

COLORADO DEPARTMENT OF REGULATORY AGENCIES

Public Utilities Commission

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PART 3 RULES REGULATING ELECTRIC UTILITIES

RENEWABLE ENERGY STANDARD

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[indicates omission of unaffected rules]

3665. [Reserved.]

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[indicates omission of unaffected rules]

3806. – 3849. [Reserved.]

INTERCONNECTION PROCEDURES AND STANDARDS.

3850. Applicability.

The following interconnection procedures shall apply to the interconnection of all retail renewable distributed generation and other distributed energy resources including energy storage systems that operate in parallel with and are connected to the utility, when such interconnections are not subject to the jurisdiction of FERC. This rule largely tracks the 2013 FERC amended version of the FERC 2006 Small Generator Interconnection Procedures.

3851. Overview and Purpose.

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 utilities are expected to meet basic standards for electric system infrastructure and operational security, including physical, operational, and cyber-security practices.

The purpose of these rules is to establish reasonable interconnection procedures and insurance requirements all utilities to adhere to when interconnecting retail renewable distributed generation, and other distributed energy resources that connect to a utility's system that operate in parallel with and are connected to the utility.

3852. Definitions.

The following definitions apply only to rules 3850 to 3859.

- (a) "Business day" means Monday through Friday, excluding federal holidays.
- (b) "Distributed energy resource" or "DER" means the interconnection customer's source of electric power connected to the utility's distribution grid, including retail renewable distributed generation, other small generation facilities for the production of electricity, energy storage systems, or combination of any of these elements, as identified in the interconnection request, but shall not include the interconnection facilities not owned by the interconnection customer. DER includes an interconnection system or a supplemental DER device that is necessary for compliance with IEEE 1547-SA, until January 1, 2022, at which time new DERs applying for interconnection will comply with IEEE 1547 2018. This rule does not include any later amendments or editions of this standard. This standard is available for public inspection at the Commission's office, 1560 Broadway, Suite 250, Denver, CO 80202.
- (c) "Distribution system" means the utility's facilities and equipment used to transmit electricity to ultimate usage points such as homes and industries directly from interconnection resources 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.
- (d) "Energy storage system" means any commercially available, customer-sited system or utility-sited system, including batteries and batteries paired with on-site generation, that does not generate energy, that is capable of retaining, storing, and delivering electrical energy by chemical, thermal, mechanical, or other means.
- (e) "Export capacity" means the amount of alternating current (AC) electrical energy that an interconnection resource is intended to transfer to the utility's system across the point of interconnection.
- (f) "Highly seasonal circuit" means a circuit with a ratio of annual peak load to off-season peak load greater than six.
- (g) "Inadvertent export" means the potential condition in which a normally non-exporting or limited-exporting DER experiences a momentary export that does not exceed limitations specified in paragraph 3853(c).

- (h) “Interconnection agreement” means a contract between the interconnection customers and the utility that formally documents terms and conditions related to the operation and maintenance of any DER in accordance with the utility’s tariffs on file with the Commission.
- (i) “Interconnection customer” or “IC” means any entity, including the utility, any affiliates or subsidiaries of either, that proposes to interconnect its DER with the utility’s system.
- (j) “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 DER and the point of interconnection, including any modification, additions or upgrades that are necessary to physically and electrically interconnect the DER to the utility’s system. Interconnection facilities are sole use facilities and shall not include distribution upgrades.
- (k) “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 DER that is interconnected with the utility’s system.
- (l) “Interconnection resource” means the interconnection customer’s source of electric power connected to the utility’s distribution grid, including retail renewable distributed generation, other small generation facilities for the production of electricity, energy storage systems, bidirectional storage, electric vehicle chargers with vehicle to grid, vehicle to home, vehicle to building or combination of any of these elements, as identified in the interconnection request, but shall not include the interconnection facilities not owned by the interconnection customer. “Interconnection resource” includes an interconnection system or a supplemental DER device that is necessary for compliance with IEEE Standard 1547-SA, until January 1, 2022, at which time new DERs applying for interconnection will comply with IEEE 1547-2018. This rule does not include any later amendments or editions of this standard. This standard is available for public inspection at the Commission’s office, 1560 Broadway, Suite 250, Denver, CO 80202.
- (m) “Interconnection tariffs” are required filings from the utilities that set forth certain fees associated with interconnection. Tariff filings would accommodate utility-specific costs, while allowing for appropriate statewide standardization in the provisions set forth.
- (n) “Line section” means that portion of the utility’s electric delivery system that is connected to a Customer and bounded by automatic sectionalizing devices or the end of the distribution line.
- (o) “Material modification” means a modification that has a material impact on the cost or timing of processing an application with a later queue priority date or a change in the point of interconnection. A material modification does not include, for example: a change of ownership of an interconnection resource; changes to the address of the generating facility, so long as the generating facility remains on the same parcel; a change or replacement of interconnection resource that is a like-kind substitution in size, ratings, impedances, efficiencies, or capabilities of the equipment specified in the original application; or a reduction in the capacity of the interconnection resource of ten percent or less.

- (p) “Minor modifications” means modifications to the utility’s distribution system or to the interconnection facilities that do not have a material impact on the cost or on the timing of an interconnection request.
- (q) “Non-exporting system” means an interconnection resource that is designed so that it does not intentionally transfer electrical energy to the utility’s distribution or transmission system across the point of common coupling. Such systems may be used to supply part or all of a customer’s load continuously or during an outage. A system can be non-exporting by virtue of inverter programming or by some other on-site limiting element. Non-exporting systems may or may not produce inadvertent exports as defined in paragraph (g) of this rule.
- (r) “Operating mode” means the mode of DER operational characteristics that determines the performance during normal and abnormal conditions. For example, an operating mode such as “export only,” “import only,” and “no exchange.”
- (s) “Parallel operation” means a DER facility that is connected to the utility’s system and can supply AC electricity to the interconnection customer simultaneously with the utility’s supply of AC electricity.
- (t) “Party” or “Parties” means the utility, interconnection customer, or any combination thereof.
- (u) “Point of interconnection” means the point where the interconnection facilities connect with the utility’s system.
- (v) “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.
- (w) “System upgrades” means the additions, modifications, and upgrades to the utility’s distribution or Commission-jurisdictional transmission system at or beyond the point of interconnection to facilitate interconnection of interconnection resources and render the service necessary to effect the interconnection customer’s operation of interconnection resources. System upgrades do not include interconnection facilities.
- (x) “Transmission system” means an interconnected group of transmission lines and associated equipment for the movement or transfer of electric energy between points of supply and points at which it is transformed for delivery to customers or is delivered to other electric systems.
- (y) “Utility system” means the facilities owned, controlled, or operated by the utility that are used to provide electric service under the tariff.
- (z) “Upgrades” means the additions and modifications to the utility’s system at or beyond the point of interconnection that are necessary to interconnect an interconnection resource. Upgrades do not include interconnection facilities.

3853. General Interconnection Procedures.

- (a) Pre-application procedures.

- (I) 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.
- (II) 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 web site.
- (III) In response to an informal pre-application request, the utility shall provide electric system information for specific locations, feeders, or small areas 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.
- (IV) In addition to the information described in subparagraphs 3853(a)(I) and (III), which may be provided in response to an informal request, an interconnection customer may submit a formal written request for a pre-application report on a proposed interconnection at a specific site using a form supplied by the utility, unless such information is confidential and cannot be provided pursuant to a confidentiality agreement. The utility may charge up to a Commission-approved fee for the pre-application report. Upon completion, each pre-application report shall be dated and publicly posted to the utility's website with any customer identifying information redacted.
 - (A) The utility shall provide the pre-application report to the interconnection customer within 20 business days of receipt of the completed request form and payment of the fee.
 - (B) The pre-application report shall be non-binding on the utility and shall not confer any rights to the interconnection customer. The provided information does not guarantee that an interconnection may be completed. Data provided in the pre-application report may become outdated at the time of the submission of the complete interconnection request.
 - (C) The pre-application report need only include existing information. A pre-application report request does not obligate the utility to conduct a study or other analysis of the proposed interconnection resource in the event that data is not readily available.
 - (D) If the utility cannot complete all or some of a pre- application report due to lack of available data, the utility should nonetheless explain what information is not available and why it is not available, and the utility shall provide the interconnection customer with a pre- application report that includes the data that is available.

- (E) The utility shall, in good faith, include data in the pre- application report that represents the best available information at the time of reporting. The pre-application report will include the following information:
- (i) total capacity (in MW) of substation/area bus, bank or circuit based on normal or operating ratings likely to serve the proposed point of interconnection;
 - (ii) existing aggregate generation DER capacity (in MW AC) interconnected to a substation/area bus, bank or circuit (i.e., amount of DER online) likely to serve the proposed point of interconnection;
 - (iii) aggregate queued DER capacity (in MW AC) for a substation/area bus, bank or circuit (i.e., amount of DER in the queue) likely to serve the proposed point of interconnection;
 - (iv) available capacity (in MW AC) of substation/area bus or bank and circuit likely to serve the proposed point of interconnection (i.e., total capacity less the sum of existing aggregate DER capacity and aggregate queued DER capacity);
 - (v) substation nominal distribution voltage and/or transmission nominal voltage, if applicable;
 - (vi) nominal distribution or transmission circuit voltage at the proposed point of interconnection whether the proposed DER is eligible for the Level 1, Level 2 or non-export process;
 - (vii) approximate circuit distance between the proposed point of interconnection and the substation;
 - (viii) relevant line section(s) actual or estimated peak load and minimum load data, including daytime minimum load as described in the supplemental review minimum load screen in subparagraph 3855(d)(VI)(A) and absolute minimum load at the time of DER production, when available;
 - (ix) number and rating of protective devices and number and type (standard, bi-directional) of voltage regulating devices between the proposed point of interconnection and the substation/area. Identify whether the substation has a load tap changer;
 - (x) number of phases available at the proposed point of interconnection. If a single phase, distance from the three-phase circuit;
 - (xi) whether the point of interconnection is located on a spot network, grid network, or radial supply; and
 - (xii) existing or known constraints such as, but not limited to, electrical dependencies at that location, short circuit interrupting capacity issues,

power quality or stability issues on the circuit, capacity constraints, or secondary networks, based on the proposed point of interconnection.

(b) Capacity of the DER.

- (I) If the interconnection request is for an increase in capacity for an existing DER, the interconnection request shall be evaluated on the basis of the new total capacity of the DER, except as provided below in subparagraph 3853(c)(III).
- (II) If the interconnection request is for a DER that includes multiple components 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 components, except as provided below in subparagraph 3853(c)(III).
- (III) The interconnection request shall be evaluated using the maximum rated capacity of the DER, except as provided below in subparagraph 3853(c)(III). At the utility's discretion in accordance with subparagraph 3853(c)(III), the interconnection request may be evaluated using less than the maximum rated capacity of the DER if the utility determines that the DER is only capable of injecting less power into the utility's system.

(c) Energy storage interconnections.

- (I) Non-exporting energy storage may inadvertently export, so long as the magnitude is less than the energy storage's nameplate rating (kW-gross) and the duration of export of power from the customer's energy storage is less than 30 seconds for any single event. There are no limits to the number of events. Inadvertent export events shall not exceed thermal, service voltage, power quality or network limits defined within Commission rules or interconnection requirements. For good cause shown, the Commission may grant a variance of this section.
- (II) When a storage system is installed in conjunction with a DER facility, both shall be reviewed at the same time and be included in one interconnection agreement.
- (III) Interconnection requests are reviewed based on the combined nameplate ratings of systems accounting for their export capacity, and energy storage operating mode. The ongoing operation capacity portion of the interconnection review is based on the actual simultaneous performance AC ratings, taking into account the operational differences of load offset and export. If the contribution of the energy storage to the total contribution is limited by programming of the maximum active power output, use of a power control system, use of a power relay, or some other mutually agreeable, on-site limiting element, only the capacity that is designed to inject electricity to the utility's distribution or transmission system (other than inadvertent exports and fault contribution) will be used within certain technical screens and evaluations as specified in paragraphs 3855(b) and (d).
- (IV) Failure of hardware or software system(s) intended to limit energy storage export capacity shall cause the energy storage system to enter a safe operating state. An energy storage system combined with a UL 1741 certified power control system shall be considered capable of entering a safe operating state upon failure of hardware or

software system(s). When mutually agreed fail-safe provisions are not provided, at the utility's discretion, the interconnection request may be evaluated using the maximum rated capacity of the energy storage system.

- (V) When a storage system is installed at the same point of interconnection location as an existing interconnected DER facility, the review level will be based upon the incremental addition of the DER rated capacity and the exporting storage system rated capacity as provided in subparagraph 3853(c)(III).
 - (IV) A storage system may be located on the same side of a production meter as a generating facility when a production meter is required by these rules provided that the storage system is either non-exporting at the service meter or is charged exclusively by the generating facility and only the production recorded by the production meter will be eligible for incentives.
- (d) Interconnection requests.
- (I) The interconnection customer shall submit its interconnection request to the utility, together with the processing fee or deposit specified in the interconnection request. Additional fees or deposits shall not be required, except as otherwise specified in these procedures. A single request to interconnect may be submitted by the interconnection customer distributed generation paired with energy storage systems and shall be subject to one interconnection agreement.
 - (II) The interconnection request shall be date-stamped and time-stamped upon receipt. The original date-stamped and time-stamp applied to the interconnection request at the time of its original submission shall be the order in which the utility reviews applications to determine completeness.
 - (III) 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 the IC.
 - (IV) 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. The IC may re-submit the application within one year without paying an additional interconnection application fee.
 - (V) An interconnection request will be deemed complete upon submission of the listed information to the utility. The interconnection request shall be date-stamped and time-stamped upon being deemed complete. This date shall be accepted as the qualifying date-stamp and time-stamp for the purposes of any timetable in subsequent procedures.

- (VI) Any modification to interconnection resource data or equipment configuration or to the interconnection site that is a material modification, may be deemed by the utility to be a withdrawal of the interconnection request and may require submission of a new interconnection request. A new interconnection request shall not be required for minor modifications to interconnection resource data or equipment configuration or to the interconnection site. Within ten business days of receipt of a proposed modification, the utility, in consultation with an affected system owner, if applicable, shall evaluate whether a proposed modification constitutes a material modification.
- (A) If the proposed modification is determined to be a material modification, then the utility shall notify the IC in writing that the customer may: withdraw the proposed modification; or proceed with a new interconnection request for such modification. The IC shall provide its determination in writing to the utility within ten business days after the utility provides the material modification determination results. If the IC does not provide its determination, the customer's request shall be deemed withdrawn.
- (B) If the proposed modification is determined not to be a material modification, then the utility shall notify the IC in writing that the modification has been accepted and that the IC shall retain its eligibility for interconnection, including its place in the interconnection queue.
- (C) Any dispute as to the utility's determination that a modification constitutes a material modification shall proceed in accordance with the dispute resolution provisions in these procedures.
- (VII) 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 interconnection resource;
- (B) an option to purchase or acquire a leasehold site for such purpose which may include a letter of intent; 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.
- (D) For generating facilities utilizing the Level 1 25 kW AC inverter process, proof of site control may be demonstrated by the IC's signature on the interconnection application.
- (VIII) The utility shall place interconnection requests in a first come, first served order per feeder, per substation transformer, and per substation based upon the date an application is complete pursuant to subparagraph 3853(d)(V). 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.

- (e) Evaluation of interconnection requests.
 - (I) A request to interconnect an interconnection resource no larger than 25 kW AC, which may be paired with a non-exporting storage system no larger than 25 kW AC, shall be evaluated under the Level 1 Process.
 - (II) If not eligible for Level 1, a request to interconnect an interconnection resource with a combined nameplate rating larger than 25 kW AC shall be evaluated under the Level 2 Process (Fast Track) in accordance with the eligibility requirements in paragraph 3855(a).
 - (III) A request to interconnect an interconnection resource that does not pass the Level 1 or Level 2 Process shall be evaluated under the Level 3 Process.
 - (IV) Non-exporting interconnection resources shall be evaluated under the simplified “non-export” interconnection processes outlined in rule 3859. The “non-export” interconnection process is also applicable to additions of new non-exporting interconnection resources paired with existing interconnection resources when the existing interconnection resources have already executed an interconnection agreement.
- (f) Interconnection agreements.
 - (I) Any interconnection resource operating in parallel with the utility’s system is required to have an interconnection agreement with the utility to ensure safety, system reliability, and operational compatibility. References in these procedures to interconnection agreement are to the utility’s interconnection agreement as provided on its website, which interconnection agreement is subject to Commission approval upon request.
 - (II) Interconnection agreements shall survive transfer of ownership of the interconnection resource to a new owner when the new owner agrees in writing to comply with the terms of the agreement and so notifies the utility.
 - (III) After receiving an interconnection agreement from the utility, the IC shall have 30 business days 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. The utility shall provide the IC a fully executed interconnection agreement within two business days after receiving a signed interconnection agreement from the IC. After the parties sign the interconnection agreement, the interconnection of the interconnection resource shall proceed under the provisions of the interconnection agreement.
 - (IV) Once the interconnection resource has been authorized by the utility to commence operation in parallel with the utility system, the interconnection customer shall abide by all rules and procedures pertaining to parallel operation in the utility’s tariffs and in the interconnection agreement.

- (V) The interconnection customer shall be responsible for the utility's reasonable and necessary cost for the purchase, installation, operation, maintenance, testing, repair and replacement of utility upgrades or utility interconnection facilities not required to serve other utility customers. Such upgrades or facilities shall be specified in the interconnection agreement unless otherwise covered by the utility's tariff or excluded by interconnection agreement. Utilities may not refuse to provide an IC with a fixed dollar amount to cover reasonable and necessary utility upgrades or utility interconnection facilities in order to facilitate an interconnection.
- (g) Reasonable efforts. The utility and IC 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 or IC cannot meet a deadline provided herein, it shall notify the IC or the utility if the notifying party is the IC, and 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.
- (h) Disputes.
 - (I) The utility and IC shall agree to attempt to resolve all disputes arising out of the interconnection process according to the provisions of this subparagraph.
 - (II) 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.
 - (III) 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.
 - (IV) 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.
 - (V) 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, pursuant to the Rules of Practice and Procedure, 4 Code of Colorado Regulations 723-1.
- (i) Interconnection metering. Except as otherwise required by other Commission's rules or by the terms of a Commission-approved program offered by the utility, any metering necessitated by the use of the interconnection resource shall be installed at the IC's expense in accordance with Commission requirements or the utility's specifications. For systems below 25 kW AC, additional metering shall not be installed for the purposes of monitoring energy storage systems.
- (j) Commissioning tests. Commissioning tests of the IC's installed interconnection resource shall be performed pursuant to applicable codes and standards, including IEEE 1547.1 "IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric

Power Systems” (2205). This rule does not include any later amendments or editions of this standard. This standard is available for public inspection at the Commission’s office, 1560 Broadway, Suite 250, Denver, CO 80202. 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.

- (k) Confidentiality.
- (I) 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.
 - (II) 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.
 - (A) 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.
 - (B) 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.
 - (III) 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.
- (l) Comparability. The utility shall receive, process, and analyze all interconnection requests in a timely manner as set forth in this rule. The utility shall use the same reasonable and expeditious

efforts in processing and analyzing interconnection requests from all interconnection customers, whether the interconnection resource is owned or operated by the utility, its subsidiaries or affiliates, or others.

- (m) 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 each step of the interconnection request approvals and disapprovals, enumerated in these rules and justification for the actions taken on the interconnection requests.
- (n) 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 this rule. The utility will include such affected system operators in all meetings held with the IC as required by this rule. 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 and shall provide to the IC any analysis and data underlying the affected system utility's determinations.
- (o) Insurance. A Utility may only require an applicant (i.e., an interconnection customer) to purchase insurance covering Utility damages, and then only in amounts stated below. An interconnection customer, at its own expense, shall secure and maintain in effect during the term of the interconnection agreement, insurance coverage in the following amounts:

- (I) For non-inverter-based Generating Facilities:

- Nameplate Rating > 5 MW \$3,000,000 for each occurrence

- 2 MW < Nameplate Rating < 5 MW \$2,000,000 for each occurrence

- 500 kW < Nameplate Rating < 2 MW \$1,000,000 for each occurrence

- 50 kW < Nameplate Rating < 500 kW \$500,000 for each occurrence

- Nameplate Rating < 50 kW - no additional insurance

- (II) For inverter-based Generating Facilities:

- Nameplate Rating > 5 MW \$2,000,000 for each occurrence

- 1 MW < Nameplate Rating > 5 MW \$1,000,000 for each occurrence

- Nameplate Rating < 1 MW no insurance

- (III) Colorado governmental entities that self-insure against liability in amounts above those required in paragraph (o) for interconnection resources up to 2 MW or to the replacement value of the interconnection resource for those interconnection resource above 2 MW, shall not be required to purchase additional insurance or to add the utility as an additional

insured to any policy, nor shall they be obligated to indemnify the utility, though they shall be liable for any negligent or intentional act or omission of the municipality, its employees, contractors, subcontractors, or agents.

- (IV) Certificates of Insurance evidencing the requisite coverage and provision(s) when required shall be furnished to utility prior to the date of interconnection of the interconnection resource. Utilities shall be permitted to periodically obtain proof of current insurance coverage from the interconnection customer in order to verify proper liability insurance coverage. Customers will not be allowed to commence or continue interconnected operations unless they provide to the utility evidence that satisfactory insurance coverage is in effect at all times.
- (p) Implementation by tariff.
- (I) Each utility shall have on file with the Commission an interconnection tariff that sets forth certain fees, deadlines and interconnection procedures. A utility's interconnection tariff shall comply with these Interconnection Rules, but when appropriate may include shorter deadlines for certain procedures.
 - (II) The interconnection tariff shall be filed along with an advice letter. Tariffs filed by cooperative electric associations shall be informational only. Tariffs filed by investor-owned electric utilities may be set for hearing and suspended in accordance with the Commission Rules of Practice and Procedure and applicable statutes.
 - (III) The tariff shall include the following provisions:
 - (A) timelines: paragraphs 3853(a),(d),(f), 3854(a), 3855(b),(c),(d), 3856(a),(b),(c),(d)
 - (B) any fees: including but not limited to those referenced at paragraphs 3853(a),(d),(f),(j), 3854(a) and (b), and 3856(a);
 - (i) The utility shall demonstrate that any fee established in tariff is cost-based.
 - (C) material modification withdrawals: paragraph 3853(d); and
 - (D) maximum rated capacity: paragraph 3853(b), and (c)
- (q) Reporting.
- (I) Each utility shall submit an interconnection report to the Commission two times per year and shall make it available to the public on its website. A cooperative electric association that has voted to exempt itself from regulation pursuant to C.R.S. § 40-9.5-103 shall submit an interconnection report to the Commission once per year. The first interconnection report shall be due 180 days after the effective date of these interconnection rules. Upon a filing by a party with proper standing showing good cause, and when necessary and appropriate, the Commission may by order increase the frequency of such reporting on a temporary basis. The report shall contain relevant totals for both the year and the most recent reporting period, including the following information listed in subparagraphs (q)(II) and (III) of this rule. The report shall also contain the total

number of missed deadlines contained in these rules in the reporting period as well as copies of any notices of delay or missed deadlines issued by the utility to an interconnection customer pursuant to paragraph 3853(g).

- (II) Pre-application reports:
 - (A) total number of reports requested;
 - (B) total number of reports in process;
 - (C) total number of reports issued;
 - (D) total number of requests withdrawn;
 - (E) maximum, mean, and median processing times from receipt of request to issuance of report; and
 - (F) number of reports processed in more than the 20 business days allowed in subparagraph 3853(a)(IV)(A).

- (III) Interconnection applications:
 - (A) total number received, broken down by:
 - (i) primary fuel type (e.g., solar, wind, bio-gas, etc.); and
 - (ii) system size (e.g., <25 kW, <1 MW, <5MW, >5MW).
 - (B) Level 1 review process.
 - (i) total number of applications processed; and
 - (ii) maximum, mean, and median processing times from receipt of complete application to provision of a counter-signed interconnection agreement.
 - (C) Level 2 review process.
 - (i) total number of applications that passed the screens in paragraph 3855(b);
 - (ii) total number of applications that failed the screens in paragraph 3855(b); and
 - (iii) maximum, mean, and median processing times from receipt of complete application to issuance of an interconnection agreement.
 - (D) Supplemental review.

- (i) total number of applications that passed the screens in paragraph 3855(d);
 - (ii) total number of applications that failed the screens in paragraph 3855(d); and
 - (iii) maximum, mean, and median processing times from receipt of complete application to issuance of interconnection agreement.
- (E) Level 3 review process:
- (i) system impact studies
 - (ii) total number of system impact studies completed under paragraph 3856(c); and
 - (iii) maximum, mean, and median processing times from receipt of a signed interconnection system impact study agreement to provision of study results.

3854. Level 1 Process (20 kW Inverter Process).

This rule establishes the procedures for evaluating an interconnection request for a certified inverter-based interconnection resource no larger than 25 kW AC which may be paired with a non-exporting energy storage system no larger than 25 kW AC. The application process uses an all-in-one document (application) that includes a simplified interconnection request, simplified procedures, and a brief set of terms and conditions.

- (a) General Level 1 procedures.
- (I) The IC completes 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 ten business days, the utility shall verify whether the interconnection resource can be interconnected safely and reliability using the same screens as applied in Level 2 Process as set forth in rule 3855 except for screens (V), (VI), (X) and (XI) which will not be deemed necessary for the Level 1 Process (25 kW AC Inverter Process). If the interconnection fails these screens, the utility shall generally consider this a failure of the Level 2 Process screens in rule 3855. The utility shall continue the interconnection review under the Level 2 Process, starting at paragraph 3855(c), provided that the IC pays the difference in the Level 2 Process application fee and deposit requirements. The utility may also review the application within the ten business day period to evaluate issues associated with highly seasonal circuits. However, 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.

- (V) Provided all the criteria of this rule 3854 are met, unless the utility determines and demonstrates that the interconnection resource cannot be interconnected safely and reliably and requires upgrades, the utility approves and executes the application and returns it to the customer within ten business days.
 - (VI) After installation, the customer returns the certificate of completion to the utility. Prior to parallel operation, the utility may inspect the interconnection resource for compliance with standards, which may include a witness test, and may schedule appropriate metering replacement, if necessary. The utilities should define “witness test” in their interconnection tariff.
 - (VII) The utility shall notify the customer that parallel operation of the interconnection resource is authorized within ten business days of the certificate of completion. If the witness test is not satisfactory, the utility has the right to disconnect the interconnection resource. 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.
- (b) Level 1 application.
- (I) The customer must provide in the application 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.
 - (II) The application is considered complete when it provides all applicable and correct information as required below. Additional information to evaluate the application may be required.
 - (III) The application shall include the following information, as applicable:
 - (A) Processing fee. A fee of _____ must accompany this application.
 - (B) Interconnection customer:
 - Name
 - Contact Person
 - Address
 - City State Zip
 - Telephone (Day) and (Evening)
 - Fax Number and E-Mail Address
 - (C) Engineering firm or Installer (If applicable):
 - Contact Person
 - Address
 - City State Zip

Telephone
Fax and E-Mail Address

- (D) Contact (if different from Interconnection Customer):
Name
Address
City State Zip
Telephone (Day) and (Evening)
Fax Number and E-Mail Address
Owner of the facility (include percent ownership by any electric utility)
- (E) DER information:
Location (if different from above)
Utility
Account number
DER components
Inverter manufacturer: _____ Model
Nameplate rating: (kW AC) (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 25 kW AC inverter process is available only for inverter-based interconnection resources no larger than 25 kW AC that meet the codes, standards, and certification requirements of specified in certain of these interconnection rules, or the utility has reviewed the design or tested the proposed interconnection resources and is satisfied that it is safe to operate.

- (F) List components of the small generating facility equipment package that are currently certified:
Equipment type certifying entity:
1.
2.
3.
4.
5.
- (G) Limited-Export / Non-Export / Limited-Import Data:
If multiple export control systems are used, provide for each control system and use additional sheets if needed.
Is export controlled to less than the Total Aggregate Nameplate Rating? Yes: No:
Method of export limitation: Power Control System / Reverse Power Protection / Minimum Power Protection / Other (describe):
Export controls are applied to how many generators? Multiple: One:
If Power Control System is used, open loop response time(s): _____
Power Control System export capacity: (kW AC) (kVA)

Energy Storage System Power Control System operating mode:
Unrestricted: Export Only: Import Only: No Exchange:
Describe which Generators the export control system controls:

(H) Interconnection customer signature and certification:

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 interconnection resource No Larger than 25kW and return the Certificate of Completion when the interconnection resource 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 25 kW and return of the certificate of completion.

Company signature: _____

Title: Date: _____

Application ID number: _____

Company waives inspection/witness test? Yes _____ No _____

(c) Level 1 terms and conditions.

(I) Construction of the facility. The interconnection customer may proceed to construct the interconnection resource when the utility approves the interconnection request (the application) and returns it to the IC.

(II) Interconnection and operation. The IC may operate the interconnection resource 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 interconnection resource 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 interconnection resource. 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 interconnection resource 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 interconnection resource 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 interconnection resource 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 interconnection resource 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 interconnection resource as allowed in the interconnection agreement and 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 interconnection resource 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) The interconnection customer is not required to provide general liability insurance coverage as part of this agreement, or through any other utility requirement.

- (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 the interconnection 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 (c)(VI) of this rule.
- (IX) Termination. The interconnection 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 interconnection resource 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 the interconnection agreement is terminated, the utility shall have the right to disconnect its facilities or direct the customer to disconnect its interconnection resource.
 - (D) Survival rights. The interconnection 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. The interconnection 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 the agreement and so notifies the utility.

3855. Level 2 Process (Fast Track).

This fast track process is available to an IC proposing to interconnect its interconnection resource with the utility's system if the interconnection resource meets the eligibility provisions in this rule 3855.

- (a) Eligibility.
 - (I) Eligibility for the Level 2 Process is determined based upon the type and size of the interconnection resource as well as the voltage of the utility line and the location of and the type of utility line at the point of interconnection. An interconnection customer may determine whether the interconnection resource is eligible for the Level 2 Process by requesting a pre-application report pursuant to subparagraph 3853(a)(IV).
 - (II) For certified inverter-based systems, the size limit of the interconnection resource varies according to the voltage of the utility line at the proposed point of interconnection. Certified inverter-based interconnection resource facilities located within 2.5 electrical circuit miles of a substation and on a mainline are eligible for the Level 2 Process under the higher thresholds pursuant to this rule 3856. The utilities should define "mainline" in their interconnection tariff.

| Level 2 Process Eligibility for Inverter-Based Systems | | |
|---|---|--|
| Line Voltage | Eligibility Regardless of Location | Eligibility Meeting Location Requirements (Mainline and Substation) |
| < 5 kV | ≤ 500 kW | ≤ 500 kW |
| ≥ 5 kV and < 15 kV | ≤ 2 MW | ≤ 3 MW |
| ≥ 15 kV and < 30 kV | ≤ 3 MW | ≤ 4 MW |
| ≥ 30 kV and < 69 kV | ≤ 4 MW | ≤ 5 MW |

- (III) All synchronous and induction facilities must be no larger than 2 MW AC to be eligible for the Level 2 Process, regardless of location.
 - (IV) In addition to the size threshold, the interconnection resource must meet the codes, standards, and certification requirements specified in certain of these interconnection rules.
 - (V) Subject to approval via the tariff amendment process, a utility may utilize tools that perform screening functions using different methodology from that set out in paragraph 3855(d) as long as the analysis is aimed at preventing the same voltage, thermal and protection limitations specified under rule 3855 and otherwise complies with these rules.
- (b) 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 following:
- (I) The proposed interconnection resource's point of interconnection must be on a portion of the utility's distribution system that is subject to the utility's tariffs. Proposed

interconnection resources on highly seasonal circuits shall also be subject to the supplemental review pursuant to paragraph 3855(d).

- (II) For interconnection of a proposed interconnection resources to a radial distribution circuit, the aggregated generation, including the proposed interconnection resources, on the line section(s) 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(s). 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. Energy storage system(s) capacity for purposes of this screen shall be based on subparagraph 3853(c)(III).
- (III) The proposed interconnection resource, 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 interconnection resource, in aggregate with other interconnection resource 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 interconnection resource shall meet the rapid voltage change and flicker requirements of IEEE Standard 1453 (2015) and IEEE Standard 1547-SA, until January 1, 2022, at which time new DERs applying for interconnection will comply with IEEE 1547- 2018 based on the appropriate test. This rule does not include any later amendments or editions of these standards. These standards are available for public inspection at the Commission's office, 1560 Broadway, Suite 250, Denver, CO 80202.
- (VI) The type of interconnection to a primary distribution line shall be determined based on the table below, including a review of the type of electrical service provided to the interconnection customer, 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 interconnection resource 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 25 kW. Energy storage system(s) capacity for purposes of this screen, shall be based on subparagraph 3853(c)(III).
- (VIII) If the proposed interconnection resource 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) For interconnection of a proposed interconnection resource to the load side of spot network protectors serving more than a single customer, the proposed interconnection resource must utilize an inverter-based equipment package and, together with the aggregated other inverter-based interconnection resource, 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 interconnection resource 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.
- (XI) For interconnection of a proposed interconnection resource to the load side of area network protectors, the proposed interconnection resource must utilize an inverter-based equipment package and, together with the aggregated other inverter-based interconnection resource, shall not exceed the smaller of ten percent of an area network's minimum load or 500 kW AC.
- (XII) The nameplate capacity of a proposed interconnection resource, in combination with the nameplate capacity of any previously interconnected interconnection resource, shall not exceed the capacity of the customer's existing electrical service unless there is a simultaneous request for an upgrade to the customer's electrical service, regardless of exporting or non-exporting designations for any of the interconnection resources.

- (c) Customer options meeting.
 - (I) If the proposed interconnection fails the screens, but the utility does not or cannot determine from the initial review whether the interconnection resource 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. The utility shall provide to the IC in writing with a detailed information on the reasons(s) for failure.
 - (II) If the utility determines the interconnection request cannot be approved without minor modifications at minimal cost; without a supplemental study or other additional studies or actions; or without significant costs to address safety, reliability, or power quality problems, the utility shall notify the IC within the five business day period after the determination 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:
 - (A) 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;
 - (B) offer to perform a supplemental review pursuant to paragraph 3855(d) and provide a non-binding good faith estimate of the costs and time of such review; or
 - (C) obtain the interconnection customer's agreement to continue evaluating the interconnection request under the Level 3 study process.
- (d) Supplemental review.
 - (I) To accept a utility's offer to conduct a supplemental review, the interconnection customer, within 15 business days of the offer, shall agree in writing to the supplemental review and submit a deposit for the estimated costs. If the written agreement and deposit have not been received by the utility within the 15 days, the interconnection request shall continue to be evaluated under the Level 3 Process, unless the request is withdrawn by the IC. 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.
 - (II) Within 30 business days following receipt of the deposit for a supplemental review, the utility will perform a supplemental review of the proposed interconnection resource using the screens set forth below, notify the interconnection customers of the results of the screens in writing, and include with the notification copies of the analysis and data underlying the utility's determinations.

- (III) The interconnection customer may specify the order in which the utility completes the supplemental review screens.
- (IV) The utility shall notify the interconnection customer of the failure of the interconnection resource in any supplement review screen or of the utility's inability to perform any screen for the interconnection resource. Within two business days of the receipt of such notice, the interconnection customer may grant the utility permission:
 - (A) to continue evaluating the proposed interconnection under this paragraph 3855(d);
 - (B) to continue evaluating the proposed interconnection under this paragraph 3855(d) subject to the utility's determination of minor modifications;
 - (C) to terminate the supplemental review and instead to continue evaluating the interconnection resource under the Level 3 Process; or
 - (D) to terminate the supplemental review upon withdrawal of the interconnection request by the interconnection customer.
- (V) Minimum load, minimum loading, and minimum load data shall be specific to time(s) that the interconnection resource exports active power to the utility.
- (VI) Supplemental review screens.
 - (A) Minimum load screen.
 - (i) The interconnection resource capacity on the line section(s) shall be less than 100 percent of the minimum load for all line sections bounded by automatic sectionalizing devices upstream of the proposed interconnection resource. Energy storage system(s), proposed and aggregated capacity for purposes of this screen, shall be based on subparagraph 3853(c)(III).
 - (ii) This screen shall be determined using 12 months of line section(s) minimum load data (including onsite load but not station service load served by the proposed interconnection resource), calculated minimum load data, or estimated minimum load data using existing data a power flow model. If minimum load data is not available or the minimum load data cannot be calculated or estimated, the utility shall include the reason(s) that it is unable to calculate, estimate or determine minimum load in its supplemental review results notification under subparagraph 3855(d)(IV).
 - (iii) The type of interconnection resource shall be taken into account when calculating or estimating circuit or line section(s) minimum load. The utility shall use daytime minimum load for solar photovoltaic (PV) interconnection resource with no battery storage (i.e., 10 a.m. to 4 p.m. for fixed panel systems and 8 a.m. to 6 p.m. for PV systems utilizing

tracking systems). The utility shall use absolute minimum load for all other types of interconnection resource.

- (iv) Only the net injection into the utility's electric system shall be considered as part of the interconnection resource when this screen is applied to interconnection resource serving some station service load.
- (v) The utility shall not consider as part of the interconnection resource the capacity known to be already reflected in the minimum load data.

(B) Voltage and power quality screen.

- (i) In aggregate with existing interconnection resource on the circuit and line section(s), the voltage regulation on the circuit and line section(s) shall be maintained in compliance with relevant requirements under all system conditions;
- (ii) in aggregate with existing interconnection resource on the circuit and line section(s), the voltage fluctuation shall be within acceptable limits as defined by IEEE Standard 1453 (2015) and conforming with IEEE Standard 1453 (2015), while also taking into account activated inverter functionality, and by the limits defined by IEEE Standard 1547 (2018). This rule does not include any later amendments or editions of these standards. These standards are available for public inspection at the Commission's office, 1560 Broadway, Suite 250, Denver, CO 80202; and
- (iii) in aggregate with existing interconnection resource on the circuit and line section(s), the harmonic levels shall meet IEEE Standard 519 (2014) limits. This rule does not include any later amendments or editions of these standards. These standards are available for public inspection at the Commission's office, 1560 Broadway, Suite 250, Denver, CO 80202.

(C) Safety and reliability screen.

- (i) The location of the proposed interconnection resource and the aggregate interconnection resource capacity on the line section(s) shall not create impacts to safety or reliability that cannot be adequately addressed without application of the Level 3 Process.
- (ii) Minimum load, minimum loading and minimum load data shall be specific to time(s) of interconnection resource export capacity.
- (iii) The utility shall consider whether the line section(s) has significant minimum loading levels dominated by a small number of customers (e.g., several large commercial customers).
- (iv) The utility shall consider whether the loading along the line section(s) is uniform or even given the sources of the screening data.

- (v) The utility shall consider whether the proposed interconnection resource is located in close proximity to a substation (i.e., less than 2.5 electrical circuit miles) and whether the line section(s) from the substation to the point of interconnection is a mainline rated for normal and emergency ampacity.
 - (vi) The utility shall consider whether the proposed interconnection resource incorporates a time delay function to prevent reconnection of the interconnection resource to the utility's system until system voltage and frequency are within normal limits for a prescribed time.
 - (vii) The utility shall consider whether operational flexibility is reduced by the proposed interconnection resource, such that transfer of the line distribution circuit/substation may trigger overloads or voltage issues.
 - (viii) The utility shall consider whether the proposed interconnection resource employs equipment or systems certified by a recognized standards organization to address technical issues such as, but not limited to, islanding, reverse power flow, and voltage quality.
- (VII) If the supplemental screening meets utility determined adequacy with minor modifications, the utility shall provide a non-binding good faith estimate of the limited cost to make such modifications to the utility's electric system upon notification of review results.
- (e) Interconnection agreements.
- (I) 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.
 - (II) 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.
 - (III) If the interconnection customer agrees to pay for the modifications to the utility's electric system as identified by the utility pursuant to subparagraph 3855(c)(II)(A), the utility will provide the interconnection customer with an executable interconnection agreement within ten business days of the customer options meeting.
 - (IV) If the interconnection customer agrees to pay for the modifications to the utility's electric system as identified by the utility pursuant to subparagraph 3855(d)(VII), the utility will provide the interconnection customer with an executable interconnection agreement within five business days of IC agreement to pay.

3856. Level 3 Process (Study Process).

This study process shall be used by an interconnection customer proposing to interconnect its interconnection resource with the utility's system if the interconnection resource does not meet the size limitations for the Level 2 Process, is not certified; or, is certified but did not pass the Level 1 Process or Level 2 Process.

- (a) Scoping meeting.
 - (I) 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.
 - (II) 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.
 - (III) 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 IC elects 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.
 - (IV) Feasibility studies, scoping studies, and facility studies may be combined or waived for simpler projects by mutual agreement of the utility and the IC. If all such studies are waived, the utility shall provide the IC an executable interconnection agreement within ten business days after the scoping meeting. If the scoping meeting is also omitted by mutual agreement, the utility shall provide the IC an executable interconnection agreement within ten business days after the interconnection request is deemed complete and this Level 2 Process is completed.
 - (V) If feasibility studies, system impact studies, and facility studies are combined, or required to be completed for a single application, a utility shall perform the combined studies within no more than 90 business days of the date upon which the IC authorizes the utility to proceed with the Level 3 Process.
 - (VI) Utility must offer a developer the opportunity to pay full fees upfront and proceed straight to the system impact study.
- (b) Feasibility study.

- (I) The feasibility study shall identify any potential adverse system impacts that would result from the interconnection of the interconnection resource. At its discretion, the utility may use the Level 2 supplemental review as described in paragraph 3855(d) as the feasibility study.
 - (II) 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.
 - (III) The scope of and cost responsibilities for the feasibility study are described in the feasibility study agreement.
 - (IV) 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.
 - (V) If the feasibility study shows the potential for adverse system impacts, the review process shall proceed to the appropriate system impact study(s).
 - (VI) If no system impact study is required and no facilities study is required for the interconnection resource, the utility shall provide the IC an executable interconnection agreement within five business days after the completion of the feasibility study.
- (c) System impact study.
- (I) Within 30 business days of executing a system impact study agreement, the utility shall perform a system impact study using the screens set forth below. A system impact study shall identify and detail the electric system impacts that would result if the proposed interconnection resource 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.
 - (II) 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.
 - (III) In instances where the feasibility study or the distribution system impact study shows potential for adverse impacts on the utility's transmission system, 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 transmission-supplied scope of the study and a transmission-supplied non-binding good faith estimate of the cost to perform the study, if such a study is required.

- (IV) 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.
 - (V) 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.
 - (VI) In order to remain under consideration for interconnection, the IC must return executed system impact study agreements, if applicable, within 30 business days.
 - (VII) A deposit of the good faith estimated costs for each system impact study may be required from the IC.
 - (VIII) The scope of and cost responsibilities for a system impact study are described in the system impact study agreement.
 - (IX) Where transmission systems and distribution systems have separate owners, such as is the case with transmission-dependent utilities 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 transmission-dependent utility to request project coordination. Affected systems shall participate in the study and provide all information necessary to prepare the study.
 - (X) If no facilities study is required for the interconnection resource, the utility shall provide the IC an executable interconnection agreement within five business days after the completion of the system impact study.
- (d) Facilities study.
- (I) Within 45 business days of executing an appropriate agreement or contract, the utility shall perform a facilities study. 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.
 - (II) 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.
 - (III) The facilities study shall include a detailed list of necessary system upgrades and an overall cost estimate, with the detailed list to indicate types of equipment, labor, operation and maintenance and other evaluated item costs, within the estimate for completing such upgrades, and identify which itemized cost estimates are uncertain and could be exceed by 125 percent if actual upgrades are completed.

- (IV) 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.
- (V) A deposit of the good faith estimated costs for the facilities study may be required from the IC.
- (VI) The scope of and cost responsibilities for the facilities study are described in a facilities study agreement.
- (VII) 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.

3857. Certification Codes and Standards.

Unless one or more of the following standards has been incorporated by reference into these interconnection rules, the Commission encourages the utilities and their interconnection customers, to whom these rules apply, to use the following standards and reference materials for guidance.

ANSI C84.1-2016 Electric Power Systems and Equipment – Voltage Ratings (60 Hertz)

ANSI/NEMA MG 1--2016, Motors and Generators

IEEE Std C37.90.1-2012, 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 C57.12.44-2014, 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 1453-2015 IEEE Recommended Practice for the Analysis of Fluctuating Installation on Power Systems

IEEE Std 1547-2018, IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces

IEEE Std 1547.1-2005, IEEE Standard Conformance Test Procedures for Equipment Interconnecting Distributed Resources with Electric Power Systems

NFPA 70 (2017), National Electrical Code

UL 1741 Inverters, Converters, and Controllers for Use in Independent Power Systems

UL 1741 SA, until January 1, 2022, at which time new DERs applying for interconnection will comply with IEEE 1547-2018, IEEE Standards for Inverters, Converters, Controllers and Interconnection System Equipment for Use with Distributed Energy Resources

3858. Certification of DER Packages.

- (a) 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 rule 3857; 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.
- (b) 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.
- (c) 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.
- (d) 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.
- (e) 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 interconnection shall be required to meet the requirements of this interconnection procedure.

(f) An equipment package does not include equipment provided by the utility.

3859. Filing of Interconnection Manual.

No later than 90 calendar days after the effective date of these rules, each utility subject to these rules, except a cooperative electric association that has voted to exempt itself from regulation pursuant to C.R.S. § 40-9.5-103, shall file its Interconnection Manual with the Commission in a miscellaneous proceeding opened by the Commission for that purpose. This filing enables the Commission to ensure the terms and conditions contained in the Interconnection Manual are just, reasonable, and not unduly discriminatory. This information should include an electronic link to the utility's filing, along with the date on which it was last updated. The utility shall update this information within 30 days after any material changes have been made to its manual. Utilities shall establish an internal process of acquiring timely feedback from stakeholders regarding the material changes provided within the Notice. Each time the utility updates the Interconnection Manual, the utility shall make available a redline highlighting the changes.

Each utility, including cooperative electric associations, shall also provide, on its web site, interconnection standards or other technical guidance not included in, but that are consistent with, these procedures.

3860. – 3874. [Reserved.]