in no event shall Y-WEA be liable for the actions or inactions of the Interconnection Customer or its subcontractors with respect to obligations of the Interconnection Customer under this Agreement. Any applicable obligation imposed by this Agreement upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of such Party.

16.2 The obligations under this article will not be limited in any way by any limitation of subcontractor's insurance.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be duly executed by their duly authorized officers or agents on the day and year first above written.

Y-W ELECTRIC ASSOCIATION, INC.	**INTERCONNECTION CUSTOMER**
By: _____	By: _____
Title: _____	Title: _____

Date: _____ Date: _____

Attachment A
Interconnection Feasibility
Study Agreement

ASSUMPTIONS USED IN CONDUCTING THE INTERCONNECTION FEASIBILITY STUDY

The Interconnection Feasibility Study will be based upon the information set forth in the Interconnection Request and agreed upon in the Scoping Meeting held on _____:

1. Designation of Point of Interconnection and configuration to be studied.

2. Designation of alternative Point(s) of Interconnection and configuration.

1. and 2. are to be completed by the Interconnection Customer. Other assumptions (listed below) are to be provided by the Interconnection Customer and the Y-W Electric Association, Inc.

Y-W ELECTRIC ASSOCIATION, INC.
System Impact Study Agreement

THIS AGREEMENT is made and entered into this_____day of_____20___ by and between _____, a _____ organized and existing under the laws of the State of _____, ("Interconnection Customer,") and Y-W Electric Association, Inc., a Corporation existing under the laws of the State of Colorado, ("Y-WEA"). Interconnection Customer and Y-WEA each may be referred to as a "Party," or collectively as the "Parties."

RECITALS

WHEREAS, the Interconnection Customer is proposing to develop a Generating Facility or generating capacity addition to an existing Small Generating Facility consistent with the Interconnection Request completed by the Interconnection Customer on_____; and

WHEREAS, the Interconnection Customer desires to interconnect the Generating Facility with Y-WEA's Transmission or Distribution System;

WHEREAS, the Interconnection Customer has requested Y-WEA to perform a System Impact Study(s) to assess the impact of interconnecting the Generating Facility with Y-WEA's Transmission or Distribution System, and of any Affected Systems;

NOW, THEREFORE, in consideration of and subject to the mutual covenants contained herein the Parties agreed as follows:

1.0 When used in this Agreement, with initial capitalization, the terms specified shall have the meanings indicated or the meanings specified in the Y-WEA Generator Interconnection Procedures (GIP).

2.0 The Interconnection Customer elects and Y-WEA shall cause to be performed a System Impact Study(s) consistent with the Y-WEA Generator Interconnection Procedures.

3.0 The scope of a System Impact Study shall be subject to the assumptions set forth in Attachment A to this Agreement.

4.0 A System Impact Study will be based upon the results of the Feasibility Study, if any and the technical information provided by Interconnection Customer in the Interconnection Request. Y-WEA reserves the right to request additional technical information from the Interconnection Customer as may reasonably become necessary consistent with Good Utility Practice during the course of the System Impact Study. If the Interconnection Customer modifies its designated Point of Interconnection, Interconnection Request, or the technical information provided therein is modified, the time to complete the system

impact study may be extended at the discretion of Y-WEA.

5.0 A System Impact Study shall consist of a short circuit analysis, a stability analysis, a power flow analysis, voltage drop and flicker studies, protection and set point coordination studies, and grounding reviews as necessary. A System Impact Study shall state the assumptions upon which it is based, state the results of the analyses, and provide the requirement or potential impediments to providing the requested interconnection service, including a preliminary indication of the cost and length of time that would be necessary to correct any problems identified in those analyses and implement the interconnection. A System Impact Study shall provide a list of facilities that are required as a result of the Interconnection Request and non-binding good faith estimates of cost responsibility and time to construct.

6.0 A distribution System Impact Study shall incorporate a distribution load flow study, an analysis of equipment interrupting ratings, protection coordination study, voltage drop and flicker studies, protection and set point coordination studies, grounding reviews and the impact on electric system operation, as necessary.

7.0 Affected Systems may participate in the preparation of a System Impact Study, with a division of costs among such entities as they may agree. All Affected Systems shall be afforded an opportunity to review and comment upon a system impact study that covers potential adverse system impacts on their electric systems.

8.0 Since Y-WEA uses a queuing procedure for sorting and prioritizing projects and their associated cost responsibilities for any required Network Upgrades, the System Impact Study shall consider (1) the project standalone interconnection case and (2) all generating facilities (and with respect to paragraph 8.3 below, any identified Upgrades associated with such higher queued interconnection) that, on the date the system impact study is commenced –

8.1 are directly interconnected with Y-WEA's electric system; or

8.2 are interconnected with Affected Systems and may have an impact on the proposed interconnection; and

8.3 have a pending higher queued Interconnection Request to interconnect with Y-WEA's electric system.

Optional additional case studies with the scope of the project increased or decreased may be analyzed upon request of the Interconnection Customer.

9.0 A System Impact Study deposit of $10,000 for Generation Facility projects 100 kW or smaller and $25,000 for Generation Facility projects larger than 100 kW is required from the Interconnection Customer.

10.0 Any study fees shall be based on Y-WEA's actual costs and will be invoiced to the Interconnection Customer after the study is completed and delivered.

11.0 The Interconnection Customer must pay any study costs that exceed the deposit without interest within 30 calendar days on receipt of the invoice or resolution of any dispute. If the deposit exceeds the invoiced fees, Y-WEA shall refund such excess within 60 calendar days of the invoice without interest.

12.0 Governing Law, Regulatory Authority, and Rules

The validity, interpretation and enforcement of this Agreement and each of its provisions shall be governed by the laws of the state of Colorado (where the Point of Interconnection is located), without regard to its conflicts of law principles. This Agreement is subject to all Applicable Laws and Regulations. Each Party expressly reserves the right to seek changes in, appeal, or otherwise contest any laws, orders, or regulations of a Governmental Authority.

13.0 Amendment

The Parties may amend this Agreement by a written instrument duly executed by both Parties.

14.0 No Third-Party Beneficiaries

This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and where permitted, their assigns.

15.0 Waiver

15.1 The failure of a Party to this Agreement to insist, on any occasion, upon strict performance of any provision of this Agreement will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.

15.2 Any waiver at any time by either Party of its rights with respect to this Agreement shall not be deemed a continuing waiver or a waiver with respect to any other failure to comply with any other obligation, right, duty of this Agreement. Termination or default of this Agreement for any reason by Interconnection Customer shall not constitute a waiver of the Interconnection Customer's legal rights to obtain an interconnection from Y-WEA. Any waiver of this Agreement shall, if requested, be provided in writing.

16.0 Multiple Counterparts

This Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

17.0 No Partnership

This Agreement shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any

partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

18.0 Severability

If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other Governmental Authority, (1) such portion or provision shall be deemed separate and independent, (2) the Parties shall negotiate in good faith to restore insofar as practicable the benefits to each Party that were affected by such ruling, and (3) the remainder of this Agreement shall remain in full force and effect.

19.0 Subcontractors

Nothing in this Agreement shall prevent a Party from utilizing the services of any subcontractor as it deems appropriate to perform its obligations under this Agreement; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this Agreement in providing such services and each Party shall remain primarily liable to the other Party for the performance of such subcontractor.

19.1 The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under this Agreement. The hiring Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made; provided, however, that in no event shall Y-WEA be liable for the actions or inactions of the Interconnection Customer or its subcontractors with respect to obligations of the Interconnection Customer under this Agreement. Any applicable obligation imposed by this Agreement upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of such Party.

19.2 The obligations under this article will not be limited in any way by any limitation of subcontractor's insurance.

IN WITNESS THEREOF, the Parties have caused this Agreement to be duly executed by their duly authorized officers or agents on the day and year first above written.

Y-W Electric Association, Inc.	**[Insert name of Interconnection Customer]**
Signed_____	Signed_____
Name (Printed):	Name (Printed):

_____ _____

Title_____ Title_____

Assumptions Used in Conducting the System Impact Study

The system impact study shall be based upon the results of the Feasibility Study and System Impact scoping meeting, if any subject to any modifications in accordance with the Y-WEA Generator Interconnection Procedures, and the following assumptions:

1) Designation of Point of Interconnection and configuration to be studied.

2) Designation of alternative Points of Interconnection and configuration.

1) and 2) are to be completed by the Interconnection Customer. Other assumptions (listed below) are to be provided by the Interconnection Customer and the Transmission Provider.

Y-W ELECTRIC ASSOCIATION, INC.
Facilities Study Agreement

THIS AGREEMENT is made and entered into this_____day of_____ 20___ by and between _____, a_____ organized and existing under the laws of the State of _____, ("Interconnection Customer,") and Y-W Electric Association, Inc., a Corporation existing under the laws of the State of Colorado, (" Y-WEA"). Interconnection Customer and Y-WEA each may be referred to as a "Party," or collectively as the "Parties."

RECITALS

WHEREAS, the Interconnection Customer is proposing to develop a Generating Facility or generating capacity addition to an existing Generating Facility consistent with the Interconnection Request completed by the Interconnection Customer on _____; and

WHEREAS, the Interconnection Customer desires to interconnect the Generating Facility with the Y-WEA's Transmission or Distribution System;

WHEREAS, the Interconnection Customer has requested Y-WEA to perform a Facilities Study to specify and estimate the cost of the equipment, engineering, procurement and construction work needed to implement the conclusions of system impact studies in accordance with Good Utility Practice to physically and electrically connect the Generating Facility with Y-WEA's Transmission or Distribution System.

NOW, THEREFORE, in consideration of and subject to the mutual covenants contained herein the Parties agreed as follows:

1.0 When used in this Agreement, with initial capitalization, the terms specified shall have the meanings indicated or the meanings specified in the standard Generator Interconnection Procedures (GIP).

2.0 The Interconnection Customer elects and Y-WEA shall cause a Facilities Study consistent with the Generator Interconnection Procedures to be performed.

3.0 The scope of the Facilities Study shall be subject to data provided in Attachment A to this Agreement.

4.0 The Facilities Study shall specify and estimate the cost of the equipment, engineering, procurement and construction work (including overY-WEAds) needed to implement the conclusions of system impact studies. The Facilities Study shall also identify (1) the electrical system configuration of equipment, including without limitation, transformer, switchgear, meters, and other equipment, (2) the nature and estimated cost of Y-WEA's Interconnection Facilities and Upgrades necessary to accomplish the interconnection, and

(3) an estimate of the time required to complete the construction and installation of such facilities.

5.0 Y-WEA may propose to group facilities required for more than one Interconnection Customer in order to minimize facilities costs through economies of scale, but any Interconnection Customer may propose the installation of facilities required for its own Generating Facility if it is willing to pay the costs of those facilities assuming that easements, land use issues and other potential facility impediments can be overcome.

6.0 A Facilities Study deposit of $10,000 for Generation Facility projects 100 kW or smaller and $50,000 for Generation Facility projects larger than 100 kW is required from the Interconnection Customer.

7.0 Once the Facilities Study is completed, a Facilities Study report shall be prepared and transmitted to the Interconnection Customer.

8.0 Any study fees shall be based on Y-WEA's actual costs and will be invoiced to the Interconnection Customer after the study is completed and delivered.

9.0 The Interconnection Customer must pay any study costs that exceed the deposit without interest within 30 calendar days on receipt of the invoice or resolution of any dispute. If the deposit exceeds the invoiced fees, Y-WEA shall refund such excess within 60 calendar days of the invoice without interest.

10.0 Governing Law, Regulatory Authority, and Rules

The validity, interpretation and enforcement of this Agreement and each of its provisions shall be governed by the laws of the state of _____ (where the Point of Interconnection is located), without regard to its conflicts of law principles. This Agreement is subject to all Applicable Laws and Regulations. Each Party expressly reserves the right to seek changes in, appeal, or otherwise contest any laws, orders, or regulations of a Governmental Authority.

11.0 Amendment

The Parties may amend this Agreement by a written instrument duly executed by both Parties.

12.0 No Third-Party Beneficiaries

This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and where permitted, their assigns.

13.0 Waiver

13.1 The failure of a Party to this Agreement to insist, on any occasion, upon strict performance of any provision of this Agreement will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.

13.2 Any waiver at any time by either Party of its rights with respect to this Agreement shall not be deemed a continuing waiver or a waiver with respect to any other failure to comply with any other obligation, right, duty of this Agreement. Termination or default of this Agreement for any reason by Interconnection Customer shall not constitute a waiver of the Interconnection Customer's legal rights to obtain an interconnection from Y-WEA. Any waiver of this Agreement shall, if requested, be provided in writing.

14.0 Multiple Counterparts

This Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

15.0 No Partnership

This Agreement shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership between the Parties or to impose any partnership obligation or partnership liability upon either Party. Neither Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, the other Party.

16.0 Severability

If any provision or portion of this Agreement shall for any reason be held or adjudged to be invalid or illegal or unenforceable by any court of competent jurisdiction or other Governmental Authority, (1) such portion or provision shall be deemed separate and independent, (2) the Parties shall negotiate in good faith to restore insofar as practicable the benefits to each Party that were affected by such ruling, and (3) the remainder of this Agreement shall remain in full force and effect.

17.0 Subcontractors

Nothing in this Agreement shall prevent a Party from utilizing the services of any subcontractor as it deems appropriate to perform its obligations under this Agreement; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this Agreement in providing such services and each Party shall remain primarily liable to the other Party for the performance of such subcontractor.

17.1 The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under this Agreement. The hiring Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made; provided, however, that in no event shall Y-WEA be liable for the actions or inactions of the Interconnection Customer or its subcontractors with respect to obligations of the Interconnection

Customer under this Agreement. Any applicable obligation imposed by this Agreement upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of such Party.

17.2 The obligations under this article will not be limited in any way by any limitation of subcontractor's insurance.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be duly executed by their duly authorized officers or agents on the day and year first above written.

Y-W ELECTRIC ASSOCIATION, INC. **[Insert name of Interconnection Customer]**

Signed_____ Signed_____

Name (Printed): Name (Printed):

_____ _____

Title_____ Title_____

Data to Be Provided by the Interconnection Customer with the Facilities Study Agreement

Provide location plan and simplified one-line diagram of the plant and station facilities. For staged projects, please indicate future generation, transmission circuits, etc.

On the one-line diagram, indicate the generation capacity attached at each metering location. (Maximum installed capacity.)

On the one-line diagram, indicate the location of auxiliary power.

One set of metering is required for each generation connection to the new tapped electrical facility or existing Y-WEA station. Number of generation connections: _____

Will an alternate source of auxiliary power be available during metering equipment maintenance?

Yes ____ No _____

For Generation Facilities requiring multiple metering installations, will a transfer bus on the generation side of the metering require that each meter set be designed for the total generation capacity? Yes _____ No _____
(Please indicate on the one-line diagram).

What type of control system will be located at the Generating Facility?

_____

_____

What protocol does the control system use?

_____

_____

Please provide a 7.5-minute quadrangle map of the site. Indicate the plant, station, transmission line, and property lines.

Physical dimensions of the proposed interconnection station:

_____

Bus length from generation to interconnection station:

_____

Line length from interconnection station to Y-WEA's Transmission or Distribution System.

_____

Number of third party easements required for transmission lines*:

_____

Is the Generating Facility located in Y-WEA's service area?

Yes _____ No _____ If No, please provide name of local provider:

_____

Please provide the following proposed schedule dates:

Begin construction Date:_____

Generator step-up transformers energized Date:_____

Generation testing Date:_____

Commercial operation Date:_____

* To be completed in coordination with Y-WEA.

(insert date)

MODEL DISTRIBUTION COOPERATIVE AGREEMENT
FOR INTERCONNECTION OF DISTRIBUTED GENERATION

SHORT FORM CONTRACT

This Interconnection Agreement ("Agreement") is made and entered into this ____ day of _____, 20____, by _____, "Cooperative"), a corporation organized under the laws of _____, and _____ ("DG Owner/Operator"), each hereinafter sometimes referred to individually as "Party" or both referred to collectively as the "Parties". In consideration of the mutual covenants set forth herein, the Parties agree as follows:

This agreement provides for the safe and orderly operation of the electrical facilities interconnecting the DG Owner/Operator's facility at (land location or description of project) and the electrical distribution facility owned by the Cooperative.

This Agreement does not supersede any requirements of any by-laws, applicable tariffs, rates, rules and regulations in place between the DG Owner/Operator and the Cooperative.

1. **Intent of Parties:** It is the intent of the DG Owner/Operator to interconnect an electric power generator to the Cooperative's electrical distribution system.

It is the intent of the Cooperative to operate the distribution system to maintain a high level of service to their customers and to maintain a high level of power quality.

It is the intent of both parties to operate the facilities in a way that ensures the safety of the public and their employees.

2. **Operating authority:** The DG Owner/Operator is responsible for establishing operating procedures and standards within their organization. The operating authority for the DG Owner/Operator shall ensure that the Operator in Charge of the generator is competent in the operation of the electrical generation system and is aware of the provisions of any operating agreements and regulations relating to the safe operation of electrical power systems.

The operating authority for the DG Owner/Operator is (name or title of operating authority, along with address and phone number).

3. **Operator in Charge:** The operator in charge is the person identified by name or job title responsible for the real time operation of all electrical facilities related to the interconnection and owned by their organization.

The operator in charge for the DG Owner/Operator is (name or title of operator in charge, along with address and phone numbers).

4. **Suspension of Interconnection:** It is intended that the interconnection should not compromise the Cooperative's protection or operational requirements. The operation of the DG Owner/Operator's System and the quality of electric energy supplied by the DG Owner/Operator shall meet the standards as specified by the Cooperative. If the operation of the DG Owner/Operator's system or quality of electric energy supplied (in the case of power export) does not meet the standards as specified, then the Cooperative will notify the DG Owner/Operator to take reasonable and appropriate corrective action. The Cooperative shall have the right to disconnect the DG Owner/Operator's System, until compliance is reasonably demonstrated. Notwithstanding, the Cooperative may in its sole discretion disconnect the DG Owner/Operator's generating plant from the Distribution Facility without notice if the operating of the Generating Plant imposes a threat, in the cooperative's sole judgement, to life and property.

5. **Maintenance Outages:** Maintenance outages will occasionally be required on the Cooperative's system, and the Cooperative will provide as much notice and planning as practical to minimize downtime.

6. **Access:** Access is required at all times by the Cooperative to the DG Owner/Operator's site for maintenance, operating and meter reading. The Cooperative reserves the right, but not the obligation, to inspect the DG Owner/Operator's facilities.

7. **Liability and Indemnification**: (DG Owner/Operator) shall assume all liability for and shall indemnify the Cooperative for any claims, losses, costs, and expenses of any kind or character to the extent that they result from (DG Owner/Operator)'s negligence or other wrongful conduct in connection with the design, construction or operation of (DG Owner/Operator)'s facility.

8. **Term:** This Agreement becomes effective when executed by both Parties and shall continue in effect until terminated. It may be canceled by DG Onwer with not less than 30 days notice to the other party. Cooperative may cancel it if DG Owner is in breach of it or is inactive for 6 months.

9. Insurance – DG Owner/Operator shall carry adequate insurance coverage that shall be acceptable to the Cooperative. ***[[MORE EXPLICIT REQUIREMENTS WILL BE ADDED TO FINAL CONTRACT]]***

AGREED TO BY

DG Owner/Operator	Y-W Electric Association, Inc.
Name: _____	Name: _____
Title: _____	Title: _____
Date: _____	Date: _____

(insert date)

MODEL DISTRIBUTION COOPERATIVE AGREEMENT FOR INTERCONNECTION AND PARALLEL OPERATION OF DISTRIBUTED GENERATION

LONG FORM CONTRACT

This Interconnection Agreement ("Agreement") is made and entered into this ____ day of _____, 20____, by _____, ("Cooperative"), a corporation organized under the laws of _____, and _____ ("DG Owner/Operator"), each hereinafter sometimes referred to individually as "Party" or both referred to collectively as the "Parties". In consideration of the mutual covenants set forth herein, the Parties agree as follows:

1. **Scope of Agreement** – This Agreement is applicable to conditions under which the Cooperative and the DG Owner/Operator agree that one or more generating facilities (described in Exhibit A) owned by the DG Owner/Operator of _____ kW or less, to be interconnected at _____ kV or less ("Facilities") may be interconnected to the Cooperative's electric power distribution system ("System").

2. **Establishment of Point of Interconnection** – The point where the electric energy first leaves the wires or facilities owned by the Cooperative and enters the wires or facilities provided by DG Owner/Operator is the "Point of Interconnection." Cooperative and DG Owner/Operator agree to interconnect the Facilities at the Point of Interconnection in accordance with the Cooperative's rules, regulations, by-laws, rates, and tariffs (the "Rules") which are incorporated herein by reference. The interconnection equipment installed by the DG Owner/Operator ("Interconnection Facilities") shall be in accordance with the Rules as well.

3. **Responsibilities of Cooperative and DG Owner/Operator for Installation, Operation and Maintenance of Facilities** – DG Owner/Operator will, at its own cost and expense, install, operate, maintain, repair, and inspect, and shall be fully responsible for, its Facilities and Interconnection Facilities, unless otherwise specified on Exhibit A. DG Owner/Operator shall conduct operations of its Facilities and Interconnection Facilities in compliance with all aspects of the Rules and in accordance with industry standard prudent engineering practice. The Cooperative shall conduct operations of its electric distribution facilities in compliance with all aspects of the Rules, or as further

described and mutually agreed to in the applicable Facilities Schedule attached hereto as Exhibit A. Maintenance of Facilities and Interconnection Facilities shall be performed in accordance with the applicable manufacturers' recommended maintenance schedule. The DG Owner/Operator agrees to cause its Facilities and Interconnection Facilities to be constructed in accordance with the Rules and specifications equal to or better than those provided by the National Electrical Safety Code and the National Electrical Code, both codes approved by the American National Standards Institute, in effect at the time of construction.

The DG Owner/Operator covenants and agrees to cause the design, installation, maintenance, and operation of, its Facilities and Interconnection Facilities so as to reasonably minimize the likelihood of a malfunction or other disturbance, damaging or otherwise affecting or impairing the System. DG Owner/Operator shall comply with all applicable laws, regulations, zoning codes, building codes, safety rules and environmental restrictions applicable to the design, installation, operation and maintenance of its Facilities and Interconnection Facilities.

Cooperative will notify DG Owner/Operator if there is evidence that the Facilities' or Interconnection Facilities' operation causes disruption or deterioration of service to other customers served from the System or if the Facilities' or Interconnection Facilities' operation causes damage to the System. DG Owner/Operator will notify the Cooperative of any emergency or hazardous condition or occurrence with the DG Owner/Operator's Facilities or Interconnection Facilities, which could affect safe operation of the System.

4. **Operator in Charge** – The DG Owner/Operator shall each identify an individual (by name or title) who will perform as "Operator in Charge" of the Facilities and the DG Owner/Operator portion of the Interconnection Facilities. This individual must be familiar with this Agreement as well as provisions of the Rules and any other agreements or regulations that may apply.

5. **Power Sales to Cooperative -** Interconnection of the Facilities with the System does not grant the DG Owner/Operator the right to export power nor does it constitute an agreement by the Cooperative to purchase or wheel excess power.[1]

6. **Limitation of Liability and Indemnification**

a. Notwithstanding any other provision in this Agreement, with respect to the Cooperative's provision of electric service to DG Owner/Operator and the services provided by the Cooperative pursuant to this Agreement, Cooperative's liability to

[1] If the DG Owner/Operator wishes to export power, separate agreements must be in place for power purchase and for wheeling.

DG Owner/Operator shall be limited as set forth in the Cooperative's tariffs and terms and conditions for electric service, which are incorporated herein by reference.

b. For the purposes of this Agreement, a Force Majeure event is any event: (a) that is beyond the reasonable control of the affected party; and (b) that the affected party is unable to prevent or provide against by exercising reasonable diligence, including the following events or circumstances, but only to the extent that they satisfy the preceding requirements: acts of war, public disorder, rebellion or insurrection; floods, hurricanes, earthquakes, lighting, storms or other natural calamities; explosions or fires; strikes, work stoppages or labor disputes; embargoes; and sabotage. If a Force Majeure event prevents a party from fulfilling any obligations under this agreement, such party will promptly notify the other party in writing and will keep the other party informed on a continuing basis as to the scope and duration of the Force Majeure event. The affected party will specify the circumstances of the Force Majeure event, its expected duration and the steps that the affected party is taking to mitigate the effect of the event on its performance. The affected party will be entitled to suspend or modify its performance of obligations under this Agreement but will use reasonable efforts to resume its performance as soon as possible.

c. Notwithstanding Paragraph 6.b of this Agreement, the DG Owner/Operator shall assume all liability for and shall indemnify the Cooperative and its members, trustees, directors, officers, managers, employees, agents, representatives, affiliates, successors and assigns for and shall hold them harmless from and against any claims, losses, costs, and expenses of any kind or character to the extent that they result from DG Owner/Operator's negligence or other wrongful conduct in connection with the design, construction, installation, operation or maintenance of the Facilities or Interconnection Facilities. Such indemnity shall include, but is not limited to, financial responsibility for (a) monetary losses; (b) reasonable costs and expenses of defending an action or claim; (c) damages related to death or injury; (d) damages to property; and (e) damages for the disruption of business.

d. Cooperative and DG Owner/Operator shall each be responsible for the safe installation, maintenance, repair and condition of their respective lines, wires, switches, or other equipment or property on their respective sides of the Point of Interconnection. The Cooperative does not assume any duty of inspecting the DG Owner/Operator's lines, wires, switches, or other equipment or property and will not be responsible therefor. DG Owner/Operator assumes all responsibility for the electric service supplied hereunder and the facilities used in connection therewith at or beyond the Point of Interconnection.

e. For the mutual protection of the DG Owner/Operator and the Cooperative, only with Cooperative prior written authorization are the connections between the

Cooperative's service wires and the DG Owner/Operator's service entrance conductors to be energized.

7. **Testing and Testing Records** – The DG Owner/Operator shall provide to the Cooperative all records of testing. Testing of protection systems for intermediate and large units shall be limited to records of compliance with standard acceptance procedures and by industry standards and practices. These records shall include testing at the start of commercial operation and periodic testing thereafter. Factory testing of pre-packaged Interconnection Facilities and the protective systems of small units shall be acceptable. In the case of a factory test, the DG Owner/Operator needs to provide a written description and certification by the factory of the test, the test results, and the qualification of any independent testing laboratory. In addition, the settings of the equipment being installed are to be approved by the Cooperative prior to DG operation.

8. **Right of Access, Equipment Installation, Removal & Inspection** – The Cooperative may send an employee, agent or contractor to the premises of the DG Owner/Operator at any time whether before, during or after the time the Facilities first produce energy to inspect the Facilities and Interconnection Facilities, and observe the Facility's installation, commissioning (including any testing), startup, operation, and maintenance.

At any time Cooperative shall have access to DG Owner/Operator's premises for any reasonable purpose in connection with the interconnection described in this Agreement, the Rules, or to provide service to its customers.

9. **Disconnection of Facilities** – DG Owner/Operator retains the option to disconnect its Facilities from the System, provided that DG Owner/Operator notifies the Cooperative of its intent to disconnect by giving the Cooperative at least thirty (30) days' prior written notice. Such disconnection shall not be a termination of this Agreement unless DG Owner/Operator exercises rights under Section 12 that do not lead to a resolution of the issue.

DG Owner/Operator shall disconnect Facilities from the System upon the effective date of any termination resulting from and required by actions under Section 12.

Cooperative shall have the right to disconnect or cause the DG Owner/Operator to disconnect the Facilities from the System and suspend service in cases where continuance of service to DG Owner/Operator will endanger persons or property. During the forced outage of the System serving DG Owner/Operator, Cooperative shall have the right to suspend service and disconnect or cause the DG Owner/Operator to disconnect the Facilities from the System to effect repairs on the System, but the Cooperative shall use its reasonable efforts to provide the DG Owner/Operator with reasonable prior notice.

10. **Metering** – The Cooperative shall purchase, own, install and maintain such metering equipment as may be necessary to meter the electrical output of the Facilities in accordance with Section 10. All costs associated therewith shall be borne by the DG Owner/Operator. Metering shall meet accuracy standards required for equivalent electrical services and can be done with standard meters or any devices that meet data collection and accuracy requirements. For Facilities greater than 200 kW, telemetry may be required by Cooperative to monitor real-time output and other DG functions for large and medium generators that are operated remotely[2]. Telemetry data shall be available to the Cooperative and the communication of such data shall be compatible with the Cooperative's communication methods.

11. **Insurance** – DG Owner/Operator shall carry adequate insurance coverage that shall be acceptable to the Cooperative. ***[[MORE EXPLICIT REQUIREMENTS WILL BE ADDED TO FINAL CONTRACT]]***

12. **Effective Term and Termination Rights** – This Agreement becomes effective when executed by both Parties and shall continue in effect until terminated. This Agreement may be terminated as follows: (a) DG Owner/Operator may terminate this Agreement at any time by giving the Cooperative at least sixty (60) days' written notice; (b) Cooperative may terminate upon failure by the DG Owner/Operator to generate energy from the Facilities within six (6) months after completion of the interconnection; (c) either Party may terminate by giving the other Party at least thirty (30) days prior written notice that the other Party is in default of any of the terms and conditions of the Agreement or the Rules or any rate notice schedule, tariff, regulation, contract, or policy of the Cooperative, so long as the specifies the basis for termination and there is opportunity to cure the default; (d) Cooperative may terminate by giving DG Owner/Operator at least sixty (60) days notice in the event that there is a material change in an applicable law, or any requirement of the Cooperative's wholesale electric suppliers or of any transmission utility, independent system operator or regional transmission organization having responsibility for the operation of any part of the System.

13. **Compliance with Laws, Rules and Tariffs** – Both the Cooperative and the DG Owner/Operator shall be responsible for complying with the laws of the state of ___ _____, and the Rules. The interconnection and services provided under this Agreement shall at all times be subject to the terms and conditions set forth in the Rules, which Rules are hereby incorporated into this Agreement by this reference. The Cooperative may make changes in any of the Rules at any time; as amended, the Rules shall continue to be incorporated into this agreement.

14. **Severability** –If any portion or provision of this Agreement is held or adjudged for any reason to be invalid or illegal or unenforceable by any court of competent

[2] Telemetry is not required if it is prevented via protective relaying from injecting energy into the Cooperative distribution system.

jurisdiction, such portion shall be deemed separate and independent, and the remainder of this Agreement shall remain in full force and effect.

15. **Amendment** – This Agreement may be amended only upon mutual agreement of the Parties, which amendment will not be effective until reduced to writing and executed by the Parties.

16. **Entirety of Agreement and Prior Agreements Superseded** – This Agreement, including the Rules and all attached Exhibits and Facilities Schedules, which are expressly made a part hereof for all purposes, constitutes the entire agreement and understanding between the Parties with regard to the interconnection of the facilities of the Parties at the Points of Interconnection expressly provided for in this Agreement. The Parties are not bound by or liable for any statement, representation, promise, inducement, understanding, or undertaking of any kind or nature (whether written or oral) with regard to the subject matter hereof not set forth or provided for herein or in the DG Owner/Operator application, or other written information provided by the DG Owner/Operator in compliance with the Rules. It is expressly acknowledged that the Parties may have other agreements covering other services not expressly provided for herein, which agreements are unaffected by this Agreement.

17. **Assignment** – At any time during the term of this Agreement, the DG Owner/Operator may assign this Agreement to a corporation, an entity with limited liability or an individual (the "Assignee") to whom the DG Owner/Operator transfers ownership of the Facilities; provided that the DG Owner/Operator obtains the consent of the Cooperative in advance of the assignment. The Cooperative's consent will be based on a determination that the Assignee is financially and technically capable to assume ownership and/or operation of the Facilities, which will not be unreasonably witheld. The company or individual to which this Agreement is assigned will be responsible for the proper operation and maintenance of the Facilities, and must agree in writing to be subject to all provisions of this Agreement. Cooperative may also assign the Agreement to another entity with the written approval of the DG Owner/Operator.

18. **Notices** – Notices given under this Agreement are deemed to have been duly delivered if hand delivered or sent by United States certified mail, return receipt requested, postage prepaid, to:

(a) If to Cooperative:

_____

_____

_____

(b) If to DG Owner/Operator:

_____

_____

_____

The above-listed names, titles, and addresses of either Party may be changed by written notification to the other, notwithstanding Section 18.

19. **Invoicing and Payment** – Invoicing and payment terms for services associated with this Agreement shall be consistent with applicable Rules.

20. **Limitations (No Third-Party Beneficiaries, Waiver, etc.)** – This Agreement is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties. This Agreement may not be assigned by the DG Owner/Operator without the prior written consent of the Cooperative as specified in Section 17. The failure of a Party to this Agreement to insist, on any occasion, upon strict performance of any provision of this Agreement will not be considered to waive the obligations, rights, or duties imposed upon the Parties.

21. **Headings** – The descriptive headings of the various articles and sections of this Agreement have been inserted for convenience of reference only and are to be afforded no significance in the interpretation or construction of this Agreement.

22. **Multiple Counterparts** – This Agreement may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

IN WITNESS WHEREOF, the Parties have caused this Agreement to be signed by their respective duly authorized representatives.

Y-W ELECTRIC ASSOCIATION, INC. [DG OWNER/OPERATOR NAME]

BY: _____ BY: _____

TITLE: _____ TITLE: _____

DATE: _____ DATE: _____

EXHIBIT A

LIST OF FACILITIES SCHEDULES AND POINTS OF INTERCONNECTION

Facility Schedule No.	Name of Point of Interconnection

[Insert Facilities Schedule number and name for each Point of Interconnection]

DG Owner/Operator will, at its own cost and expense, operate, maintain, repair, and inspect, and shall be fully responsible for its Facilities, unless otherwise specified on Exhibit A.

FACILITIES SCHEDULE NO.

[The following information is to be specified for each Point of Interconnection, if applicable]

1. Name:
2. Facilities location:
3. Delivery voltage:
4. Metering (voltage, location, losses adjustment due to metering location, and other:
5. Normal Operation of Interconnection:
6. One line diagram attached (check one):/_____ Yes /_____ No
7. Facilities to be furnished by Cooperative:
8. Facilities to be furnished by DG Owner/Operator:
9. Cost Responsibility:
10. Control area interchange point (check one): /_____ Yes /_____ No
11. Supplemental terms and conditions attached (check one): /_____ Yes /_____ No
12. Cooperative rules for DG interconnection attached (check one): /_____ Yes / _____ No

[COOPERATIVE NAME]	[DG OWNER/OPERATOR NAME]
BY:_____	BY:_____
TITLE:_____	TITLE:_____
DATE:_____	DATE:_____