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DEPARTMENT OF ENERGY
Federal Energy Regulatory Commission

18 CFR Part 35

[Docket No. RM22-14-000]

Improvements to Generator Interconnection Procedures and Agreements

AGENCY: Federal Energy Regulatory Commission.

ACTION: Notice of proposed rulemaking.

SUMMARY: The Federal Energy Regulatory Commission (Commission) is issuing a Notice of Proposed Rulemaking (NOPR) proposing reforms to its *pro forma* Large Generator Interconnection Procedures, *pro forma* Small Generator Interconnection Procedures, *pro forma* Large Generator Interconnection Agreement, and *pro forma* Small Generator Interconnection Agreement to address interconnection queue backlogs, improve certainty, and prevent undue discrimination for new technologies. The reforms are intended to ensure that the generator interconnection process is just and reasonable and not unduly discriminatory or preferential. The Commission invites all interested persons to submit comments on the proposed reforms, including proposed revisions to the *pro forma* interconnection procedures and agreements, and in response to specific questions.

DATES: Comments are due **[INSERT DATE 100 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]** and Reply Comments are due **[INSERT DATE 130 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Comments, identified by docket number, may be filed in the following ways. Electronic filing through https://www.ferc.gov is preferred.

- Electronic Filing: Documents must be filed in acceptable native applications and print-to-PDF, but not in scanned or picture format.
- For those unable to file electronically, comments may be filed by U.S. Postal Service mail or by hand (including courier) delivery.
    - Mail via U.S. Postal Service only: Addressed to: Federal Energy Regulatory Commission, Office of the Secretary, 888 First Street NE, Washington, DC 20426.
    - For delivery via any other carrier (including courier): Deliver to: Federal Energy Regulatory Commission, Office of the Secretary, 12225 Wilkins Avenue, Rockville, MD 20852.

The Comment Procedures Section of this document contains more detailed filing procedures.

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I. Introduction

1. Pursuant to our authority under section 206 of the Federal Power Act (FPA),[1] we are proposing reforms in this Notice of Proposed Rulemaking (NOPR) to the Commission's *pro forma* Large Generator Interconnection Procedures (LGIP), *pro forma* Small Generator Interconnection Procedures (SGIP), *pro forma* Large Generator Interconnection Agreement (LGIA), and *pro forma* Small Generator Interconnection Agreement (SGIA) to address interconnection queue backlogs, improve certainty, and prevent undue discrimination for new technologies.

2. Nineteen years ago the Commission issued Order No. 2003,[2] in which the Commission required all public utilities that own, control, or operate facilities used for transmitting electric energy in interstate commerce to have on file standard procedures and a standard agreement for interconnecting generating facilities larger than 20 MW

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[1] 16 U.S.C. 824e. Section 206 of the FPA requires that whenever the Commission finds any rate, term, or condition for the transmission of electric energy in interstate commerce or the sale of such energy at wholesale in interstate commerce to be unjust, unreasonable, unduly discriminatory, or preferential, the Commission must establish a just and reasonable and not unduly discriminatory or preferential replacement rate, term, or condition.

[2] *Standardization of Generator Interconnection Agreements & Proc.*, Order No. 2003, 68 FR 49845 (Aug. 19, 2003), 104 FERC ¶ 61,103 (2003), *order on reh'g*, Order No. 2003-A, 69 FR 15932 (Mar. 5, 2004), 106 FERC ¶ 61,220, *order on reh'g*, Order No. 2003-B, 70 FR 265 (Jan. 19, 2005), 109 FERC ¶ 61,287 (2004), *order on reh'g*, Order No. 2003-C, 70 FR 37661 (July 18, 2005), 111 FERC ¶ 61,401 (2005), *aff'd sub nom. Nat'l Ass'n of Regul. Util. Comm'rs v. FERC*, 475 F.3d 1277 (D.C. Cir. 2007) (*NARUC v. FERC*).

(called the *pro forma* LGIP, and the *pro forma* LGIA).[3] The Commission stated its expectation that the changes would prevent undue discrimination, preserve reliability, increase energy supply, and lower wholesale prices for customers by increasing the amount and variety of new generation that would compete in the wholesale electricity market.[4] The Commission further stated that the standard procedures would facilitate market entry for generation competitors by reducing interconnection costs and time.[5] In Order No. 2006,[6] the Commission adopted standard procedures and a standard agreement for interconnecting generating facilities no larger than 20 MW (called the *pro forma* SGIP, and the *pro forma* SGIA), citing the same purposes outlined in Order No. 2003.[7]

3. The electricity sector has transformed significantly since the issuance of Order Nos. 2003 and 2006. The growth of new resources seeking to interconnect to the transmission system and the differing characteristics of those resources have created new challenges for the generator interconnection process. These new challenges are creating large interconnection queue backlogs and uncertainty regarding the cost and timing of interconnecting to the transmission system, potentially increasing costs for consumers. Backlogs in the generator interconnection process, in turn, can create reliability issues as

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[3] Order No. 2003, 104 FERC ¶ 61,103 at P 2.

[4] *Id.* P 1.

[5] *Id.* P 12.

[6] *Standardization of Small Generator Interconnection Agreements & Proc.*, Order No. 2006, 70 FR 34189 (June 13, 2005), 111 FERC ¶ 61,220, *order on reh'g*, Order No. 2006-A, 70 FR 71760 (Nov. 30, 2005), 113 FERC ¶ 61,195 (2005), *order granting clarification*, Order No. 2006-B, 71 FR 42587 (July 27, 2006), 116 FERC ¶ 61,046 (2006).

[7] Order No. 2006, 111 FERC ¶ 61,220 at PP 15, 36.

needed new generating facilities are unable to come online in an efficient and timely manner. Therefore, we believe that it may be appropriate to reform the Commission's standard interconnection procedures and agreements to ensure that interconnection customers are able to interconnect to the transmission system in a reliable, efficient, transparent, and timely manner, thereby ensuring that rates, terms, and conditions for Commission-jurisdictional services remain just and reasonable and not unduly discriminatory or preferential.

4. Accordingly, we propose in this NOPR reforms to the Commission's *pro forma* LGIP and *pro forma* LGIA. Specifically, as explained in detail in this NOPR, we propose reforms to: (1) implement a first-ready, first-served cluster study process;[8] (2) increase the speed of interconnection queue processing; and (3) incorporate technological advancements into the interconnection process.

5. We also propose reforms to the *pro forma* SGIP and *pro forma* SGIA. Specifically, as explained in detail in this NOPR, for small generators we propose reforms to incorporate alternative transmission technologies into the interconnection process and to provide modeling and performance requirements for non-synchronous generators. In addition, we seek comment on whether the other reforms proposed in this NOPR should be applied to the *pro forma* SGIP and *pro forma* SGIA.

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[8] A first-ready, first-served cluster study process includes the following elements: increased access to information prior to entering the queue; a mechanism to study interconnection requests in groups; and increased financial commitments and readiness requirements to enter and proceed through the queue. To contrast, the existing first-come, first-served serial study process assigns interconnection requests an individual queue position based solely on the date of entry into the queue and does not include access to information prior to entering the queue.

6. We recognize that transmission providers have undertaken efforts to address interconnection queue management issues. This NOPR is not intended to divert or slow the potential progress represented by those efforts. We will review any filings that result from those efforts based on the record before us in those proceedings and not based on whether they comply with the proposed reforms in this NOPR. We note that any compliance obligations arising out of any final rule in this docket on the issues addressed herein will be evaluated in light of the independent entity variation for RTO/ISO regions and the consistent with or superior to standard for non-RTO regions.

A. Background

1. The Commission's *Pro Forma* Generator Interconnection Procedures

7. In Order No. 2003, the Commission recognized a need for a standard set of interconnection procedures for transmission providers[9] and a single, uniformly applicable

[9] In this order, transmission provider "shall mean the public utility (or its designated agent) that owns, controls, or operates transmission or distribution facilities used for the transmission of electric energy in interstate commerce and provides transmission service under the [Transmission Provider's Tariff]. The term . . . should be read to include the Transmission Owner when the Transmission Owner is separate from the Transmission Provider." *Pro forma* LGIP section 1; *pro forma* LGIA art. 1; *pro forma* SGIP attach. 1; *pro forma* SGIA attach. 1. Therefore, unless otherwise noted, "transmission provider" refers only to public utility transmission providers. FPA section 201(e) defines "public utility" to mean "any person who owns or operates facilities subject to the jurisdiction of the Commission under this subchapter." 16 U.S.C. 824(e). A non-public utility that seeks voluntary compliance with the reciprocity condition of an Open Access Transmission Tariff (OATT) may satisfy that condition by filing an OATT, which includes the *pro forma* LGIP, the *pro forma* SGIP, the *pro forma* LGIA, and the *pro forma* SGIA. *See* Order No. 2003, 104 FERC ¶ 61,103 at PP 1, 616; Order No. 2006, 111 FERC ¶ 61,220 at P 1.

interconnection agreement for large generating facilities.[10] The Commission noted that generator interconnection is a "critical component of open access transmission service and thus is subject to the requirement that utilities offer comparable service under the [*pro forma*] OATT."[11] The Commission found that it was appropriate to establish a standard set of generator interconnection procedures to "minimize opportunities for undue discrimination and expedite the development of new generation, while protecting reliability and ensuring that rates are just and reasonable."[12] To this end, the Commission adopted the *pro forma* LGIP and *pro forma* LGIA and amended its regulations to require all transmission providers to incorporate these standard procedures and agreement into their OATTs.[13]

8. To initiate the generator interconnection process set forth in the Commission's *pro forma* LGIP,[14] the interconnection customer submits an interconnection request for its proposed generating facility that includes preliminary documentation of the site of the proposed generating facility, certain technical information about the proposed generating

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[10] Order No. 2003, 104 FERC ¶ 61,103 at P 11. Large generating facilities are defined to mean "a Generating Facility having a Generating Facility Capacity of more than 20 MW." *Pro forma* LGIP section 1.

[11] Order No. 2003, 104 FERC ¶ 61,103 at P 9 (citing *Tenn. Power Co.*, 90 FERC ¶ 61,238 (2000)).

[12] *Id.* P 11.

[13] 18 CFR 35.28(f)(1).

[14] While we provide a broad description of the process in the Commission's *pro forma* LGIP as background here, we recognize that many transmission providers have adopted (and the Commission has accepted) variations to many of the terms in the Commission's *pro forma* LGIP and *pro forma* LGIA. Consequently, some or many of the details of a particular transmission provider's generator interconnection procedures may vary considerably from the broad description provided here.

facility, and the expected commercial operation date of the proposed generating facility, along with a refundable deposit of $10,000.[15] After the transmission provider determines that the interconnection request is complete, the interconnection request enters the transmission provider's interconnection queue with other pending interconnection requests and is assigned a queue position based on the time and date of its receipt.[16] The queue position determines the order in which the transmission provider studies the interconnection requests in its queue.[17]

9. Transmission providers must schedule a scoping meeting with the interconnection customer to discuss possible points of interconnection for the proposed generating facility and exchange technical information, which is followed by a series of interconnection studies to evaluate the proposed interconnection in detail.[18] Transmission providers study interconnection requests in three phases: (1) the Interconnection Feasibility Study (feasibility study);[19] (2) the Interconnection System Impact Study (system impact

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[15] Order No. 2003, 104 FERC ¶ 61,103 at P 35; *pro forma* LGIP sections 3.1, 3.4.

[16] *Pro forma* LGIP section 4.1.

[17] *Id*.

[18] Order No. 2003, 104 FERC ¶ 61,103 at P 36; *pro forma* LGIP sections 3.4.4; 6–8.

[19] The *pro forma* LGIP defines a feasibility study as "a preliminary evaluation of the system impact and cost of interconnecting the Generating Facility to the Transmission Provider's Transmission System." The scope of a feasibility study is described in section 6 of the *pro forma* LGIP. *Pro forma* LGIP sections 1, 6.

study);[20] and (3) the Interconnection Facilities Study (facilities study).[21] These studies contain the power flow, short circuit, and stability analyses necessary to: (1) identify any adverse impacts on the transmission providers' transmission system or any affected systems;[22] (2) determine the interconnection facilities and network upgrades[23] needed to reliably interconnect the generating facility; and (3) estimate the interconnection customer's cost responsibility for these facilities.[24] The *pro forma* LGIP requires that

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[20] The *pro forma* LGIP defines a system impact study as "an engineering study that evaluates the impact of the proposed interconnection on the safety and reliability of Transmission Provider's Transmission System and, if applicable, an Affected System." In particular, a system impact study identifies and details "the system impacts that would result if the Generating Facility were interconnected without project modifications or 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." *Id*. section 1.

[21] The *pro forma* LGIP defines a facilities study as "a study conducted by the Transmission Provider or a third-party consultant for the Interconnection Customer to determine a list of facilities (including Transmission Provider's Interconnection Facilities and Network Upgrades as identified in the [system impact study]), the cost of those facilities, and the time required to interconnect the Generating Facility with the Transmission Provider's Transmission System." The scope of a facilities study is described in section 8 of the *pro forma* LGIP. *Id*. sections 1, 8.

[22] An affected system is an electric system other than the transmission provider's transmission system that may be affected by the proposed interconnection. *Id*. section 1; *pro forma* LGIA art. 1.

[23] For purposes of this NOPR, unless otherwise noted, "network upgrades" refers to interconnection-related network upgrades. More specifically, the *pro forma* LGIP and *pro forma* LGIA state that "Network Upgrades shall mean the additions, modifications, and upgrades to the Transmission Provider's Transmission System required at or beyond the point at which the Interconnection Facilities connect to the Transmission Provider's Transmission System to accommodate the interconnection of the Large Generating Facility to the Transmission Provider's Transmission System." *Pro forma* LGIP section 1 (Definitions); *pro forma* LGIA art. 1 (Definitions).

[24] Order No. 2003, 104 FERC ¶ 61,103 at PP 35-37; *pro forma* LGIP sections 6–8. The interconnection customer is responsible for the actual costs of interconnection studies and any necessary re-studies. *Pro forma* LGIP section 13.3.

transmission providers use reasonable efforts to complete: (1) feasibility studies within 45 days; (2) system impact studies within 90 days; and (3) facilities studies within 90 or 180 days, depending on the interconnection customer's requested accuracy margin.[25]

10. At the completion of the facilities study, the *pro forma* LGIP requires the transmission provider to issue a report on the best estimate of the costs to effectuate the requested interconnection and provide a draft generator interconnection agreement to the interconnection customer.[26] If the interconnection customer wishes to proceed, after negotiations, the interconnection customer enters into a generator interconnection agreement with the transmission provider or, in specific circumstances, requests that the transmission provider file the agreement with the Commission unexecuted.[27] The transmission provider is responsible for the construction of all network upgrades, but, as further discussed below, the interconnection customer has the option to build these facilities in certain circumstances.[28]

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[25] *Id*. sections 6.3, 7.4, 8.3.

[26] Order No. 2003, 104 FERC ¶ 61,103 at P 38. Section 11.1 of the *pro forma* LGIP requires the transmission provider to tender a draft LGIA to the interconnection customer "in the form of Transmission Provider's FERC-approved standard form LGIA."

[27] If the transmission provider and interconnection customer execute an LGIA that conforms to the transmission provider's FERC-approved standard form LGIA, the agreement does not need to be filed with the Commission (if the transmission provider has such a standard form LGIA on file and submits an Electronic Quarterly Report). Alternatively, the transmission provider must file an LGIA with the Commission for review and approval if: (1) the interconnection customer determines that negotiations with the transmission provider over the terms of an LGIA are at an impasse and requests submission of the unexecuted LGIA with the Commission; or (2) the LGIA does not conform to the transmission provider's FERC-approved standard form LGIA. *See* Order No. 2003-A, 106 FERC ¶ 61,220 at P 201; *pro forma* LGIP sections 11.2-11.3.

[28] Order No. 2003, 104 FERC ¶ 61,103 at PP 351-354; *pro forma* LGIA art. 5.1.3.

11. Similar to Order No. 2003, in Order No. 2006, the Commission recognized the need for standardized interconnection procedures and agreements for small generating facilities with a capacity of 20 MW or less.[29] In addition to establishing a *pro forma* interconnection study process for small generating facilities similar to the process for large generation established in Order No. 2003, the Commission included: (1) a "Fast Track Process"[30] that uses technical screens to evaluate a certified small generating facility no larger than 2 MW; and (2) a "10 kW Inverter Process"[31] that uses the same technical screens to evaluate a certified inverter-based small generating facility no larger than 10 kW.[32] The Commission later issued Order No. 792,[33] in which the Commission revised the *pro forma* SGIP and *pro forma* SGIA to provide for interconnection customers to receive point of interconnection information in advance of submitting an interconnection request, increase the threshold for participation in the Fast Track Process to 5 MW, and to specifically include electric storage devices.[34]

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[29] Order No. 2006, 111 FERC ¶ 61,220 at P 36.

[30] *Pro forma* SGIP section 2.1.

[31] *Id.* attach. 5.

[32] Order No. 2006, 111 FERC ¶ 61,220 at PP 36, 38-39.

[33] *Small Generator Interconnection Agreements & Procs.*, Order No. 792, 78 FR 73240 (Dec. 5, 2013), 145 FERC ¶ 61,159 (2013), *clarifying*, Order No. 792-A, 146 FERC ¶ 61,214 (2014).

[34] *See* Order No. 792, 145 FERC ¶ 61,159 at P 1.

2. 2008 Order on RTO/ISO Interconnection Queuing Practices

12. In response to concerns voiced to the Commission about interconnection queue management, in 2007, the Commission held a technical conference,[35] and later issued an order[36] addressing interconnection queue issues in RTOs/ISOs. In the order, the Commission noted that some transmission providers were not processing their interconnection queues within the timelines established in the *pro forma* LGIP, and in certain cases, were greatly exceeding them.[37] The Commission stated that, although it "may need to [impose solutions] if the RTOs and ISOs do not act themselves," each RTO/ISO would have an opportunity to work with its stakeholders to develop its own solutions.[38] As further discussed below, following the order, multiple RTOs/ISOs submitted queue reform proposals to the Commission, some of which moved away from a so-called "first-come, first-served" approach (whereby interconnection requests are processed in the order they are received) to a so-called "first-ready, first-served" approach (whereby interconnection requests are processed based on when interconnection customers meet certain project development milestones).[39]

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[35] *Interconnection Queuing Practices*, Docket No. AD08-2-000, Notice of Technical Conference (issued Nov. 2, 2007).

[36] *Interconnection Queuing Practices*, 122 FERC ¶ 61,252 (2008) (2008 Technical Conference Order).

[37] *Id.* P 3.

[38] *Id.* P 8.

[39] *See, e.g.*, *Sw. Power Pool, Inc.*, 128 FERC ¶ 61,114 (2009) (*SPP*); *Midwest Ind. Sys. Operator, Inc.*, 124 FERC ¶ 61,183 (2008); *Cal. Ind. Sys. Operator Corp.*, 124 FERC ¶ 61,292 (2008).

3. Order No. 845

13. In 2018, the Commission issued Order No. 845,[40] in which the Commission made the most comprehensive revisions to the *pro forma* LGIP and *pro forma* LGIA since their adoption in Order No. 2003. In Order No. 845, the Commission concluded that reforms to the *pro forma* LGIP and *pro forma* LGIA were needed to mitigate concerns regarding systemic inefficiencies, remedy discriminatory practices, and address recent developments, including changes in the resource mix and emergence of new technologies.[41] The Commission therefore adopted reforms designed to improve certainty for interconnection customers, promote more informed interconnection decisions, and enhance the generator interconnection process.[42] Among other things, the Commission: (1) expanded the interconnection customer's option to build certain network upgrades; (2) revised the definition of generating facility to include electric storage resources;[43] (3) established reporting requirements for aggregate interconnection study performance; (4) allowed interconnection customers to request a level of interconnection service that is lower than their generating facility capacity; (5) required transmission providers to allow provisional interconnection service that provides for

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[40] *Reform of Generator Interconnection Procs & Agreements*, Order No. 845, 83 FR 21342 (May 09, 2018), 163 FERC ¶ 61,043 (2018), *order on reh'g*, Order No. 845-A, 166 FERC ¶ 61,137, 84 FR 8156 (Mar. 06, 2019), *order on reh'g*, Order No. 845-B, 168 FERC ¶ 61,092 (2019).

[41] Order No. 845, 163 FERC ¶ 61,043 at P 7.

[42] *Id.* P 2.

[43] Generating Facilities "shall mean Interconnection Customer's device for the production and/or storage for later injection of electricity identified in the Interconnection Request, but shall not include the Interconnection Customer's Interconnection Facilities." *Pro forma* LGIP section 1.

limited operation of a generating facility prior to completion of the full generator interconnection process; (6) required transmission providers to create a process for interconnection customers to use surplus interconnection service[44] at existing points of interconnection; and (7) required transmission providers to assess and, if necessary, study, an interconnection customer's technology changes without affecting the interconnection customer's queue position.[45]

4. Transmission Planning and Cost Allocation ANOPR

14. On July 15, 2021, the Commission issued an Advance Notice of Proposed Rulemaking (ANOPR) in Docket No. RM21-17-000, presenting potential reforms to the Commission's requirements governing the regional transmission planning and cost allocation and generator interconnection processes.[46] Specific to the generator interconnection process, the Commission sought comment on whether and which reforms may be necessary to ensure a more purposeful integration of the generator interconnection process with the regional transmission planning and cost allocation processes, establish a faster and more efficient interconnection queueing process, and promote a more efficient and cost-effective allocation of interconnection-related network

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[44] The *pro forma* LGIP defines surplus interconnection service as "any unneeded portion of Interconnection Service established in a Large Generator Interconnection Agreement, such that if Surplus Interconnection Service is utilized the total amount of Interconnection Service at the Point of Interconnection would remain the same." *Pro forma* LGIP section 1.

[45] Order No. 845, 163 FERC ¶ 61,043 at PP 3-5.

[46] *Bldg. for the Future Through Elec. Reg'l Transmission Plan. & Cost Allocation & Generator Interconnection*, 86 FR 40266 (July 15, 2021), 176 FERC ¶ 61,024 (2021) (ANOPR).

upgrade costs.[47] For instance, the Commission noted that the cost of interconnection-related network upgrades can depend largely on both the timing of when the interconnection customer enters the interconnection queue and where the interconnection customer proposes to interconnect its generating facility. Therefore, the Commission noted, interconnection customers may submit multiple interconnection requests in an effort to determine the most favorable point of interconnection[48] that minimizes their interconnection-related network upgrade costs.[49] The Commission stated that this practice, in turn, may lead to late-stage withdrawals of the excess interconnection requests, which can then impede the transmission provider's ability to process its interconnection queue in an efficient manner. As a result, the Commission stated that it may be time to consider reforms to generator interconnection process that would make them more efficient and ensure that generation facilities that are more "ready" than others are not unduly delayed in the interconnection queue.

15. On April 21, 2022, the Commission issued a Notice of Proposed Rulemaking (Transmission Planning and Cost Allocation NOPR) proposing reforms to its existing regional transmission planning and cost allocation requirements in the same proceeding as it issued the ANOPR. While the Transmission Planning and Cost Allocation NOPR did not address many of the concerns raised by the Commission in the ANOPR with respect to the generator interconnection queue process, the Commission noted in the

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[47] *Id.* P 5.

[48] Point of Interconnection refers to "the point, as set forth in Appendix A to the Standard Large Generator Interconnection Agreement, where the Interconnection Facilities connect to the Transmission Provider's Transmission System." *Pro forma* LGIP section 1.

[49] ANOPR, 176 FERC ¶ 61,024 at P 41.

Transmission NOPR that it would continue to review the record and that it expected to address possible inadequacies through subsequent proceedings that propose reforms, as warranted, related to that topic.[50] We are now taking that next step with the reforms we propose in this NOPR.

5. Joint Federal-State Task Force on Electric Transmission

16. On June 17, 2021, the Commission established a Joint Federal-State Task Force on Electric Transmission (Task Force) to formally explore broad categories of transmission-related topics.[51] The Commission explained that the development of new transmission infrastructure implicates a host of different issues, including generator interconnection. The Task Force is comprised of all FERC Commissioners as well as representatives from 10 state commissions nominated by the National Association of Regulatory Utility Commissioners (NARUC), with two originating from each NARUC region.[52] The Task Force will convene for multiple formal meetings and has thus far met three times—on November 10, 2021, on February 16, 2022, and on May 6, 2022.

17. The discussion at the May meeting focused on interconnection issues, including generator interconnection queue processes and backlogs. The Task Force Members discussed: the primary challenges preventing more efficient processing of

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[50] *Bldg. for the Future Through Elec. Reg'l Transmission Plan. & Cost Allocation & Generator Interconnection*, 87 FR 26504 (May 04, 2022), 179 FERC ¶ 61,028, at P 10 (2022) (Transmission Planning and Cost Allocation NOPR).

[51] *Joint Fed.-State Task Force on Elec. Transmission*, 175 FERC ¶ 61,224, at PP 1, 6 (2021).

[52] An up-to-date list of Task Force members, as well as additional information on the Task Force, is available on the Commission's website at: https://www.ferc.gov/TFSOET. Public materials related to the Task Force, including transcripts from public meetings, are available in the Commission's eLibrary in Docket No. AD21-15-000.

interconnection queues; specific improvements to interconnection processes (such as tighter applicant requirements to enter and remain in the queue, clustering, fast tracking, tighter deadlines on transmission providers completing studies, and minimizing reiterative studies); and how to balance near term improvements to the interconnection procedures with longer-term regional transmission planning and development.[53]

B. Need for Reform

18. Under the Commission's *pro forma* LGIP, the interconnection study process for large generating facilities is a serial first-come, first-served study process by which transmission providers study interconnection requests individually in the order the transmission provider received them.[54] The Commission adopted these procedures at a time when most interconnection requests were for large traditional generating facilities that would use readily available transmission capacity. In the 2008 Technical Conference Order, the Commission acknowledged that, while the generator interconnection process set forth in the *pro forma* LGIP made sense at the time that the Commission adopted it, it has since led to some unexpected consequences, particularly for transmission systems with numerous interconnection customers and limited excess transmission capacity.[55] The Commission also explained that surges in the volume of new types of generating facilities, principally renewable generation, were placing stress on interconnection queue management because such generating facilities can be constructed and placed into operation more quickly than traditional types of generating facilities. The increase in the

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[53] *Joint Fed.-State Task Force on Elec. Transmission*, Notice of Meeting, Docket No. AD21-15-000 (issued Apr. 22, 2022) (attaching agenda).

[54] *Pro forma* LGIP section 4.1.

[55] 2008 Technical Conference Order, 122 FERC ¶ 61,252 at P 15.

number of interconnection requests and limited transmission capacity have not subsided since the issuance of the 2008 Technical Conference Order. Although in Order No. 845, the Commission attempted to address interconnection queue backlogs,[56] the interconnection queue backlog has persisted and worsened. Indeed, as of the end of 2021, there were over 8,100 active interconnection requests in interconnection queues throughout the United States, representing over 1,000 GW of generation and an estimated 420 GW of electric storage.[57] This is more than triple the total volume, in gigawatts, of generation and electric storage in interconnection queues nationwide just five years earlier.[58]

19. The continued use of the Commission's *pro forma* LGIP in the face of dramatic increases in interconnection requests is leading to a growing backlog of interconnection requests for many transmission providers. Based on Commission staff's compilation of information posted by transmission providers for 2021, nationwide, almost 1,900 interconnection requests were awaiting interconnection studies that had not been performed as of the tariff-defined deadline.[59] These interconnection queue backlogs and

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[56] Order No. 845, 163 FERC ¶ 61,043 at P 24.

[57] Joseph Rand et al., Lawrence Berkeley Nat'l Lab'y, *Queued Up: Characteristics of Power Plants Seeking Transmission Interconnection as of the End of 2021*, at 26 (Apr. 2022), https://emp.lbl.gov/sites/default/files/queued_up_2021_04-13-2022.pdf (*Queued Up*).

[58] *See* Ryan Wiser et al., Lawrence Berkeley Nat'l Lab'y, Wind Energy Techs. Office, *Land-Based Wind Market Report: 2021 Edition*, at 10 (Aug. 2021), https://www.energy.gov/eere/wind/articles/land-based-wind-market-report-2021-edition-released.

[59] *See* app. A (compiling data publicly posted by transmission providers in compliance with Order No. 845); *see also* Order No. 845, 163 FERC ¶ 61,043 at P 305. This is based on informational reports submitted by transmission providers in compliance with Order No. 845.

study delays create uncertainty and inhibit project developers' ability to interconnect generating facilities to the transmission system.[60] In addition, as interconnection studies fall behind, the amount of time subsequent interconnection requests spend in the interconnection queue rises.[61]

20. Numerous factors appear to contribute to these interconnection queue backlogs. Increasing volumes of interconnection requests are entering the interconnection queue due to a confluence of the rapidly changing resource mix,[62] market forces,[63] and

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[60] *See* Joint Fed.-State Task Force on Elec. Transmission, Technical Conference, Docket No. AD21-15-000, Tr. 15:21-16:1 (Ted Thomas) (May 6, 2022) (May Joint Task Force Tr.) ("Houston, we have a problem. As stated in the NARUC ANOPR comments, existing methods for interconnecting new resources to the transmission grid are inadequate and inefficient because of the time necessary to interconnect new resources and the corresponding network upgrade costs.").

[61] For the four RTOs/ISOs (California Independent System Operator Corporation (CAISO), Electric Reliability Council of Texas (ERCOT), New York Independent System Operator, Inc. (NYISO), and PJM Interconnection, L.L.C (PJM) and one utility (Arizona Public Service Company)) for which data was available, the average time projects spent in interconnection queues before being constructed increased from ~2.1 years for projects built between 2000 and 2010 to ~3.7 years for those built between 2011 and 2021. *Queued Up* at 3. As of the end of 2021, only 13% of total capacity in interconnection queues had an executed generator interconnection agreement. *Id.* at 17. *See also* May Joint Task Force Tr. 23:18-25 (Jason Stanek) (expressing frustration with the status quo and agreement that it is "no longer tenable" considering the inability of generators to interconnect in a timely manner, e.g., there are "2,500 projects under study [in the MACRUC region] and about a half of them have been in the queue since at least 2001").

[62] Corporations purchased over 30 GW of clean energy through power purchase agreements in 2021, up nearly 24% from 2020. U.S.-based purchases represented 17 GW of the power purchase agreements executed in 2021. Bloomberg New Energy Finance, *Corporate Clean Energy Buying Tops 30GW Mark in Record Year* (Jan. 31, 2022), https://about.bnef.com/blog/corporate-clean-energy-buying-tops-30gw-mark-in-record-year/#:~:text=Corporate%20Clean%20Energy%20Buying%20Tops%2030GW%20Mark%20in%20Record%20Year,-January%2031%2C%202022&text=New%20York%20and%20London%2C%20January, research%20firm%20BloombergNEF%20 (BNEF).

[63] From 2009 to 2021, the levelized cost of energy from unsubsidized utility scale wind and solar photovoltaic facilities dropped 72% and 90%, respectively. Lazard,

emerging technologies.[64] At the same time, available transmission capacity appears to have been exhausted in many regions. As the Commission observed in the Transmission Planning and Cost Allocation NOPR, "[t]he evidence suggests that long-term regional transmission planning and cost allocation to identify and plan for transmission needs . . . is not occurring in most transmission planning regions on a regular or consistent basis."[65] Instead, the Commission added, significant transmission expansion appears to be happening in an incremental fashion, in response to individual interconnection requests.[66] This reactive approach to transmission expansion adds to the challenge many proposed projects face to successfully complete the interconnection queue process and reach commercial operation. Therefore, the number of projects waiting in the interconnection queue is increasing. Further, transmission providers report that there is a nationwide shortage of qualified engineers to keep pace with the increasing number of interconnection requests in the queue and associated interconnection studies.[67] Many, if

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Lazard's Levelized Cost of Energy Analysis—Version 15.0, at 9 (Oct. 2021), https://www.lazard.com/perspective/levelized-cost-of-energy-levelized-cost-of-storage-and-levelized-cost-of-hydrogen/ (*Lazard's LCOE*).

[64] For instance, 42% (285 GW) of solar and 8% (17 GW) of wind projects currently in the queue include are proposed as hybrid resources including electric storage. *Queued Up* at 18.

[65] Transmission Planning and Cost Allocation NOPR, 179 FERC ¶ 61,028 at P 36.

[66] *Id.*

[67] For example, CAISO stated in its recent proposal to extend its interconnection study deadlines to accommodate its interconnection queue cluster 14 that neither CAISO nor the participating transmission owners could increase staffing as few experts are available to hire. *Cal. Indep. Sys. Operator Corp.*, 176 FERC ¶ 61,207, at PP 7, 21 (2021). The Midcontinent Independent System Operator (MISO) has indicated that it similarly has experienced delays in performance of interconnection studies by outside consultants. *See* MISO, Informational Report, Transmittal, Docket No. ER19-1960, at 12 (filed Nov. 16, 2020).

not all, of these drivers are either ongoing or increasing. Thus, we are concerned that, without reforms to the generator interconnection process, existing interconnection queue backlogs are likely to intensify.

21. In recent years, numerous transmission providers have responded to the types of trends and challenges outlined above by seeking to reform their interconnection queue processes.[68] Since 2018, the Commission has approved proposals from five non-independent transmission providers to transition from the serial first-come, first-served study process set forth in the *pro forma* LGIP to a first-ready, first-served cluster study process that imposes increasing readiness requirements to advance through the study phases.[69] Meanwhile, several RTOs/ISOs, including MISO and Southwest Power Pool (SPP), have proposed refinements to the cluster study processes in their regions that the Commission had previously approved.[70]

22. As the factors contributing to interconnection queue backlogs and study delays continue and even increase, it has become more apparent that the Commission's existing generator interconnection procedures and agreements may be insufficient to ensure that interconnection customers are able to interconnect to the transmission system in a reliable, efficient, transparent, and timely manner, thereby ensuring that rates, terms, and

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[68] *See* May Joint Task Force Tr. 88:10-12 (Ted Thomas) ("[T]he RTOs have been working on these interconnection issues and we don't have a solution yet.").

[69] *Dominion Energy S.C., Inc.*, Docket No. ER22-301-000 (Dec. 28, 2021) (delegated order) (*Dominion*); *Duke Energy Carolinas, LLC*, 176 FERC ¶ 61,075 (2021) (*Duke*); *PacifiCorp*, 171 FERC ¶ 61,112 (2020); *Pub. Serv. Comm'n of Colo.*, 169 FERC ¶ 61,182 (2019) (*PSCo*); *Tri-State Generation & Transmission Ass'n, Inc.*, 173 FERC ¶ 61,015 (2020) (2020 Tri-State Order).

[70] *See*, *e.g.*, *Midcontinent Indep. Sys. Operator, Inc.*, 178 FERC ¶ 61,141 (2022); *Sw. Power Pool, Inc.*, 178 FERC ¶ 61,015 (2022).

conditions for Commission-jurisdictional services remain just and reasonable and not unduly discriminatory or preferential.[71] We preliminarily find that the Commission's *pro forma* LGIP, *pro forma* LGIA, *pro forma* SGIP, and *pro forma* SGIA result in rates, terms, and conditions pursuant to which transmission providers provide generator interconnection service are unjust and unreasonable and unduly discriminatory or preferential. Further, because the interconnection queue backlogs and study delays afflicting generator interconnection service nationwide hinder the timely development of new generation and thereby stifle competition in the wholesale electric markets, we preliminarily find that the Commission's *pro forma* LGIP, *pro forma* LGIA, *pro forma* SGIP, and *pro forma* SGIA result in rates, terms, and conditions in the wholesale electric markets that are unjust and unreasonable and unduly discriminatory or preferential.

23. Our preliminary findings are based on several features of the Commission's existing generator interconnection procedures and agreements that are of concern, specifically: (1) the information (or lack thereof) available to prospective interconnection customers and the commitments required of them to enter and progress through the interconnection queue; (2) the reliance on a serial first-come, first-served study process and the standard to which transmission providers are held for meeting interconnection study deadlines; (3) the protocols for affected systems studies; (4) the provisions for studying new or hybrid (co-located) generation technologies and considering alternative transmission technologies; and (5) the performance requirements for inverter-based

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[71] *See* May Joint Task Force Tr. 23:6-11 (Riley Allen) ("Ultimately, this system is not working efficiently now and those inefficiencies translate into costs. It's not just cost on the developers, but I find from my decades of experience that, if there are inefficiencies in the system, they ultimately have to be borne by the loads and ratepayer interests.").

technologies, including wind, solar, and electric storage facilities. We describe these features of the Commission's existing generator interconnection procedures and agreements—as set forth in the Commission's *pro forma* LGIP, *pro forma* LGIA, *pro forma* SGIP, and *pro forma* SGIA—in this section and then turn to our proposed reforms to address the concerns identified with those features.[72]

24. First, the *pro forma* LGIP does not contain a process by which an interconnection customer can obtain information at a specific location or point of interconnection about potential interconnection costs prior to submitting an interconnection request. As a result, at the outset of the generator interconnection process,[73] interconnection customers typically have little insight into the interconnection capacity available at various points on the transmission system. Furthermore, interconnection customers face limited financial commitments to enter and stay in the interconnection queue and few requirements to prove the commercial viability of proposed generating facilities.[74] Therefore, developers often submit multiple interconnection requests for proposed generating facilities at various points of interconnection, not all of which are expected to reach commercial

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[72] *See id.* 184:6-19 (Clifford Rechtschaffen) ("I think it's beyond dispute that we need queue reform. I don't know if it's a crisis, but there's logjams, dysfunctions, inefficiencies . . . . I think there's a real need to keep the foot on the gas and for FERC to provide guidance templates, best practices, . . . minimum baselines, while again, providing for flexibility.").

[73] As in the background of this NOPR, we describe the generator interconnection process set forth in the Commission's *pro forma* LGIP, which we recognize differs from many transmission providers' generator interconnection processes due to Commission-approved variations.

[74] For example, the total cost of interconnection studies under the *pro forma* LGIP is often under $500,000. *See pro Forma* LGIP sections 3.1 ($10,000 deposit with interconnection request), 6.1 ($10,000 deposit with Feasibility Study Agreement), 7.2 ($50,000 deposit with System Impact Study Agreement), 8.1 (minimum $100,000 deposit with Facilities Study Agreement).

operation, as an exploratory mechanism to obtain information to allow them to choose the most favorable site.[75]

25. Second, securing a higher interconnection queue position is valuable when interconnecting to a transmission provider that uses the serial first-come, first-served study process as laid out in the *pro forma* LGIP because the transmission provider will process interconnection requests (i.e., perform required interconnection studies) in the order in which the interconnection requests are received. By obtaining an early queue position, a generating facility may be able to use available transmission capacity and not need to incur costs for network upgrades that later-queued interconnection customers potentially incur. Under this framework, interconnection customers have an incentive to submit interconnection requests to secure a queue position as early as possible, even if they are not prepared to move forward with the proposed generating facility at the time the interconnection request is made, to identify locations with available headroom on the transmission system and establish priority over later-queued interconnection requests.

26. Often, these more speculative interconnection requests do not prove to be commercially viable. For example, in many interconnection queues, the MW volumes of interconnection requests far exceed the transmission provider's peak network load.[76] A

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[75] *See, e.g.*, *Review of Generator Interconnection Agreements and Procedures*, Technical Conference Transcript, Docket No. RM16-12-000, at 211:10-21 (May 13, 2016) (Steve Naumann, Exelon Corp.) (filed Aug. 23, 2016) ("We would look at putting let's say new gas fired generation in PJM, it may have four queue positions. And we only intend to go through with one, that's not speculation, that's trying to get information on which is the most viable.").

[76] For example, Dominion, PSCo, and Tri-State each provided statistics to this effect as part of their argument for interconnection queue reforms. *See* Dominion, Transmittal Letter, Docket No. ER22-301-000, at 8 (filed Nov. 1, 2021); PSCo, Transmittal Letter, Docket No. ER19-2774-000, at 27 (filed Sep. 9, 2019); Tri-State, Transmittal Letter, Docket No. ER21-410-000, at 20 (filed Nov. 13, 2020).

lack of commercial viability often means that many proposed generating facilities in the interconnection queue will eventually withdraw after not finding a purchaser for their output. In the case where the interconnection customer submits multiple requests, the developer may select only the one or two most viable project candidates and withdraw the interconnection requests for the remaining projects. These withdrawals then impact the remaining interconnection customers in the interconnection queue. A withdrawal may necessitate re-studies and cause the shifting of network upgrade costs to lower-queued interconnection customers. New cost estimates, in turn, can alter a proposed generating facility's commercial viability and create further re-studies and withdrawals, often referred to as cascading re-studies and withdrawals.[77] These re-studies exacerbate the cost uncertainty faced by interconnection customers[78] and prevent the transmission provider from maintaining a model base case for how its transmission system is expected to reliably operate and serve load in the future.

27. These delays faced by individual interconnection customers may hinder the timely development of new generation, and, thereby, stifle competition in wholesale energy markets or delay access to potential low cost generation, which ultimately drive up costs for consumers.

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[77] *See pro forma* LGIP section 7.6; s*ee also* May Joint Task Force Tr. 70:20-71:6 (Matthew Nelson) (analogizing reiterative studies to going to the supermarket to buy ingredients for a recipe without knowing how much the ingredients cost, finding out at the register that they cost too much for your budget, and having to "go home, get a new recipe, and start it all over again").

[78] *Id* 74:9-21 (Andrew French) (stating that generator developers complain principally about cost certainty and cost sharing and that "cost certainty is the much bigger issue" given that "an essential element of being able to sell a product is to know what your inputs are so you can market it").

28. Compounding these issues, the *pro forma* LGIP does not require transmission providers to meet deadlines for conducting interconnection studies. Rather, transmission providers are only required to use "reasonable efforts"[79] to complete interconnection studies on time.[80] Despite complaints from interconnection customers, the Commission has not yet found that a transmission provider failed to use reasonable efforts to meet interconnection study deadlines, even though such studies are routinely completed months or years late. While interconnection customers can be removed from the queue for failure to comply with deadlines throughout the generator interconnection process,[81] transmission providers face no consequences for failure to comply with study deadlines.

29. Third, similar to the lack of requirements for timely completion of interconnection studies, the *pro forma* LGIP provides almost no requirements regarding how or when transmission providers or affected systems should complete affected system studies; in particular, even the reasonable efforts standard does not apply to these studies.[82] In

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[79] Reasonable efforts are defined as "actions that are timely and consistent with Good Utility Practice and are substantially equivalent to those a Party would use to protect its own interests." Order No. 2003, 104 FERC ¶ 61,103 at P 67; *pro forma* LGIP section 1.

[80] *See pro forma* LGIP sections 2.2, 6.3, 7.4, 8.3.

[81] *Id.* section 3.7 ("[I]f Interconnection Customer fails to adhere to all requirements of this LGIP . . . Transmission Provider shall deem the Interconnection Request to be withdrawn and shall provide written notice to Interconnection Customer . . . [.] Interconnection Customer shall have fifteen (15) Business Days in which to either respond with information or actions that cures the deficiency or to notify Transmission provider of its intent to pursue Dispute Resolution.").

[82] Affected systems studies are used to study the impact of proposed interconnection requests on neighboring transmission systems. Transmission providers are obligated to coordinate the conduct of affected system studies, but the Commission has not required transmission providers to follow any specific affected system coordination process. *See pro forma* LGIP section 3.6.

practice, these studies often lag behind those completed by the host transmission provider and are sometimes completed very late in the process, causing an additional round of delays and cost uncertainty for interconnection customers.[83]

30. In short, under the Commission's existing *pro forma* LGIP, *pro forma* LGIA, *pro forma* SGIP, and *pro forma* SGIA, it is difficult for transmission providers to disincentivize interconnection customers from entering multiple speculative interconnection requests into the interconnection queue or minimize the risk of late-stage withdrawals of interconnection requests. Conversely, transmission providers have little incentive to perform interconnection studies in a timely fashion. The resulting timing and cost uncertainty creates a barrier to entry that hinders competitive wholesale electric markets. As the Commission has previously observed, delayed interconnection study results or unexpected cost increases can disrupt numerous aspects of generating facility development, including project financing and the ability to obtain a power purchase agreement.[84] Developers in the interconnection queues have recently filed complaints with the Commission alleging that interconnection study delays have caused direct and indirect financial harm to them by threatening the viability of their projects.[85] Cost uncertainty poses an especially significant obstacle because proposed generating facilities may simply not be able to absorb substantial unexpected interconnection costs allocated as the result of a re-study. As indicated earlier, our fundamental concern is the follow-on

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[83] *EDF Renewable Energy, Inc. v. Midcontinent Indep. Sys. Operator, Inc.*, 168 FERC ¶ 61,173 (2019) (*EDF v. MISO*).

[84] *Reform of Generator Interconnection Procedures and Agreements*, 157 FERC ¶ 61,212, at P 30 (2016).

[85] *See, e.g.*, SOO Green HVDC Link Project Co, LLC, Complaint, Docket No. EL21-85-000, at 24, 38-39 (filed June 21, 2021).

impacts of these issues on rates paid by consumers. Unnecessary interconnection costs, either on the part of project developers or transmission providers, are ultimately passed through to consumers through higher energy or transmission rates, respectively. Conversely, efficient interconnection queues and well-functioning wholesale markets deliver enormous benefits to consumers by driving down wholesale electricity costs.

31. Fourth, in addition to our preliminary findings related to the interconnection queue backlogs described above, we preliminarily find that the Commission's *pro forma* LGIP, *pro forma* LGIA, *pro forma* SGIP, and *pro forma* SGIA are unjust and unreasonable, unduly discriminatory, and preferential as applied to several interconnection procedural and modeling issues. This set of inquiries was prompted by newer technologies entering interconnection queues in greater numbers. Interconnection queues consist now predominantly of non-synchronous resources such as wind, solar, and electric storage projects, all of which have operating characteristics that were not anticipated when the Commission issued Order No. 2003.[86] In particular, interest in hybrid resources, which combine more than one generating facility type, often with electric storage, has increased dramatically.[87] This change in the types of resources has brought to light several issues. For example, the *pro forma* LGIP does not specify whether interconnection customers of all resource types can submit a single interconnection request for co-located components

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[86] As of the end of 2019, 90% of the generating capacity that was waiting in interconnection queues nationwide was wind, solar, or energy storage projects. *See* Jay Caspary et al., Ams. for a Clean Energy Grid, *Disconnected: The Need for a New Generator Interconnection Policy*, at 4 (Jan. 2021), https://cleanenergygrid.org/disconnected-the-need-for-new-interconnection-policy/ (ACEG Report).

[87] 42% (285 GW) of solar and 8% (17 GW) of wind projects currently in the queue are proposed as hybrid resources including electric storage. *Queued Up* at 18.

of a generating facility, although research shows that this option is frequently used in regions where it has been made available through variations from the Commission's *pro forma* generator interconnection procedures.[88]

32. Further, the addition of generating facilities that do not affect the requested interconnection service level are often deemed a material modification without review, which can cause unnecessary network upgrades. Also, the use of the surplus interconnection process, as adopted in Order No. 845, has proven helpful for interconnection customers seeking to access interconnection capacity that has already been approved through an LGIA, but it is currently only available when a resource is fully operational. Lastly, with respect to interconnection requests involving electric storage resources, a transmission provider may use operating assumptions for interconnection studies that employ worst-case assumptions or other inaccuracies (e.g., that electric storage will charge during peak load periods)[89] that do not accurately reflect the planned operation of these resources, thus requiring network upgrades that may not be necessary.

33. We also preliminarily find that failing to consider alternative transmission technologies that can be deployed both more quickly and at lower costs than network

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[88] In researching hybrid interconnection requests, Lawrence Berkeley National Laboratory encountered many projects for which "the 'Generator Type' field includes multiple types for a single queue entry." *See* Mark Bolinger, et al., Lawrence Berkeley Nat'l Lab'y, *Hybrid Power Plants: Status of Installed and Proposed Projects*, at 16 (Aug. 2021), https://emp.lbl.gov/sites/default/files/hybrid_plant_development_2021.pdf.

[89] Hybrid Resource Coalition, Comments, Docket No. AD20-9-000, at 11-12 (filed Sept. 20, 2021); City of New York, Comments, Docket No. AD20-9-000, at 3 (filed Sept. 20, 2021); Clean Grid Alliance, Comments, Docket No. AD20-9-000, at 3 (filed Sept. 20, 2021); Savion, Post-Technical Conference Comments, Docket No. AD20-9-000, at 7 (filed Sept. 24, 2020); Enel, Post-Technical Conference Comments, Docket No. AD20-9-000, at 2-3 (filed Sept. 24, 2020).

upgrades may render Commission-jurisdictional rates unjust and unreasonable. Therefore, we propose to modify the Commission's *pro forma* LGIP and SGIP to require their consideration to achieve their benefits in generator interconnection processes.[90] Alternative transmission technologies might allow for the interconnection of a proposed generating facility at a lower cost and require less time to implement than traditional network upgrades.[91] Despite these potential benefits, alternative transmission technologies often do not receive the same consideration during generator interconnection processes and have only been deployed in a small number of instances.[92] The result is that interconnection customers—and ultimately consumers—may be paying more than is reasonable to reliably interconnect new generating facilities, rendering Commission-jurisdictional rates unjust and unreasonable and unduly discriminatory and preferential.

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[90] A variety of technologies offer potential alternatives to standard infrastructure network upgrades (e.g., reconductoring transmission lines or building new ones). These technologies include advanced power flow control devices, transmission switching, dynamic line ratings, static synchronous compensators, static volt-ampere reactive (VAR) compensators, and electric storage in specific use cases.

[91] *See, e.g.*, EDF Renewables, Comments, Docket No. RM21-17-000, at 16 (filed Nov. 30, 2021); State Agencies, Comments, Docket No. RM21-27-000, at 30-33 (filed Nov. 30, 2021); Alliant Energy Corporate Services, Inc. et al., Comments, Docket No. RM20-16-000, at 6 (filed Mar. 22, 2021) (stating that "utilization of [dynamic line ratings] can improve contingency planning and defer or eliminate the need for line upgrades or reconductoring").

[92] *See, e.g.*, EDF Renewables, Comments, Docket No. RM21-17-000, at 16 (filed Nov. 30, 2021); Potomac Economics, Comments, Docket No. RM21-17-000, at 8-9 (filed Nov. 30, 2021); State Agencies, Comments, Docket No. RM21-27-000, at 31-32 (filed Nov. 30, 2021).

34. Fifth, we preliminarily find that the *pro forma* LGIP and SGIP's data submission and performance requirements for non-synchronous generating facilities[93] (including wind, solar, and electric storage facilities) require reform to avoid undue discrimination and ensure just and reasonable Commission-jurisdictional rates. When an interconnection customer submits an interconnection request for a proposed synchronous generating facility, it must provide a variety of system information, which allows the transmission provider to assess and model the facility's ability to respond appropriately to transmission system disturbances.[94] By contrast, non-synchronous generating facilities are not required to provide a comparable level of information that would allow the transmission provider to model and assess the facility's ability to respond appropriately to transmission system disturbances.[95] As the penetration of wind, solar, and electric storage resources increases, the behavior of these types of non-synchronous generating facilities during transmission system disturbances becomes more consequential, as does the need to assess their potential contribution to cascading outages or other major electric system issues. Furthermore, we are concerned that, without reform to require interconnection customers developing non-synchronous resources to provide sufficiently

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[93] Non-synchronous generating facilities are "connected to the bulk power system through power electronics, but do not produce power at system frequency (60 Hz)." They "do not operate in the same way as traditional generators and respond differently to network disturbances." *Reactive Power Requirements for Non-Synchronous Generation*, Order No. 827, 81 FR 40793 (June 23, 2016), 155 FERC ¶ 61,277, at P 10 n.24 (2016) (citing *Interconnection for Wind Energy*, Order No. 661, 70 FR 34993 (June 16, 2005), 111 FERC ¶ 61,353, at P 3 n.4 (2005)).

[94] This information includes model block diagrams for excitation systems, power system stabilizers, and governor systems, to inform and verify the dynamic models used by the transmission provider to assess the proposed synchronous generating facility's response to transmission system disturbances. *See pro forma* LGIP app. 1, attach. A.

[95] *See infra* PP 310-312.

accurate and validated models, interconnection studies may not identify the appropriate interconnection facilities and network upgrades needed for that interconnection request. If the interconnection studies are not able to identify the appropriate interconnection facilities and network upgrades, then the interconnection costs assigned to that interconnection customer may be skewed, resulting in unjust and unreasonable rates for interconnection service.

35. In addition, we are concerned that the *pro forma* LGIA and SGIA may impose disparate performance requirements during system disturbances on synchronous and non-synchronous resources. Specifically, the physical characteristics of synchronous generating facilities result in such facilities continuing to inject electric current during transmission system disturbances, consistent with the need to remain "connected to and synchronized with the Transmission System" as required by the *pro forma* LGIA and SGIA.[96] As a result, services that support transmission system reliability are not disrupted during such events. However, the *pro forma* LGIA and SGIA do not currently require non-synchronous generating facilities to continue injecting current in a comparable manner during system disturbances. Specifically, non-synchronous resources many cease injecting current through "momentary cessation."[97] As a result, transmission providers cannot determine whether non-synchronous generating facilities, in the aggregate, will continue to inject electric current during transmission system disturbances.

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[96] *Pro forma* LGIA art. 9.73; *pro forma* SGIA art. 1.57.

[97] *See infra* note 463.

36. In light of the concerns outlined above, we preliminarily find that it is necessary to reform the Commission's *pro forma* LGIP, *pro forma* LGIA, *pro forma* SGIP, and *pro forma* SGIA to ensure that interconnection customers are able to interconnect to the transmission system in a reliable, efficient, transparent, and timely manner, thereby ensuring that rates, terms, and conditions for Commission-jurisdictional services remain just and reasonable and not unduly discriminatory or preferential.

II. Proposed Reforms

A. Reforms to Implement a First-Ready, First-Served Cluster Study Process

37. In recent years, late-stage withdrawals of interconnection requests have caused significant delays in interconnection study processes. In its January 2020 interconnection queue reform filing, PacifiCorp noted that about 75% of all interconnection requests ultimately withdraw from its interconnection queue and that withdrawals are a significant cause of delays in the generator interconnection process because withdrawals trigger re-studies. PacifiCorp argued that the current generator interconnection process encourages speculative projects to enter the interconnection queue because it does not require any progress toward commercial viability and does not penalize withdrawals from the interconnection queue.[98]

38. In support of its 2019 interconnection queue reform proposal, PSCo stated that it has experienced a surge in interconnection requests that cannot be processed under its current generator interconnection process. PSCo explained that, because the amount of generation requesting interconnection is significantly greater than the region's needs,

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[98] *PacifiCorp*, 171 FERC ¶ 61,112 at P 3.

only a small fraction of the generating facilities in the interconnection queue are likely to reach commercial operation. In addition, PSCo stated that, due to the configuration of PSCo's transmission system and the fact that most requests are for network resource integration service (NRIS),[99] almost all lower-queued interconnection requests, regardless of study phase, are affected by changes to higher-queued interconnection requests.[100]

39. For the reasons explained above, we preliminarily find that the Commission's *pro forma* LGIP and LGIA are unjust, unreasonable, unduly discriminatory, and preferential and that reforms are needed to allow interconnection customers to interconnect in a reliable, efficient, timely manner, thereby ensuring that rates, terms, and conditions for Commission-jurisdictional services remain just and reasonable and not unduly discriminatory or preferential. In particular, with regard to interconnecting in an efficient and timely manner, we propose reforms to the *pro forma* LGIP that: (1) require transmission providers to offer an optional informational interconnection study to serve as additional information for prospective interconnection customers in deciding whether to submit an interconnection request and set minimum requirements for transmission providers to publicly post available information pertaining to generator interconnection; (2) require transmission providers to implement a first-ready, first-served cluster study process that allocates costs associated with cluster studies and identified network upgrades consistent with the discussion below; and (3) impose more stringent financial

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[99] NRIS allows the interconnection customer to integrate its generating facility with the transmission provider's transmission system in a manner comparable to that in which the transmission provider integrates its generating facilities to serve native load customers, or in an RTO/ISO with market-based congestion management, in the same manner as Network Resources. NRIS in and of itself does not convey transmission service. *Pro forma* LGIP section 1.

[100] *PSCo*, 169 FERC ¶ 61,182 at P 21.

commitments and readiness requirements on interconnection customers, including increased study deposits, more stringent site control requirements, a commercial readiness framework, and higher withdrawal penalties. To implement these reforms, we also propose to require transmission providers to establish a transition process, consistent with the proposed requirements below.

1. Interconnection Information Access

a. Need for Reform

40. We are concerned that the lack of transparency for prospective interconnection customers to obtain information about potential interconnection costs prior to submitting an interconnection request is problematic. Without this information, it is difficult for interconnection customers to assess the viability of a specific proposed generating facility. Subsequently, interconnection customers submit multiple speculative interconnection requests in an attempt to obtain information through the system impact study process about the costs associated with various project configurations.

41. Some transmission providers have attempted to solve these problems by making more information available to interconnection customers before they enter the interconnection queue through an optional informational interconnection study that provides estimates of costs and scheduling for various sites.[101] These optional informational interconnection studies evaluate the feasibility of a proposed interconnection request and provide interconnection customers with non-binding information upon which to base preliminary siting decisions. Transmission providers that

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[101] *Dominion*, Docket No. ER22-301-000 (Dec. 28, 2021) (delegated order); *Duke*, 176 FERC ¶ 61,075 at P 19; *PacifiCorp*, 171 FERC ¶ 61,112 at P 54; *PSCo*, 169 FERC ¶ 61,182 at PP 9-10, 30; *Tri-State Generation & Transmission Ass'n, Inc.*, 174 FERC ¶ 61,021, at P 6 (2021) (*Tri-State*).

offer these types of studies require a $10,000 deposit for the studies, subject to a true-up based on actual costs of performing the studies.[102] While some transmission providers offer such an option, it is not currently required by the *pro forma* LGIP.

b. Proposed Reforms

i. Informational Interconnection Study

42. To address the lack of information available to interconnection customers prior to entering the interconnection queue, and the associated impacts on development of new generating facilities, interconnection queue backlogs, and interconnection study delays, we propose to revise the Commission's *pro forma* LGIP to require transmission providers to offer an informational interconnection study to serve as additional information for prospective interconnection customers in deciding whether to submit an interconnection request. The study would provide cost estimates for the transmission provider's interconnection facilities[103] and network upgrade costs specific to the interconnection

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[102] *See, e.g.*, Dominion, OATT and Service Agreements, attach. M (4.5.0), section 3.1; PSCo, Transmission and Service Agreements Tariff, OATT, attach. N. (0.8.0), section 6.1 (requiring a $10,000 deposit for an informational study request).

[103] The *pro forma* LGIA defines "Transmission Provider's Interconnection Facilities" as "all facilities and equipment owned, controlled or operated by the Transmission Provider from the Point of Change of Ownership to the Point of Interconnection as identified in Appendix A to the Standard Large Generator Interconnection Agreement, including any modifications, additions or upgrades to such facilities and equipment. Transmission Provider's Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades." These are distinct from "Interconnection Customer's Interconnection Facilities," which are those facilities "identified in Appendix A of the Standard Large Generator Interconnection Agreement, that are located between the Generating Facility and the Point of Change of Ownership, including any modification, addition, or upgrades to such facilities and equipment necessary to physically and electrically interconnect the Generating Facility to the Transmission Provider's Transmission System. Interconnection Customer's Interconnection Facilities are sole use facilities." *Pro forma* LGIA section 1.

scenario detailed in the study agreement. Specifically, we propose to revise sections 6.1-6.3 and Appendix 2 to the *pro forma* LGIP to implement this reform: section 6.1 (Informational Interconnection Study Agreement), section 6.2 (Scope of Informational Interconnection Study), section 6.3 (Informational Interconnection Study Procedures), Appendix 2 (Informational Interconnection Study Request form), and Attachment A to Appendix 2 (Informational Interconnection Study Agreement form). We also propose to include new definitions for an informational interconnection study and informational interconnection study agreement.

43. Proposed section 6.1 of the *pro forma* LGIP provides that a prospective interconnection customer may request an informational interconnection study. The proposed provision would limit prospective interconnection customers to no more than five separate informational interconnection study requests pending at a time to ensure that transmission providers are not overburdened with these studies and that one prospective interconnection customer cannot prevent others from taking advantage of this information-gathering process.[104] Each configuration of an interconnection request would require a separate informational interconnection study. For example, prospective interconnection customers seeking to evaluate different sites or different voltage levels at the same site would need to submit a separate request for each configuration. The informational interconnection study would be at the interconnection customer's expense, and each study would require a $10,000 deposit, subject to a true-up based on actual study costs.

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[104] *See, e.g.*, Dominion, OATT and Service Agreements, attach. M (4.5.0), section 3.1 ("Any one Interconnection Customer (including affiliates) shall have no more than five (5) requests for Informational Interconnection Study reports pending at one time.").

44. Under the proposal, within seven business days of the receipt of a prospective interconnection customer's request for an informational interconnection study, the transmission provider would have to provide the prospective interconnection customer with an informational interconnection study agreement in the form of Attachment A to Appendix 2 of the *pro forma* LGIP. The informational interconnection study agreement would specify the technical data that the prospective interconnection customer must provide and an estimate of the expected costs of the study, including, to the extent known by the transmission provider, an estimate of the study costs expected to be incurred by any relevant affected systems. The prospective interconnection customer would have 10 business days to execute the agreement and deliver it to the transmission provider, along with the relevant technical data and study deposit, after which the transmission provider would have 45 days to complete the study.

45. Proposed section 6.2 of the *pro forma* LGIP explains that the informational interconnection study consists of a sensitivity analysis based on the assumptions specified in the informational interconnection study agreement. The informational interconnection study would identify potential interconnection facilities and network upgrades that may be required to interconnect the prospective interconnection customer's proposed generating facility, including an approximation of the costs of such interconnection facilities and network upgrades. The transmission provider would also coordinate with affected systems that may be impacted by the prospective interconnection customer's request to provide information on affected systems-related issues.

46. Proposed Attachment A to Appendix 2 of the *pro forma* LGIP contains the informational interconnection study agreement form. The form agreement explains that the informational interconnection study is performed solely for informational purposes

and is not binding on either party. It also requires the study report to provide specific information, including, at a minimum: (1) preliminary identification of any circuit breaker short circuit capability limits exceeded; (2) preliminary identification of any thermal overload or voltage limit violations; and (3) estimated network upgrade costs related to the identified overloads and violations.

47. We recognize that the benefit of the informational interconnection study results would depend on the information provided, the assumptions made, and the timing of the proposed interconnection, with studies looking at interconnection requests with proposed commercial operation dates further into the future carrying greater uncertainty. Nevertheless, we seek comment on whether the informational interconnection study, as proposed, would provide prospective interconnection customers with sufficient and timely information to inform decision-making prior to submitting an interconnection request.

48. We seek comment on whether transmission providers should be required to establish a request window of a limited number of days each year in which potential interconnection customers can request an optional informational interconnection study. Lastly, we seek comment on the burdens on transmission providers of conducting informational studies and whether other options, such as the proposal below for public interconnection information, might strike a better balance of providing interconnection customers with useful information while making efficient use of transmission provider resources.

ii. Public Interconnection Information

49. In addition to the optional informational interconnection study described above, to address the lack of information available to interconnection customers prior to entering

the interconnection queue, and the associated impacts on development of new generating facilities, interconnection queue backlogs, and interconnection study delays, we also propose to set minimum requirements for transmission providers to publicly post available information pertaining to generator interconnection. We believe that providing an interactive visual representation[105] of available interconnection capacity, as explained below, across a transmission provider's transmission system could provide valuable information to prospective interconnection customers that are considering efficient points of interconnection and could ameliorate the incentive to submit multiple speculative interconnection requests to gather information useful to assessing the viability of proposed generating facilities.

50. Some transmission providers already post such generator interconnection information as an extra tool for prospective interconnection customers. For example, MISO provides an interactive heatmap of expected congestion to serve as a guide on potential points of interconnection with available interconnection capacity.[106] The heatmap allows prospective interconnection customers to see estimated changes in variables such as the distribution factor (an approximation of congestion) and the percentage impact on power flow for monitored facilities based on a user-entered MW amount and voltage level at a user-selected point of interconnection. Transmission congestion is a key consideration for potential interconnection customers because elevated congestion in a particular area of the transmission system may signal that it is a location where network upgrades are more likely to be required or curtailments are more

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[105] *See, e.g.*, Midcontinent Indep. Sys. Operator, *Points of Interconnection*, https://giqueue.misoenergy.org/PoiAnalysis/index.html (accessed March 17, 2022).

[106] *Id.*

likely to occur relative to an area with less congestion. This heatmap is based on the assumptions in a given interconnection study cycle and MISO includes the caveat that the tool does not provide consideration for all system conditions, including voltage and stability constraints.

51. In order to make similar information available to prospective interconnection customers across the country—ensuring comparable access to information regardless of the interconnecting transmission provider—we propose to require transmission providers to maintain and make publicly available an interactive visual representation of available interconnection capacity as well as a table of relevant interconnection metrics that allow prospective interconnection customers to see certain estimates of a potential generating facility's effect on the transmission provider's transmission system. Specifically, we propose to revise section 6.4 of the *pro forma* LGIP to implement this reform. Section 6.4 (Publicly Posted Interconnection Information) would set forth minimum requirements that include a heatmap of estimated incremental injection capacity (in MW) available at each bus in the transmission provider's footprint under N-1 conditions, as well as providing a table of results showing the estimated impact of the addition of a proposed project (based on the user-specified MW amount, voltage level, and point of interconnection) for each monitored facility impacted by the proposed project on: (1) the distribution factor; (2) the MW impact (based on the proposed project size and the distribution factor); (3) the percentage impact on the monitored facility (based on the MW values of the proposed project and the monitored facility rating); (4) the percentage of power flow on the monitored facility before the proposed project; and (5) the percentage power flow on the monitored facility after the injection of the proposed project. These metrics would be calculated based on the power flow model of the cluster

study or re-study with the transfer simulated from each bus to the whole transmission providers footprint (to approximate NRIS), and with the incremental capacity at each bus decremented by the existing and queued generation in the Cluster (based on the existing or requested interconnection service limit of the generation). These metrics would be intended to facilitate a high-level comparison between various points of interconnection, without submitting an interconnection request. We propose to require transmission providers to make this information available on their public websites to facilitate transparency and the usefulness of this information for prospective interconnection customers. We propose to require transmission providers to update this information within 30 days after the completion of each cluster study and re-study. Should prospective interconnection customers require more detailed analysis, they could submit a request for an informational interconnection study, as we proposed to establish above in Section A.1.b.

52. We seek comment on whether there are any security concerns with this proposed requirement. We also seek comment on whether the assumptions specified for the analysis are the right set of assumptions.

2. Cluster Study

a. Need for Reform

53. As discussed above, the inefficiency of the *pro forma* serial first-come, first-served interconnection study process in the *pro forma* LGIP is a major cause of the backlogs delaying transmission providers' interconnection queues. Using the *pro forma* serial interconnection study process in the face of a large interconnection queue backlog leads to uncertainty with regard to how long it will take to complete the interconnection

study process, and the interconnection customer's cost responsibility for network upgrades.

54. Even for transmission providers that have not yet experienced large backlogs, the serial interconnection study process may cause unnecessary delay and inefficiently allocate network upgrade costs. Under the *pro forma* LGIP study process, interconnection requests are typically studied individually where a single proposed generating facility may create a need for network upgrades. This current serial process may result in a piecemeal identification of network upgrades which does not account for possible efficiencies of studying multiple interconnection customer requests and identifying fewer network upgrades that are able to accommodate multiple interconnection requests, particularly requests that may be located in a similar area.[107]

55. Moreover, advancing interconnection customers' facilities through the queue based solely on date of entry may result in inefficiencies where earlier queued customers have the potential to delay later-queued facilities. Specifically, the serial process combined with existing allocation of costs may cause unreasonable delays in the study process. Under existing tariffs within the RTOs/ISOs and non-RTO/ISO regions, the transmission provider allocates the full cost of those network upgrades to the individual interconnection customer. Although the crediting policy in the *pro forma* LGIP requires that the interconnection customer is ultimately reimbursed for the cost of the network upgrades, the large upfront network upgrade cost allocation may render a proposed generating facility economically non-viable, such that the interconnection customer is

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[107] *See* May Joint Task Force Tr. 43:25-44:4 (Riley Allen) ("Clustering helps the regions identify what I'll call the backbone or trunk facilities that provide efficiencies in the system to the benefit ultimately of ratepayers. New England has been relying on clustering and I'm told that that's going very well.").

forced to withdraw from the interconnection queue.[108] Unless the withdrawing interconnection customer's proposed generating facility is electrically isolated, this withdrawal will also trigger individual re-study of lower-queued interconnection requests. As the transmission provider attempts to allocate this large network upgrade cost to the next interconnection customer in the interconnection queue, it can cause several projects to withdraw and trigger further re-studies—commonly referred to as cascading re-studies. If the interconnection customer does not withdraw and pays for the network upgrade to be constructed, lower-queued interconnection customers that will benefit from the network upgrade are not required to share cost responsibility simply because they submitted an interconnection request at a later date.[109] Therefore, the existing serial study process may now be unjust and unreasonable because interconnection customers are no longer able to consistently progress through the interconnection process in a timeframe consistent with Order No. 2003 and the *pro forma* LGIP. Further, the existing serial study process may now be unjust and unreasonable because the process frequently allocates to individual interconnection customers the cost network upgrades that may create additional interconnection capacity needed for several interconnection customers.

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[108] *See, e.g.*, *Duke*, 176 FERC ¶ 61,075 at P 3 (explaining that, in many cases, assignment of such significant network upgrade costs can make new generation projects infeasible, incentivizing those projects to delay in committing to fund the network upgrades or to withdraw from the interconnection queue, causing delays and the need for re-studies). Interconnection customers may be even more likely to withdraw in RTO/ISO areas where the Commission has allowed for participant funding of network upgrades, whereby the interconnection customer will not be fully reimbursed for the cost of the network upgrades.

[109] *See* Order No. 845-A, 166 FERC ¶ 61,137 at P 78 ("The principle of cost causation generally requires that costs 'are to be allocated to those [that] cause the costs to be incurred and reap the resulting benefits.'") (citing *S.C. Pub. Serv. Auth. v. FERC*, 762 F.3d 41, 87 (D.C. Cir. 2014)) (quoting *NARUC v. FERC*, 475 F.3d at 1285).

b. Proposed Reforms

i. Background

56. The serial first-come, first-served study process in the *pro forma* LGIP includes three distinct studies, conducted on an individual basis, to identify the interconnection facilities and network upgrades that are needed to accommodate the interconnection request and provide an estimate of the cost responsibility and timing for those facilities. Each study incorporates the base case study model, which includes all generating facilities and the associated interconnection facilities and network upgrades needed for higher-queued interconnection requests that are pending, as well as an up-to-date model of the transmission provider's transmission system.[110] First, the transmission provider conducts the feasibility study, which is a preliminary evaluation of the system impact and cost of interconnecting the generating facility to the transmission provider's transmission system, and consists of a power flow and short circuit analysis.[111] The transmission provider must use reasonable efforts to complete the feasibility study no later than 45 days after it receives the executed interconnection feasibility study agreement.[112]

57. Second, the transmission provider conducts the system impact study. The system impact study identifies and details the impacts to the transmission provider's transmission

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[110] *Pro forma* LGIP section 2.3.

[111] *Id.* section 6.2. Some transmission providers—including CAISO, Arizona Public Service Company, El Paso Electric Company (El Paso Electric), Sierra Pacific Power Company and Nevada Power Company (jointly, NV Energy), and Public Service Company of New Mexico (PNM)—have eliminated the feasibility study to reduce interconnection request processing time.

[112] *Id.* section 6.3.

system or an affected system of the interconnection of the proposed generating facility.[113] The system impact study consists of a short circuit analysis, a stability analysis, and a power flow analysis. The transmission provider must use reasonable efforts to complete the system impact study within 90 days after it receives the executed interconnection system impact study agreement.[114] The *pro forma* LGIP provides transmission providers with the option to study interconnection requests on a clustered basis for the system impact study.[115]

58. Third, the transmission provider conducts the facilities study, which specifies and estimates the cost of the equipment, engineering, procurement, and construction work needed to implement the conclusions of the system impact study.[116] Where the system impact study focuses mainly on impacts to the transmission system, the facilities study aims to provide a more accurate estimate of the electrical switching configuration of the connection equipment, such as transformers, switchgear, meters, and other station equipment and a more accurate estimate of the specific costs associated with required network upgrades rather than a per-mile estimate. The facilities study will also identify any potential control equipment needed to accommodate requests for interconnection

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[113] *Id.* section 7.3.

[114] *Id.* section 7.4.

[115] Order No. 2003, 104 FERC ¶ 61,103 at PP 153-156; *pro forma* LGIP section 4.2. If the transmission provider elects to study interconnection requests using clustering, all interconnection requests received within 180 days (queue cluster window) must be studied together without regard to the nature of the underlying interconnection service, whether NRIS or ERIS. However, the *pro forma* LGIP allows the transmission provider to study an interconnection request separately based on the electrical remoteness of the proposed generating facility. *Pro forma* LGIP section 4.2.

[116] *Id.* section 8.2.

service that are lower than the generating facility capacity. Interconnection customers have two options for the timeframe in which the facilities study must be completed: 90 days, if the interconnection customer requests a +/- 20% cost estimate contained in the report; or 180 days, if the interconnection customer requests a +/- 10% cost estimate.[117]

59. Re-study is required when (1) a higher-queued interconnection request withdraws from the interconnection queue, (2) a higher-queued interconnection request modifies its proposed generating facility pursuant to section 4.4 of the *pro forma* LGIP, or (3) the interconnection customer redesignates its point of interconnection.[118] Transmission providers are required to conduct re-study of the feasibility study within 45 days of the triggering event and re-study of the system impact and facilities studies within 60 days of the triggering event.

60. Under the *pro forma* LGIP, the interconnection customer can request to begin negotiations to the LGIA with the transmission provider at any time after the interconnection customer executes the interconnection facilities study agreement, for not more than 60 days after tender of the final interconnection facilities study report.[119] If the interconnection customer determines that negotiations are at an impasse, it may request termination of the negotiations at any time after tender of the draft LGIA and request submission of the unexecuted LGIA to the Commission, or initiate dispute resolution

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[117] If the interconnection customer wants its cost estimate to be accurate within a range of +/- 20%, the study must be completed within 90 days since there is greater room for error on the part of the transmission provider's estimate, whereas if the interconnection customer wants its cost estimate to be accurate within a range of +/- 10%, the transmission provider has up to 180 days to develop a more accurate cost estimate. *Id.* section 8.3.

[118] *Id.* sections 6.4, 7.6, 8.5.

[119] *Id.* section 11.2.

procedures. The transmission provider must provide a final LGIA to the interconnection customer within 15 days after the completion of the negotiation process. Within 15 days after receipt of the final LGIA, the interconnection customer must provide the transmission provider either (1) reasonable evidence of continued site control or (2) post additional non-refundable security of $250,000, which will be applied toward future construction costs.[120] The interconnection customer also must provide reasonable evidence that it has achieved one or more milestones in the development of the generating facility as listed in section 11.3 of the *pro forma* LGIP. As soon as practicable, but not later than 10 days after receiving the tendered LGIA or the request to file an unexecuted LGIA, the transmission provider must file the LGIA with the Commission.[121]

61. The Commission has stated that clustering is the preferred method for conducting interconnection studies, and has strongly encouraged clustering in interconnection queue management and interconnection study processes for all transmission providers.[122] In the 2008 Technical Conference Order, the Commission noted that clustering that takes into account factors other than the interconnection request filing date may allow for more efficient prioritization of interconnection requests while still providing protection from undue discrimination by transmission providers.[123] Subsequently, the Commission approved many variations of cluster study processes where the transmission provider

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[120] *Id.* section 11.3.

[121] *Id.*

[122] Order No. 2003, 104 FERC ¶ 61,103 at P 155, Order No. 2006, 111 FERC ¶ 61,220 at P 181.

[123] 2008 Technical Conference Order, 122 FERC ¶ 61,252 at P 18.

groups interconnection requests received during an open window period and processes those requests as a cluster, with some form of shared cost responsibility for identified network upgrades triggered by the cluster. The Commission noted that performing studies in clusters helps alleviate interconnection queue backlogs and offers considerable benefits as the network upgrades required for an interconnection customer to interconnect to the transmission system may be large enough to accommodate more than one interconnection request.[124] Generally, cluster study processes include the following elements: (1) an interconnection request window; (2) a customer engagement window; (3) cluster studies including (a) a power-flow and voltage study, which is similar to a feasibility study under the *pro forma* LGIP, and (b) a stability and short circuit study, which completes the traditional system impact study; (4) a facilities study; (5) re-study, if needed; and (6) LGIA execution or filing of an unexecuted LGIA.

62. To join a cluster, an interconnection customer must generally submit a valid interconnection request before the close of the request window for that cluster. Some transmission providers accept interconnection requests during an annual[125] window,

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[124] *Midwest Ind. Sys. Operator, Inc.*, 124 FERC ¶ 61,183 at PP 114, 143 (accepting usage of group studies as a means to help alleviate interconnection queue backlog and finding that clustering studies offers considerable benefits); *SPP*, 128 FERC ¶ 61,114 at P 32 (finding that performing cluster studies should enable processing the interconnection queue backlog more effectively); *So. Cal. Edison Co*., 135 FERC ¶ 61,093, at P 50 (2011) (finding that coordinating the cluster study processes for interconnection requests to a utility's transmission and distribution systems would "achieve greater efficiency and effectively manage network impacts"); *see also* May Joint Task Force Tr. 42:3-9 (Gladys Brown Dutrieuille) (explaining that clustering has two goals: minimizing the study time and minimizing the first mover disadvantage by sharing costs among those resources that need the same upgrades).

[125] PacifiCorp, Tri-State, Duke, ISO New England Inc. (ISO-NE), MISONYISO, and SPP have annual windows.

whereas others have a semi-annual[126] window. After the interconnection requests are received and deemed valid, and before the start of the interconnection study process for the cluster, a customer engagement window begins.[127] During the customer engagement window, transmission providers work with interconnection customers to build study models, verify data, hold stakeholder meetings, and generally prepare for the interconnection study process. At the end of the customer engagement window, all interconnection customers with complete interconnection requests and a signed study agreement will be included in that cluster.

63. Many transmission providers with large transmission systems typically group interconnection requests on the basis of geographic location and electrical relevance before conducting a cluster study.[128] Most transmission providers that use a cluster study process still conduct facilities studies on an individual basis.[129] In addition, some non-RTO/ISO transmission providers offer a separate generator interconnection process for interconnection customers participating in a resource solicitation process.[130]

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[126] PNM, Arizona Public Service Company, El Paso Electric, NV Energy, PSCo, and CAISO have semi-annual windows.

[127] PSCo and Tri-State have 75-day customer engagement windows, while Duke has a 60-day customer engagement window.

[128] MISO, CAISO, SPP, ISO-NE, NV Energy, Arizona Public Service Company, and PNM group projects in such a way, and PacifiCorp and Tri-State have added the term Cluster Area to their LGIPs. *See* PacifiCorp, Transmission OATT and Service Agreements, part. IV.36 (Definitions) (5.0.0); Tri-State Generation and Transmission Association, Inc., Open Access Transmission Tariff, attach. N, Standard LGIP (7.0.0), section 1.

[129] NV Energy, however, uses clusters for the facilities study. MISO performs both the system impact study and facilities study in a group study format.

[130] The resource solicitation process provision is discussed later in the NOPR.

ii. Proposal

64. We propose to revise the *pro forma* LGIP and *pro forma* LGIA to make cluster studies the required interconnection study method under the *pro forma* LGIP.[131] We therefore propose to require transmission providers to eliminate the serial first-come, first-served study process and instead use a first-ready, first-served cluster study process. We preliminarily find that a first-ready, first-served cluster study process, coupled with increased financial commitments and readiness requirements that we also propose in this NOPR, will address the interconnection queue issues described above, thereby remedying potentially unjust and unreasonable Commission-jurisdictional rates.[132] Even in areas that have not yet experienced large backlogs, we believe the first-ready, first-served cluster study process increases efficiency of the interconnection process and would help prevent delays in the future. A first-ready, first-served cluster study process is a more efficient way of studying a large interconnection queue because transmission providers can perform larger interconnection studies encompassing numerous proposed generating

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[131] *See* May Joint Task Force Tr. 46:15-19 (Clifford Rechtschaffen) (stating that CAISO's cluster process has been helpful and important for improving interconnection queue processing and that clustering "is a best practice and should be promoted").

[132] *See* 2020 Tri-State Order, 173 FERC ¶ 61,015 at PP 29, 45 (finding that a first-ready, first-served cluster study process would address interconnection queue backlog and rejecting the filing on other grounds); *PacifiCorp*, 171 FERC ¶ 61,112 at P 47 (finding that proposed interconnection queue reform was a just and reasonable solution to an interconnection queue backlog); *PSCo*, 169 FERC ¶ 61,182 at P 30 (same); *Pub. Serv. Co. of N.M.*, 136 FERC ¶ 61,231, at P 77 (2011) (*PNM*) (finding that first-ready, first-served cluster study process would address interconnection queue backlog and allow projects that are further along in development to proceed on a more accelerated basis while allowing less developed projects to receive early information); *Duke*, 176 FERC ¶ 61,075 at P 51 (finding that proposed revisions to Duke LGIP and LGIA were consistent with or superior to the *pro forma* LGIP and LGIA); *see also Tri-State*, 174 FERC ¶ 61,021 at P 27 (noting previous findings from the 2020 Tri-State Order).

facilities, rather than separate studies for each individual interconnection customer.[133] Additionally, conducting a single cluster study and cluster re-study each year would minimize delays that can arise from proposed generating facility interdependencies and also minimize the risk of cascading re-studies when a higher-queued interconnection customer withdraws.[134] This limited re-study process would consume far less time than under a serial first-come, first-served re-study process, which requires re-studying all proposed generating facilities in isolation with a new base case. In addition, the proposed reforms may assist interconnection queue management because, even if clusters have cascading re-study issues, there will be fewer re-studies needed and fewer cost consequences for lower-queued generators as compared to serial re-studies. Thus, we believe that requiring a first-ready, first-served cluster study process, coupled with increased financial commitments and readiness requirements that we also propose in this NOPR, should improve the efficiency in processing generator interconnection requests, and result in just and reasonable Commission-jurisdictional rates.

65. In particular, we propose several revisions to the *pro forma* LGIP and *pro forma* LGIA to implement a first-ready, first-served cluster study process. We describe these

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[133] *See Duke*, 176 FERC ¶ 61,075 at P 52 (finding that Duke's transition to a first-ready, first-served cluster study process could relieve "(1) delays in completing generator interconnection studies; (2) inability of interconnection customers to share costs of network upgrades; and (3) existence of non-viable projects in the queues"); *see also Tri-State*, 174 FERC ¶ 61,021 at P 31 (noting PSCo's Comments that PSCo's preliminary experience of operating under the cluster study process has demonstrated that "studying requests in clusters is shown to be more efficient than studying each request individually," and that "this approach to generator interconnection is superior to the *pro forma* LGIP and LGIA").

[134] *PNM*, 136 FERC ¶ 61,231 at P 79 (noting that "PNM's proposal adopting the cluster approach to study related projects together will likely improve efficiency by limiting the need for re-studies") (citing Order No. 2006, 111 FERC ¶ 61,220, at P 181).

revisions briefly in this section and include the full proposed language in appendices to this NOPR. We propose to add several new defined terms and revise several defined terms in section 1 of the *pro forma* LGIP and article 1 of the *pro forma* LGIA. For example, we propose to modify the definition of stand alone network upgrade to clarify that, for a network upgrade to be eligible for treatment as a stand alone network upgrade,[135] the network upgrade must only be required for one interconnection customer. This clarification should prevent lengthy conflict and negotiations in instances where multiple interconnection requests trigger the need for a network upgrade that could be considered a stand alone network upgrade under the current definition mainly because it can be constructed without affecting day-to-day operations of the transmission system, and several interconnection customers have an interest in exercising the option to build. We also propose modifying the definition of material modification to account for the equal queue position of generating facilities in the same cluster.[136] The new definition would clarify that material modifications are those with a material impact on the cost or timing of interconnection requests with a later or equal queue position.

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[135] Under the current *pro forma*, Stand Alone Network Upgrades are defined as "Network Upgrades that are not part of an Affected System that an Interconnection Customer may construct without affecting day-to-day operations of the Transmission System during their construction. Both the Transmission Provider and the Interconnection Customer must agree as to what constitutes Stand Alone Network Upgrades and identify them in Appendix A to the Standard Large Generator Interconnection Agreement. If the Transmission Provider and Interconnection Customer disagree about whether a particular Network Upgrade is a Stand Alone Network Upgrade, the Transmission Provider must provide the Interconnection Customer a written technical explanation outlining why the Transmission Provider does not consider the Network Upgrade to be a Stand Alone Network Upgrade within 15 days of its determination." *Pro forma* LGIP section 1.

[136] Under the current *pro forma*, Material Modification is defined as "those modifications that have a material impact on the cost or timing of any Interconnection Request with a later queue priority date." *Pro forma* LGIP section 1.

66. We propose revisions to add new subsection 3.1.1.1 (Initial Study Deposit) to the *pro forma* LGIP, which provides that an interconnection customer must submit its interconnection request and applicable study deposit during a cluster request window (described below). We also propose to add new subsection 3.1.2 (Submission) to the *pro forma* LGIP, which provides that interconnection customers evaluating different options (such as different sizes, sites, or voltages) are encouraged but not required to use the new informational interconnection study proposed in this NOPR before entering the cluster study. New subsection 3.1.2 of the *pro forma* LGIP also provides that the interconnection customers must select a definitive point of interconnection to be studied when executing the cluster study agreement. Upon mutual agreement, the transmission provider may make reasonable changes to the requested point of interconnection to facilitate efficient interconnection of clustered interconnection requests at common points of interconnection.

67. We also propose to add new subsection 3.4.1 (Cluster Request Window) to the *pro forma* LGIP, which provides that interconnection customers must submit an interconnection request during a specified period, the cluster request window, which is a 45-day period with the start date to be determined by each transmission provider (with the annual start date for the transmission provider's cluster request window included in its LGIP). The transmission provider would consider all interconnection requests accepted within this period to have equal queue priority for purposes of the cluster study. Following the close of the cluster request window, the transmission provider would begin a 30-day customer engagement window as provided in new subsection 3.4.5 (Customer Engagement Window) of the *pro forma* LGIP.

68. We propose to renumber and revise subsection 3.4.4 (Scoping Meeting) as subsection 3.4.6 of the *pro forma* LGIP to provide that, during the customer engagement window, transmission providers must hold a scoping meeting with all interconnection customers whose interconnection requests were received in that cluster request window. Revised subsection 3.4.6 of the *pro forma* LGIP would also require transmission providers to hold individual customer-specific scoping meetings, at the interconnection customer's request, which must be requested by no later than 15 business days after the close of the cluster request window. By the end of the customer engagement window, the transmission provider would post on OASIS the final cluster study plan, which lists all valid interconnection requests with an executed cluster study agreement that will be part of the cluster study.

69. We propose to replace the sections of the *pro forma* LGIP, including subsection 3.5.2 (Requirement to Post Interconnection Study Metrics) of the *pro forma* LGIP, that require the posting of metrics for interconnection feasibility studies processing time and system impact study processing time with sections that require the posting of metrics for cluster study processing time and cluster re-study processing time. We also propose to add a new subsection to require the posting of the time from when the transmission provider received a valid interconnection request to the completion of the cluster study, cluster re-study, and facilities study.

70. We also propose several revisions to section 4 (Queue Position) of the *pro forma* LGIP to make clear that cluster studies are the required interconnection study method under the *pro forma* LGIP and that transmission providers may not have a first-come, first-served interconnection study method under their respective LGIPs. We propose to rename and revise section 4.1 of the *pro forma* LGIP as "Queue Position" and add two

new subsections: (1) subsection 4.1.1 (Assignment of Queue Position), which makes clear that queue position will be based on the time and date that the transmission provider receives all items required under section 3.4 (Valid Interconnection Request) and that there is no queue priority for interconnection customers that opted for informational interconnection studies;[137] and (2) subsection 4.1.2 (Higher Queue Position), which provides that all interconnection requests studied in a single cluster shall be considered to have equal queue priority, but clusters initiated earlier in time shall be considered to have a higher queue position than clusters initiated later. To be clear, the date of submission of an individual interconnection request within the same cluster would have no bearing on the allocation of the cost of the network upgrades identified in the applicable cluster study, because such costs would be allocated among interconnection requests using a proportional impact method (discussed below in section II.A.4.).

71. New subsection 4.1.2 of the *pro forma* LGIP also provides that moving a point of interconnection shall result in a loss of queue position if the transmission provider deems the change a material modification. To align with this, we propose corresponding changes to the material modification provisions in section 4.4 (Modification) of the *pro forma* LGIP to provide that moving a point of interconnection shall result in a loss of interconnection queue position if it is deemed a material modification by the transmission provider. We note that the interconnection customer may decide to forego the requested change that constitutes a material modification and retain its existing queue position.[138]

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[137] *See supra* PP 42-45 (explaining that the informational interconnection study is intended to provide prospective interconnection customers with information prior to entering the queue).

[138] *Pro forma* LGIP section 4.4.3.

We also propose to revise *pro forma* LGIP section 4.4.5, which currently states that an extension of less than three cumulative years of the generating facility's commercial operation date are not material and should be handled through construction sequencing. We propose to provide that the commercial operation date reflected in the initial interconnection request shall be used in calculating the permissible three-year extension.

72. We propose to remove from section 4.2 (Clustering) of the *pro forma* LGIP the provisions allowing interconnection requests to be studied serially. We also propose to remove the requirement for the transmission provider to provide 180 days' advance notice before opening a cluster window. In addition to removing these provisions, we propose to rename section 4.2 of the *pro forma* LGIP "General Study Process" and revise it to provide that interconnection studies shall be performed within the cluster study process.

73. We propose to revise subsection 4.4.1 of the *pro forma* LGIP to make clear that: (1) the modifications previously permitted prior to return of the executed system impact study agreement are now permitted to be made prior to return of the executed cluster study agreement; and (2) for plant increases, the incremental increase will be studied with the next cluster study for purposes of cost allocation and study analysis.

74. We propose to delete section 6 (Interconnection Feasibility Study) of the *pro forma* LGIP (and all subsections). As explained above, we propose to adopt the new section 6 (Interconnection Information Access) of the *pro forma* LGIP to establish a mechanism for the interconnection customer to evaluate the feasibility of a prospective generating facility. We propose to revise section 7 (Interconnection System Impact Study) of the *pro forma* LGIP to make clear that the system impact study will now be conducted on a clustered basis, and that the transmission provider must complete the

cluster study within 150 days of the closing of the customer engagement window. We further propose revisions to sections 3.4.2 and 8.1 of the *pro forma* LGIP to include the financial commitments and readiness requirements that must be met for the interconnection customer to remain in the interconnection queue following the completion of the cluster study. Those requirements are discussed in greater detail below. We propose additional revisions to delete section 7.5 (Meeting with Transmission Provider) of the *pro forma* LGIP and adopt the new section 7.5 (Cluster Study Re-Studies) of the *pro forma* LGIP to include provisions governing clustered re-studies where an interconnection customer in the cluster or a higher-queued cluster withdraws its interconnection request. Specifically, we propose to require transmission providers to conduct a re-study of the cluster within 150 days of informing the cluster of the need for re-study.

75. We propose revisions to the facilities study provisions in section 8 (Interconnection Facilities Study) of the *pro forma* LGIP to make clear that re-studies can be triggered by a higher or equally queued interconnection project withdrawing from the interconnection queue or modification of a higher or equally queued interconnection project pursuant to section 4.4 (Modifications) of the *pro forma* LGIP.

76. We also propose revisions to section 11.1 (Tender) of the *pro forma* LGIP to clarify the procedures for executing the LGIA. We propose revisions to section 11.3 (Execution and Filing) of the *pro forma* LGIP to provide that the interconnection customer must submit to the transmission provider at the same time it submits the executed LGIA demonstration of continued site control, the requisite deposit, and reasonable evidence of achieving milestones in the development of the generating facility. An interconnection customer that requests that the transmission provider file an

unexecuted LGIA with the Commission must submit the aforementioned information within 15 days of the Commission issuing an order on the unexecuted LGIA filing, or its interconnection request will be deemed withdrawn. We propose revisions to the system impact study agreement and facilities study agreement to be consistent with the new cluster study process. We propose to add several new definitions to section 1 of the *pro forma* LGIP and article 1 of the *pro forma* LGIA that relate to the new first-ready, first-served cluster study process and to modify a number of other definitions.

77. We seek comment on whether the Commission should require transmission providers to conduct cluster studies on subgroups of interconnection customers based on areas of geographic and electric relevance, and, if so, whether the Commission should adopt provisions governing how cluster areas should be formed to ensure that cluster areas are formed in a transparent and not unduly discriminatory manner.[139]

78. We seek comment on whether the *pro forma* LGIP should specify how cluster studies must be rerun after re-study is triggered or whether there are provisions the Commission could adopt to improve the efficacy of the re-study process, such as preventing excessive re-study by limiting the transmission provider to two re-studies per month within the 150-day cluster re-study period.

79. We seek comment on whether the Commission should maintain an option in the *pro forma* LGIP for some interconnection requests to be processed outside of the annual

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[139] Commenters that believe that the Commission should adopt provisions governing how cluster areas should be formed should also explain how to define such a cluster area (e.g., based on geographic proximity, geographic constraints such as bodies of water or mountain ranges, system topology, and/or major transmission system constraints).

cluster study process, and if so, in what circumstances and on what timeframe (for completion of the study), and on what priority compared to any active clusters.

3. Allocation of Cluster Study Costs

a. Background

80. Under the *pro forma* LGIP, interconnection studies are conducted for each individual interconnection request and study costs are paid by the interconnection customer. Transitioning to a first-ready, first-served cluster study process would require transmission providers to establish a method to allocate the shared cost of clustered interconnection studies among the interconnection customers in the cluster.

81. The Commission has accepted a variety of approaches to allocating the costs of cluster studies, most of which allocate costs using two factors: (1) the total MW size requested in a cluster; and (2) the number of interconnection requests in the cluster. Approaches among transmission providers vary with regard to the weight assigned to each of these factors. For example, Duke and Dominion allocate 90% of the applicable study costs to interconnection customers on a pro rata basis based on requested MWs included in the applicable cluster, and 10% on a per capita basis based on the number of interconnection requests included in the applicable cluster.[140] SPP, PNM, PSCo, PacifiCorp, and Tri-State allocate 50% of the study costs based on requested MWs, and 50% based on the number of interconnection requests.[141] CAISO, NYISO, and MISO only use one of the two factors in their allocation method. CAISO and NYISO allocate

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[140] *See Duke*, 176 FERC ¶ 61,075 at P 18; *Dominion*, Docket No. ER22-301-000 (Dec. 28, 2021) (delegated order).

[141] *See* SPP, OATT, attach. V (4.0.0), section 4.2.5; *PNM*, 136 FERC ¶ 61,231 at P 24; *PSCo*, 169 FERC ¶ 61,182 at P 32; *PacifiCorp*, 171 FERC ¶ 61,112 at P 13; *Tri-State*, 174 FERC ¶ 61,021 at P 33.

all study costs equally based on the number of interconnection requests within the cluster,[142] while MISO allocates all study costs pro rata based on the number of MWs requested.[143]

b. Proposal

82. We propose to revise section 13.3 (Obligation for Study Costs) of the *pro forma* LGIP to allocate the shared costs of cluster studies as follows: 90% of the applicable study costs to interconnection customers on a pro rata basis based on requested MWs included in the applicable cluster, and 10% of the applicable study costs to interconnection customers on a per capita basis based on the number of interconnection requests included in the applicable cluster.[144] We preliminarily find that this allocation of the costs of cluster studies would result in just and reasonable Commission-jurisdictional rates because it appropriately recognizes that the MW size of a cluster has a dramatic impact on the cost of studying the cluster, while also recognizing that the number of interconnection requests included in the cluster also impacts the cost of studying the cluster, but to a lesser degree.

83. We seek comment on whether a different cost allocation approach may be appropriate or whether each transmission provider should be provided additional flexibility to propose a cost allocation approach on compliance with any final rule.

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[142] CAISO, CAISO eTariff, OATT, app. DD, section 3 (14.0.0), section 3.5.1.2; NYISO, NYISO Tariffs, attach. X, section 30.13 (5.0.0), section 30.13.3.

[143] MISO, FERC Electric Tariff, OATT, attach. X, (155.0.0) section 3.3.1.

[144] If an interconnection customer withdraws its interconnection request prior to the start of the cluster study, that customer would be required to pay the actual costs of processing its interconnection request but would not be assessed a withdrawal penalty.

4. Allocation of Cluster Network Upgrade Costs

a. Background

84. As discussed above, under the serial first-come, first-served study process in the *pro forma* LGIP, transmission providers study interconnection requests individually and in the order in which they are received. If a study identifies a need for network upgrades in response to an individual interconnection customer request, the transmission provider allocates the initial cost of those network upgrades to the individual interconnection customer. The *pro forma* LGIP allows transmission providers to perform clustered system impact studies but does not explain how transmission providers should allocate network upgrade costs among interconnection customers within a cluster.

85. Several of the transmission providers that have adopted a cluster first-ready, first-served study process have also adopted methods for allocating network upgrade costs that differ from their previously existing cost allocation mechanisms in one of two ways: (1) proportional capacity (based on the proposed generating facility's MW capacity in proportion to the cluster's total MW capacity); or (2) proportional impact (determined based on a distribution factor analysis). Several transmission providers also separate network upgrades into two categories prior to allocating costs based on the proportional capacity or proportional impact method: (1) station equipment, including all equipment located in the substation immediately beyond the point of interconnection to which the generating facility is connected (called station equipment network upgrades); and (2) all other network upgrades, including equipment located beyond the substation, such as transmission lines, transformers, voltage support, and distantly located breakers (called

system network upgrades).[145] These methods allocate station equipment network upgrade costs based on the number of generating facilities interconnecting at an individual station (i.e., allocated equally to each interconnection customer interconnecting to the substation).

86. For network upgrades beyond the transmission provider's substation, PNM and PacifiCorp use the proportional capacity method.[146] PacifiCorp explained in its interconnection queue reform proposal that the proportional capacity method is better for PacifiCorp given the size of its service territory, and that PacifiCorp uses a cluster area approach in which it clusters projects by electrical relevance, which prevents interconnection customers from bearing the costs of network upgrades in distant areas of PacifiCorp's transmission system.[147]

87. CAISO, MISO, SPP, NYISO, PSCo, Tri-State, Duke, and Dominion use the proportional impact method by performing a distribution factor analysis.[148] Relative to other transmission providers, Tri-State includes a more comprehensive explanation of its distribution factor analysis method in its tariff. Specifically, Tri-State's tariff provides that: (1) thermal network upgrade costs are allocated based on the impact (in MWs) from each generating facility within the cluster or cluster area; (2) voltage network upgrade costs are allocated based on the voltage impact from each generating facility within the

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[145] *E.g.*, *PNM*, 136 FERC ¶ 61,231 at P 25.

[146] *Id.*; *PacifiCorp*, 171 FERC ¶ 61,112 at P 18.

[147] PacifiCorp, Transmittal, Docket No. ER20-924-000, at n.107 (filed Jan. 31, 2020).

[148] *PSCo*, 169 FERC ¶ 61,182 at P 34; *Tri-State*, 174 FERC ¶ 61,021 at P 38; *Duke*, 176 FERC ¶ 61,075 at P 11; *Dominion*, Docket No. ER22-301-000 (Dec. 28, 2021) (delegated order).

cluster or cluster area on the most constrained bus under the most constraining contingency in the definitive interconnection study case(s); (3) transient stability network upgrade costs within a cluster or cluster area are allocated based on the pro rata share of the total MW requests of all generating facilities causing instability; (4) short circuit network upgrade costs are allocated based on the impact (in kiloamperes) from each generating facility within the cluster or cluster area, on the constrained facilities under the most constraining fault in the definitive interconnection study case(s); and (5) in instances when a network upgrade resolves multiple types of constraints (such as thermal and voltage or thermal and voltage and transient stability), the costs are allocated within a cluster or cluster area based on a ratio share of the total cost of the independent mitigation types to equitably allocate the cost to all generating facilities contributing to constraints.[149]

b. <u>Proposal</u>

88. We propose to revise the *pro forma* LGIP to include new subsection 4.2.3 to require transmission providers to allocate network upgrade costs to interconnection customers within a cluster using a proportional impact method. Therefore, we propose to establish the definition "Proportional Impact Method" in the *pro forma* LGIP,[150] and require transmission providers to revise their LGIPs to include the specific technical parameters and thresholds of the method for cost allocation. We preliminarily find that this approach will ensure just and reasonable Commission-jurisdictional rates because it

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[149] Tri-State LGIP section 4.2.4.b.

[150] We propose to revise section 1 of the *pro forma* LGIP to provide that Proportional Impact Method shall mean a technical analysis conducted by the transmission provider to determine the degree to which each generating facility in the cluster contributes to the need for a specific network upgrade.

will allow the transmission provider to allocate network upgrade costs among several interconnection customers that may benefit from (and cause the need for) certain network upgrades.[151] By allocating shared network upgrade costs among a cluster of interconnection customers, we expect that this reform will reduce the frequency of an individual customer being allocated a large network upgrade that benefits subsequent interconnection customers, reduce the incentive to submit multiple speculative requests, and reduce the amount of cascading withdrawals and re-studies. We believe that a proportional impact method will accurately reflect the level of contribution of an interconnection request to the need for the network upgrade.

89. We seek comment on whether there are specific types of analyses that the Commission should require transmission providers to use to determine the proportional impact attributed to an interconnection request, including the benefits and drawbacks of any proposed approach. Conversely, we seek comment on whether there are specific types of analyses that the Commission should prohibit because they are known to be inaccurate, provide undue discretion to the transmission provider, or could otherwise be problematic. Additionally, we seek comment on alternative methods to allocate the cost of network upgrades within a cluster such as the proportional capacity method as discussed above. While such a method does not assign cost based on level of contribution of an interconnection request to the need for a network upgrade, we seek comment on whether this method can be sufficiently accurate, in certain instances, in a manner consistent with or superior to the proposed method. For instance, we seek comment on whether the proportional capacity method may be appropriate when a

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[151] *Tri-State*, 174 FERC ¶ 61,021 at P 38.

transmission provider with a relatively small service territory clusters projects by electrical relevance. Conversely, we seek comment on whether there are some circumstances where the proportional capacity method would not be appropriate, such as circumstances where there may be potential for discriminatory treatment.

5. Shared Network Upgrades

a. Background

90. There are no existing provisions in the *pro forma* LGIP that require transmission providers to share network upgrade costs between earlier-in-time and later-in-time interconnection customers (e.g., customers studied in separate clusters). However, in MISO and NYISO, the Commission has approved tariff provisions that require interconnection customers in later cluster studies that benefit from network upgrades completed prior to that later-in-time interconnection customer commencing commercial operation to partially reimburse the interconnection customers in an earlier cluster study that were initially responsible for the facilities' construction.[152]

91. MISO tests all network upgrades in service for less than five years to determine whether they qualify for cost sharing. MISO requires interconnection customers in a later cluster study to share costs if they (1) connect to that network upgrade or (2) pass a two-part power flow screening.[153] If the test reveals that more than five MW of the later-in-time interconnection customer's generating facility uses the network upgrade with a

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[152] *See* NYISO, NYISO Tariffs, attach. S, section 25 (16.0.0), section 25.7.2; MISO, FERC Electric Tariff, MISO OATT, attach. FF section III (81.0.0), section III.A.2.d.2.

[153] MISO Business Practice Manual No. 15, section 6.1.1.1.11, version 23 (May 2021), https://cdn.misoenergy.org/BPM%20015%20-%20Generation%20Interconnection49574.zip

network upgrade rating exceeding one percent, MISO performs an additional analysis. If the results of the second analysis conclude that the interconnection customer generating facility's impact exceeds more than five percent of the network upgrade's facility rating, or that the transmission distribution factor (TDF)[154] is greater than 20%, the interconnection customer in the later cluster study will reimburse interconnection customers from the earlier cluster study based on the share of the cost of the network upgrade allocated to each interconnection customer. MISO allocates the costs of the shared network upgrades using the pro rata share of the MW contribution on all constraints from each project.

92. NYISO accounts for excess capacity created by network upgrades and requires that interconnection customers in a later cluster study reimburse the interconnection customers from an earlier cluster study for the use of these facilities. NYISO tracks any excess capacity, or headroom,[155] created by network upgrades and determines eligibility for cost sharing using two methods. When technically feasible, a later-in-time interconnection customer's use of headroom is measured in terms of the interconnection customer's electrical impact. Otherwise, headroom usage is based on the total number of interconnection customers using a given network upgrade. The headroom is available for 10 years or until it is depleted.[156]

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[154] TDF measures the energy the interconnection customer has requested to inject onto the transmission system, expressed as the percent of the flows across a given transmission facility.

[155] NYISO defines headroom as "the functional or electrical capacity of the System Upgrade Facility or the electrical capacity of the System Deliverability Upgrade that is in excess of the functional or electrical capacity actually used by the Developer's Project." NYISO, NYISO Tariffs, attach. S, section 25.1 (12.0.0).

[156] *See id*. section 25.8.7.

b. Relevant ANOPR Comments

93. Multiple commenters support the concept of cost sharing approaches. The National Association of Regulatory Utility Commissioners (NARUC), for example, contends that the Commission should encourage improvements to the participant funding model through sharing the costs of clusters of similarly situated interconnection customers.[157]

94. MISO and NYISO each highlight the advantages of their existing network upgrade cost sharing approaches. MISO claims that its cost sharing method appropriately balances the interconnection customers' interests.[158] NYISO asserts that its group-based facilities study minimizes later-in-time interconnection customers benefiting without paying for the use of a network upgrade at the outset.[159] NYISO also states that its headroom accounting process partly addresses the issue caused by later-in-time interconnection customers benefiting from preexisting network upgrades.

95. The Michigan Commission asserts that MISO has not made frequent use of its shared network upgrade process and suggests that the Commission explore whether analyzing network upgrades up to 20 years post-construction would encourage the development of higher-cost network upgrades in transmission constrained areas.[160]

96. Some commenters argue that a network upgrade sharing arrangement would be too complicated to execute and lead to stakeholder disagreements. EDF asserts that,

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[157] NARUC, Comments, Docket No. RM21-17-000, at 23 (filed Oct. 12, 2021).

[158] MISO, Comments, Docket No. RM21-17-000, at 87-88 (filed Oct. 12, 2021).

[159] NYISO, Comments, Docket No. RM21-17-000, at 45 (filed Oct. 12, 2021).

[160] Michigan Comm'n, Comments, Docket No. RM21-17-000, at 21-22 (filed Oct. 12, 2021).

while a study-based cost allocation might offer a more precise representation of benefits, such approaches are time-consuming and can be prone to stakeholder disagreement over the study's assumptions and results; EDF believes that any cost sharing percentage for generators should be commensurate with the value of the reimbursement generators receive.[161] TAPS states that, while cost sharing arrangements make sense conceptually, developing a cost sharing process can be resource-intensive and highly contentious.[162]

c. Need for Reform

97. We preliminarily find that the absence of network upgrade cost sharing provisions in the *pro forma* LGIP poses a barrier to entry to generation development. Absent cost sharing provisions among clusters, interconnection customers may significantly benefit from earlier-in-time network upgrades but not share in the cost of those network upgrades in a manner that is roughly commensurate with benefits.[163] As a result, individual interconnection customers may be responsible for the entire cost of network upgrades and may be reluctant to move forward with the development of an interconnection request if there is no opportunity to recover some of the costs associated with the construction of significant network upgrades that are likely to benefit interconnection customers in subsequent cluster studies.

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[161] EDF Renewables, Inc., Comments, Docket No. RM21-17-000, at 13 (filed Oct. 12, 2021).

[162] Transmission Access Policy Study Group (TAPS), Comments, Docket No. RM21-17-000, at 47-48 (filed Oct. 12, 2021).

[163] *See* May Joint Task Force Tr. 135:6-7 (Andrew French) ("I do think costs should be shared between clusters.")

d. Proposal

98. We propose to revise the *pro forma* LGIP and *pro forma* LGIA to require transmission providers to allocate the costs for network upgrade costs between interconnection customers in an earlier cluster study and interconnection customers in a subsequent cluster study that benefit from the same network upgrade in a manner that is roughly commensurate with the benefits received. First, we propose to require that, as part of the first-ready, first-served cluster study process that we also propose in this NOPR, the transmission provider analyze all network upgrades identified through the transmission provider's study process, and, if a generating facility of an interconnection customer in a later cluster study directly connects either to (1) a network upgrade in-service for less than five years or (2) a substation where the network upgrade in-service for less than five years terminates, then the transmission provider would be required to designate the network upgrade a shared network upgrade, and the interconnection customer in the later cluster study would be required to contribute a pro rata portion of the shared network upgrade's remaining undepreciated capital cost based on the impact the interconnection customer in the later cluster study has on the network upgrade as measured using the same method the transmission provider used to determine the impact of the interconnection customer(s) in the earlier cluster study. Second, if the new generating facility does not directly connect to the network upgrade, then the transmission provider would perform a power flow analysis with a two-step test to measure the later-in-time interconnection customer's use of and benefit from the network upgrade funded by interconnection customers from an earlier cluster study. Under the first step, the transmission provider would determine if the impact of the interconnection customer in the later cluster study exceeds 5 MW and exceeds one percent of the network

upgrade's rating, which we believe would reasonably identify interconnection customers that benefit from the network upgrade. Then, if those criteria are met, the transmission provider would determine if the later-in-time interconnection customer's impact either exceeds more than five percent of the network upgrade's facility rating or if the TDF is greater than 20%.[164] Finally, if either of these criteria were met, the transmission provider would be required to designate that network upgrade a shared network upgrade, and the interconnection customer in the later cluster study would be responsible for a pro rata share of the network upgrade's remaining undepreciated capital cost based on the impact the interconnection customer in the later cluster study has on the network upgrade as measured using the same method the transmission provider used to determine the impact of the interconnection customer(s) from the earlier cluster study.

99. We propose to require the interconnection customer in the later cluster study to pay the transmission provider for the interconnection customer's share of the shared network upgrade costs through a one-time lump sum, which the transmission provider would disburse to the appropriate interconnection customer(s) from the earlier cluster study. Where applicable, the interconnection customer from the earlier cluster study or the relevant transmission provider would be required to assign transmission credits for the portion of the shared network upgrade that the interconnection customer in the later cluster study funded to the interconnection customer in the later cluster study. Additionally, we propose to require that the interconnection customer in the later study cluster not be required to pay for its share of the cost of the shared network upgrade until

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[164] *Midwest Indep. Transmission Sys. Operator, Inc.*, 133 FERC ¶ 61,221, at P 336 (2010) (finding that the 20% TDF screen is an appropriate measure of benefits for shared network upgrades that strikes an appropriate balance between cost sharing and guarding against overcharging late-coming generating facilities).

that shared network upgrade is in service. We propose to require transmission providers to provide the list of shared network upgrades to interconnection customers in subsequent cluster studies at the conclusion of the cluster study and to list those network upgrades in the LGIA.

100. As noted above, an interconnection customer in a later cluster study that otherwise meets the criteria described above would only bear some of the network upgrade costs for a network upgrade that was in service before the commercial operation date of the generating facility of the interconnection customer in the later cluster study. Thus, there could be scenarios where the network upgrade may be identified as both a shared network upgrade and a contingent facility pursuant to section 3.8 of the *pro forma* LGIP; and, therefore a designation of a network upgrade as a contingent facility does not preclude it from also being a shared network upgrade if the network upgrade meets the aforementioned criteria and passes the screens.[165]

101. We preliminarily find that requiring transmission providers to develop a method to share network upgrade costs among interconnection customers in earlier and later cluster studies will result in just and reasonable Commission-jurisdictional rates by allowing for allocation of costs of network upgrades in a manner more closely aligned to the distribution of benefits than the status quo.[166] Specifically, to the extent that

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[165] Contingent facilities include "those unbuilt . . . Network Upgrades upon which the Interconnection Request's costs, timing, and study findings are dependent, and if delayed or not built, could cause a need for Re-Studies of the Interconnection Request or a reassessment of the Interconnection Facilities and/or Network Upgrades and/or costs and timing." *Pro forma* LGIP section 1. Pursuant to section 3.8 of the *pro forma* LGIP, transmission providers must have a method for identifying contingent facilities to be provided to the interconnection customer at the conclusion of the system impact study and including in the LGIA. *Id.* section 3.8.

[166] *See, e.g.*, *Midwest Indep. Transmission Sys. Operator, Inc.*, 133 FERC ¶ 61,221 at PP 55, 336 (accepting shared network upgrades as just and reasonable and agreeing

interconnection customers in later cluster studies benefit from pre-existing network upgrades, we preliminarily find that it is just and reasonable for those interconnection customers to share a portion of those network upgrade costs.[167]

6. Increased Financial Commitments and Readiness Requirements

a. Need for Reform

102. The *pro forma* LGIP allows an interconnection customer to proceed through the generator interconnection process without having shown evidence to the transmission provider of meaningful progress toward achieving commercial viability (e.g., a power purchase agreement or site control). We are concerned that without requiring this type of evidence, interconnection customers will continue to submit multiple speculative interconnection requests and later withdraw those requests, triggering rounds of re-studies. While we believe that our proposal to require transmission providers to implement a first-ready, first-served cluster study process will substantially improve transmission providers' ability to manage their interconnection queues, we recognize that the sheer volume of interconnection requests in interconnection queues nationwide are overwhelming many transmission providers' resources.[168] Although the optional informational interconnection study that we also propose in this NOPR would provide a

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that the proper test for cost sharing with regard to an already-constructed upgrade is not what effect a late-coming generating facility would have had on the system as it existed prior to the network upgrade, but rather whether that late-coming generating facility will actually benefit from the network upgrade).

[167] *Id.* P 336.

[168] *See, e.g.,* Tri-State Generation and Transmission Association, Inc., Transmittal Letter, Docket No. ER20-2593-000, at 3, 14, and 17 (filed Jul. 31, 2020); Transmittal Letter, Docket No. ER11-3522-000, at 3 (filed May 5, 2011); PacifiCorp, Transmittal Letter, Docket No. ER20-924-000, at 5 (filed Jan. 31, 2020).

mechanism for prospective interconnection customers to obtain key information on potential points of interconnection for proposed generating facilities, prospective interconnection customers may still prefer to submit an interconnection request to establish a queue position rather than investing in and waiting for the results of an optional informational interconnection study.

103. Therefore, in addition to the reforms that we propose to implement a first-ready, first-served cluster study process, we also propose a set of reforms to adopt more stringent financial commitments and readiness requirements for interconnection customers to remain in the interconnection queue to discourage speculative interconnection requests and allow transmission providers to focus on processing viable interconnection requests and to better approximate the cost of the interconnection study process.[169] These proposed reforms pertain to (1) increased study deposits, (2) demonstration of site control, (3) commercial readiness, and (4) withdrawal penalties.

b. Proposed Reforms

i. Increased Study Deposits and LGIA Deposit

(a) Background

104. Under the serial first-come, first-served interconnection study process in the *pro forma* LGIP, an interconnection customer must submit the following study deposits:[170]

- $10,000 deposit with its interconnection request, which is used for the feasibility study,

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[169] *See* May Joint Task Force Tr. 38:7-8 (Matthew Nelson) ("[W]hat we hope to do is try to make sure that being in the queue means something[.]"); *id* 47:1-4 (Clifford Rechtschaffen) (cautioning that clustering is important but must be accompanied by other reforms to interconnection queue processing to address existing problems).

[170] *Pro forma* LGIP sections 6.1, 7.2, 8.1.

- $50,000 deposit when executing the system impact study agreement, and
- $100,000 deposit when executing the facilities study agreement.

105. Several transmission providers have increased the study deposit requirements in a tiered fashion to recognize that interconnection requests with higher generating facility capacities cost more to study. In accepting PNM's tiered approach, the Commission stated that increasing the study deposit in a tiered fashion is reasonable because it recognizes that larger proposed generating facilities within a cluster likely carry a greater risk (such as risk triggering the need for substantial network upgrades and triggering re-studies when withdrawing from the queue).[171] The Commission has accepted maximum study deposits as high as $250,000 for interconnection requests of 200 MW and greater and accepted proposals requiring study deposits at multiple points throughout the interconnection study process. For example, PSCo, Tri-State, Dominion, and Duke require four study deposits throughout their cluster study processes, and an additional deposit upon LGIA execution. In accepting PSCo's study deposit framework, the Commission reasoned that the study deposits represented the total approximate cost of PSCo's reformed cluster study process and that this framework was consistent with Order No. 2003's requirement that interconnection customers pay the actual costs of their studies.[172]

(b) <u>Proposal</u>

106. We propose to adopt the following study deposit framework in the *pro forma* LGIP:

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[171] *PNM*, 136 FERC ¶ 61,231 at P 80.

[172] *PSCo*, 169 FERC ¶ 61,182 at P 36 (citing Order No. 2003, 104 FERC ¶ 61,103 at P 37).

Size of Proposed Generating Facility Associated with Interconnection Request	Amount of Deposit
> 20 MW < 80 MW	$35,000 + $1,000/MW
≥ 80 MW < 200 MW	$150,000
≥ 200 MW	$250,000

107. We propose to require transmission providers to collect this study deposit before each phase of the new first-ready, first-served cluster study process (i.e., cluster study, cluster re-study, and facilities study).[173] We propose to require the interconnection customer to provide an initial study deposit along with its interconnection request which will be used to pay for the cluster study.[174] We propose to require the interconnection customer to provide the second study deposit of the same amount within 20 days of receiving the cluster study report from the transmission provider.[175] This second study deposit will cover the cost of any clustered re-studies. We propose to require the interconnection customer to provide the third study deposit of the same amount along with its executed facilities study agreement.[176] Study deposits would be refundable, and the transmission provider would refund any portion of the study deposits above the applicable study costs and withdrawal penalties once the interconnection customer

[173] Proposed *pro forma* LGIP section 3.1.1.

[174] *Id.* section 3.1.1.1.

[175] *Id.* section 3.1.1.2.

[176] *Id.* section 3.1.1.2.

executes the LGIA, requests the filing of an unexecuted LGIA and submits the corresponding payment discussed below, or withdraws from the queue.[177]

108. We also propose to require interconnection customers to submit a deposit equal to nine times the amount of its study deposit when executing the LGIA or requesting the filing of an unexecuted LGIA.[178] This deposit would be fully refunded once the generating facility achieves commercial operation, but if the interconnection customer withdraws after executing the LGIA or after requesting the filing of an unexecuted LGIA, this deposit would be refunded subject to the withdrawal penalty discussed below.

109. We believe that increasing the total study deposit amounts submitted in the interconnection study process would better approximate the cost of the interconnection study process and disincentivize interconnection customers from submitting interconnection requests for speculative, non-commercially viable generating facilities. As the Commission recognized in the 2008 Technical Conference Order, "relatively small deposit amounts, coupled with the incentives produced by a first-come, first-served approach to allocating capacity, provides an incentive for developers to secure a place in the queue even for projects that may not be commercially viable."[179] Conversely, the Commission has specifically found that increased study deposits "better identif[y] viable projects that are more ready to proceed with construction and commercial operation while

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[177] Consistent with Order No. 2003, interconnection customers would be responsible for actual study costs, and the study deposits would be subject to true-up. Order No. 2003, 104 FERC ¶ 61,103 at P 37; *pro forma* LGIP section 8.1.

[178] Proposed *pro forma* LGIP section 3.1.1.3.

[179] 2008 Technical Conference Order, 122 FERC ¶ 61,252 at P 15.

discouraging speculative projects that could delay the cluster study process."[180] The Commission has similarly explained "that increasing the deposit in a tiered fashion . . . is reasonable because it recognizes that larger projects likely carry a greater risk."[181] Accordingly, we propose to revise section 3 of the *pro forma* LGIP to implement these proposed increased study deposit reforms.

110. We seek comment on whether the proposed study deposit amounts accurately estimate the cost of conducting cluster studies, such that interconnection customers are not required to submit deposits that are likely to far exceed actual study costs. We also seek comment on whether the Commission should adopt additional provisions or a different framework that would require larger proposed generating facilities to provide a higher deposit amount—such as a per MW framework.

ii. Demonstration of Site Control

(a) Background

111. The *pro forma* LGIP defines site control as documentation demonstrating: (1) ownership of, a leasehold interest in, or a right to develop a site for the purpose of constructing the generating facility; (2) an option to purchase or acquire a leasehold site for such purpose; or (3) an exclusivity or other business relationship between the interconnection customer and the entity having the right to sell, lease, or grant the interconnection customer the right to possess or occupy a site for such purpose.[182] Interconnection customers are required to submit a demonstration of site control along

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[180] *PNM*, 136 FERC ¶ 61,231 at P 80; *see also PSCo*, 169 FERC ¶ 61,182 at PP 36, 49.

[181] *PNM*, 136 FERC ¶ 61,231 at P 80.

[182] *Pro forma* LGIP section 1.

with the interconnection request or submit a $10,000 deposit in lieu of such a demonstration.[183] The in-lieu-of deposit allows the interconnection customer to proceed through the generator interconnection process without providing evidence of site control. At the end of the study process, within 15 days after receipt of the draft LGIA, the interconnection customer must provide evidence of continued site control or post $250,000 of non-refundable security that will be applied toward future construction costs. The *pro forma* LGIA allows the interconnection customer to suspend its LGIA for up to three years before providing the additional security or demonstration of site control.[184]

112. The Commission has accepted several interconnection queue reform proposals that have increased the initial $10,000 deposit in lieu of site control. For example, Nevada Power increased the initial deposit amount to $50,000[185] and Arizona Public Service Company and El Paso Electric increased the amount of the initial deposit in lieu of site control to match their increased study deposits—$160,000 for interconnection requests less than 75 MW, and $250,000 for interconnection requests for 75 MW and greater.[186] All of these transmission providers maintain the *pro forma* LGIP provision allowing the interconnection customer to post $250,000 of non-refundable security in lieu of site control at LGIA execution.

113. PacifiCorp allows interconnection customers to submit a $10,000 deposit in lieu of site control to begin the cluster study process but requires that the interconnection

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[183] *Id.* section 3.4.1.

[184] *Pro forma* LGIA art. 5.16.

[185] *NV Energy, Inc.*, 142 FERC ¶ 61,165, at P 25 (2013).

[186] *Ariz. Pub. Serv. Co.*, 137 FERC ¶ 61,099, at P 11 (2011); *El Paso Elec. Serv. Co.*, 137 FERC ¶ 61,101, at P 11 (2011).

customer demonstrate exclusive site control before proceeding to the facilities study.[187] Duke and Dominion adopted a similar approach of requiring that the interconnection customer demonstrate exclusive site control before proceeding to the facilities study but increased the deposit amount to $20,000 plus $500 per MW.[188] These transmission providers have removed the option to post $250,000 of non-refundable security in lieu of site control at LGIA execution and instead require proof of site control without exception.

114. PNM,[189] PSCo,[190] and MISO have eliminated the deposit in lieu of site control. However, MISO allows a deposit in lieu of site control of $10,000 per MW where regulatory limitations prohibit the procurement of site control.[191] This deposit is subject

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[187] PacifiCorp, Transmission OATT and Service Agreements, attach. W, section 5 (3.0.0), section 5.2.

[188] Duke, Tariffs, Rate Schedules and Service Agreements, OATT, attach. J (18.0.0), section 4.4.2; Dominion, OATT and Service Agreements, attach. M (4.5.0), section 4.4.2.

[189] *PNM*, 136 FERC ¶ 61,231 at P 81.

[190] *PSCo*, 169 FERC ¶ 61,182 at P 58. Site control requirements for PSCo are as follows: (1) before entering Phase 1, demonstration of 50% site control and 0% site control of interconnection customer's interconnection facilities is required; (2) before entering Phase 2, demonstration of 50% site control and 0% site control of interconnection customer's interconnection facilities is required; (3) before entering Phase 1, demonstration of 60% site control and 0% site control of interconnection customer's interconnection facilities is required; (4) before entering Phase 4, demonstration of 75% site control and 0% site control of interconnection customer's interconnection facilities is required; (5) before executing an LGIA, demonstration of 90% site control and 50% site control of interconnection customer's interconnection facilities is required. PSCo, Transmission and Service Agreements Tariff, Xcel Energy Operating Cos. Joint OATT, attach. N (0.8.0), section 7.7.6.

[191] In order to demonstrate regulatory limitations to securing site control, MISO requires the interconnection customer to submit: (1) a signed affidavit from an officer of the company indicating that site control is unobtainable due to regulatory requirements; and (2) documentation sufficiently describing and explaining the source and effects of such regulatory restrictions, including a description of any conditions that must be met in order to satisfy the regulatory restrictions and the anticipated time by which the

to a floor of $500,000 and a ceiling of $2,000,000. The cash in lieu deposit is only available to customers at the start of the study process: interconnection customers must demonstrate 100% site control prior to MISO conducting the facilities study.[192] To cut down on multiple speculative projects leasing the same site in order to remain in the queue, MISO also requires that interconnection customers demonstrate an "exclusive right to develop the site" of a generating facility or, where facilities are to be co-located, a right that is "sufficient to accommodate the final design of the facility and account for any other projects that will utilize all or part of the same site."[193]

(b) <u>Proposal</u>

115. We believe that more stringent site control requirements will help prevent interconnection customers from submitting interconnection requests for speculative, non-commercially viable proposed generating facilities.[194] We preliminarily find that an interconnection customer securing the exclusive land right necessary to construct its proposed generating facility (or for co-located resources, demonstration of shared land use) is sufficient evidence of the interconnection customer's commitment to construct the generating facility.

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interconnection customer expects to satisfy the regulatory restrictions. MISO, FERC Electric Tariff, MISO OATT, attach. X (155.0.0), section 7.2.1.2.

[192] *Midcontinent Indep. Sys. Operator, Inc.*, 169 FERC ¶ 61,173, at P 27 (2019).

[193] *Id.* P 48; *see also Midcontinent Indep. Sys. Operator, Inc.*, 166 FERC ¶ 61,187 (2019).

[194] *See, e.g.*, *PNM*, 136 FERC ¶ 61,231 at P 81 (accepting PNM's increased deposit requirement and revised site control); *PSCo*, 169 FERC ¶ 61,182 at P 58 (stating that removing the $10,000 deposit option "provides interconnection customers with the flexibility to demonstrate their viability while also balancing the goal of ensuring viable projects continue through the queue").

116. We propose to revise the *pro forma* LGIP to require interconnection customers to demonstrate 100% site control for their proposed generating facilities when they submit their interconnection request. We propose to have transmission providers include in their tariff specific acreage requirements for each generating facility technology type.

117. To cut down on multiple interconnection customers leasing the same site in order to remain in the queue, we propose to revise the *pro forma* LGIP to require interconnection customers to demonstrate the exclusive land right (where the land rights are exclusive to the interconnection customer, not necessarily the individual project) to develop, construct, operate, and maintain its generating facility or, where facilities are co-located, to demonstrate a shared land use right to develop, construct, operate, and maintain co-located facilities.

118. We propose to include a limited option for interconnection customers to submit a deposit in lieu of site control when they submit their interconnection request only when regulatory limitations prohibit the interconnection customer from obtaining site control.[195] In such instances, the interconnection customer would submit an initial deposit in lieu of site control of $10,000 per MW, subject to a floor of $500,000 and a ceiling of $2,000,000, which would be applied toward any interconnection studies or withdrawal penalty, if applicable. Such an interconnection customer must demonstrate 100% site control prior to the facilities study.

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[195] For example, in MISO, the Commission found that 100% site control for the interconnection customer's interconnection facilities, the transmission owner's interconnection facilities, and network upgrades at the point of interconnection is impractical because those facilities often are subject to additional state siting and permitting requirements that do not apply to generating facilities. *Midcontinent Indep. Sys. Operator, Inc.*, 169 FERC ¶ 61,173 at P 40.

119. In compliance with any final rule in this proceeding, we also propose that, after notifying the transmission provider of a change to the interconnection customer's site control demonstration, the transmission provider give the interconnection customer 10 business days to demonstrate satisfaction with the applicable requirement after notification. We propose to implement these requirements through revisions to sections 3.4.1 and 11.3 of the *pro forma* LGIP, as set forth in Appendix B to this NOPR.

120. We believe that strengthening the site control requirements of the *pro forma* LGIP to include a demonstration of 100% site control would help prevent speculative interconnection requests. We recognize that requiring site control effectively bars entry into the queue until land is acquired, and that this may prevent early-stage projects from entering the queue. We nevertheless believe this proposed reform to be just and reasonable because it will address the concerns with interconnection queue backlogs and study delays explained in the Need for Reform by reducing the number of interconnection requests being submitted and ensure that interconnection customers in the queue are ready to proceed.

121. We seek comment on whether there are other specific situations in which the Commission should accept a deposit in lieu of site control.

122. We seek comment on whether the definition of "site control," including the requirement to obtain an exclusive land right (or, for co-located resources, a shared land right), should be broadened or refined to account for circumstances that may arise in, for example, the siting and permitting of offshore resources in bodies of water and/or submerged land. Further, for circumstances where interconnection customers are proposing to develop generating facilities on sites owned or physically controlled by a state governmental entity and/or federal governmental entity, there may be a need to

craft a different site control requirement that acknowledges that the interconnection customer, that has to comply with regulatory requirements, may not be able to demonstrate site control as proposed in this NOPR until later. For this reason, we seek comment on whether and how the definition of "site control" should be adjusted for interconnection customers (including both onshore and offshore) to account for any regulatory requirements they may have associated with proposed generating facilities developed on sites owned or physically controlled by a state governmental entity and/or a federal governmental entity. We also seek comment on the appropriate stage in developing such sites when the Commission should view completion of such stage as indicative of an interconnection customer's request being non-speculative and whether there are substantive differences among interconnection customers (including both onshore and offshore) developing sites owned or physically controlled by a state governmental entity and/or a federal governmental entity.

123. We also seek comment on whether the Commission should allow transmission providers to accept demonstrations of less than 100% site control in the initial phases of the interconnection study process, outside of when regulatory limitations prohibit the interconnection customer from obtaining site control. Additionally, we seek comment on whether the Commission should instead adopt site control provisions that allow a deposit in lieu of site control to enter the generator interconnection process and be evaluated under the first-ready, first-served cluster study process described above but require interconnection customers to demonstrate site control to enter the facilities study.

iii. Commercial Readiness

(a) Background

124. Generally, at least in bilateral markets, an interconnection customer does not proceed to construct a generating facility unless it has executed some form of off-take agreement, such as a contract for the sale of electric energy or capacity from the generating facility. Transmission providers often use the terms "ready" or "commercially viable" to describe projects that have demonstrated commercial progress by executing such an agreement.[196] Aside from a demonstration of site control or the $10,000 deposit in lieu of site control, the *pro forma* LGIP does not require interconnection customers to demonstrate progress towards achieving commercial readiness throughout the interconnection study process. Rather, section 11.3 of the *pro forma* LGIP only requires demonstrations of commercial progress within 15 days after receipt of the final LGIA, after the transmission provider has completed its studies of the interconnection request. If interconnection customers cannot meet this deadline, the *pro forma* LGIA allows them to suspend their LGIAs for up to three years: that suspension may include a decision by the interconnection customer to pause work on their proposed generating facilities and network upgrades.[197] Under this approach, interconnection customers are able to submit interconnection requests and progress through the interconnection queue for only $160,000 in study deposits, subject to true-up based on actual study costs and then

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[196] *See, e.g.*, PSCo, Transmission and Service Agreements Tariff, Xcel Energy Operating Cos. Joint OATT, attach. N, (0.8.0) § 7.7.6; PacifiCorp, Transmission OATT and Service Agreements, OATT, pt. IV.38 (6.0.0), section 38.4.1.

[197] *Pro forma* LGIA art. 5.16.

suspend their LGIAs for an additional three year time period for no cost.[198] In Order 2003, the Commission allowed suspension for a three year time period to allow generation projects the flexibility necessary to accommodate permitting and other delays that are particularly likely to affect large projects.[199]

125. PSCo, PacifiCorp, Tri-State, Dominion, and Duke have implemented frameworks that require interconnection customers to demonstrate commercial readiness early in the generator interconnection process to incentivize developers to submit ready or near-ready proposed generating facilities into the interconnection queue and to discourage the inclusion of speculative interconnection requests in the interconnection queue. These transmission providers offer several options to demonstrate commercial readiness. Notably, the commercial readiness requirements become more stringent as the interconnection customer proceeds to the later phases of the interconnection study process:

- Executed term sheet in early phases, or executed contract or power purchase agreement in later phases;
- Reasonable evidence of being selected in a resource plan or offered into a resource solicitation plan in early phases, or proof of applying for certificate of public convenience and necessity, if required, in later phases; or

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[198] *See pro forma* LGIP sections 3.4.1, 6.1, 7.2, 8.1 (providing for: $10,000 for the Interconnection Feasibility Study, $50,000 for the Interconnection System Impact Study, and $100,000 for the Interconnection Facilities Study).

[199] Order No. 2003, 104 FERC ¶ 61,103 at P 410.

- Provisional LGIA filed executed or unexecuted at the Commission in early phases or accepted at the Commission in later phases.[200]

126. As an alternative, PSCo, PacifiCorp, Tri-State, Dominion, and Duke allow interconnection customers that cannot provide these non-financial forms of readiness to instead provide additional deposit funds to proceed through the interconnection study process. Because PacifiCorp's cluster study process has fewer phases than PSCo, Tri-State, Dominion, and Duke, PacifiCorp offers the option to submit a deposit in lieu of readiness of $3,000/MW at the interconnection request phase, and for the later phase, a deposit equal to the network upgrade costs allocated to the interconnection customer in the most recent cluster study.[201] To contrast, in PSCo, Tri-State, Dominion, and Duke, an interconnection customer that cannot provide a readiness demonstration must provide additional deposits equal to:

- Two times the study deposit amount to enter the phase 1 cluster study;
- Three times the study deposit amount after the phase 1 report meeting to enter the phase 2 cluster study;
- Five times the study deposit amount after the phase 2 report meeting; and

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[200] PSCo, Transmission and Service Agreements Tariff, Xcel Energy Operating Cos. Joint OATT, attach. N (0.8.0), section 7.7; PacifiCorp, Transmission OATT and Service Agreementts, OATT, pt. IV.38 (6.0.0), section 38.4.1; Tri-State, Tri-State OATT, attach. N (7.0.0), section 7.7; Dominion, OATT and Service Agreements, attach. M (4.5.0), section 10.1; Duke, Tariffs, Rate Schedules and Service Agreements, OATT, attach. J (18.0.0), section 10.11 .

[201] PacifiCorp, Transmission OATT and Service Agreements, OATT, pt. IV.38 (6.0.0), section 38.4.1(v).

- Seven times the study deposit amount after receipt of the facilities study agreement.[202]

127. As explained earlier, we are concerned with the significant interconnection queue backlogs and study delays, which we believe are caused in part by the minimal requirements for submitting interconnection requests and the tendency for non-viable projects to linger in interconnection queues. We have learned through interconnection queue reform filings that interconnection customers typically do not actually construct generating facilities unless they have entered into an off-take agreement for the output of such facilities, at least in bilateral market areas.[203] On the other hand, interconnection customers that do not enter into such agreements frequently withdraw from the interconnection queue, sometimes late in the study process or even after the conclusion of the study process, triggering the types of delays and re-studies for commercially viable projects that raise concerns for us. Thus, we believe that the existing *pro forma* LGIP requirements may be insufficient because they do not require customers to demonstrate commercial readiness early enough in the study process to deter interconnection customers from submitting interconnection requests for, and continuing in the interconnection queue, speculative proposed generating facilities.

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[202] PSCo, Transmission and Service Agreements Tariff, Xcel Energy Operating Cos. Joint OATT, attach. N (0.8.0), section 7.7.5; Tri-State, Tri-State OATT, attach. N (7.0.0), section 7.7.5; Dominion, OATT and Service Agreements, attach. M (4.5.0), section 10.1.6; Duke, Tariffs, Rate Schedules and Service Agreements, OATT, attach. J (18.0.0), section 10.11.6.

[203] PNM, Transmittal Letter, Docket No. ER11-3522-000, at 10-12 (filed May 5, 2011); PacifiCorp, Transmittal Letter, Docket No. ER20-924-000, at 51 (filed Jan. 31, 2020).

(b) Proposal

128. We propose to revise the *pro forma* LGIP to include a commercial readiness framework. One major benefit of the frameworks adopted by PSCo, PacifiCorp, Tri-State, Dominion, and Duke is that the financial requirement in lieu of readiness increases throughout the study process, which encourages interconnection customers that are not ready to proceed to withdraw from the interconnection queue earlier in the study process while also providing them the flexibility to enter and remain in the interconnection queue without an off-take agreement. We believe that such a mechanism would reduce the number of times an interconnection customer executes and suspends an LGIA for a speculative interconnection request, only to later withdraw the request, which impacts the remaining interconnection customers in the interconnection queue by causing re-studies and shifting network upgrade costs to lower-queued interconnection customers. This proposed reform should also reduce the strain on transmission providers and enable viable interconnection requests to progress more quickly through a less congested interconnection queue, thereby remedying the unjust and unreasonable Commission-jurisdictional rates discussed in our need for reform.

129. Therefore, we propose to establish the defined terms "Commercial Readiness Demonstration"[204] and "Commercial Readiness Deposit"[205] in the *pro forma* LGIP. We also propose to add to sections 3.4.2, 7.5 and 8.1 of the *pro forma* LGIP the following

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[204] We propose to revise section 1 of the *pro forma* LGIP to provide that Commercial Readiness Demonstration shall have the meaning set forth in Sections 3.4.2, 7.5, and 8.1 of this LGIP.

[205] We propose to revise section 1 of the *pro forma* LGIP to provide that Commercial Readiness Deposit shall mean a deposit paid in lieu of submitting a Commercial Readiness Demonstration, as set forth in Sections 3.4.2, 7.5, and 8.1 of this LGIP.

options as acceptable commercial readiness demonstration options to enter into the cluster study and cluster re-study:

- Executed term sheet (or comparable evidence) related to a contract, binding upon the parties to the contract, for sale of (1) the constructed generating facility, (2) the generating facility's energy or capacity, or (3) the generating facility's ancillary services; where the term of sale is not less than five years.
- Reasonable evidence that the project has been selected in a resource plan or resource solicitation process by or for a load serving entity, is being developed by a load-serving entity (LSE), or is being developed for purposes of a sale to a commercial, industrial, or other large end-use customer.
- Provisional LGIA which has been filed at the Commission (executed or unexecuted), which is not suspended and includes a commitment to construct the generating facility.

130. We propose to add to section 8.1 of the *pro forma* LGIP that the following may serve as commercial readiness demonstration options to enter the facilities study, and must be provided with the executed facilities study agreement:

- Executed contract (as opposed to term sheet), binding upon the parties to the contract, for sale of (1) the constructed generating facility, (2) the generating facility's energy or capacity, or (3) the generating facility's ancillary services; where the term of sale is not less than five years.
- Reasonable evidence that the project has been selected in a resource plan or resource solicitation process by or for a load serving entity, is being developed by an LSE, or is being developed for purposes of a sale to a commercial, industrial, or other large end-use customer.

- Provisional LGIA accepted for filing by the Commission, which is not suspended, with reasonable evidence that the generating facility and interconnection facilities have commenced design and engineering.

131. We also propose to require the interconnection customer to inform the transmission provider of any material change to its commercial readiness demonstration. We propose to require the transmission provider to give the interconnection customer 10 business days to demonstrate satisfaction with the applicable requirement after notification of a change to the interconnection request's commercial readiness demonstration. The interconnection customer would have the option to submit a commercial readiness deposit, discussed further below, within the 10-day cure period if the change to the commercial readiness demonstration meant that the interconnection request no longer satisfied the criteria.

132. The Commission has previously accepted interconnection queue reform proposals that allow interconnection customers to submit additional refundable deposits in lieu of a demonstration of commercial readiness. In accepting these proposals, the Commission has found that the demonstrations of commercial readiness and alternative deposit in lieu of commercial readiness framework provide interconnection customers with the flexibility to employ a variety of business models.[206] We believe that this approach is appropriate for all transmission providers and therefore propose to allow interconnection customers the option to submit a Commercial Readiness Deposit in lieu of demonstrating commercial readiness through the commercial readiness demonstration options required to enter a cluster study, cluster re-study, and facilities study. We note that, outside of

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[206] *See, e.g.*, *PSCo*, 169 FERC ¶ 61,182 at P 50; *PacifiCorp*, 171 FERC ¶ 61,112 at P 102.

RTOs/ISOs, transmission providers may be able to provide certain contractual arrangements to their own projects or other preferred interconnection customers, such as the term sheet option discussed above, which could lead to unduly discriminatory behavior. This deposit in lieu of demonstrating commercial readiness may potentially prevent any undue discrimination in the generator interconnection process, consistent with the adoption of a standard set of procedures in the first instance.[207]

133. We propose to revise the *pro forma* LGIP to include a framework to allow interconnection customers to provide a commercial readiness deposit in lieu of meeting commercial readiness requirements in the following amounts:

- Two times the study deposit amount to enter the initial cluster study phase;
- Five times the study deposit amount after the initial cluster study phase and before the system impact re-study phase; and
- Seven times the study deposit after receipt of the facilities study agreement.[208]

134. The commercial readiness deposit is separate from the study deposit. The commercial readiness deposit is returned if the interconnection customer later makes a commercial readiness demonstration. If the interconnection customer withdraws from the interconnection queue, the commercial readiness deposit is applied toward any incurred withdrawal penalties. As described below in section III.A.1.iv, we propose that

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[207] Order No. 2003, 104 FERC ¶ 61,103 at PP 1-2.

[208] *See* PSCo, Transmission and Service Agreements Tariff, Xcel Energy Operating Cos. Joint OATT, attach. N (0.8.0), section 7.7.5; Tri-State, Tri-State OATT, attach. N (7.0.0), section 7.7.5; Dominion, OATT and Service Agreements, attach. M (4.5.0), section 10.1.6; Duke, Tariffs, Rate Schedules and Service Agreements, Duke OATT, attach. J (18.0.0), section 10.11.6.

withdrawal penalties will be higher for interconnection customers that made a deposit in lieu of a demonstration of commercial readiness.

135. Additionally, we propose revisions to the list of development milestones in section 11.3 of the *pro forma* LGIP to clarify the following: (1) a contract for the supply or transportation of fuel and a contract for the supply of cooling water will not be accepted for wind, storage, or solar photovoltaic resources; (2) comparable evidence of a contract for the sale of energy or capacity will be accepted; and (3) any of the commercial readiness demonstration options accepted to enter the facilities study will be accepted along with the executed LGIA or within 15 days of the Commission issuing an order on the unexecuted LGIA filing, while a commercial readiness deposit will not be accepted.

136. We propose this framework because we believe that it will allow interconnection customers to calculate the exact deposit that will be required prior to entering the interconnection queue, as it is based on multiples of the study deposit, and the study deposit is based on the size of the proposed generating facility, as chosen by the interconnection customer, leading to predictability in the deposit amount. We believe this increased transparency of the deposit amount early in the generator interconnection process will discourage speculative requests from entering the queue.

137. We seek comment on whether the Commission should also establish, as another alternative demonstration of commercial readiness, evidence of a commitment to participate in RTO/ISO markets, a site specific purchase order for generating equipment specific to the interconnection request, or a statement signed by an officer or authorized agent of the interconnection customer attesting that the generating facility included is to be supplied with major electric generating components (such as wind turbines) with a

manufacturer's blanket purchase agreement to which the interconnection customer is a party.

iv. Withdrawal Penalties

(a) Background

138. The *pro forma* LGIP does not require transmission providers to assess withdrawal penalties when an interconnection customer withdraws from the interconnection queue. Under the *pro forma* LGIP, withdrawing interconnection customers need only pay the actual study costs that the transmission provider incurred. Specifically, section 3.7 of the *pro forma* LGIP states that "[a]n Interconnection Customer that withdraws or is deemed to have withdrawn its Interconnection Request shall pay to Transmission Provider all costs that Transmission Provider prudently incurs with respect to that Interconnection Request prior to Transmission Provider's receipt of [Interconnection Customer's written notice of such withdrawal to Transmission Provider]."

139. The Commission has accepted several transmission providers' proposals to assess withdrawal penalties on interconnection customers that withdraw from a cluster study process and thereby delay the timing or increase the interconnection costs for other proposed generating facilities in the same cluster, reasoning that such penalties decrease the number of late-stage withdrawals and mitigate potential harm to other interconnection customers.[209] The Commission found that withdrawal penalties provide an incentive to

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[209] *See e.g., PacifiCorp*, 171 FERC ¶ 61,112; *PSCo*, 169 FERC ¶ 61,182; *Tri-State*, 174 FERC ¶ 61,021; *see also* May Joint Task Force Tr. 31:19-32:1 (Kimberly Duffley) (describing Duke's withdrawal penalty requirements, stating that "North Carolina is optimistic that these revisions will allow for the efficient interconnection of generation projects.").

interconnection customers to ensure that their interconnection-related decisions consider the costs associated with an interconnection customer withdrawing from the queue.[210]

(b) Proposal

140. As explained below, we propose to revise the *pro forma* LGIP to require transmission providers to assess withdrawal penalties to interconnection customers in certain circumstances. We preliminarily find that withdrawal penalties are needed to account for the harms that can occur when interconnection customers withdraw from the interconnection queue, as detailed in the Need for Reform for this NOPR. We believe that withdrawal penalties—as we propose to require below—will encourage interconnection customers to make every effort to ensure their proposed projects are viable and all interconnection requirements are met in a timely fashion, thereby limiting the potential for situations where an interconnection customer must withdraw at a late stage of the generator interconnection process and remedying the unjust and unreasonable Commission-jurisdictional rates discussed in our Need for Reform.

141. More specifically, we propose to revise the *pro forma* LGIP to require transmission providers to assess withdrawal penalties to interconnection customers that choose to withdraw at any point in the interconnection study process or do not otherwise reach commercial operation unless: (1) the withdrawal does not delay the timing of other proposed generating facilities in the same cluster; (2) the withdrawal does not increase the cost of network upgrades for other proposed generating facilities in the same cluster; (3) the interconnection customer withdraws after receiving the most recent cluster study report and the costs assigned to the interconnection customer have increased 25%

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[210] *PacifiCorp*, 171 FERC ¶ 61,112 at P 112.

compared to the previous cluster study report; or (4) the interconnection customer withdraws after receiving the individual facilities study report and the costs assigned to the interconnection customer have increased by more than 100% compared to costs identified in the cluster study report. Thus, under this proposal, interconnection customers would be exempt from a withdrawal penalty if the withdrawal does not harm other interconnection customers or if the withdrawal follows a significant unanticipated increase in network upgrade cost estimates.

142. The proposed withdrawal penalty will increase as the interconnection customer moves through the study process and will also increase if a commercial readiness deposit is provided in lieu of a demonstration of commercial readiness.[211] For an interconnection customer that provides a commercial readiness deposit in lieu of a demonstration of commercial readiness, we propose that its withdrawal penalty will be higher and increase as the interconnection customer progresses in the interconnection study process. This will help dissuade interconnection customers from submitting interconnection requests for speculative, non-commercially viable proposed generating facilities or from remaining in the interconnection queue despite the non-viability of the proposed generating facility.

143. We propose that the withdrawal penalty for an interconnection customer that provides a commercial readiness deposit in lieu of a demonstration of commercial readiness will be the greater of the study deposit or: (1) two times the study cost if the customer withdraws during the cluster study or after receipt of a cluster study report,

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[211] *See* May Joint Task Force Tr. 75:23-76:1 (Kimberly Duffley) ("I think one of the best practices of the new system that DEP & DEC have implemented is the increase of withdrawal penalties as the interconnection moves through the process.")

capped at $1,000,000; (2) three times the study cost if the customer withdraws during the cluster re-study or after receipt of any applicable re-study reports, capped at $1,500,000; (3) five times the study cost if the customer withdraws during the facilities study, after receipt of the individual facilities study report, or after receipt of the draft LGIA, capped at $2,000,000; or (4) nine times the study costs if the customer withdraws before achieving commercial operation and after executing the LGIA or filing an unexecuted LGIA. We also propose that the withdrawal penalty revenues be used to fund studies conducted under the cluster study process.

144. The table below summarizes the proposed withdrawal penalty structure for both interconnection requests that have demonstrated commercial readiness and those that have not (by instead submitting a deposit in lieu of commercial readiness).

Phase of Withdrawal	**Commercial Readiness Demonstration Provided?**	**Total Withdrawal Penalty (if greater than study deposit)**	**Withdrawal Penalty Cap**
1	Yes	1 times study costs	No Cap
2	Yes	1 times study costs	No Cap
3	Yes	1 times study costs	No Cap
LGIA	Yes	9 times study costs	No Cap
1	No	2 times study costs	$1 million
2	No	3 times study costs	$1.5 million
3	No	5 times study costs	$2 million
LGIA	No	9 times study costs	No Cap

145. Accordingly, we propose to add the defined term "Withdrawal Penalty" and revise section 3.7 of the *pro forma* LGIP, as set forth in Appendix B to this NOPR.

146. We seek comment on how to define the circumstances in which a withdrawal is deemed to have delayed the timing or increased the cost of network upgrades for other proposed generating facilities in the same cluster, including what criteria should be used to determine whether the withdrawal caused the delay or increased cost, and whether to establish a threshold for when a delay or increase in cost will trigger a withdrawal penalty (and if so, what that threshold should be).

147. We seek comment on whether the Commission should consider exceptions to the proposed withdrawal penalties beyond those we propose in this NOPR.

148. In addition, we seek comment on whether withdrawal penalties that increase with proposed generating facility size (as measured by MW) would more effectively deter withdrawals that cause the greatest harm. Specifically, we seek comment on whether a correlation exists between the size of a withdrawing proposed generating facility and the relative level of harm (in terms of delays and increased cost) to other interconnection customers as a result of the withdrawal.

7. Transition Process

a. Need for Reform

149. Requiring transmission providers both to utilize a first-ready, first-served cluster study process and to adopt more stringent financial commitments and readiness requirements to remain in the interconnection queue should significantly improve interconnection queue management in the future. However, we are mindful that many providers currently face significant backlogs of existing interconnection customers. Absent a transition process, the need to study all existing interconnection requests under existing rules could substantially delay the transmission provider's ability to use and benefit from the new cluster study process and commercial readiness requirements, thus

diminishing the effectiveness of these reforms in the near term. Therefore, we are proposing that transmission providers be required to implement a transition process whereby most existing interconnection customers will be subject to the new study process, financial commitments, and readiness requirements, while certain late-stage customers will be allowed to finish the interconnection process under the existing rules.

b. Proposed Reform

i. Background

150. The transmission providers that have proposed to adopt a first-ready, first-served cluster study process have proposed a transition process to provide an orderly move to the new approach and to resolve their interconnection queue backlogs.

151. Following the 2008 Technical Conference Order, the Commission accepted several RTO/ISO proposals to implement a one-time transition process as the RTOs/ISOs moved to a first-ready, first-served cluster study process. To expedite interconnection queue processing, each of these transition plans applied a cluster study process to the majority of the interconnection requests in the interconnection queue. CAISO and SPP created a large transitional cluster study group (or a pair of study groups) yet continued to study later-stage interconnection customers under the preexisting serial first-come, first-served study process (i.e., grandfathered). Specifically, CAISO grandfathered all interconnection customers slated to receive a system impact study by the date of CAISO's filing with the Commission (as well as those meeting selected readiness requirements),[212] while SPP grandfathered all interconnection customers with executed

[212] CAISO also grandfathered interconnection customers with a power purchase agreement approved by the California Public Utilities Commission or pending with it, and interconnection customers seeking to interconnect to a new transmission line, with

facilities study agreements.[213] MISO gave existing interconnection customers 60 days to meet new commercial readiness requirements, although interconnection requests for which the facilities study had already commenced were only subject to new suspension procedures. All projects in MISO's interconnection queue at the start of the transition were slated for cluster study unless they were determined to be electrically remote. However, the size of cluster study groups was not addressed in MISO's filing.[214]

152. Recent non-RTO/ISO interconnection queue reform filings gave existing interconnection customers three options: transitional serial study, transitional cluster study, or withdrawal from the interconnection queue.[215] Eligibility for the transitional studies was based on study status and/or commercial readiness demonstrations, as discussed further below. In accepting PSCo's interconnection queue reform filing, the Commission found that PSCo's transition process "consider[s] the interests of interconnection customers whose requests are far along in the process" while allowing a transmission provider to resolve its interconnection queue backlog.[216]

153. As discussed above, in the interconnection queue reform filings immediately following the 2008 Technical Conference Order, the Commission approved transition

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sufficient capacity, that had received land-use approval. *See Cal. Ind. Sys. Operator Corp.*, 124 FERC ¶ 61,031, at PP 1, 11, 12 (2008).

[213] SPP also allowed interconnection customers that had received a system impact study but not yet executed a facilities study agreement to opt out of the new cluster study process. *See Sw. Power Pool*, *Inc.*, 126 FERC ¶ 61,012, at P 6 (2009).

[214] *See Midwest Ind. Sys. Operator, Inc.*, 124 FERC ¶ 61,183 at PP 84, 90, 112, 114.

[215] *See, e.g.*, *Duke*, 176 FERC ¶ 61,075 at P 20; *PSCo*, 169 FERC ¶ 61,182 at P 64; *Tri-State*, 174 FERC ¶ 61,021 at P 17.

[216] *PSCo*, 169 FERC ¶ 61,182 at P 7.

plans that grandfathered interconnection customers that had executed a system impact study agreement or a facilities study agreement.[217] However, in more recent interconnection queue reform filings, only late-stage interconnection customers have been consistently given a path to executing an LGIA under the existing interconnection procedures. Specifically, a grandfathering threshold based on the execution of a facilities study agreement has been more common. For example, transmission providers may require receipt of a facilities study agreement by the interconnection customer[218] or receipt of a completed system impact study as well as execution of a facilities study agreement for an interconnection customer to qualify for grandfathering.[219]

154. The Commission has also allowed transmission providers to apply the new commercial readiness requirements in their interconnection queue reforms to existing interconnection customers. For example, to qualify for a transitional serial study, several transmission providers have required interconnection customers to: execute a transitional facilities study agreement; provide a deposit equivalent to 100% of the costs identified in the system impact study for interconnection facilities and network upgrades; demonstrate exclusive site control; and demonstrate commercial readiness.[220] To qualify for the transitional cluster study, the Commission has approved transition plans that require

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[217] *See, e.g.*, *id.* P 58; *Midwest Indep. Sys. Operator, Inc.*, 124 FERC ¶ 61,183 at P 90; *Sw. Power Pool, Inc.*, 129 FERC ¶ 61,226 at P 28.

[218] *See PacifiCorp*, 171 FERC ¶ 61,112 at P 115.

[219] *PSCo*, 169 FERC ¶ 61,182 at P 65; 2020 Tri-State Order, 173 FERC ¶ 61,015 at P 54.

[220] *See, e.g.*, *PSCo*, 169 FERC ¶ 61,182 at P 65; 2020 Tri-State Order, 173 FERC ¶ 61,015 at PP 17-18 (describing transitional study requirements but rejecting the filing due to insufficient time period to meet them); *Tri-State*, 174 FERC ¶ 61,021 at P 45.

interconnection customers to: execute a transitional cluster study agreement; provide a $5 million deposit;[221] demonstrate exclusive site control for the generating facility; and demonstrate commercial readiness.[222] The Commission has also approved less stringent requirements for transitional cluster study eligibility. For example, Duke's transition plan imposes lower cost security deposit requirements for ready interconnection customers and allows the use of cash deposits in lieu of site control (for the first phase of the transitional cluster study) or commercial readiness.[223]

155. The Commission has also made it clear that existing interconnection customers must be given sufficient time to meet new requirements. For example, the Commission rejected Tri-State's initial transition process proposal because it would have given interconnection customers just 10 calendar days after the filing's effective date to meet new requirements.[224] Commission-approved transition processes commonly allow

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[221] In its interconnection queue reform filing, PSCo stated that this value is "likely at the low end of the potential cost" of interconnection, based on a review of interconnection costs from 2003 to 2017, estimates of transmission investments in PSCo's Resource Planning Process, and the experience of a neighboring facility. PSCo, Transmittal Letter, Docket No. ER19-2774-000, at 86-87 (filed Sept. 9, 2019).

[222] *See, e.g.*, *PSCo*, 169 FERC ¶ 61,182 at P 65; 2020 Tri-State Order, 173 FERC ¶ 61,015 at P 56 (order describing $5 million deposit yet rejecting filing for other reasons); *Tri-State*, 174 FERC ¶ 61,021 at P 45.

[223] *See* Duke, Transmittal Letter, Docket No. ER21-1579-000, at 48, 52 (filed Apr. 1, 2021). In its interconnection queue reform proposal, Duke stated that it selected these lower thresholds d in response to stakeholder feedback. *See Duke*, 176 FERC ¶ 61,075 at P 51 (approving these provisions).

[224] *Tri-State*, 174 FERC ¶ 61,021 at P 43.

interconnection customers between 30-60 days after a filing's effective date (or the provision of written notice) to meet new commercial readiness requirements.[225]

ii. Proposal

156. We propose to revise the *pro forma* LGIP to require transmission providers to establish a transition process for moving to a first-ready, first-served cluster study process, as proposed in this NOPR.[226] Specifically, we propose to require transmission providers to offer existing eligible, interconnection customers the options, for each project in the queue, to either enter a transitional serial interconnection facilities study or a transitional cluster study, with commercial readiness requirements, or to permit them to withdraw from the interconnection queue without penalty.

157. We believe that this approach would provide an efficient way to prioritize and process interconnection requests in the interconnection queue based on how far they have advanced through the interconnection study process on the effective date of these reforms and their commercial readiness to continue that process. We also believe that this proposal strikes an appropriate balance between respecting previous expectations of interconnection customers and ensuring that the interconnection requests that continue under the transition process pose an acceptably low risk of withdrawal from the interconnection queue, which should help reduce the likelihood of re-studies. Accordingly, we propose to revise section 5 of the *pro forma* LGIP to specify how interconnection customers can elect to enter a transitional serial study or transitional

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[225] *See, e.g.*, *Midwest Indep. Sys. Operator, Inc.*, 124 FERC ¶ 61,183 at P 84; *PSCo*, 169 FERC ¶ 61,182 at P 65; *Tri-State*, 174 FERC ¶ 61,021 at P 60.

[226] We note that this proposed reform may not be applicable to transmission providers that already employ a cluster study approach.

cluster study or withdraw from the interconnection queue without penalty, as set forth in Appendix B to this NOPR.

158. Our proposed transitional serial study process will allow late-stage interconnection customers that have executed a facilities study agreement by the deadline discussed below to continue under the existing serial study process, enter into an LGIA, and interconnect, provided they are ready to move forward to commercial operation. To proceed to the transitional serial study, eligible interconnection customers would be required to execute a transitional serial interconnection facilities study agreement to codify their choice. At the time of execution of such agreement, the interconnection customer would be required to provide a deposit equal to 100% of the interconnection facility and network upgrade costs allocated to the interconnection customer in the system impact study report. If the customer reaches commercial operation, this deposit would be used towards construction costs of the same facilities. If the customer withdraws, the deposit would be refunded after the final invoice for study costs and the withdrawal penalty are settled. The transitional serial study withdrawal penalty would equal nine times the study cost because all future interconnection requests may be harmed if the transitional projects do not reach commercial operation. Specifically, these transitional projects would be included in the base case of the transitional cluster study, so a transitional serial project withdrawing could cause the entire first cluster to be re-studied. Transitional serial projects would also be required to provide evidence of exclusive site control for the entire generating facility and demonstrate commercial readiness through one of the following: (1) an executed term sheet (or comparable evidence) related to a contract for the sale of the generating facility or its energy/ancillary services; (2) reasonable evidence that the generating facility is included in a resource

planning entity's resource plan, has received a contract via a resource solicitation process, or is being developed for a large end-use customer; or (3) a provisional LGIA that is not suspended and includes a commitment to build the generating facility. We propose that the deadline for the interconnection customer to meet all the provisions above will be 60 days after the effective date of a transmission provider's compliance filing with the final rule. Finally, we propose that the transitional serial studies be completed by the transmission provider within 90 days after the deadline for eligibility requirements to be satisfied.

159. Existing interconnection customers that opt for the transitional cluster study would have to execute a transitional cluster study agreement to codify their choice. The costs of this study and the identified facilities would be allocated as the costs are allocated for future clusters as set forth in the final rule in this proceeding. The transitional cluster will be subject to an expedited combined system impact and interconnection facilities study. Transitional cluster study projects would be required to select Energy Resource Interconnection Service (ERIS)[227] or NRIS.[228] To ensure that interconnection customers are ready to move forward, interconnection customers opting for a transitional cluster study would be required to make a $5 million deposit. We draw on the evidence provided by PSCo in proposing this value; specifically, it is equivalent to a reasonable estimate of the costs that would be allocated to the customer via the transitional cluster

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[227] ERIS allows the interconnection customer to connect its generating facility to the transmission provider's transmission system to be eligible to deliver the generating facility's electric output using the existing firm or nonfirm capacity of the transmission provider's transmission system on an as available basis. ERIS in and of itself does not convey transmission service. *Pro forma* LGIP section 1.

[228] *See supra* note 99.

study. We propose to subject this deposit to the same conditions as the transitional serial study deposit. Transitional cluster study projects also would be required to produce evidence of exclusive site control for the entire generating facility and demonstrate commercial readiness through one of the same three options described above for transitional serial studies. Once again, we propose to set the deadline for satisfying these requirements as 60 days after the effective date of a transmission provider's compliance filing with any final rule. Finally, we propose that the transitional cluster study be completed by the transmission provider within 300 days after the deadline for eligibility requirements to be satisfied.

160. We seek comment on whether certain interconnection customers with a pending interconnection request prior to the issuance of a final rule in this proceeding should be allowed to proceed to LGIA execution without entering the transition process, for example, interconnection customers with an executed facilities study agreement. We seek comment on whether the Commission should require transmission providers to accept any additional commercial readiness demonstrations for entry into the transition process, and whether existing interconnection customers should be permitted to enter the transitional cluster study process by posting a deposit in lieu of demonstrating commercial readiness. We seek comment on whether five million dollars is a reasonable estimate of the costs that would be allocated to the customer via the transitional cluster study.

B. Reforms to Increase the Speed of Interconnection Queue Processing

1. Elimination of the Reasonable Efforts Standard

a. Background

161. The *pro forma* LGIP requires transmission providers to use reasonable efforts to process interconnection requests in a timely manner. Reasonable efforts are defined as "actions that are timely and consistent with Good Utility Practice and are substantially equivalent to those a Party would use to protect its own interests."[229]

162. Specifically, section 2.2 of the *pro forma* LGIP requires transmission providers to use reasonable efforts in processing and analyzing interconnection requests. Sections 6.3, 7.4, and 8.3 of the *pro forma* LGIP require transmission providers to use reasonable efforts to complete feasibility studies within 45 days, system impact studies within 90 days, and facilities studies within 90 or 180 days, depending on the requested accuracy of the cost estimate. The *pro forma* LGIP does not include any penalties or financial consequences if a transmission provider fails to meet these deadlines.

163. In the Order No. 845 proceeding, some commenters advocated for the elimination of the reasonable efforts standard and imposition of firm study deadlines.[230] The Commission declined to do so, explaining that the record in that proceeding did not support such action.[231] Further, the Commission reasoned that "reliance on improved

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[229] Order No. 2003, 104 FERC ¶ 61,103 at P 67; *pro forma* LGIP section 1.

[230] Order No. 845, 163 FERC ¶ 61,043 at P 315.

[231] *Id.* P 322.

reporting is a preferable approach to encourage timely processing of interconnection studies, rather than moving to a regime of firm study deadlines."[232]

164. To improve reporting, the Commission required transmission providers to post interconnection study metrics on a quarterly basis to increase the transparency of interconnection study completion timeframes.[233] The Commission also adopted a filed report requirement pursuant to which transmission providers that exceed study deadlines for more than 25% of any study type for two consecutive quarters must file informational reports at the Commission.[234] In adopting these requirements, the Commission reasoned that the increased transparency should provide for improved interconnection queue management.[235] The Commission also explained that the informational requirements could highlight systemic problems in interconnection study processing and could be useful to the Commission in determining if additional action is required to address interconnection study delays in the future.[236]

b. <u>Need for Reform</u>

165. The transmission provider reporting requirements adopted in Order No. 845 indicate that the failure to timely complete interconnection studies is a significant problem nationwide. Appendix A to this NOPR compiles the interconnection study metrics that transmission providers publicly posted in 2021 in compliance with Order No.

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[232] *Id.* P 323.

[233] *Id.* P 305.

[234] *Id.* PP 290, 305.

[235] *Id.* P 306.

[236] *Id.* PP 309, 323.

845. The data shows that almost 1,900 interconnection studies were delayed as of the end of Q4 2021. Additionally, in February 2022, the following transmission providers submitted required informational reports to the Commission because they exceeded an interconnection study deadline for more than 25% of any study type for two consecutive quarters: Arizona Public Service Company, Avista, Dominion, Duke, FP&L, ISO-NE, LG&E/KU, MISO, Northwestern Corp, NYISO, PacifiCorp, PJM, PNM, Puget Sound, Tri-State, and Tucson Electric.[237] Common explanations for these study delays include the high volume of interconnection requests,[238] re-studies caused by withdrawal of higher-queued interconnection requests,[239] and coordination among transmission owners, affected systems, and interconnection customers.[240]

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[237] Arizona Pub. Serv. Co., Filing, Docket No. ER19-1939-000 (filed Feb. 14, 2022); Avista Corp., Filing, Docket No. ER19-1959-000 (filed Feb. 11, 2022); Dominion, Filing, Docket No. ER19-1946-000 (filed Feb. 14, 2022); Duke, Filing, Docket No. ER19-1507-000 (filed Feb. 14, 2022); FP&L, Filing, ER20-1384-000 (filed Feb. 14, 2022); ISO-NE, Filing, Docket No. ER19-1951-000 (filed Feb. 14, 2022); LG&E/KU, Filing, Docket No. ER19-1916-000 (filed Feb. 14, 2022); Midcontinent Indep. Sys. Operator, Inc., Filing, Docket No. ER19-1960-004 (filed Feb. 11, 2022); NorthWestern Corp., Filing, Docket No. ER19-1943-000 (filed Feb. 14, 2022); NYISO, Filing, Docket No. ER19-1949-000 (filed Feb. 14, 2022); PacifiCorp., Filing, Docket No. ER19-1948-000 (filed Feb. 9, 2022); PJM Interconnection, L.L.C., Filing, Docket No. ER19-1958-003 (filed Feb. 14, 2022); PNM, Filing, Docket No. ER19-1955-000 (filed Feb. 15, 2022); Puget Sound, Filing, Docket No. ER19-1947-000 (filed Feb. 15, 2022); Tri-State, Filing, Docket No. ER20-687-000 (filed Feb. 2, 2022); Tucson Electric, Filing, Docket No. ER19-1934-000 (filed Feb. 14, 2022).

[238] *See, e.g.*, Dominion, Filing, Docket No. ER19-1946-000, at 3 (filed Feb. 14, 2022); ISO-NE, Filing, Docket No. ER19-1951-000, at 5 (filed Feb. 14, 2022); LG&E/KU, Filing, Docket No. ER19-1916-000, at 2 (filed Feb. 14, 2022); NYISO, Filing, Docket No. ER19-1949-000, at 5 (filed Feb. 14, 2022); PJM Interconnection, L.L.C., Filing, Docket No. ER19-1958-003, at 1-2, 5-6 (filed Feb. 14, 2022).

[239] *See, e.g.*, ISO-NE, Filing, Docket No. ER19-1951-000, at 5 (filed Feb. 14, 2022); NorthWestern Corp., Filing, Docket No. ER19-1943-000, at 2 (filed Feb. 14, 2022).

[240] *See, e.g.*, ISO-NE, Filing, Docket No. ER19-1951-000, at 5 (filed Feb. 14, 2022); Midcontinent Indep. Sys. Operator, Inc., Filing, Docket No. ER19-1960-004, at 9-

166. Overall, the data demonstrate that nearly all transmission providers across the country regularly fail to meet interconnection study deadlines. Importantly, the data show that many of the transmission providers that have implemented some of the reforms that we propose in this NOPR, such as a first-ready, first-served cluster study process, still often fail to meet interconnection study deadlines. We believe that this indicates the potential need for further reforms to better ensure that transmission providers meet interconnection study deadlines. In particular, we believe that the reasonable efforts standard in the *pro forma* LGIP contributes to interconnection study delays because transmission providers do not face any consequence for missing study deadlines.[241]

167. The timely provision of interconnection service is critical to maintaining just and reasonable rates. As such, this NOPR proposes reforms to remedy several well-established sources of delay, such as speculative interconnection requests, affected systems coordination, and serial interconnection queues. While we expect that these reforms will yield a more efficient process, we also believe that it is appropriate to establish mechanisms to hold transmission providers accountable for the timely execution of their duties under the tariff. The data collected pursuant to Order No. 845 indicates that the reasonable efforts standard does not provide a meaningful incentive for the transmission providers to complete their studies within the deadlines established in their tariffs. Indeed, the fact that the Commission has never found a transmission provider to

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12, 14-15 (filed Feb. 11, 2022); NYISO, Filing, Docket No. ER19-1949-000, at 4 (filed Feb. 14, 2022); PJM Interconnection, LLC, Filing, Docket No. ER19-1958-003, at 13-15 (filed Feb. 14, 2022).

[241] May Joint Task Force Tr. 89:6-25 (Ted LeVar) (encouraging FERC to examine "appropriate consequences to the transmission providers when they don't comply with the tariffs," including by missing study deadlines).

have violated the reasonable efforts standard despite wide-spread study delays further heightens this concern.[242] Accordingly, we preliminary find that use of the reasonable efforts standard results in rates that are unjust and unreasonable.

c. Proposal

168. We propose to revise the *pro forma* LGIP to eliminate the reasonable efforts standard for transmission providers completing interconnection studies, and instead impose firm study deadlines and establish penalties that would apply when transmission providers fail to meet these deadlines.[243] Specifically, we propose to revise sections 2.2, 3.5.4(i), 7.4, 8.3, and Attachment A to Appendix 4 of the *pro forma* LGIP to remove the phrase "reasonable efforts" in relation to the completion of cluster studies and facilities studies.

169. Furthermore, we propose to add a new section 3.9 to the *pro forma* LGIP to impose financial penalties on transmission providers that fail to meet study deadlines[244] for cluster studies, cluster re-studies, facilities studies, and affected system studies,[245] except in situations where force majeure is determined to be applicable. By cluster

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[242] *See, e.g.*, *EDF v. MISO*, 163 FERC ¶ 61,003, at P 47, *order on reh'g*, 165 FERC ¶ 61,071, at PP 7-12 (2018); *California Indep. Sys. Operator Corp.*, 124 FERC ¶ 61,292 at PP 188-189, 199.

[243] This proposal would not affect the application of the reasonable efforts standard in other contexts, such as construction of network upgrades or legally ordered disclosure of confidential information. *Pro forma* LGIP sections 12.2.2, 13.1.6.

[244] *See Preventing Undue Discrimination & Preference in Transmission Service*, Order No. 890, 72 FR 12266 (Mar. 15, 2007), 118 FERC ¶ 61,119, at P 1340 (2007) (imposing penalties when transmission providers fail to meet study deadlines for transmission service request).

[245] Specifically, we propose to penalize transmission providers when they fail to meet study deadlines for studying interconnection requests on an affected transmission system.

studies,[246] we mean those that are part of the first-ready, first-served cluster study process that we propose in this NOPR, and we exclude the proposed transitional cluster study process from this meaning. Specifically, we propose to require transmission providers that do not complete a cluster, cluster re-study, facilities, or affected system study by the deadline specified in the *pro forma* LGIP to pay a penalty of $500 per day that the study is late. For example, a transmission provider that misses a study deadline by 150 days would be penalized $75,000. We believe that $500 per day is an appropriate penalty because (1) it is in line with the penalties applied in the context of studies performed for transmission service requests, and (2) it is high enough to incent transmission providers to comply with study deadlines, without being unnecessarily punitive.[247] Such penalties would be distributed to the delayed interconnection customers on a pro rata basis to offset their study costs. Consistent with other penalties, we propose that such penalties would not be recoverable in transmission rates.[248]

170. We propose to cap penalties at 100% of the total study deposit received for the late study to provide a safeguard against overly large penalties that may be considered punitive. We further propose that no financial penalties on transmission providers that fail to meet study deadlines shall be assessed until one cluster study cycle (that is not a transitional study cycle) after the effective date accepted on compliance for implementing

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[246] *See supra* PP 64-76.

[247] *See* Order No. 890, 118 FERC ¶ 61,119 at P 1347.

[248] *See* Order No. 890, 118 FERC ¶ 61,119 at P 1357 ("We will prohibit all jurisdictional transmission providers from recovering penalties for late studies from transmission customers); Order No. 2003, 104 FERC ¶ 61,103 at P 884 ("[B]ecause liquidated damages liability will not have to be paid unless the Transmission Provider is at fault, we conclude that these damages will not be considered just and reasonable costs of service and will not be recoverable in transmission rates.").

the reforms proposed herein. Thus, for example, once the reforms proposed herein become effective, a transmission provider would not be subject to penalties until *after* the completion of (1) the transition process, and (2) the first cluster study cycle applying the first-ready, first-served cluster study process. We also propose a 10-day grace period such that no penalties will be assessed for a study that is delayed by 10 business days or less. However, for studies that are delayed by more than 10 business days, the penalty would be calculated based on the first business day the study was late. For example, a transmission provider whose study was delayed by 11 business days would pay a $5,500 penalty. Additionally, we propose to permit the transmission provider to extend the deadline or a particular study by 30 days by mutual agreement of the transmission provider and all interconnection customers in the relevant study. In such a scenario, we propose that no penalties will be assessed for missing the original deadline. Finally, we propose to require transmission providers to post to its OASIS or a public website on a quarterly basis (1) the total amount of such penalties from the previous quarter, and (2) the highest amount of such penalties to a single interconnection request from the previous quarter.

171. We recognize that the application of penalties for late interconnection studies in the context of RTOs/ISOs may raise several unique issues. Consistent with our findings in Order No. 890, we continue to believe that penalties are appropriate in certain circumstances to incent compliance with tariff deadlines, notwithstanding the RTO's/ISO's status as a not-for-profit entity. As the Commission explained in Order No. 890, "we believe that all entities administering the tariff should operate under the same rules, reporting obligations, and performance metrics . . . Non-profit transmission providers have other sources of money to pay penalties beyond the revenue they collect

for sales of transmission service."[249] Similarly, in Order No. 672-A, the Commission noted "it is not arbitrary and capricious to treat all operators alike, including RTOs and ISOs, in terms of their liability for violation of a Reliability Standard."[250] We continue to believe it is appropriate to apply penalties to RTOs/ISOs in a similar manner to other transmission providers.

172. In the context of reliability penalties, the Commission has recognized that, as not-for-profit entities, RTOs/ISOs may need to seek to recover from other entities the costs of monetary penalties imposed on the RTO/ISO.[251] As such, the Commission has approved tariff provisions creating mechanisms to permit RTOs/ISOs to recover monetary penalties imposed by NERC for violations of reliability standards from entities that are responsible for, or contributed to, such violations, or from a broader set of entities.[252] We recognize that similar tariff provisions are likely to be necessary to permit RTOs/ISOs to recover the costs of penalties they are obligated to pay for failing to meet interconnection study deadlines. Therefore, to ensure that RTOs/ISOs will be able to pay any such penalties, we propose to require RTOs/ISOs to propose tariff provisions that require the RTO/ISO to submit requests to recover the costs of specific interconnection study penalties under

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[249] *Id.* P 1357.

[250] *Rules Concerning Certification of the Elec. Reliability Org.; & Procs. for the Establishment, Approval, & Enforcement of Elec. Reliability Standards*, Order No. 672-A, 71 FR 19814 (Apr. 18, 2006), 114 FERC ¶ 61,104, at P 56 (2006).

[251] *Reliability Standard Compliance & Enf't in Regions with Reg'l Transmission Organizations or Indep. Sys. Operators*, 122 FERC ¶ 61,247 (2008) (Reliability Penalty Guidance Order).

[252] *Midcontinent Indep. Sys. Operator, Inc.*, 147 FERC ¶ 61,022 (2014); *Cal. Indep. Sys. Operator Corp.*, 138 FERC ¶ 61,156 (2012); *N.Y. Indep. Sys. Operator, Inc.*, 127 FERC ¶ 61,196 (2009).

FPA section 205. Similar to the ability of RTOs/ISOs to seek to directly assign monetary penalties for violations of reliability standards to other responsible entities, RTOs/ISOs may include a provision that the RTO/ISO may make a FPA section 205 filing seeking to allocate such penalties to the appropriate transmission owner that is responsible for, or contributed to, the delay.[253] However, given the complexity recognized above regarding assigning monetary penalties to RTOs/ISOs for late interconnection studies, we seek comment on whether there is a more appropriate method for assigning such penalties in RTOs/ISOs. More generally, we seek comment on whether penalties will effectively incent more timely completion of interconnection studies in RTOs/ISOs, and/or whether monetary penalties may have adverse consequences (e.g., incenting timeliness over accuracy or increased waiver requests).

173. Additionally, we seek comment on the proposed penalty structure, including whether the penalty amount for a cluster study should be $500 per day or whether an approach that accounts for the number of interconnection customers affected, such as $100 per day per customer in the delayed study, would be more appropriate. We further seek comment on how and when the Commission should require transmission providers to communicate to interconnection customers the status of studies that may be delayed. Additionally, we seek comment on whether to include exceptions to the penalty other than force majeure, and if so, what those exceptions should be. Lastly, to improve transparency, we seek comment on whether Commission staff should issue periodic reports summarizing the status of transmission providers' queues and timeliness of interconnection studies based on information collected through existing reporting

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[253] *See* Reliability Penalty Guidance Order, 122 FERC ¶ 61,247 at P 23.

requirements,[254] and whether this periodic report should be in addition to or a substitute for the proposed monetary penalties discussed above.

2. Affected Systems

a. Background

174. In Order No. 2003, the Commission found that the transmission system with which a generating facility directly interconnects (the host transmission system) must allow any affected system[255] to participate in the process when conducting interconnection studies, as well as incorporate the legitimate safety and reliability needs of the affected system. However, the Commission rejected a request to require that an affected system operator[256] participate in the host transmission provider's generator interconnection process.[257] Instead, section 3.6 of the *pro forma* LGIP requires the host transmission provider to coordinate required interconnection studies with affected system operators and, if possible, to include those results within the host transmission provider's applicable results in the LGIP study process.

175. Specifically, the *pro forma* LGIP requires that host transmission providers: (1) coordinate the conduct of any studies required to determine the impact of an interconnection request on an affected system with the affected system operator and, if possible, include those study results in the transmission provider's applicable

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[254] Order No. 845, 163 FERC ¶ 61,043 at P 305.

[255] An affected system is an electric system other than the transmission provider's transmission system that may be affected by the proposed interconnection. *Pro forma* LGIP section 1; *pro forma* LGIA art. 1.

[256] An affected system operator is an entity that operates an affected system. *Pro forma* LGIP section 1; *pro forma* LGIA art. 1.

[257] Order No. 2003, 104 FERC ¶ 61,103 at P 121.

interconnection study; and (2) include affected system operators in all meetings held with the interconnection customer.[258] The *pro forma* LGIP further requires affected system operators to "cooperate with [Host] Transmission Provider . . . in all matters related to the conduct of studies and the determination of modifications to Affected Systems."[259]

176. The affected system operator is not bound by the terms of the host transmission provider's *pro forma* LGIP, is not a party to any study agreement, and is not otherwise required to meet any deadlines to complete the affected system study. Additionally, in Order No. 2003, the Commission explicitly stated that a host transmission provider may proceed with the generator interconnection process even if an affected system operator does not provide information in a timely manner by not taking into account any information that could have been provided by the affected system operator, provided that the interconnection itself (as distinct from any future delivery service) will not endanger reliability.[260] The Commission also stated that neither the *pro forma* LGIP nor the *pro forma* LGIA is intended to expose the host transmission provider to liability resulting from delays by the affected system operator.[261]

177. The Commission did not specifically require in Order No. 2003 that host transmission providers post their process for coordinating with affected system

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[258] *See pro forma* LGIP section 3.6.

[259] *Id.*

[260] Order No. 2003, 104 FERC ¶ 61,103 at P 121; *see also* Order No. 2003-A, 106 FERC ¶ 61,220 at P 114 (clarifying on rehearing that delays by an affected system operator are not an acceptable reason to deviate from the timetables established in Order No. 2003 unless the interconnection will endanger reliability).

[261] Order No. 2003, 104 FERC ¶ 61,103 at P 121.

operators.[262] The Commission also did not require that affected system operators give interconnection customers the affected systems study results at any specific time in the generator interconnection process.

178. The Commission convened a technical conference in Docket No. AD18-8-000 to explore affected systems coordination issues and address a complaint filed by EDF in Docket No. EL18-26-000 regarding affected systems coordination between PJM, MISO, and SPP. In the order on complaint and technical conference, the Commission declined to act generically to reform affected systems requirements but required PJM, MISO, and SPP to clarify certain aspects of their affected systems study processes in their tariffs and joint operating agreements (JOA).[263]

b. <u>Need for Reform</u>

179. As further discussed below, affected systems study processes lack consistency between transmission providers.[264] Interconnection customers need a timely cost determination to make decisions to facilitate the interconnection of their generating facilities, and without any requirement for a timely cost determination, affected system operators may not return study results in time for interconnection customers to make

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[262] Transmission providers are obliged to coordinate the conduct of affected system studies (*see pro forma* LGIP section 3.6), but the Commission has not required transmission providers to follow any specific affected systems study process.

[263] *EDF v. MISO*, 168 FERC ¶ 61,173.

[264] *See* May Joint Task Force Tr. 67:6-8 (Dan Scripps) ("Specifically, there may be an opportunity to create a general framework that would be consistent across RTO seams."); *id.* 68:12-18 (Ted Thomas) (agreeing with Chair Scripps that "the most effective place that FERC can operate is in the area where you have two RTOs and the real issue is getting them on the same page").

those decisions.[265] As explained earlier, interconnection queues have dramatically increased in size and are only getting larger. Without an efficient affected system study process that enables interconnection customers to receive affected system study results and cost estimates in a timely manner, there will continue to be late-stage withdrawals due to unexpected high costs for affected system network upgrades and resulting re-studies and delays.[266]

180. During the technical conference in Docket No. AD18-8-000 and in comments on the ANOPR,[267] interconnection customers have recommended standardization of the affected systems study process. Specifically, they requested that the Commission standardize the timing of study results, the amount of study costs, and modeling criteria used in affected systems studies.[268]

181. Currently, detailed information about any two transmission providers' affected systems study processes is found in multiple transmission provider documents and is not necessarily cohesive, which creates confusion and uncertainty. For example, some information about the study process may be contained in a JOA between two

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[265] *See id.* 65:2-8 (Dan Scripps) (citing affected systems studies as "a growing source of delay and cost uncertainty for interconnection customers, both in terms of just the timelines involved and the difficulty in pinning those down").

[266] *See id.* 67:14-17 (Dan Scripps) ("[W]e expect the affected systems study process to become increasingly critical as more renewable resources come online in renewable rich areas and transmission capacity becomes ever more scarce.").

[267] *See, e.g.*, Clean Energy Coalition, Supplemental Comments, Docket No. RM21-17-000, at 9-12 (filed Feb. 14, 2022).

[268] *See also* May Joint Task Force Tr. 64:18-24 (Dan Scripps) (stating that "FERC may have a larger role to play in issues that cross RTO boundaries, particularly, around cross-RTO affected system studies where individual RTOs have limited control" and certainty "around the timing of affected systems studies").

transmission providers and some may be in the transmission provider's business practice manuals. However, much of the study process coordination between transmission providers is ad hoc and, therefore, unclear to interconnection customers. Affected systems study processes are also highly variable based on region and transmission provider and may not be uniform even across a single transmission provider's footprint.[269]

c. Affected Systems Study Process

i. Need for Reform

182. We preliminarily find that the lack of an affected system study process results in Commission-jurisdictional rates that are unjust and unreasonable because an interconnection customer cannot evaluate its costs in a timely manner, which increases uncertainty and may result in late-stage withdrawals and subsequent re-studies, delays, and increased costs to the remaining interconnection customers in the interconnection queue. Without a transparent affected system study process, neither an interconnection customer nor the Commission can evaluate whether the affected system operator has acted in an unduly discriminatory manner. Reforms to improve transparency and coordination, therefore, may be necessary to establish a just and reasonable and not unduly discriminatory or preferential affected systems study process.

ii. Proposal

183. We propose to revise the *pro forma* LGIP to include an affected systems study process. The proposed process includes initial notification, affected system scoping

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[269] *Compare* Sw. Power Pool, Inc., Rate Schedule FERC No. 9, MISO-SPP Joint Operating Agreement (1.0.0), *with* Sw. Power Pool, Inc., Rate Schedule FERC No. 10, SPP-AECI Joint Operating Agreement (0.0.0).

meeting, study process, cost allocation, study results and assessment, and financial penalties assessment. We also propose to add several definitions to section 1 of the *pro forma* LGIP, including "Affected System Interconnection Customer," "Affected System Network Upgrades," "Affected System Scoping Meeting," and "Affected System Study."

184. In subsection 3.6.1 of the *pro forma* LGIP, we propose to require that the transmission provider notify the affected system operator of a potential affected system impact caused by the interconnection request within 10 business days after the close of the first event giving rise to the identification of an affected system impact. For transmission providers utilizing a cluster study process, this event could be (1) the cluster request window, (2) the customer engagement window, (3) the cluster study, or (4) the cluster re-study as part of the first-ready, first-served cluster study process we also propose in this NOPR (described above in section II.A). At the same time that the transmission provider notifies the affected system, we propose to require the transmission provider to provide the interconnection customer with a list of potential affected systems, along with relevant contact information. The transmission provider would be required to provide the affected system operator data monthly, or more frequently as needed, about its transmission system and generation in its interconnection queue for the duration of the affected system study process.

185. In subsection 3.6.2 and section 9 of the *pro forma* LGIP, we also propose several requirements on transmission providers acting as an affected system, whose transmission systems may be impacted by the proposed interconnection of a generating facility to a transmission system other than transmission provider's transmission system. We propose to add a new definition for the interconnection customer whose proposed interconnection with the host transmission system impacts the transmission provider acting as the affected

system: the "Affected System Interconnection Customer."[270] We propose to require the transmission provider acting as an affected system, within 15 business days of receiving notification from the host transmission provider of an impact on its transmission system, to respond in writing indicating whether it intends to perform an affected system study. We believe that the proposed initial notification requirement would streamline the affected systems study process and minimize miscommunications that lead to delays and cost uncertainty for interconnection customers as well as potential impacts on affected systems that may be unaccounted for absent an effective coordination process. Firm deadlines ensure that the notification process advances expediently and that the obligations of each party are clear.

186. In subsection 3.6.2 of the *pro forma* LGIP, we propose to require that the transmission provider acting as the affected system schedule an affected system scoping meeting within seven business days after providing written notification that it intends to conduct an affected system study. We also propose to require that the affected system scoping meeting be held within seven business days after it is scheduled. The transmission provider acting as the affected system must include the affected system interconnection customer, using best efforts to include the transmission provider with whom interconnection has been requested. The purpose of the affected system scoping meeting is to discuss the potential impacts on transmission provider's transmission system and how they may be mitigated. Within 15 business days after the close of this meeting, the transmission provider would share with all scoping meeting attendees the

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[270] As we propose to define in the LGIP, the "Affected System Interconnection Customer" shall mean "any entity that proposes interconnection of a device for the production and/or storage for later injection of electricity to a transmission system other than Transmission Provider's Transmission System." *See* proposed LGIP section 1.

schedule to complete the affected system study. We believe that these requirements will ensure that all relevant parties are timely aware of relevant impacts to affected systems and have the opportunity to discuss potential required network upgrades and mitigation measures.

187. In subsection 3.6.3 of the *pro forma* LGIP, we propose to require that the transmission provider provide data monthly, or more frequently as needed, regarding the amount and location of generation in the transmission provider's interconnection queue as well as updated information about the transmission provider's transmission system.

188. In section 9 of the *pro forma* LGIP, we propose to require the transmission provider acting as the affected system to tender an affected system study agreement to the affected system interconnection customer within five business days of sharing the schedule for the affected system study.[271] The affected system interconnection customer must then return the executed affected system study agreement within 10 business days of receipt.

189. In subsection 9.2 of the *pro forma* LGIP, we propose to require the transmission provider acting as the affected system to use what we refer to as a "first-ready, first-served interconnection queue priority approach," which should explain how affected system network upgrade costs will be allocated by that transmission provider amongst interconnection customers in separate transmission systems.[272] Specifically, in some

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[271] *See infra* PP 197-198 for an explanation of the proposed *pro forma* affected system study agreement.

[272] *See, e.g.*, *Sw. Power Pool, Inc.*, 179 FERC ¶ 61,148 (2022) (accepting JOA between SPP and MISO with similar queue priority provisions setting forth, in section 9.4 of the JOA, procedures under which "[t]he relative queue position for interconnection requests in the MISO or SPP interconnection queues will be determined…").

situations, both affected system interconnection customers and interconnection customers on the transmission system of the transmission provider acting as the affected system cause the need for affected system network upgrades; in this case, each interconnection customer's relative queue priority must be determined. A first-ready, first-served interconnection queue priority approach would require the transmission provider acting as the affected system to assign the affected system interconnection customer an interconnection queue position its interconnection queue according to when the affected system interconnection customer executes an affected system study, rather than when the affected system interconnection customer entered its host transmission provider's queue. Such a position would be equivalent to that of a transmission provider's own interconnection customer that had just received its cluster study report. Under subsection 9.8 of the *pro forma* LGIP, the transmission provider acting as the affected system must allocate network upgrade costs in accordance with LGIP section 4.2.3, which requires using a proportional impact method, as discussed above in section II.A.4.

190. In subsection 9.6 of the *pro forma* LGIP, the transmission provider acting as the affected system must provide the affected system interconnection customer with affected system study results within 90 calendar days after the receipt of the executed affected system study agreement. The transmission provider acting as the affected system would be required to include in the study results both the estimated costs for any network upgrades identified in the study and the timing for the construction of those network upgrades.

191. In subsection 9.9 of the *pro forma* LGIP, we also propose to require, after the completion of the affected system study, that the transmission provider acting as the affected system provide the affected system interconnection customer with an affected

system facilities construction agreement within 30 calendar days after providing the affected system study results.[273] The affected system interconnection customer would then be required to notify the transmission provider within five business days of executing its generating interconnection agreement with its host transmission provider whether it would like to execute the affected system facilities construction agreement or request it to be filed unexecuted with the Commission. The transmission provider acting as the affected system would then be required to execute (or file unexecuted) the affected system facilities construction agreement within five business days after receiving such direction from the affected system interconnection customer.

192. In subsection 9.6 of the *pro forma* LGIP, we propose to impose financial penalties on transmission providers acting as the affected systems that fail to timely complete actions required within section 9 of the *pro forma* LGIP, in accordance with the proposed new section 3.9 of the *pro forma* LGIP, discussed above.[274] We reiterate that transmission providers conducting cluster studies are not required to delay those studies by waiting for the results of affected systems studies. A host transmission provider would not be penalized for a late Affected System Study, and we do not require a host transmission provider to wait on the results of an Affected System Study to conduct its Cluster Study, so any Affected System Study delay would not delay such a Cluster Study. The transmission provider acting as the affected system is the only entity that would be penalized for failure to timely complete an Affected System Study.

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[273] *See infra* PP 200-201 for a discussion of the proposed *pro forma* affected system facilities construction agreement.

[274] *See supra* P 169.

193. These proposals aim to streamline the affected systems study process by addressing concerns about the lack of transparency and certainty in the affected systems study process. A detailed affected systems study process within the *pro forma* LGIP would prevent the use of ad hoc approaches that may give rise to interconnection customers being treated in an unjust, unreasonable, unduly discriminatory, or preferential manner. Such an approach would provide interconnection customers certainty regarding expectations throughout the generator interconnection process, including greater cost certainty when it is time to finalize an LGIA. Definitive deadlines should ensure that the process moves along expediently, provide clarity and certainty in costs prior to an interconnection customer finalizing an LGIA, and provide increased transparency throughout the study process that should minimize opportunities for undue discrimination. We seek comment on the proposed affected systems study process.

d. ***Pro Forma* Agreements**

i. **Need for Reform**

194. We are concerned that the lack of *pro forma* agreements related to affected system studies and the construction of network upgrades on affected systems is both hindering the efficiency of the generator interconnection process through increased litigation over such agreements and leaving the door open to potential unduly discriminatory behavior against interconnection customers whose interconnection requests necessitate affected system network upgrades. In Order No. 2003, the Commission found that standard agreements applicable to large generating facilities would, among some other functions,

minimize opportunities for undue discrimination and expedite the development of new generation, while protecting reliability and ensuring that rates are just and reasonable.[275]

195. We believe that there is a pressing need for (1) a standardized, uniformly applicable affected system study agreement that stipulates how to study the impact of interconnecting generating facilities on an affected system to identify network upgrades needed to accommodate the interconnection request and (2) a standardized affected system facilities construction agreement to set the terms and conditions for the construction of those network upgrades to minimize opportunities for undue discrimination against interconnection customers and expedite the development of new generation.[276] In Order No. 2003, the Commission stated that, if an affected system operator fails to provide information in a timely manner, the transmission provider may proceed in the generator interconnection process without taking into account the information that could have been provided by the affected system operator. However, there is no definition for a "timely manner" and affected system study delays could result in delays to the host transmission provider's interconnection study process.[277] Additionally, the Commission found in Order No. 2003 that, when an interconnection customer is required to pay for network upgrades on an affected system, the interconnection customer must enter into an agreement with the affected system operator unless the costs are incorporated in the interconnection agreement between the

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[275] *See* Order No. 2003, 104 FERC ¶ 61,103 at PP 12, 919.

[276] *Id.* P 11.

[277] *Id.* P 121.

interconnection customer and the host transmission provider.[278] Although the Commission incorporated this requirement into article 11.4.1 of the *pro forma* LGIA, the *pro forma* LGIP does not contain a *pro forma* agreement that governs the terms and conditions of the affected system study process to identify when the interconnection request requires network upgrades to be built on the affected system. The Commission has recently seen disputes arising from an affected system operator attempting to negotiate terms not in accordance with the *pro forma* LGIA and Order No. 2003.[279] With the increasing number of affected system-related disputes, it has become apparent that the current approach is an inadequate and inefficient means to address affected system issues.

196. We preliminarily find that it is unjust and unreasonable to leave affected systems facilities construction agreements wholly up to individualized negotiations because such negotiations leave open opportunities for undue discrimination against interconnection customers throughout the process. Among other things, the *pro forma* LGIA sets terms and conditions for the construction of network upgrades identified as necessary to interconnect the generating facility to the transmission owner's transmission system to which it will directly connect. However, the Commission does not have a similar *pro forma* agreement governing the construction of affected system network upgrades. Notably, MISO has both a *pro forma* facilities construction agreement and a *pro forma* multi-party facilities construction agreement in its tariff for instances when an interconnection customer is interconnecting to the MISO transmission system and

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[278] *Id.* P 739.

[279] *See Duke Energy Progress, LLC*, 177 FERC ¶ 61,001, *reh'g denied*, 177 FERC ¶ 62,114 (2021), *appeal pending sub nom.* Duke Energy Progress, LLC v. FERC, No. 21-1272 (Dec. 27, 2021); *see also Edgecombe Solar Energy LLC v. Duke Energy Progress, LLC*, 177 FERC ¶ 61,122 (2021).

network upgrades are needed to ensure reliability on a neighboring transmission owner's transmission system within the MISO footprint.[280] Specifically, MISO's *pro forma* facilities construction agreement is an agreement for network upgrades constructed for an interconnection customer by a MISO transmission owner other than the MISO transmission owner with which it directly interconnects. MISO's *pro forma* multi-party facilities construction agreement is used when multiple interconnection requests cause the need for construction of common network upgrades (network upgrades that are constructed by a transmission owner for more than one interconnection customer) on the transmission owner's transmission system to which the interconnection customer is either directly or indirectly connecting to in MISO. The Commission found in its acceptance of these *pro forma* agreements that MISO accomplished the goal of Order No. 2003 to standardize procedures. As evidence of the importance of these *pro forma* agreements, which set consistent terms and conditions for the construction of network upgrades necessary for an interconnection customer's interconnection, more than 69 multi-party facilities construction agreements have been executed since 2017.[281]

ii. Proposal

(a) *Pro Forma* Affected System Study Agreement

197. We propose to establish a *pro forma* affected system study agreement to further improve the efficiency and transparency of the interconnection customer's interaction with the affected system operator. We believe that a *pro forma* affected system study

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[280] MISO Tariff, attach. X, app. 8 (Facilities Construction Agreement) (45.0.0); *id.* app. 9 (Multi-Party Facilities Construction Agreement) (45.0.0).

[281] MISO, Transmittal, Docket No. ER21-2793-000 (filed Aug. 31, 2021).

agreement could reduce uncertainty for the interconnection customer and save time by reducing the need for individualized negotiations for each interconnection customer with the affected system operator.

198. We propose to model the *pro forma* affected system study agreement, incorporated as a new Appendix 15 to the *pro forma* LGIP, on the form of the existing *pro forma* system impact study agreement, with necessary minor revisions to the party names.[282] Specifically, the affected system interconnection customer and transmission provider acting as the affected system would be parties to the agreement to ensure close coordination, which should reduce delays and errors in the affected system study process.

199. In article 5 of the proposed affected system study agreement, we propose to require the affected system study to provide the following information: identification of any circuit breaker short circuit capability limits exceeded as a result of the interconnection; identification of any thermal overload or voltage limit violations resulting from the interconnection; identification of any instability or inadequately damped response to system disturbances resulting from the interconnection; a non-binding, good faith estimated cost of facilities required to interconnect the Affected System Interconnection Customer's project to its host transmission provider's system; and a description of how such facilities will address the identified short circuit, instability, and power flow issues. We seek comment on whether the information required for the study report provides adequate information to the affected system interconnection customer to understand the results of the affected system study.

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[282] We also note that the Commission recently approved adoption of a *pro forma* affected system study agreement for CAISO, which CAISO proposed in anticipation of an increase in the need to perform affected system studies. *Cal. Indep. Sys. Operator Corp.*, 178 FERC ¶ 61,223 (2022) (delegated order).

(b) ***Pro Forma* Affected Systems Facilities Construction Agreement**

200. We propose to revise the *pro forma* LGIP to add a new Appendix 16 to include a *pro forma* affected systems facilities construction agreement. A *pro forma* affected systems facilities construction agreement would improve the efficiency of the generator interconnection process by reducing delays through improved coordination among the parties and minimizing opportunities for undue discrimination.

201. The proposed Appendix 16 includes 11 articles based on the *pro forma* facilities construction agreement included in MISO's tariff, including: terms of the agreement; construction of network upgrades; taxes; force majeure; information reporting; security, billing, and payments; assignment; indemnity; breach, cure, and default; termination; contractors; confidentiality; information access and audit rights; dispute resolution; and notices. Appendix A to the agreement details network upgrades, cost estimates and responsibility, construction schedule, and payment schedule. Appendix B discusses how to handle notification of completed construction. Appendix C includes the transmission provider site map, the site plan, the network upgrades plan and profile, and the estimated cost of the network upgrades.

202. The affected systems facilities construction agreement would be entered into by the transmission provider acting as the affected system and the affected system interconnection customer. The transmission provider acting as the affected system would be responsible for the design, procurement, construction, and installation of all network upgrades identified in Appendix A using reasonable efforts to complete construction consistent with the schedule identified in Appendix A. The affected system interconnection customer will initially fund the cost of any assigned network upgrades

and be reimbursed by the transmission provider acting as the affected system. Because affected system interconnection customers do not take transmission service over the affected system's transmission system, we do not require transmission providers acting as affected systems to reimburse affected system interconnection customers with transmission service credits. Rather, we propose to require that the transmission provider acting as the affected system repay the affected system interconnection customer the full cost of network upgrades, plus interest, in a term to be mutually agreed upon but not to exceed 20 years. This term mirrors the repayment term in the *pro forma* LGIA but allows for flexibility for the parties to come to another arrangement if they prefer. Within six months of construction completion of the network upgrades, the transmission provider acting as the affected system would invoice the affected system interconnection customer for the final construction costs to include a true-up of estimated and actual costs. The affected system facilities construction agreement would terminate upon the transmission provider acting as the affected system's final repayment to the affected system interconnection customer. The affected system interconnection customer could also terminate the affected system facilities construction agreement with 60 days' written notice to the transmission provider acting as the affected system.

203. We seek comment on the network upgrade funding and repayment provisions in the proposed affected system facilities construction agreement. Specifically, we seek comment as to the repayment time frame and whether the similarity of the proposal to the repayment terms in the *pro forma* LGIA is appropriate.

204. We also seek comment on whether any additional articles or provisions should be added to the *pro forma* affected system facilities construction agreement or whether the proposed provisions are sufficient.

e. Affected System Modeling and Study Assumptions

i. Background

205. When an interconnection customer submits an interconnection request, they must choose to be studied as ERIS or NRIS, depending on the level of deliverability they will ultimately seek for the electric output of their facility. For interconnection customers seeking to deliver their generating facility's electric output using the existing firm or non-firm capacity of the transmission provider's system on an as-available basis, the interconnection customer will choose an ERIS study. A customer will choose an NRIS study when seeking to integrate their generating facility with the transmission provider's system (1) in a manner comparable to that in which the transmission provider integrates its generating facilities to serve native load customers or (2) in an RTO/ISO with market-based congestion management, in the same manner as network resources.[283] An NRIS study goes beyond the prerequisite ERIS study and uses stricter modeling standards[284] to

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[283] "Network Resource shall mean any designated generating resource owned, purchased, or leased by a Network Customer under the Network Integration Transmission Service Tariff. Network Resources do not include any resource, or any portion thereof, that is committed for sale to third parties or otherwise cannot be called upon to meet the Network Customer's Network Load on a non-interruptible basis." *Pro forma* LGIP section 1; *pro forma* LGIA art. 1.

[284] The term "modeling standard" refers to the distribution factor threshold on a transmission element used by transmission providers, such that beyond this threshold an interconnection request will require network upgrades. For example, for SPP, if a transmission element is found to be overloaded in the study, and an NRIS interconnection request has over a 3% distribution factor on that element, the requesting entity will be assigned network upgrades. SPP uses a 19.5% distribution factor threshold for ERIS requests. *See EDF v. MISO*, 168 FERC ¶ 61,173 at P 17. A lower threshold indicates a stricter modeling standard because a smaller impact triggers network upgrades. Additionally, when conducting an affected system analysis, although some RTOs/ISOs (PJM and SPP, for example) use a modeling standard associated with the same level of service as requested on the host transmission provider's transmission system, the output of proposed generating facilities is always sunk into the host transmission provider's

assess an interconnection request to ensure that the interconnection customer's electric output is deliverable to load in aggregate on the host transmission provider's system.[285] Such a deliverability analysis varies from region to region but can analyze anything from various stressed dispatch scenarios to an additional set of contingencies. As such, an NRIS study will likely identify more network upgrades than an ERIS study.

206. When an affected system operator is notified of a possible impact on its system due to an interconnection request on the host transmission provider's system, the host transmission provider must specify whether the interconnection customer requested ERIS or NRIS. Currently, there is no requirement for transmission providers acting as affected system operators to apply either ERIS or NRIS modeling standards to study interconnection requests made on neighboring systems. For example, MISO, as an affected system, studies all interconnection requests from host transmission systems using ERIS modeling standards, even if the interconnection customer requested NRIS on the host system. In contrast, PJM and SPP, as affected systems, study interconnection requests from host transmission systems using the modeling standards associated with the level of service requested by the interconnection customer on the host transmission system (i.e., they study ERIS requests as ERIS and NRIS requests as NRIS).[286]

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transmission system by reducing the output of other generating facilities on that system. *Id.* P 85.

[285] *See* Order No. 2003, 104 FERC ¶ 61,103 at P 768; Order No. 2003-A, 106 FERC ¶ 61,220 at P 500. Specifically, a transmission provider studying generating facility for NRIS would study the transmission system at peak load, under a variety of severely stressed conditions to determine whether, with the generating facility operating at full output, the aggregate of generation in the local area can be delivered to the aggregate of load, consistent with reliability criteria and procedures.

[286] *EDF v. MISO*, 168 FERC ¶ 61,173 at PP 75-76.

207. Commenters in Docket No. AD18-8-000 (the affected systems coordination technical conference proceeding)[287] support the MISO approach of using ERIS criteria to study affected system interconnection requests, regardless of the level of service requested by the interconnection customer.[288] Some argued that the Commission should require affected system transmission providers to use the ERIS modeling standard for affected system analysis regardless of whether the interconnection customer requests NRIS or ERIS in the host system.[289] This is due to the fact that the interconnection customer would not get NRIS on the affected system, yet could be required to pay for more extensive network upgrades based on the stricter modeling assumptions.

ii. <u>Need for Reform</u>

208. The use of different modeling standards can significantly alter an interconnection customer's network upgrade costs. As explained above, the NRIS modeling standard studies the generating facility's full output such that it would be deliverable at all times. However, on an affected system, the interconnection customer does not seek to deliver power even if it is studied under the NRIS modeling standard.

209. Further, an affected system has no obligation to continually ensure deliverability for a generating facility on a neighboring transmission system that has obtained NRIS on its host transmission provider's system. Specifically, under Order No. 2003, a host transmission provider must maintain its system to: (1) ensure that NRIS-interconnected

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[287] Relevant comments are incorporated into the discussion below, and a full summary of comments is available in *Midcontinent Indep. Sys. Operator, Inc.*, 169 FERC ¶ 61,173 at PP 79-85.

[288] *Midcontinent Indep. Sys. Operator, Inc.*, 169 FERC ¶ 61,173 at P 82.

[289] *Id.* P 79.

resources can transmit their output to other electrical areas within the transmission provider's system, even while other generating facilities in the same electrical area are at peak output; and (2) allow the resource to be designated as a network resource for the life of the interconnection agreement.[290] Order No. 2003 places no similar requirements on affected system operators to ensure deliverability for NRIS customers interconnecting to a host transmission provider's system. Thus, the potential exists for an interconnection request to be studied by an affected system as NRIS and for an interconnection customer to construct significant network upgrades on the affected system, but not be fully deliverable on the host system due to curtailment or congestion on the affected system.

210. We preliminarily find that it is unjust and unreasonable for a transmission provider acting as the affected system to study interconnection requests on other transmission systems using NRIS modeling standards. As noted above, unlike the transmission provider with which affected system interconnection customer will directly interconnect, a transmission provider acting as the affected system does not have a continuing obligation to operate its system so that NRIS resources will remain deliverable on the host system. Without such an obligation, an affected system interconnection customer

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[290] Order No. 2003 provided that NRIS interconnection entitles a generating facility to be treated in the same manner as the transmission provider's own resources in assessing whether aggregate supply is sufficient to meet aggregate load within the transmission provider's control area. Order No. 2003, 104 FERC ¶ 61,103 at P 768. On rehearing, Order No. 2003-A clarified that: "NRIS ensures that the generating facility, as well as other generating facilities in the same electrical area, can be operated simultaneously at peak load and that any output produced above peak load requirements can be transmitted to other electrical areas within the transmission provider's transmission system. Thus, NRIS ensures that output of the generating facility will not be 'bottled up' during peak load conditions." Order No. 2003-A, 106 FERC ¶ 61,220 at P 531. Order No. 2003-A further clarified that "[t]he [NRIS] interconnection customer holds, through the life of the interconnection agreement, the right to use the network upgrade capacity that allows the generating facility to be designated as a network resource." *Id.* P 560.

may be required to construct significant network upgrades on the transmission provider's affected system, but not be fully deliverable due to curtailment or congestion on the affected system. We are concerned that this results in unjust and unreasonable rates by increasing the costs for the interconnection customer without a commensurate increase in service.

iii. Proposal

211. We propose in new subsection 9.6 of the *pro forma* LGIP to require the transmission provider acting as the affected system to study interconnection requests using ERIS modeling standards, regardless of the requested level of service on the host transmission provider's transmission system. However, if a transmission provider acting as an affected system believes that it is necessary to study an interconnection request that is requesting NRIS-level service using NRIS modeling standards, such a transmission provider could make a filing under section 205 of the FPA. The Commission will evaluate such case-by-case section 205 filings to determine whether they are just and reasonable, and not unduly discriminatory or preferential.[291] A transmission provider acting as an affected system making this type of filing should provide evidence indicating that using NRIS modeling standards in such a scenario would not treat similarly situated customers differently or afford similar treatment to dissimilar customers. In addition, this section 205 filing could contain, for example, such supporting documentation as a reference to a NERC Reliability Standard violation, an operational concern such as over-duty breakers, fault current violations, impacts on transmission stability, increased loop flows or other concerns that implicate any other critical reliability parameters. We seek

[291] 16 U.S.C. section 824d.

comment on how to align the possibility for such case-by-case section 205 filings with the required timeline for the affected system study and other deadlines proposed herein for affected system studies.

212. With respect to the proposal for a transmission provider acting as the affected system to study interconnection requests using ERIS modeling standards, regardless of the requested level of service on the host transmission provider's transmission system, a standard modeling requirement would create consistency in the modeling standards used across all transmission provider regions.[292] ERIS modeling standards, in addition, generally reduce the number and cost of network upgrades identified. By using these standards, we believe that interconnection customers would be subject to fewer late-stage cost increases, which would reduce the number of potential re-studies and withdrawals, thereby addressing the concerns we have identified that we preliminarily find are resulting in unjust and unreasonable and unduly discriminatory and preferential Commission-jurisdictional rates. It would also allow interconnection queues to be processed more quickly because affected system network upgrades would be focused on local impacts that will generally implicate fewer other interconnection customers, reducing the amount of interdependence among interconnection customers. Under this reform, fewer interconnection requests will be found to cause impacts to large numbers of projects, which will reduce the number of high-cost network upgrades and potential withdrawals and re-studies.

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[292] We note that, while this proposal would standardize the use of ERIS for affected system studies, individual transmission providers use different specific thresholds for ERIS studies.

213. We acknowledge that using a less stringent modeling standard may result in more frequent redispatch or curtailment by not fully capturing all the potential impacts of the interconnecting generating facility(ies) on an affected system.[293] However, we believe that these risks are limited in nature and any significant impact would be captured by an ERIS study, which would ensure that a proposed generating facility can safely connect to the affected system under the expectation it will deliver its electric output using the existing firm or non-firm capacity of the affected system transmission provider's system on an as-available basis. As noted above, MISO has used this approach for many years without any adverse impacts on reliability. Nevertheless, we seek comment on whether the proposed reform will adversely affect reliability for the transmission provider acting as the affected system or the host transmission provider. This could include examples of reliability impacts caused by a transmission provider acting as the affected system conducting an ERIS study on an NRIS interconnection request from a host transmission provider or examples of why an NRIS study is required to ensure reliable interconnection on the transmission provider acting as the affected system's system when the interconnection customer is not seeking to NRIS on the affected system.

214. Additionally, we understand that there is some concern that requiring only ERIS modeling standards may be inconsistent with the Commission's current policy of requiring interconnection customers to be responsible for all network upgrades needed "but for" their interconnection.[294] This is because using only ERIS modeling standards

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[293] *EDF v. MISO*, 168 FERC ¶ 61,173 at PP 80-81.

[294] *See* Order No. 2003, 104 FERC ¶ 61,103 at P 677 ("The Commission noted that in a region that uses locational pricing, the RTO or ISO usually assigns to the Interconnection Customer the cost of any new network facilities that would not be in its transmission expansion plan but for the interconnecting Generating Facility.").

would in some cases result in curtailment or redispatch on the affected system that is arguably caused by the interconnection customer's proposed generating facility but that is not paid for by the interconnection customer. For example, the full possibility of loop flow[295] may not be accounted for under an ERIS modeling standard. However, we note that the Commission has previously acknowledged and accepted that some inadvertent or unauthorized power flows are an unavoidable consequence of interconnected public utilities and that public utilities must work closely to ensure their operations do not jeopardize the reliability of each other.[296]

215. We seek comment on the potential impact of requiring transmission providers acting as the affected systems to use ERIS modeling standards when an interconnection customer seeks NRIS in the host transmission provider's system. We seek comment as to whether there are modifications to this proposal that would reduce the likelihood of curtailment or redispatch on the affected system transmission provider's system without requiring the affected system interconnection customer to pay network upgrade costs that are not commensurate with the level of service it receives.

3. Optional Resource Solicitation Study

a. Background

216. Some transmission providers operate in states that take a portfolio approach to resource planning, in which resource planning entities procure an entire portfolio of diverse resources that all need to interconnect to the transmission system on

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[295] Loop flows refer to physical flows that differ from scheduled flows, which can cause congestion on transmission lines. *N.Y. Indep. Sys. Operator, Inc.*, 132 FERC ¶ 61,031 (2010).

[296] *Am. Elec. Power Serv. Corp.*, 49 FERC ¶ 61,377, at 62,381 (1989), *order on reh'g*, 50 FERC ¶ 61,192 (1990).

approximately the same timetable. Entities that have these resource planning responsibilities may conduct resource solicitations that involve an assessment of need for additional resources and, if necessary, competitive acquisition processes to procure new resources.[297]

217. To help meet the needs of entities that must develop a resource solicitation plan or conduct a resource solicitation process to meet state-imposed requirements,[298] several transmission providers offer such resource planning entities the option to initiate an interconnection study that studies combinations of the resources that have submitted supply bids through the resource planning entity's resource solicitation process.[299] For example, a resource planning entity, under PSCo's tariff, is defined as any entity required

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[297] *See, e.g.*, 4 Colo. Code Regs. section 723-3:3610 (2019) (Rule 3610: Assessment of Need for Additional Resources); *id.* section 723-3:3611 (Rule 3611: Utility Plan for Meeting the Resource Need) (establishing that "a competitive acquisition process will normally be used to acquire new utility resources"); *id.* section 723-3:3600 (Rule 3600: Applicability) (explaining which electric utilities are subject to electric resource planning requirements); *id.* section 723-3:3617 (Rule 3617: Commission Review and Approval of Resource Plans) (providing for review and approval of resource plans by the Colorado Commission).

[298] *See PSCo*, 169 FERC ¶ 61,182 at PP 5, 14, 30; *Tri-State*, 174 FERC ¶ 61,021 at P 65; *see also* Tri-State, Open Access Transmission Tariff, attach. N, Standard LGIP (7.0.0) section 1 (defining "Resource Planning Entity" as "any entity required to develop a Resource Plan or conduct a Resource Solicitation Process," "Resource Plan" as "any process authorized or required by Applicable Laws and Regulations for, inter alia, the selection of Generating Facilities," and "Resource Solicitation Process" as "any process authorized or required by Applicable Laws and Regulations for the acquisition of Network Resources").

[299] *See PSCo*, 169 FERC ¶ 61,182 at PP 5, 14, 30; *see also Xcel Energy Operating Cos.*, 109 FERC ¶ 61,072 (2004) (accepting modifications to LGIP terms and conditions to accommodate the Colorado-mandated resource solicitation process, subject to certain conditions); PSCo, Transmission and Service Agreements Tariff, attach. N, Standard LGIP (0.8.0) section 4.2.2 (Initiation of a Resource Solicitation Cluster) (describing process).

to develop a resource plan or resource solicitation process,[300] which may include LSEs that must meet state-imposed resource procurement obligations.[301] Though PSCo began offering this option more than a decade ago, several other transmission providers have followed suit—Tri-State, the Duke Southeast Utilities (i.e., Duke Energy Carolinas, Duke Energy Progress, and Duke Energy Florida), and Dominion offer versions of the resource solicitation study option to resource planning entities.[302]

218. Under PSCo's process, interconnection requests associated with the resource solicitation are studied separately from clusters initiated through a fixed time interval window (e.g., bi-annual cluster windows), respecting the queue position of any ongoing interconnection cluster studies.[303] Like interconnection cluster studies, the interconnection requests that reflect the resources being considered in the resource solicitation combinations are studied as their own cluster and proceed through the same series of interconnection studies as other clusters.[304] Unlike interconnection cluster studies, however, the resource planning entity—i.e., the entity required to develop a

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[300] *E.g.*, PSCo, Transmission and Service Agreements Tariff, attach. N, Standard LGIP (0.8.0) section 1 (defining "Resource Planning Entity" to mean "any entity required to develop a Resource Plan or conduct a Resource Solicitation Process").

[301] *See Tri-State*, 174 FERC ¶ 61,021 at PP 64-65.

[302] *See* Duke Energy Carolinas, LLC, Transmittal, Docket No. ER21-1579-000, at 31 (filed Apr. 1, 2021) (explaining section 10.2, Initiation of a Resource Solicitation Cluster); *Duke*, 176 FERC ¶ 61,075 at PP 1, 51-52; Dominion Energy S.C., Inc., Transmittal, Docket No. ER22-301-000, at 19 (filed Nov. 1, 2021) (explaining section 10.2, Initiation of a Resource Solicitation Cluster); *Dominion*, Docket No. ER22-301-000 (Dec. 28, 2021) (delegated order).

[303] *See PSCo*, 169 FERC ¶ 61,182 at P 14.

[304] PSCo, Transmission and Service Agreements Tariff, attach. N, (Standard LGIP) (0.8.0) section 4.2.2.

resource solicitation plan or conduct a resource solicitation—requests a position in the interconnection queue as the authorized representative for all interconnection requests submitted to the resource solicitation cluster, and that entity may request study of a reasonable number of different combinations of such interconnection requests to meet the resource planning entity's identified needs and assumptions in the resource solicitation process.[305] Further, PSCo provides the study results for the requested combinations to the resource planning entity for use in the resource solicitation process, where interconnection-related costs may be considered as a factor in selection. After the completion of the system impact study for the cluster, the resource planning entity is then expected to select one of the studied combinations prior to the commencement of any interconnection facilities study associated with the resource solicitation process before proceeding to that stage.[306]

b. <u>Need for Reform</u>

219. Although several transmission providers offer versions of the resource solicitation study concept to resource planning entities, transmission providers in general are not required to offer this option in their tariffs, and many do not. Across the country, however, electric resource procurement mandates have led to several state-managed and other required resource solicitations that seek to procure entire portfolios of resources

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[305] *See id.* Resource planning entities must also submit all interconnection requests arising from the resource solicitation process at the same time to ensure an equal interconnection queue position for all generating facilities included in the resource solicitation study and cooperate with the transmission provider in conducting the studies as well. *See id.*

[306] *See id.* (referring to steps that follow "[a]fter receipt of the Phase 2 Report"); *see also PSCo*, 169 FERC ¶ 61,182 at P 19 (explaining, in part, that "Phase 2 completes the traditional system impact study by adding stability and short circuit analysis to the power-flow analysis").

with significant interconnection needs.[307] These resource solicitations may be managed by LSEs or by states. In addition, these resource solicitations may be open to all potential resources or targeted at specific types of resources, depending on the particular resource planning mandate or planning goals guiding the solicitation.[308]

220. In the Commission's recent proceeding in Docket No. AD20-18-000, which explored offshore wind generation and potential issues related to such generation in RTOs/ISOs, several commenters addressed the relationship between state electric resource procurement mandates and the generator interconnection process. Exelon and RWE Renewables Americas, for example, supported the idea that state agencies should be permitted to participate in the generator interconnection process as a means to help account for state resource preferences.[309] How new resource procurement portfolios are studied in the generator interconnection process is also important; for example, Ørsted North America Offshore and the Clean Energy Associations stated that studying new groups of resources in clusters would be more beneficial than studying them serially, because cluster studies may better identify opportunities to realize economies of scale from larger network upgrades that can accommodate multiple projects.[310] Other

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[307] *See* Fredrich Kahrl, Lawrence Berkeley Nat'l Lab'y, Solar Energy Techs. Office, *All-Source Competitive Solicitations: State and Electric Utility Practices*, at 2-7 (Mar. 2021), https://emp.lbl.gov/publications/all-source-competitive-solicitations (describing different types of resource procurements).

[308] *Id.* at vi.

[309] *See* Exelon, Comments, Docket No. AD20-18-000, at 19-21 (filed May 10, 2021); *see also* RWERA, Comments, Docket No. AD20-18-000, at 2 (filed May 10, 2021).

[310] *See* Ørsted North America Offshore, Comments, Docket No. AD20-18-000, at 4-6 (filed May 11, 2021); American Clean Power Association for the Clean Energy Associations, Comments, Docket No. AD20-18-000, at 10-11 (filed May 10, 2021).

commenters, however, expressed concerns regarding greater state participation in the generator interconnection process. PJM and Eversource Energy, for example, expressed concern that (potentially sizable) interconnection requests associated with state participation, if withdrawn, could have adverse consequences for other resources in the interconnection queue.[311]

221. We preliminarily find that the failure to provide a study process for entities required to conduct a resource plan or resource solicitation process may result in rates for Commission-jurisdictional service that are unjust and unreasonable. Resource solicitation processes inspire a number of interconnection requests, but in most cases, state agencies and LSEs implementing state mandates do not have the opportunity to request dedicated studies themselves. As a result, interconnection customers seeking to participate in a resource solicitation are interspersed throughout the queue, making it more difficult to compare the interconnection costs of their proposals. Moreover, interconnection customers that submit requests associated with state-mandated or supervised resource solicitation and selection processes have a greater incentive to submit numerous interconnection requests to better compete in the resource solicitation. Yet, the volume of interconnection requests submitted in total increases uncertainty regarding interconnection costs generally and decreases the value of information obtained. These problems in turn make the selection decisions to be made by state agencies and LSEs implementing state mandates more difficult and potentially less efficient. Additionally, the queue delays associated with increased volumes of interconnection requests then may delay states acquiring the resources needed to meet their resource procurement mandates.

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[311] *See* PJM, Comments, Docket No. AD20-18-000, at 6-7 (filed May 10, 2021); Eversource, Comments, Docket No. AD20-18-000, at 8-9 (filed May 10, 2021).

Delays in meeting such resource procurement mandates can then raise costs to consumers and affect reliability.

222. Furthermore, we believe that the trends in electric resource procurement mandates and in state-managed and other required resource solicitations demonstrate the potential need to provide state agencies and LSEs with the opportunity to efficiently study solicitation requests in light of the reformed cluster study process.[312] While resource solicitation processes are conducted pursuant to state mandates, not federal mandates,[313] we believe that there is substantial interplay between resource solicitation processes and the generator interconnection process that should be accommodated.[314] We thus recognize the need for our *pro forma* LGIP to better accommodate resource solicitation processes.

c. <u>Proposal</u>

223. We propose to revise the *pro forma* LGIP to require transmission providers to allow a resource planning entity[315] to initiate an optional resource solicitation study,[316] as

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[312] *See* May Joint Task Force Tr. 54:15-55:9 (Kimberly Duffley) (explaining that aligning the generator interconnection process and the state solicitation process is a challenge).

[313] *See Xcel Energy Operating Cos.*, 109 FERC ¶ 61,072 at P 43.

[314] *See Hughes v. Talen Energy Mktg., LLC*, 578 U.S. 150, 167 (2016) (Sotomayor, J., concurring) (recognizing the "congressionally designed interplay between state and federal regulation" envisioned by the Federal Power Act (quoting *Nw. Cent. Pipeline Corp. v. State Corp. Comm'n of Kan.*, 489 U.S. 493, 518 (1989)).

[315] Proposed *pro forma* LGIP section 1 (defining "Resource Planning Entity" as any entity required to develop a Resource Plan or conduct a Resource Solicitation Process, including a relevant state entity or load serving entity). A "Resource Planning Entity" could be an LSE, a state entity, a wholesale customer (e.g., an LSE not affiliated with the transmission provider), depending on the incidence of the state mandate(s).

[316] *See infra* notes 324-326 (defining key terms).

further described in this section. These qualifying solicitations may include all-source procurements, or procurements focused on particular geographic areas, such as offshore wind lease areas or other location-constrained resource procurements.

224. We believe that this proposal will benefit interconnection customers and transmission providers through efficiencies in studying resources vying for selection in a qualifying solicitation process by grouping these resources together for purposes of informational interconnection studies. Under this proposal, a qualifying resource planning entity (including a state agency or LSE implementing state mandates) would play a facilitation role in helping group together and organize interconnection requests associated with the resource planning entity's qualifying resource solicitation process or qualifying resource plan.[317] The resource planning entity would identify the valid interconnection requests associated with its qualifying resource solicitation process or qualifying resource plan and request that the transmission provider study several combinations of those interconnection requests in a resource solicitation study.[318]

225. In other words, the proposed informational study option for these types of interconnection requests would enable the resource planning entity to initiate an optional resource solicitation study evaluating the various combinations of associated interconnection requests studied by the transmission provider. Because this arrangement affords the resource planning entity the flexibility to indicate to the transmission provider

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[317] *See* proposed *pro forma* LGIP section 4.2.2 (providing, in part, that a "Resource Planning Entity must . . . act as the point of contact for purposes of the Optional Resource Solicitation Study for all Interconnection Requests submitted to the Optional Resource Solicitation Study").

[318] *See* proposed *pro forma* LGIP section 4.2.2 ("Transmission Provider shall conduct the Optional Resource Solicitation Study separate from the Cluster Study Process.").

which interconnection requests in the optional resource solicitation study to study (and which to discontinue studying), this arrangement can help resource planning entities make decisions about their resource solicitations through increased access to information about the relative costs of different combinations of interconnection requests. This process can also help interconnection customers receive evidence of selection in a resource plan in a more timely manner by providing the resource planning entity with needed information.[319] As the Commission has explained, it has approved similar modifications to the interconnection process as consistent with or superior to the *pro forma* LGIP, reasoning with respect to PSCo's process that this "innovative approach to queue management" was "a reasonable approach to complying with a state-mandated resource solicitation process" in "states that have mandated resource planning programs."[320]

226. Although prior iterations of this approach may have involved a somewhat novel "concept of allowing load to reserve a queue position,"[321] we clarify here that interconnection customers will maintain their queue position obtained through the cluster request window and proceed through the regular interconnection queue alongside all other customers. The resource planning entity under our proposal (which may include a

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[319] *See Xcel Energy Operating Cos.*, 109 FERC ¶ 61,072 at PP 38-39 (explaining that studies conducted under this concept may be "based on an assumption that not all solicitation bids will prevail as to that queue position," and may also "avoid the need for extensive iterative studies" and "minimize the number of re-studies that will be necessary"); *see also id.* P 39 ("This increased efficiency will benefit both generators participating in the solicitation and any lower queued generators that will not participate in the solicitation.").

[320] *See id.* PP 22-25.

[321] *See id.* P 24.

state agency or LSE) will not receive a queue position. The resource planning entity must submit for inclusion in the optional resource solicitation study valid interconnection requests made by interconnection customers, and those interconnection customers remain responsible for meeting all requirements associated with maintaining their individual queue position(s).[322] Thus, while the resource planning entity plays an important organizational and facilitation role regarding the initiation and progress of an optional resource solicitation study, resource planning entities under this proposal are not themselves requesting interconnection service, establishing a separate interconnection queue or queue position, or reserving interconnection capacity or transmission capacity. While this proposal does not lessen interconnection study requirements, this proposal allows the sharing of information to administratively simplify the process of studying a potentially large number of interconnection requests that are all related to the same state-authorized or mandated resource solicitation.

227. We believe that our proposed reforms related to qualifying resource solicitations will lead to greater efficiencies in the interconnection study process for proposed generating facilities participating in such solicitations, as well as for those proposed generating facilities in the interconnection queue that are not participating in those solicitations. Accordingly, we believe that our proposed reforms will remedy

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[322] *See* proposed *pro forma* LGIP section 4.2.2 (providing, in part, that the optional resource solicitation study process is initiated by a request to perform an Optional Resource Solicitation Study that includes " "a list of Interconnection Requests, which have already been submitted to Transmission Provider in the current Cluster Request Window, that the Resource Planning Entity would like evaluated in the Optional Resource Solicitation Study" and also that it is the "Interconnection Customer [that] must meet all requirements associated with maintaining its Queue Position").

Commission-jurisdictional rates that may be unjust and unreasonable and deliver greater benefits for customers in the long run than the status quo.

228. Additionally, we note that this proposal may help resource planning entities procure resources more efficiently and effectively. By giving resource planning entities the ability to initiate an optional resource solicitation study, these reforms may also enable qualifying state agencies and LSEs to obtain better information about the interconnection requirements and potential network upgrade costs of various configurations of interconnection requests associated with bids submitted into their solicitations. With that information, state agencies and LSEs may then be able to make more informed choices in their qualifying solicitation processes.

229. As mentioned above, we propose to revise the *pro forma* LGIP to require transmission providers to allow resource planning entities, i.e., any entity required to develop a resource plan[323] or conduct a resource solicitation process,[324] including a state entity or LSE, to initiate an optional resource solicitation study,[325] as further described in this section. Specifically, we propose to require transmission providers to adopt new subsection 4.2.2 of the *pro forma* LGIP, which outlines the optional resource solicitation

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[323] We propose to define "Resource Plan" as "any process for, *inter alia*, the selection of Generating Facilities that is competitive, substantively state agency-reviewed and approved, or state agency-managed, and authorized or required by Applicable Laws and Regulations." Proposed *pro forma* LGIP section 1.

[324] We propose to define "Resource Solicitation Process" as "any process for the acquisition of Network Resources that is competitive, substantively state agency-reviewed and approved, or state agency-managed, and authorized or required by Applicable Laws and Regulations." *Id.*

[325] We propose to define an "Optional Resource Solicitation Study" as "the informational evaluation of one or more Interconnection Requests for a Resource Planning Entity as described in more detail in Section 4.2.2 of this LGIP." *Id.*

study and the roles of interconnection customers and the resource planning entity in that process.

230. To limit opportunities for undue discrimination by transmission providers and reduce incentives for transmission providers or LSEs to obtain information through the optional resource solicitation study that could be used to favor or advance the interests of affiliated generation resources, we propose to require that a resource plan or resource solicitation process as defined in the *pro forma* LGIP either use competitive procurement techniques, or be substantively reviewed and approved or directly managed by a relevant state agency. Regarding competitive procurement techniques, while we do not propose to adopt a singular definition of that term, in general, we believe that competitive solicitation processes tend to be those that are open, fair, and employ the services of an independent third party that applies standardized evaluation criteria to choose amongst various options. Regarding state agency involvement or oversight, substantive review and approval of a resource plan or resource solicitation process could only be demonstrated by showing that the resource plan or resource solicitation process uses a process that results in or involves a state commission order or state agency decision that approves or ratifies a procurement plan or procurement results. Substantive review and approval of a resource plan or resource solicitation process would not be demonstrated by a purely informational planning process that does not require state commission or state agency approval or ratification of a procurement plan or procurement results.[326] Thus,

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[326] We note that, while some state commissions must substantively review and approve the contents of utility resource plans, others simply provide interested stakeholders and the public with transparency regarding a utility's intended resource procurements. *Compare* Cal. Pub. Util. Code section 454.5(c) (2021) (providing that the California Commission "shall review and accept, modify, or reject each electrical corporation's procurement plan and any amendments or updates to the plan") *with* Ind. Code section 8-1-8.5-3(e)(2) (2022) (requiring electric utilities to submit to the Indiana

only resource planning entities whose resource plan or resource solicitation process either uses competitive procurement techniques, or is substantively reviewed and approved or directly managed by a relevant state agency, could qualify to request that a transmission provider initiate an optional resource solicitation study. We believe that these safeguards will help ensure that interconnection studies are not unfairly used to favor the resource planning entity's own economic self-interests.[327]

231. The resource planning entity

232. would be responsible for identifying the interconnection requests it is submitting for inclusion in the optional resource solicitation study (and for which the resource planning entity would serve as point of contact regarding the study). The resource planning entity would also be required to submit no more than five different combinations of such interconnection requests to meet the resource planning entity's identified needs and assumptions in its solicitation, which are considered as part of the study. The resource planning entity would not be responsible for the costs of this optional study; rather the interconnection customer would be responsible for actual study

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Commission an integrated resource plan); 170 Ind. Admin. Code 4-7-2.2(g)(3) (2022) (providing that the Indiana Commission's staff report on such submissions will "not comment on . . . the desirability of the utility's preferred resource portfolio" or on "a proposed resource action in the" integrated resource plan); 170 Ind. Admin. Code 4-7-2.5(b) (2022) (allowing utility resource actions to deviate from the utility's most recent integrated resource plan if "fully explained and justified with supporting evidence, including an updated [integrated resource plan] analysis").

[327] *See, e.g.*, *Carolina Solar Power, LLC*, 164 FERC ¶ 61,058, at PP 14-16 (2018) (explaining that the use of "a competitive procurement" model and an "RFP process . . . designed to be a rigorous, fair, and open process that is administered by an independent evaluator and overseen by the North Carolina Commission" helped "ensure just and reasonable rates" and "safeguard against the exercise of market power"). Substantive review and approval—or direct management—of a resource plan or resource solicitation process also helps indicate the commercial readiness of the resources selected by such a process.

costs. While an additional deposit would not be required to perform this study, the costs would be included in the true-up based on actual costs of performing the studies.[328] We also propose to amend the definition of Interconnection Study in the *pro forma* LGIP to clarify that the costs of an optional resource solicitation study would be the responsibility of participating interconnection customers.[329]

233. The resource planning entity and the transmission provider would determine a mutually agreeable scope of study for the optional resource solicitation study. We propose that the transmission provider must evaluate each combination of interconnection requests submitted by the resource planning entity as a group, in the same manner it will perform cluster studies under the proposed *pro forma* LGIP. The resource planning entity must act as the point of contact for purposes of the optional resource solicitation study for all interconnection requests submitted to the optional resource solicitation study. To allow the resource planning entity sufficient time to select interconnection customers in the solicitation, we propose a 135-day time limit on the optional resource solicitation study (compared to 150-days of the cluster study) to avoid over-burdening the transmission provider.[330] We also propose revisions to the *pro forma* LGIP to prohibit

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[328] *Pro forma* LGIP § 13.3 (noting that the interconnection customer is responsible for the actual costs of interconnection studies and any necessary restudies).

[329] *See id.* (providing, in part, that "Transmission Provider shall charge and Interconnection Customer shall pay the actual costs of the Interconnection Studies"); proposed *pro forma* LGIP §1 (adding "Optional Resource Solicitation Study" to the definition of "Interconnection Study").

[330] *See* proposed *pro forma* LGIP section 4.2.2.

transmission providers from delaying other interconnection requests not involved in the qualifying resource solicitation.[331]

234. After the transmission provider completes the optional resource solicitation study for the identified interconnection requests, it will provide the results to the resource planning entity for use in the selection process in the form of a resource solicitation study report. The results will also be posted on the transmission provider's OASIS consistent with the posting of other study results. Interconnection requests may proceed in the remainder of the transmission provider's interconnection study process regardless of whether they are selected by the resource planning entity for inclusion in the resource plan. Interconnection requests that are selected by the resource planning entity for inclusion in the resource plan may choose to submit evidence of selection as part of the new requirement to demonstrate commercial readiness. Interconnection requests that are not selected by the resource planning entity for inclusion in the resource plan may remain in the interconnection queue by submitting other forms of commercial readiness or providing a commercial readiness deposit.

235. Regarding withdrawal penalties, we propose that inclusion in an optional resource solicitation study does not exempt interconnection customers from withdrawal penalties under section 3.7.1 of the *pro forma* LGIP. Unlike the exemptions approved in *Tri-State*, the withdrawal penalty here applies equally to those interconnection customers

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[331] *See id.*; *Xcel Energy Operating Cos.*, 109 FERC ¶ 61,072 at P 26 (making clear that "XES must not disadvantage or delay other Interconnection Requests not involved in the solicitation").

participating in the optional resource solicitation study if their withdrawal meets the criteria for imposing withdrawal penalties proposed above.[332]

236. We seek comment regarding our proposal to explicitly include state agencies that are required to develop a resource plan or conduct a resource solicitation process in the definition of a resource planning entity.[333] We also seek comment regarding whether other entities should qualify as resource planning entities and therefore be able to request initiation of an optional resource solicitation study, and, if so, what impact, if any, their inclusion would have on the efficiency of the generator interconnection process and whether their inclusion would raise concerns of undue discrimination or preference.[334] We also seek comment on whether the proposed optional resource solicitation study raises any confidentiality concerns, including whether the optional resource solicitation study report could be posted on the transmission provider's OASIS before the qualifying solicitation process has concluded.

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[332] *Tri-State*, 174 FERC ¶ 61,021 at P 12.

[333] *See* proposed *pro forma* LGIP section 1.

[334] Although the Commission has indicated that the "flexibility" afforded by a resource solicitation cluster should be open to "any entity . . . conducting a solicitation for a Commission-jurisdictional interconnection," *see Xcel Energy Operating Cos.*, 109 FERC ¶ 61,072 at P 35, we note that we propose to limit the definition of Resource Planning Entity to entities "*required* to develop a Resource Plan or conduct a Resource Solicitation Process," *see* proposed *pro forma* LGIP section 1 (emphasis added); PSCo, Transmission and Service Agreements Tariff, attach. N, Standard LGIP (0.8.0) section 1 (same). Our proposed definition would include an LSE or "utility that develops a resource plan as authorized by its appropriate governing authority," or "a local distribution cooperative that creates a resource plan under its governing body." *See Tri-State*, 174 FERC ¶ 61,021 at P 65; *see also id.* P 64 (explaining that it was "Tri-State's intent that the Resource Solicitation Cluster process be open to any load serving entity (or other load) that requires its use to comply with its resource procurement obligations"). But as is the case under the PSCo and Tri-State LGIPs today, our proposed definition may not include every entity conducting a resource solicitation.

237. We recognize that transmission providers operating across multiple states may need flexibility in implementing this optional resource solicitation study proposal. Thus, we seek comment on what, if any, challenges multistate transmission providers—in particular, those RTOs/ISOs that serve large, multi-state areas—may face regarding study timing, multiple concurrent studies, or other issues in offering an optional resource solicitation study option, and any proposals to mitigate such challenges.

C. Reforms to Incorporate Technological Advancements into the Interconnection Process

1. Increasing Flexibility in the Generator Interconnection Process

a. Co-Located Generation Sites Behind One Point of Interconnection with Shared Interconnection Requests

i. Background

238. Historically, interconnection requests have been limited to a single generating facility seeking to interconnect to the transmission system. When the Commission adopted the *pro forma* LGIP in Order No. 2003, hybrid resources (which are co-located, share a point of interconnection, and proceed through the generator interconnection process with a single interconnection request) were not widely contemplated and therefore their needs were not considered when developing the requirements. However, recent studies demonstrate that large numbers of generating facilities currently in interconnection queues are seeking to co-locate on a shared site behind one point of interconnection and share an interconnection request.[335] There are now a number of

[335] Currently, 42% (285 GW) of solar and eight percent (17 GW) of wind projects in the queue are proposed as hybrid resources that would include electric storage. *Queued Up* at 18.

different types of generating facilities that may prove complementary, such as solar combined with electric storage, wind combined with solar, or natural gas combined with wind and electric storage,[336] and that may seek to co-locate for various efficiency reasons.

ii. Need for Reform

239. In Order No. 2003, the Commission noted that interconnection is a critical component of open access transmission service, and that case-by-case approaches to solving interconnection issues is inadequate and inefficient.[337] However, the current *pro forma* LGIP does not address interconnection requests made up of multiple generating facilities seeking to co-locate and to share a single point of interconnection.[338] The lack of procedures in the *pro forma* LGIP for generating facilities seeking to co-locate behind a single point of interconnection and share an interconnection request may necessitate a case-by-case approach that the Commission cautioned against in Order No. 2003 and may serve as a barrier to entry for these types of configurations. The benefits of such

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[336] *See, e.g.*, Eric Hittinger et al., *Compensating for Wind Variability Using Co-Located Natural Gas Generation and Energy Storage* (Carnegie Mellon Elec. Indus. Ctr, Working Paper CEIC-10-01, 2010), https://www.cmu.edu/ceic/assets/docs/publications/working-papers/ceic-10-01.pdf.

[337] Order No. 2003, 104 FERC ¶ 61,103 at PP 9-10.

[338] All RTOs/ISOs currently allow at least two resources to co-locate on a shared site behind the same point of interconnection and share a single interconnection request. CAISO, Post-Technical Conference Comments, Docket No. AD20-9-000, at 5 (filed Sept. 24, 2020); ISO-NE, Post-Technical Conference Comments, Docket No. AD20-9-000, at 4 (filed Sept. 24, 2020); MISO, Post-Technical Conference Comments, Docket No. AD20-9-000, at 5 (filed Sept. 24, 2020); NYISO, Post-Technical Conference Comments, Docket No. AD20-9-000, at 3-4 (filed Sept. 24, 2020); *see also* NYISO, Informational Report, AD20-9-000, at 5-6 (filed July 19, 2021); PJM, Post-Technical Conference Comments, Docket No. AD20-9-000, at 5 (filed Oct. 1, 2020); SPP, Report on Hybrid Resources, Docket No. AD20-9-000, at 4-5 (filed July 19, 2021) (note SPP allows co-location but separately models the resources); AWEA, Post-Technical Conference Comments, Docket No, AD20-9-000, at 15-16 (filed Sept. 24, 2020).

configurations may include efficiency in managing the interconnection queue and increased reliability of the transmission system. For example, allowing electric storage resources to be combined with variable energy resources (such as wind and solar resources) can reduce their intermittency and prevent sudden changes in output. In addition, wind and solar resources can complement one another because they generally reach peak generation at different times throughout the day (wind in the early morning and late-night hours and solar in the afternoon).

240. Therefore, we preliminarily find that that the lack of a process limits the interconnection of generating facilities, hindering competition and rendering the Commission's existing *pro forma* LGIP unjust and unreasonable or unduly discriminatory or preferential.

241. Because the *pro forma* LGIP does not specify how to approach such proposals, requests to co-locate at a single point of interconnection and share an interconnection request may be subject to differing generator interconnection processes depending on the transmission provider to which the resource is seeking to interconnect or may not be allowed at all in certain regions.[339] We are concerned that this disparate treatment may be unjust and unreasonable or unduly discriminatory or preferential because multiple generating facilities seeking to co-locate behind a single point of interconnection and share an interconnection request are similarly situated no matter the region in which they propose to interconnect.

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[339] *See* Lawrence Berkeley Nat'l Lab'y, *Generation, Storage, and Hybrid Capacity in Interconnection Queues*, May 2021, https://emp.lbl.gov/generation-storage-and-hybrid-capacity.

iii. **Proposal**

242. We propose to revise the *pro forma* LGIP and *pro forma* LGIA to require transmission providers to allow more than one resource to co-locate on a shared site behind a single point of interconnection and share a single interconnection request. This proposed reform would create a minimum standard that would remove barriers for co-located resources by creating a standardized procedure for these types of configurations to enable them to access the transmission system.

243. We propose to revise the *pro forma* LGIP to: (1) define "Co-Located Resources" as more than one resource located behind the same point of interconnection; (2) state that co-located resources can share an interconnection request; and (3) modify the definition of site control such that it allows interconnection customers to demonstrate shared land-use for generating facilities that include more than one resource.

244. We believe that requiring transmission providers to permit interconnection requests that represent more than one resource behind a single point of interconnection is required to ensure just and reasonable rates. We also believe that this requirement, by allowing a single interconnection request to represent a generating facility with more than one resource, would improve efficiency for transmission providers in the study process and may reduce study costs for developers because they would only submit a single set of deposits. Finally, this reform allows the assignment of more accurate queue positions, such that these types of generating facilities' component resources are tied together in the generator interconnection process and not studied separately, which facilitates a more accurate study of the planned generating facilities' actual electrical impact when connected to the transmission system.

245. The *pro forma* LGIP requires that the transmission provider treat an interconnection request at one site with two different voltage levels as two interconnection requests. We recognize that this situation may occur with co-located generating facilities under this proposal. Therefore, we also propose revisions to the *pro forma* LGIP to require generating facilities that are co-locating to have technology to address differences in terminal voltage between the co-located generating facilities to ensure that these generating facilities have the same voltage levels. This requirement will ensure that co-located resources with voltage differences are on notice of the need to address attendant challenges.

b. Revisions to the Material Modification Process to Require Consideration of Generating Facility Additions

i. Background

246. It has become increasingly common for generating facilities already in the interconnection queue to seek to change their interconnection requests to add electric storage or other types of generating facilities without changing the interconnection service level and/or MW total in the interconnection request. Contributing factors to this increasingly common occurrence include reduction of costs for technologies such as electric storage and the long time that interconnection customers remain in the queue, which may result in technology changes while the generating facility is still in the interconnection queue.

247. Under section 4.4 of the *pro forma* LGIP, an interconnection customer can modify its interconnection request and still retain its queue position if the modifications are either explicitly allowed under the *pro forma* LGIP or if the transmission provider determines that the modifications are not material. The *pro forma* LGIP and *pro forma* LGIA, as

modified by the cluster reform above, will define material modifications to be "modifications that have a material impact on the cost or timing of any Interconnection Request with a later or equal Queue Position."

248. If the transmission provider determines that a proposed modification is material, the interconnection customer can choose either to (1) abandon the proposed modification or (2) proceed but forfeit its queue position and reenter the interconnection queue. The requirements of such a review vary by transmission provider and the modifications requested are often not included in the tariff; rather, many such requirements are typically in the transmission provider's business practice manuals.[340] In some transmission provider tariffs or business practice manuals, the addition of a generating facility[341] to an existing interconnection request is automatically considered to be a material modification, even if that addition does not change the requested level of interconnection service.[342]

ii. Comments in Hybrid Resource Proceeding

249. Commenters in the hybrid resources proceeding in Docket No. AD20-9-000 noted the nationwide growth of hybrid resources that are made up of at least one electric

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[340] *See, e.g.*, SPP Manual 7250 (Generator Interconnection Service); NYISO Manual 23 (Transmission Expansion and Interconnection), section 3 (Interconnection Process); CAISO BPM, Generator Interconnection Procedure, section 9.2 (Types of Modification); PJM Manual 14G (Generation Interconnection Requests), section 4 (Generator Interconnection Requirements, Rights and Obligations).

[341] "Generating Facility" shall mean "Interconnection Customer's device for the production and/or storage for later injection of electricity identified in the Interconnection Request, but shall not include the Interconnection Customer's Interconnection Facilities" as defined in the *pro forma* LGIA.

[342] PJM Manual 14G (Generation Interconnection Requests).

storage resource.[343] Some commenters called for uniformity in transmission providers' material modification determinations when evaluating an addition to an interconnection request of a generating facility, such as electric storage, that does not change the interconnection service level of the existing interconnection request.[344] They noted that developers may be hesitant to request that the transmission provider consider the addition of an electric storage resource or other generating facility that does not change the interconnection service level in an existing interconnection request where such addition could cause the loss of a queue position if the developer is unwilling to forgo the change.[345] In PJM, for example, the addition of electric storage is automatically deemed to be a material modification even in instances where the addition does not increase the requested interconnection service level, regardless of both (1) the use case for the proposed generating facility and (2) the operational controls that could be applied to the generating facility's output to limit fluctuation from the original injection limit at the point of interconnection.[346]

250. By contrast, in its informational report submitted as part of the hybrid resources proceeding, CAISO stated that it takes a more flexible approach to the material

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[343] Edison Electric Institute Comments, Docket No. AD20-9-000, at 2 (filed Sept. 20, 2021); Hybrid Resources Coalition Comments, Docket No. AD20-9-000, at 1 (filed Sept. 20, 2021); Clean Grid Alliance Comments, Docket No. AD20-9-000, at 2 (filed Sept. 20, 2021).

[344] *See* Savion, Post-Technical Conference Comments, Docket No. AD20-9-000 (filed Sept. 24, 2020).

[345] SEIA, Comments, Docket No. AD20-9-000, at 6 (filed Sept. 20, 2021).

[346] Pine Gate, Comments, Docket No. AD20-9-000, at 4 (filed Sept. 20, 2021); *see* PJM Manual 14G (Generation Interconnection Requests), section 4 (Generator Interconnection Requirements, Rights and Obligations).

modification process that causes fewer interconnection customers to automatically lose their queue positions.[347] Interconnection customers in CAISO may add an electric storage resource to an existing interconnection request or to a generating facility already in operation using the same process as all other modifications.[348] Following the request, CAISO and the participating transmission owner study the modification to ensure there is no material change in electrical characteristics and that the proposed modification would not adversely affect the cost or timing of other interconnection requests. Even when an adverse impact is expected, however, CAISO allows the interconnection customer to mitigate the impact and revise the modification request. If the addition does not change the requested interconnection service level injection limit or the electrical characteristics, it is not considered a material modification and there is no loss in queue position. Under this approach, CAISO's overall process allows for fewer resource additions to be determined a material modification, especially if it does not change the requested interconnection service level.

251. In the absence of a flexible approach, commenters suggested that transmission providers should be required to provide a specific list of the criteria that would cause a requested modification to a generating facility to be considered material. Several commenters additionally suggested that interconnection customers should be permitted to

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[347] This flexible approach is possible, in part, because CAISO uses congestion management to mitigate the charging of an electric storage resource. *See Hybrid Resources*, Technical Conference Transcript, Docket No. AD20-9-000, at Tr. 66 (July 23, 2020) (Deb Levine, California Indep. Sys. Op.) (filed Dec. 8, 2020) ("Adding energy storage [to an existing interconnection request] is typically non-material because we use congestion management to mitigate any overloads caused by charging the energy storage.").

[348] CAISO, Informational Report, Docket No. AD20-9-000, at 8-9 (filed July 19, 2021).

propose to add electric storage to an interconnection request without automatically triggering a material modification, as long as the addition of electric storage does not alter the requested interconnection service level and there are no other reliability concerns.[349] Commenters suggested that interconnection customers should also be permitted to propose to install and use pre-approved controls that limit the resource's output to the requested interconnection service limit to prevent the addition of an electric storage resource being classified as a material modification by the transmission provider.[350]

iii. Need for Reform

252. For the reasons explained below, we are concerned that, because certain requested modifications are often deemed material without an evaluation, the material modification process may result in unjust and unreasonable or unduly discriminatory or preferential outcomes. As explained in Order No. 2003, it is inadequate and inefficient to solve interconnection issues on a case-by-case basis.[351] In the case of material modification, without a standard set of procedures, transmission providers have adopted variable strategies for processing requests to add electric storage, or other generating facilities that do not change the requested interconnection service limit, to existing interconnection requests. This lack of uniformity leads to disparate outcomes across the country and leaves open the potential for undue discrimination.

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[349] *See, e.g.*, Hybrid Resources Coalition, Comments, Docket No. AD20-9-000, at 14-16 (filed Sept. 20, 2021).

[350] *See, e.g.*, Pine Gate, Comments, Docket No. AD20-9-000, at 4 (filed Sept. 20, 2021).

[351] Order No. 2003, 104 FERC ¶ 61,103 at PP 9-10.

253. As explained above, the material modification provisions in the *pro forma* LGIP do not specify whether an interconnection customer can modify its interconnection request to add another generating facility at the same point of interconnection without increasing the requested interconnection service level. While in some regions, such as SPP, electric storage can be added to an interconnection request if it does not change the interconnection service limit,[352] many transmission providers treat such a request automatically as a material modification because the *pro forma* LGIP does not clearly state whether transmission providers are obligated to evaluate such modification requests under section 4.4 of the *pro forma* LGIP. As such, the interconnection customer that wishes to make this type of change faces a loss of queue position regardless of the actual effect the addition of a generating facility to an interconnection request may have on the system. Yet, the addition of electric storage or other generating facilities—particularly for variable energy resources—will often have either a neutral or a net-positive impact on the reliability of the transmission system without changing the total interconnection service level requested. For example, the addition of electric storage can ensure that the output of variable energy resources becomes more predictable or provide other reliability support services to the transmission system.[353]

254. Because the *pro forma* LGIP material modification process does not evaluate the addition of an electric storage resource or other generating facility that does not change

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[352] SPP Hybrid Report, Docket No. AD20-9-000, at 4 (filed July 19, 2021); CAISO, CAISO eTariff, app. A, Definitions, Congestion (2.0.0), Congestion Management (0.0.0). Note that SPP and CAISO have similar approaches that utilize congestion management as a way to address concerns with any overloads caused by charging energy storage.

[353] Gorman et al., *Motivations & Options for Deploying Hybrid Generator-Plus-Battery Projects within the Bulk Power System*, Electricity J., at 2 (June 2020).

the interconnection service limit before deeming it a material modification, it is a significant barrier to interconnection customers that wish to make this type of change. We preliminarily find that such a barrier hinders access to the transmission system and may render the existing generator interconnection processes unjust and unreasonable and unduly discriminatory or preferential.

iv. <u>Proposal</u>

255. We propose to revise the *pro forma* LGIP to require transmission providers to evaluate the proposed addition of a generating facility to an interconnection request as long as the interconnection customer does not request a change to the originally requested interconnection service level. The transmission provider cannot automatically consider such a request to be a material modification. Specifically, we propose to require that: (1) transmission providers evaluate the proposed addition of a generating facility to an interconnection request within 60 calendar days of receiving the request for modification if such addition does not change the requested interconnection service level; (2) the change cannot be considered an automatic material modification and an evaluation (including studying the configuration and necessary modeling) must occur prior to determining whether the proposed change constitutes a material modification of the interconnection request; and (3) if the proposed change does not have a material impact on the cost or timing of any interconnection request that is lower or equally queued, and does not cause any other reliability concerns, the addition will not be considered a material modification. The reliability concerns could include, for example, a material impact on the transmission system with regard to short circuit capability limits, steady-state thermal and voltage limits, or dynamic system stability and response.

256. We seek comment on whether the addition of a generating facility that does not alter an interconnection customer's interconnection service limit could nonetheless require a full interconnection service study. We also seek comment on how transmission providers should perform studies required to confirm that there is no adverse impact because of the addition of a generating facility to an interconnection request, such as confirmation that the electrical characteristics of the interconnection customer remain the same.

257. In addition, we seek comment on whether and how interconnection customers in a later cluster, or interconnection customers that are in the same cluster, could be adversely impacted by such changes. We further seek comment on whether the addition of electric storage when in charging mode (in terms of resistance, inductance, and capacitance) may change the electrical characteristics of an interconnection request, and whether those changes may affect the reliable operation of the generating facility related to that interconnection request. We also seek comment on whether further specification is needed for the assessment of the electrical characteristics due to the addition of a complex load.

c. Availability of Surplus Interconnection Service

i. Background

258. In Order No. 845, the Commission implemented a reform that established a surplus interconnection service. The requirement mandated that transmission providers provide an expedited process for interconnection customers to utilize or transfer surplus interconnection service at existing generating facilities.[354] The Commission defined

[354] Order No. 845, 163 FERC ¶ 61,043 at P 453.

surplus interconnection service as "any unused portion of Interconnection Service established in a Large Generator Interconnection Agreement, such that if Surplus Interconnection Service is utilized the Interconnection Service limit at the Point of Interconnection would remain the same."[355] The Commission explained that the "surplus interconnection service is created because generating facilities may not operate at full capacity at all times. Consistent with the requirements of Order No. 2003, transmission providers assume that each interconnection customer is fully utilizing its interconnection service when studying other requests for new interconnections."[356] The surplus interconnection service process does not require an assessment from the transmission provider, nor does it require the approval of the transmission provider.

259. The surplus interconnection service reform contemplated that the existing facilities would be in commercial operation at the time of the request to use the surplus interconnection service. However, the Commission has recognized that, once an interconnection customer is fully studied and has an executed LGIA or filed an unexecuted LGIA, it could be considered an existing facility for purposes of the surplus interconnection service process.[357]

260. MISO, in particular, has recently implemented changes that would allow interconnection customers to utilize the surplus interconnection service process prior to obtaining an executed LGIA or requesting the filing of an unexecuted LGIA.[358]

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[355] *Id.* P 459.

[356] *Id.* P 468.

[357] *Midcontinent Indep. Sys. Operator, Inc.*, 177 FERC ¶ 61,234, at P 13 (2021).

[358] *See id.*

Previously, MISO allowed interconnection customers to request, and MISO to begin processing, interconnection requests for surplus interconnection service after an interconnection customer obtained an "effective [GIA]"[359] for a generating facility. MISO now allows interconnection customers to request surplus interconnection service much earlier in the interconnection study process for a generating facility with a valid interconnection request from which such service will be obtained upon request. Specifically, such requests are now allowed after the completion of Decision Point II, which occurs after an interconnection customer receives certain study results for an interconnection request and which, according to MISO, is the point that interconnection requests remaining in the interconnection queue become more likely to successfully proceed to a GIA. MISO will begin processing and studying the surplus interconnection request, but no GIA will be tendered for the surplus interconnection service before the generating facility from which such service will come has an "effective GIA."

ii. <u>Comments</u>

261. In the hybrid resources proceeding in Docket No. AD20-9-000, the Hybrid Resources Coalition argued that MISO's process should serve as the model for how transmission providers process requests to add an electric storage resource to an existing generating facility because it allows the surplus interconnection service process to be used earlier, as noted above. The Hybrid Resources Coalition further argued that owners

[359] MISO, FERC Electric Tariff, attach. X, Generator Interconnection Procedures (GIP) (155.0.0), section 3.3.1.1.3.a.

of existing generating facilities should be able to add electric storage through the surplus interconnection service process or some other process.[360]

iii. Need for Reform

262. As described above, Order No. 845 established a surplus interconnection service process to enable a new interconnection customer to utilize the unused portion of an existing interconnection customer's approved interconnection service through the inclusion of an additional generating facility behind a single point of interconnection. Most transmission providers subsequently implemented additional requirements limiting requests for surplus interconnection service until after a facility reaches commercial operation. Even though the addition of a generating facility could be pursued as a material modification prior to the commercial operation date, that process is more burdensome because it requires an evaluation by the transmission provider and is subject to transmission provider approval.

263. While the surplus interconnection service process was created for existing generating facilities, Order No. 845 does not specify when a generating facility is considered to be "existing" for the purpose of Order No. 845. Limiting the use of surplus interconnection service to only those interconnection customers that have achieved commercial operation may unduly restrict access to potentially available surplus interconnection capacity. We find that this restriction may therefore be unjust and unreasonable and unduly discriminatory or preferential because it limits the applicability of surplus interconnection service.

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[360] Hybrid Resources Coalition, Comments, Docket No. AD20-9-000 (filed Sept. 20, 2021).

iv. Proposal

264. We propose to revise the *pro forma* LGIP to require transmission providers to allow interconnection customers to access the surplus interconnection service process once the original interconnection customer has an executed LGIA or requests the filing of an unexecuted LGIA. Allowing an interconnection customer to request surplus interconnection service after the original interconnection customer executes an LGIA or requests the filing of an unexecuted LGIA would enable interconnection customers with unused interconnection capacity to let other generating facilities use that capacity earlier than is currently allowed. We believe that doing so would increase the overall efficiency of the interconnection queue and ensure the efficient use of available interconnection capacity that has already been studied and granted to an interconnection customer. This is consistent with Order 845, in which we state:

> We affirm that requiring transmission providers to establish an expedited process, separate from the interconnection queue, for the use of surplus interconnection service could reduce costs for interconnection customers by increasing the utilization of existing interconnection facilities and network upgrades rather than requiring new ones, improve wholesale market competition by enabling more entities to compete through the more efficient use of surplus existing interconnection capacity, and remove economic barriers to the development of complementary technologies such as electric storage resources that may be able to easily tailor their use of interconnection service to adhere to the limitations of the surplus interconnection service that may exist. Further, we find that facilitating the use of surplus interconnection service could improve capabilities at existing generating facilities, prevent stranded costs, and improve access to the transmission system.[361]

[361] Order No. 845, 163 FERC ¶ 61,043 at P 467.

d. Operating Assumptions for Interconnection Studies

i. Background

265. The *pro forma* LGIP includes only general requirements regarding the operating assumptions for generating facilities in interconnection studies.[362] In particular, current operating assumptions for interconnection studies were developed prior to the large-scale adoption of variable energy resources, the advent of electric storage, and the adoption of co-located resources, including hybrid resources. In many instances, these operating assumptions may not reflect the real-world operation of electric storage resources,[363] and co-located resources containing electric storage resources (including hybrid resources[364]), among others, because they assume patterns of operation similar to traditional resources and firm end-use customer load. For example, some transmission providers assume that all generating facilities in a constrained area will seek to generate simultaneously during light load conditions or that all electric storage resources will seek to charge during peak load conditions. Similarly, some transmission providers may assume that resources will operate in a manner in which they are physically incapable of operating, such as

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[362] *See, e.g.*, *pro forma* LGIP section 3.2.1.2 (describing the study requirements for ERIS); *id.* section 3.2.2.2 (describing the study requirements for NRIS).

[363] An electric storage resource is defined as a resource capable of receiving electric energy from the grid and storing it for later injection of electric energy back to the grid. *See Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators*, Order No. 841, 162 FERC ¶ 61,127 at n.1 (2018), *order on reh'g*, Order No. 841-A, 167 FERC ¶ 61,154 (2019). Because the *pro forma* LGIP and *pro forma* LGIA address interconnection to the transmission system (*See Pro Forma* LGIP Section 1), we use the term electric storage resource in this NOPR in that context.

[364] *Hybrid Resources*, Order Directing Reports, 174 FERC ¶ 61,034 (Jan. 2021). Hybrid Resources White Paper: A Staff Paper: Federal Energy Regulatory Commission. Docket No. AD20-9-000 (May 2021).

assuming that solar resources will produce electricity after the sun sets, for example, or that wind will produce maximum output in a less windy season. In addition, other examples could include natural gas facilities that need adjusted operating assumptions based on the inability to procure fuel at certain times, or a pumped hydro plant that is limited in its ability to pump at night given voltage constraints.

266. Further, for generating facilities that intend to inject energy onto the transmission system as well as withdraw energy from the transmission system, such as electric storage resources and co-located resources containing electric storage resources (including hybrid resources), transmission providers have expanded the traditional scope of interconnection studies to include the impact of energy withdrawals by the generating facility during the generator interconnection process to determine whether network upgrades are needed. Many transmission providers assume in their interconnection studies that these generating facilities withdraw the maximum amount of energy during peak load conditions, which is comparable to assuming that these generating facilities behave like firm end-use customer load that is unresponsive to transmission system conditions. However, during real-time operations, the controlled withdrawals of an electric storage resource or co-located resources containing an electric storage resource (including hybrid resources) for charging differ significantly from the behavior of largely uncontrollable end-use customer loads. Unlike most firm load, an electric storage resource, or co-located resource containing an electric storage resource (including hybrid resources), can choose when to withdraw energy based on real-time information from the transmission provider, and some electric storage resources or co-located resources containing an electric storage resource (including hybrid resources) can respond to signals from the transmission

provider to reduce or stop charging (withdrawing energy from the transmission system) within seconds.[365]

267. By contrast, other transmission providers have used operating assumptions for interconnection studies that more closely match the expected operation of the generating facility seeking to interconnect. For instance, CAISO's approach, in which electric storage resources are subject to CAISO's congestion management practices,[366] has helped to avoid some of the issues above. This difference allows CAISO to curtail an electric storage resource's charging, if necessary, during a peak load period and remain confident that such curtailment will not adversely affect its system.

ii. <u>Comments</u>

268. Several commenters in the hybrid resources proceeding raised concerns with the operating assumptions for interconnection studies that transmission providers generally use to study co-located resources and hybrid resources, as well as for stand-alone electric storage resources. For instance, several commenters stated that multiple RTOs/ISOs rely on worst-case operating assumptions for interconnection studies, for example that the electric storage resources will charge during peak load periods and discharge when load

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[365] *See, e.g.*, Pac. Nw. Nat'l Lab'y, *Energy Storage Technology and Cost Characterization Report*, at 3.6 (July 2019), https://www.energy.gov/sites/prod/files/2019/07/f65/Storage%20Cost%20and%20Performance%20Characterization%20Report_Final.pdf; NERC, *Energy Storage: Impacts of Electrochemical Utility-Scale Battery Energy Storage Systems on the Bulk Power System*, at 15 (Feb. 2021), https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/Master_ESAT_Report.pdf.

[366] *See* CAISO, *Energy Storage Interconnection: Draft Final Proposal*, at 15-17 (2014), http://www.caiso.com/Documents/DraftFinalProposal_EnergyStorageInterconnection.pdf

is light.[367] Commenters argued that such operating assumptions for interconnection studies can lead to projects being assigned unnecessary and expensive network upgrade costs that make projects uneconomic.[368]

269. In addition, commenters noted that interconnection studies often include inappropriate assumptions for electric storage resources regarding when the resource will charge to capture energy that would have been lost during curtailment.[369] This can also include studying electric storage resources as if it were consistently using full charge and discharge cycles, even though that is often not how the resource would operate—in many cases the electric storage may be partially charging or discharging in response to market signals, such as responding to locational marginal prices in the RTO/ISO context, or responding to dispatch instructions more generally.

270. Some commenters argued that the increased network upgrade costs caused by unnecessary or redundant network upgrades for generating facilities can be avoided if the interconnection studies assume that the planned resource will respond to market signals,[370] or assume a particular "use case," such as avoiding charging during peak

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[367] Hybrid Resource Coalition, Comments, Docket No. AD20-9-000, at 11-12 (filed Sept. 20, 2021); City of New York, Comments, Docket No. AD20-9-000, at 3 (filed Sept. 20, 2021); Clean Grid Alliance, Comments, Docket No. AD20-9-000, at 3 (filed Sept. 20, 2021); Savion, Post-Technical Conference Comments, Docket No. AD20-9-000, at 7 (filed Sept. 24, 2020); Enel, Post-Technical Conference Comments, Docket No. AD20-9-000, at 2-3 (filed Sept. 24, 2020).

[368] City of New York, Comments, Docket No. AD20-9-000, at 3 (filed Sept. 20, 2021).

[369] Savion, Post-Technical Conference Comments, Docket No. AD20-9-000, at 4-5 (filed Sept. 24, 2020).

[370] City of New York, Comments, Docket No. AD20-9-000, at 3 (filed Sept. 20, 2021); Clean Grid Alliance, Comments, Docket No. AD20-9-000, at 3 (filed Sept. 20,

periods, scarcity periods, or other designated periods. Pine Gates states that operating assumptions for interconnection studies could also be based on the generating facility's specific configuration and known operational constructs for electric storage projects.[371] Pine Gates further states that this could also be applied to other generating facility types, such as solar, that currently may have erroneous assumptions made about their ability to operate at night, for instance.

271. Resource developers advocated for a process under which transmission providers would specify, per the requirements of identified use cases, pre-determined conditions under which an electric storage resource would be permitted to operate as load or as a generating facility: for instance, that electric storage resources could only charge outside of peak load conditions.[372] One commenter noted that this approach would enable the transmission provider to realistically study the electric storage resource, as opposed to studying it under scenarios where the resource acts as load and as a generating facility simultaneously.[373]

272. In addition, in response to the Commission's recent ANOPR on transmission and interconnection reform, the National Association of Regulatory Utility Commissioners (NARUC) agreed that interconnection studies used to evaluate Electric Storage Resources should reflect reasonable operating assumptions, such as charging during off-

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2021); Hybrid Resources Coalition, Comments, Docket No. AD20-9-000, at 11-12, 16 (filed Sept. 20, 2021).

[371] Pine Gate, Comments, Docket No. AD20-9-000, at 5-6 (filed Sept. 20, 2021).

[372] *Id.*

[373] *Id.*

peak hours.[374] The American Clean Power Association and U.S. Energy Storage Association (ACPA/ESA) noted that the unrealistic assumption that storage will charge at full capacity during peak load incentivizes developers to site storage far from binding transmission elements to avoid costly network upgrades.[375] ACPA/ESA argued that siting this way is inefficient because the expected dispatch of storage near a binding transmission element in response to wholesale market prices would most likely *relieve* the binding transmission element rather than exacerbate it. The Union of Concerned Scientists agreed that assuming electric storage resources will charge during peak load periods and exacerbate transmission constraints is unrealistic because electric storage resources are typically deployed with a specific operating strategy in mind to reduce or eliminate a transmission constraint.[376] ACPA/ESA further argued that current operating assumptions in interconnection studies disregard the ability of storage to install software and hardware controls to prevent dispatch in response to predefined line loading criteria and/or predetermined time periods.

273. Other commenters noted that the issue concerning inaccurate operating assumptions applies beyond the electric storage resource and co-located resource or hybrid resource context and argued that the requirement for accurate operating assumptions should apply to all generating facility types. Using the framework of fuel-based dispatch as a reference to accurate operating assumptions, Enel explains, "[t]he

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[374] NARUC, Comments, Docket No. RM21-17-000, at 9 (filed Oct. 12, 2021).

[375] ACPA/ESA, Comments, Docket No. RM21-17-000, at 41-42 (filed Oct. 12, 2021).

[376] Union of Concerned Scientists, Comments, Docket No. RM21-17-000, at 63-64 (filed Oct. 12, 2021).

Commission should direct all Transmission Providers to implement fuel-based dispatch assumptions in studies to further reduce interdependency between interconnection requests."[377] Enel further states,

> by studying new generators only in seasons and load profiles that match the likely generation profile of the fuel source, interconnection requests become less dependent on the results of interconnection studies for generators of different fuel types. For instance, a solar project may produce more during the summer, and a wind project may produce more during the winter. Studying the two projects as if they will achieve maximum output at the same time for several hours of the year could create the false impression that upgrades are necessary to integrate the two projects on the grid. This would create interdependence, such that one project dropping out would trigger a restudy for the other project and queue delays. With fuel-based dispatch [assumptions,] the two projects will not achieve maximum output at the same time for many hours of the year and avoid the interdependence and need to restudy.[378]

Enel also noted that MISO and PJM already employ such an approach.

274. Commenters in the hybrid resources proceeding also noted that modern control technology can limit an entire hybrid facility's impact at the point of interconnection.[379] This ability would apply to variable energy resources and stand-alone electric storage resources, as well as co-located resources containing electric storage resource (including hybrid resources).

275. Commenters also suggested that transmission providers should provide guidance regarding required control equipment, such that developers can better plan for any additional costs of this equipment, because this may influence how a developer

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[377] Enel, Comments, Docket No. RM21-17-000, at 16 (filed Oct. 12, 2021).

[378] *Id.*

[379] Pine Gate, Comments, Docket No. AD20-9-000, at 4 (filed Sept. 20, 2021).

configures its project.[380] Commenters further recommended that the Commission require transmission providers to use operating assumptions for interconnection studies that are based on a hybrid resource's specific configuration.[381] In one example, Clean Grid Alliance asserted that the MISO generator interconnection process does not account for all applications of electric storage resources because it studies storage at 100% dispatch in all planning scenarios.[382] Clean Grid Alliance noted that this problem is particularly pronounced for hybrid resources, where each component is separately submitted to the MISO queue, because the electric storage component is assessed for impacts to the transmission system in operating scenarios that will never exist.

276. Providing another perspective, EEI stated that transmission providers may need to gain more experience with the operation of hybrid resources before determining whether new study approaches are necessary. EEI contended that this could allow transmission providers the time needed to gain more experience with hybrid resources in order to inform the need for new study approaches in the future.[383]

277. In addition, commenters such as NYISO raised concerns that requiring transmission providers to change operating assumptions for interconnection studies could

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[380] Hybrid Resources Coalition, Comments, Docket No. AD20-9-000, at 12 (filed Sept. 20, 2021).

[381] *Id.* at 10-11; Pine Gate, Comments, Docket No. AD20-9-000, at 6 (filed Sept. 20, 2021).

[382] Clean Grid Alliance, Comments, Docket No. AD20-9-000, at 3 (filed Sept. 20, 2021).

[383] Edison Electric Institute, Comments, Docket No. AD20-9-000, at 6 (filed Sept. 20, 2021).

pose reliability and market concerns.[384] NYISO argued that it needs to study the actual minimum and maximum capabilities of a proposed resource to consider potential market impacts of that resource. NYISO asserted that studying a proposed resource based on its planned operational parameters would limit the resources available to system operators to address system needs during real-time operation and could result in directing the operation or curtailment of other generating facilities out of economic merit order because the transmission system is not sufficiently robust.[385]

278. Some participants in and commenters to the Commission's 2016 technical conference on generator interconnection agreements identified CAISO's approach as a best practice for modeling electric storage resources in interconnection studies during the conference and in post-technical conference comments.[386]

iii. Need for Reform

279. We expect that, in many cases, the operating assumptions used for interconnection studies will be sufficient to accurately identify the network upgrades needed to reliably interconnect many generating facilities. However, as newer technologies with operating parameters that differ from traditional generation seek to interconnect, we preliminarily find that it is necessary for transmission providers to use assumptions that accurately reflect the operating parameters of electric storage resources and co-located resources containing electric storage resources (including hybrid resources), so that the unique

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[384] NYISO, Reply Comments, Docket No. AD20-9-000, at 8 (filed Oct. 20, 2021).

[385] *Id.* at 8-9.

[386] *Review of Generator Interconnection Agreements and Procedures*, Technical Conference Transcript, Docket No. RM16-12-000, at Tr. 239-240 (May 13, 2016); RES Americas, Comments, Docket No. RM16-12-000, at 3 (filed June 30, 2016).

operating characteristics of such resources are taken into account during the generator interconnection process. If the operating assumptions for interconnection studies do not reflect the operational pattern of the interconnecting generating facilities, it is possible that interconnection studies will overestimate the proposed generating facilities' impact on the transmission system, thereby assigning network upgrades to the interconnection customer that would be unnecessary under planned operations. Because the *pro forma* LGIP includes only general requirements regarding the operating assumptions for generating facilities in interconnection studies, we are concerned that electric storage resources, and co-located resources containing electric storage resources (including hybrid resources), may be studied under inappropriate operating assumptions that result in assigning unnecessary network upgrades and increased costs to interconnection customers. We therefore preliminarily find that the lack of realistic operating assumptions used in interconnection studies for electric storage resources and co-located resources containing electric storage resources (including hybrid resources) can result in excessive and unnecessary network upgrades and may hinder the timely development of new generation, thereby stifling competition in the wholesale markets, and resulting in rates, terms, and conditions that are unjust and unreasonable. Further, we preliminarily find that the lack of appropriate operating assumptions used in interconnection studies may present an unduly discriminatory or preferential barrier to the interconnection of electric storage resources and co-located resources containing electric storage resources (including hybrid resources).

iv. <u>Proposal</u>

280. We propose to revise the *pro forma* LGIP to require transmission providers, at the request of the interconnection customer, to use operating assumptions for interconnection

studies that reflect the proposed operation of an electric storage resource or co-located resource containing an electric storage resource (including hybrid resources) – i.e., whether the interconnecting resource will or will not charge during peak load conditions, unless good utility practice, including applicable reliability standards, otherwise require the use of different operating assumptions. Such operating assumptions shall be proposed by the interconnection customer as part of its initial interconnection request. We believe this will ensure that the flexibility provided by this reform does not delay the cluster study process as proposed earlier in this NOPR, and does not delay interconnection studies, or otherwise harm other interconnection customers in the cluster because all operating assumptions for interconnection studies would be clarified prior to entering a cluster study process. Such operating assumptions must be reasonably representative of the likely behavior of an electric storage resource or co-located resource containing an electric storage resource (including hybrid resources) and, in cases where available, consistent with the historical performance of such resources in the relevant geographic area. Further, to help facilitate alignment between as-studied and real-world conditions, we propose to allow transmission providers to hold interconnection customers to the intended operation of their electric storage resource or co-located resource containing an electric storage resource (including hybrid resources) by: (1) memorializing these operating restrictions in the interconnection customer's LGIA; (2) requiring control technologies (software and/or hardware) in cases where appropriate, such as for electric storage that wishes to limit its operations, with such protection devices included in Appendix C of the LGIA. If the interconnection customer fails to operate its electric storage resource or co-located resource containing an electric storage resource (including hybrid resources) in accordance with these conditions as

memorialized in the LGIA, the interconnection customer may be considered in breach and the transmission provider may pursue termination pursuant to article 17 of the LGIA. Additionally, we propose to require that any transmission provider that requires electric storage resources or co-located resources containing an electric storage resource (including hybrid resources) to install control technologies to publicly post a list of acceptable control technologies. Furthermore, we propose revisions to the description of the ERIS and NRIS studies in sections 3.2.1.2. and 3.2.2.2 of the *pro forma* LGIP to accommodate this proposed reform.

281. We propose to require that interconnection customers clearly communicate to the transmission provider the expected operating patterns of the electric storage resource, or co-located resource containing an electric storage resource (including hybrid resources). In addition, for the electric storage resource or co-located resource containing an electric storage resource (including hybrid resources) to be studied, the interconnection customer must specify, as part of its initial interconnection request, the ancillary services that it would or would not provide so that the proper operating assumptions may be made in interconnection studies. Regardless of any changes to operating assumptions, all electric storage resources, or co-located resources containing an electric storage resource (including hybrid resources) must continue to meet all requirements in the *pro forma* LGIP and *pro forma* LGIA, as well as all applicable reliability standards.

282. Under this proposed reform, studies based on operational use cases would reflect the planned operation of the electric storage resource, or co-located resource containing electric storage resource (including hybrid resources). Order No. 845 provides precedent for the Commission to require transmission providers to revise their interconnection study assumptions to ensure just and reasonable rates. In Order No. 845, the Commission

revised the *pro forma* LGIP to require transmission providers to allow interconnection customers' requests to be studied and modeled below their full generating capacity.[387] Under this proposed reform, each transmission provider's operating assumptions used in their interconnection studies would be required to take into consideration the services that the generating facility would provide and the timing of such services, as applicable.[388] This could be done in a variety of ways, and the transmission provider would have flexibility to consider services as best fits its transmission system.

283. We acknowledge the concern held by some entities that transmission providers should not be required to study electric storage resources, or co-located resources containing an electric storage resource (including hybrid resources) according to their intended operation because it is not possible to guarantee that those resources will not deviate from the intended operating assumptions.[389] However, we preliminarily find that this concern can be addressed by requiring interconnection customers to utilize control technologies inherent to electric storage resources[390] to ensure that the operation does not deviate from the proposed operational pattern, consistent with the Commission's requirements for requesting interconnection service below full generating capacity. We

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[387] Order No. 845, 163 FERC ¶ 61,043 at P 343.

[388] This could include potential ancillary services any generating facility, including hybrid resources, could provide, such as contingency reserves, ramping or other operating reserves, which when dispatched or called upon, causes the electric storage device to be recharged in the peak period to meet its obligations later in the day.

[389] NYISO, Reply Comments, Docket No. AD20-9-000, at 8 (filed Oct. 20, 2021).

[390] *See, e.g.,* AES Companies, Comments, Docket No. RM16-12-000, at 14-15 (filed June 21, 2016); Energy Storage Association, Comments, Docket No. RM16-12-000, at 2-3, 7-8 (filed June 30, 2016); Hybrid Resources Coalition, Comments, Docket No. AD20-9-000, at 16 (filed Sept. 20, 2021).

seek comment on the extent of the potential burden on transmission providers in tracking the usage of such operating limitations.

284. As noted previously, when studying the charging of an electric storage resource or co-located resources containing an electric storage resource (including hybrid resources), assuming for purposes of operating assumptions in interconnection studies that all such resources will behave like firm load and add to peak demand without the ability to respond to signals from the transmission provider to curtail charging, is inaccurate and can lead to expensive and unnecessary network upgrades.

285. For that reason, we propose to clarify that the proposed reform described in this section to study electric storage resources, or co-located resources containing an electric storage resource (including hybrid resources) according to their planned operating assumptions at the request of the interconnection customer as part of its initial interconnection request is intended to mean the operating assumptions for withdrawals of energy (e.g., the charging of an energy storage resource) in interconnection studies. In line with the proposed reform as described above, we propose to require that the interconnection customer include in its initial interconnection request any operating assumptions for withdrawals of energy to be used by the transmission provider in interconnection studies.

286. We seek comment on whether the Commission should expand this reform to address operating assumptions for additional generating facility technologies that may currently be inaccurately modeled, such as variable energy resources. For example, we seek comment on whether the Commission should expand this proposal to specify only that, at the interconnection customer's request, a transmission provider must not study generating facilities in ways that are not physically possible, for example studying a solar

resource as producing energy at night, or a wind resource as producing maximum energy during low wind seasons, or other circumstances wherein any resource is studied in ways that are not physically possible, subject to the same proposed requirement that the generating facility be equipped with sufficient control technology, such as special protection systems, and/or subject to penalties for deviating from dispatch. We seek comment on whether other operating assumptions, in addition to the assumption that electric storage resources withdraw energy during peak load periods, should be considered as part of this proposed reform.

287. We seek comment on how the Commission should define the study parameters (e.g., should the Commission define the "peak load period" and/or "net peak load" during which transmission providers must not study a generating facility as withdrawing energy, and if so how).

288. In addition to this proposed reform, we seek comment on whether, and if so how, the Commission should define firm and non-firm charging for electric storage resources and require transmission providers to define study criteria and possible ways to interconnect related to both firm and non-firm charging. We seek comment on whether providing such options would improve the effectiveness of this proposed reform and whether there would be other consequences of implementing such an approach. With respect to the definition of firm and non-firm charging, we seek comment on whether the Commission should, for example, (1) define firm charging service as interconnection service that allows the interconnection customer to be eligible to receive electric energy in a manner comparable to a transmission provider's load, and (2) define non-firm charging service as interconnection service that allows the interconnection customer to be eligible to receive electric energy using the existing firm or non-firm capacity of the

transmission system on an "as available" basis, noting that in an RTO/ISO with market-based congestion management, a generating facility with non-firm charging service must respond to the RTO's/ISO's dispatch instructions, including curtailment to manage congestion.

2. Incorporating Alternative Transmission Technologies into the Generator Interconnection Process

a. Background

289. Under the *pro forma* LGIP and *pro forma* SGIP, transmission providers often do not consider newer technologies—such as dynamic line ratings or advanced power flow control devices—as they identify network upgrades, and instead tend toward solutions they have more experience with, such as reconductoring a line or upgrading a transformer at a transmission substation.[391] For example, reconductoring a transmission line provides a certain MW capacity increase, while dynamic line ratings or advanced power flow control devices may increase capacity dependent on ambient or transmission system conditions.

290. To date, the Commission has provided few requirements regarding how to consider dynamic line ratings and advanced power flow control devices in generator interconnection processes, and only a small number of such technologies have been deployed to address impacts that result from the potential addition of a generating facility.[392] In the Commission's transmission incentives proceedings, the Commission is

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[391] *See supra* note 90.

[392] *See, e.g.*, Advanced Energy Economy, Comments, Docket No. RM21-17-000, at 21 (filed Oct. 12, 2021); EDF Renewables, Comments, Docket No. RM21-17-000, at 17-18 (filed Oct. 12, 2021).

considering reforms to encourage the deployment of "transmission technologies that, as deployed in certain circumstances, enhance reliability, efficiency, and capacity, and improve the operation of new or existing transmission facilities,"[393] which includes the transmission technologies we discuss in this NOPR. In the ANOPR, the Commission sought comment on whether there is the potential for grid-enhancing technologies (GETs)[394]—which also include the transmission technologies we discuss in this NOPR—not only to increase the capacity, efficiency, and reliability of transmission facilities, but in so doing, also to reduce the cost of interconnection-related network upgrades.[395]

291. In comments responding to the ANOPR, several commenters[396] support the consideration of GETs during the generator interconnection process, with some

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[393] *See Elec. Transmission Incentives Pol'y Under Section 219 of the Fed. Power Act*, Notice of Proposed Rulemaking, 85 FR 18784 (Apr. 2, 2020), 170 FERC ¶ 61,204, at P 9, *errata notice*, 171 FERC ¶ 61,072 (2020).

[394] We do not use or define the term GETs for purposes of these reforms. However, for accuracy, we use the term GETs to summarize comments from the ANOPR because many of the technologies contemplated here are often considered GETs. In the ANOPR, the Commission referred to GETs as technologies that "increase the capacity, efficiency, or reliability of transmission facilities," including "(1) power flow control and transmission switching equipment; (2) storage technologies, and (3) advanced line rating management technologies." ANOPR, 176 FERC ¶ 61,024 at n.68. *See also*, Transmission Planning and Cost Allocation NOPR, 179 FERC ¶ 61,028 at P 270 ("Advanced power flow control devices serve a transmission function. These devices can help the system operator control power flows over a given path and can include phase shifting transformers (also known as phase angle regulators) and devices or systems necessary for implementing optimal transmission switching. Advanced power flow control devices allow power to be pushed and pulled to alternate lines with spare capacity leading to maximum utilization of existing transmission capacity.")

[395] ANOPR, 176 FERC ¶ 61,024 at P 158.

[396] American Clean Power Association and Energy Storage Association (ACPA/ESA), Comments, Docket No. RM21-17-000, at 49 (filed Nov. 30, 2021); CAISO, Comments, Docket No. RM21-17-000, at 113-114 (filed Nov. 30, 2021); Clean Energy Coalition, Supplemental Comments, Docket No. RM21-17-000, at 7 (filed Nov. 30, 2021); EDF Renewables, Comments, Docket No. RM21-17-000, at 16-17 (filed Nov. 30, 2021); Environmental Advocates, Comments, Docket No. RM21-17-000, at 23-25

advocating for a requirement that GETs be considered in all interconnection studies.[397] Several commenters note that GETs can reduce the cost of network upgrades[398] and the duration of time spent in interconnection queues.[399] Commenters state that GETs are not currently considered in generator interconnection processes.[400]

292. Environmental Advocates state that the Commission should not simply allow transmission providers to independently decide on the viability of an alternative transmission technology; rather, the Commission should ensure that consideration of alternatives is open and transparent, and that interconnection customers should be able to determine if the analysis is sufficiently comprehensive.[401] Similarly, EDF Renewables and ACPA/ESA argue that interconnection customers should have the opportunity to

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(filed Nov. 30, 2021); Industrial Customers, Comments, Docket No. RM21-17-000, at 37 (filed Nov. 30, 2021); Potomac Economics, Comments, Docket No. RM21-17-000, at 8-9 (filed Nov. 30, 2021); United States Department of Energy, Comments, Docket No. RM21-17-000, at 48 (filed Nov. 30, 2021).

[397] Environmental Advocates, Comments, Docket No. RM21-17-000, at 23-25 (filed Nov. 30, 2021); Industrial Customers, Comments, Docket No. RM21-17-000, at 37 (filed Nov. 30, 2021).

[398] ACPA/ESA, Comments, Docket No. RM21-17-000, at 49 (filed Nov. 30, 2021); Environmental Advocates, Comments, Docket No. RM21-17-000, at 23-25 (filed Nov. 30, 2021); Industrial Customers, Comments, Docket No. RM21-17-000, at 36-37 (filed Nov. 30, 2021); Potomac Economics, Comments, Docket No. RM21-17-000, at 8-9 (filed Nov. 30, 2021).

[399] ACPA/ESA, Comments, Docket No. RM21-17-000, at 64-65 (filed Nov. 30, 2021); Environmental Advocates, Comments, Docket No. RM21-17-000, at 23-25 (filed Nov. 30, 2021).

[400] EDF Renewables, Comments, Docket No. RM21-17-000, at 16-17 (filed Nov. 30, 2021).

[401] Environmental Advocates, Comments, Docket No. RM21-17-000, at 23-25 (filed Nov. 30, 2021).

request GETs as an alternative solution to a network upgrade.[402] ACPA/ESA state that electric storage could be considered a GET for interconnection purposes and submit that electric storage (and potentially other GETs) should qualify as a standalone network upgrade and be included under the option to build.[403]

293. On the other hand, EEI states that there are significant risks involved with the deployment of new technologies, such as uncertainties regarding long-term effectiveness, rapidly evolving technology rendering formerly installed technology obsolete, and concerns regarding cost recovery for these new investments. Thus, EEI advocates flexibility, but not a requirement, to evaluate them in the generator interconnection process.[404]

b. Need for Reform

294. Alternative transmission technologies[405] can provide substantial benefits to optimize the transmission system in specific scenarios. Namely, the below identified transmission technologies often can be deployed both more quickly and at lower costs

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[402] ACPA/ESA, Comments, Docket No. RM21-17-000, at 64-65 (filed Nov. 30, 2021); EDF Renewables, Comments, Docket No. RM21-17-000, at 16-17 (filed Nov. 30, 2021).

[403] ACPA/ESA, Comments, Docket No. RM21-17-000, at 64-65 (filed Nov. 30, 2021) (citing Order 845-A, 166 FERC ¶ 61,137 at P 2 n.5 ("Stand alone network upgrades: shall mean Network Upgrades that an Interconnection Customer may construct without affecting day-to-day operations of the Transmission System during their construction. Both the Transmission Provider and the Interconnection Customer must agree as to what constitutes Stand Alone Network Upgrades and identify them in Appendix A to the Standard Large Generator Interconnection Agreement.")).

[404] EEI, Comments, Docket No. RM21-17-000, at 39 (filed Nov. 30, 2021).

[405] For purposes of these reforms, alternative transmission technologies are: advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and/or static VAR compensators.

than other network upgrades.[406] As a result, selecting alternative transmission technologies as a network upgrade or in-lieu of a network upgrade may reduce interconnection costs by providing lower cost transmission solutions to interconnect new generating facilities. These technologies also have the potential to be used as temporary solutions while new network upgrades are constructed or used in combination with other network upgrades in generator interconnection processes.[407]

295. Specific opportunities to use alternative transmission technologies include resolving thermal overloads and/or redirecting flows following contingencies so that the transmission system will be operated within system operating limits. This could be achieved with advanced power flow control or by switching transmission system or generation elements. Transmission switching can reduce local congestion and increase transfer capacity. Dynamic line ratings, along with other alternative transmission technologies, can be used to enable dynamic injection limits at the point of interconnection and accommodate additional energy or ancillary services from generating facilities behind the point of interconnection. Devices such as static synchronous compensators and static VAR compensators can support or maintain voltages to avoid voltage collapse situations by increasing load and generation transfer capability.

296. Despite these potential benefits, alternative transmission technologies often do not receive the same consideration during generator interconnection processes as other

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[406] *See, e.g.*, State Agencies, Comments, Docket No. RM21-27-000, at 30-33 (filed Nov. 30, 2021).

[407] *See, e.g.*, TAPS, Comments, Docket No. RM21-27-000, at 21-22 (filed Nov. 30, 2021).

network upgrades and have only been deployed in a small number of instances.[408] Furthermore, the current LGIP does not require transmission providers to consider such technologies. Therefore, reforms to require their consideration may be necessary to achieve their benefits in generator interconnection processes. We preliminarily find that failing to consider alternative transmission technologies that can be deployed both more quickly and at lower costs than network upgrades may render Commission-jurisdictional rates unjust and unreasonable.

c. Proposals

i. Consideration of Alternative Transmission Technologies in Interconnection Studies Upon Request of the Interconnection Customer

297. In order to ensure just and reasonable Commission-jurisdictional rates, we propose to revise the *pro forma* LGIP and *pro forma* SGIP to require transmission providers, upon request of the interconnection customer, to evaluate the requested alternative transmission solution(s) during the LGIP cluster study and the SGIP system impact study and facilities study within the generator interconnection process.

298. Here, to provide more certainty for evaluation purposes, and focus on technologies that serve a transmission function and thus are subject to Commission jurisdiction, we propose to specify the technologies that the interconnection customer may request to be evaluated. Specifically, we propose revisions to the LGIP and SGIP to require

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[408] *See, e.g.*, Department of Energy, *Advanced Transmission Technologies*, at 28-30 (Feb. 12, 2020), https://www.energy.gov/oe/downloads/advanced-transmission-technologies-report; Environmental Advocates, Comments, Docket No. RM21-17-000, at 20 (filed Oct. 12, 2021); R Street Institute, Comments, Docket No. RM21-17-000, at 3-4 (filed Oct. 12, 2021).

transmission providers to consider the following technologies within the cluster study of the LGIP and within the system impact study and facilities study of the SGIP upon request of the interconnection customer: advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and static VAR compensators. Advanced power flow control devices serve a transmission function. These devices can help the system operator control power flows over a given path and can include phase shifting transformers (also known as phase angle regulators) and devices or systems necessary for implementing optimal transmission switching. Advanced power flow control devices allow power to be pushed and pulled to alternate lines with spare capacity leading to maximum utilization of existing transmission capacity.[409] Transmission switching, an application of transmission topology control, consists of strategically removing or inserting transmission elements into the transmission topology. Transmission switching can be used to route energy around areas with high congestion.[410] A dynamic line rating is a transmission line rating that applies to a time period of not greater than one hour and reflects up-to-date forecasts of inputs such as (but not limited to) ambient air temperature, wind, solar heating, transmission line tension, or

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[409] Transmission Planning and Cost Allocation NOPR, 179 FERC ¶ 61,028, at P 261 (citing T. Bruce Tsuchida et al., Brattle *Unlocking the Queue with Grid-Enhancing Technologies*, at 19-20 (Feb. 1, 2021), https://watt-transmission.org/wp-content/uploads/2021/02/Brattle__Unlocking-the-Queue-with-Grid-Enhancing-Technologies__Final-Report_Public-Version.pdf90.pdf).

[410] T. Bruce Tscuchida & Rob Gramlich, *Improving Transmission Operation with Advanced Technologies: A Review of Deployment Experience and Analysis of Incentives* 12 (Sustainable FERC Project, WATT Coalition, White Paper, June 2019), https://www.brattle.com/wp-content/uploads/2021/05/16634_improving_transmission_operating_with_advanced_technologies.pdf.

transmission line sag.[411] Static synchronous compensators are voltage source converter[412] devices that consists of a direct current (DC) voltage source behind a power electronic interface connected to the alternating current (AC) transmission system through a transformer. This results in a controllable voltage source and hence reactive power output.[413] Static VAR compensators are flexible alternating current transmission system (FACTS) devices that consist of thyristor-controlled reactors (TCR), thyristor-switched capacitors (TSC), and fixed capacitors acting as a harmonic filter. The TCR consists of reactors in series with thyristor valves that continuously control the reactive power output by varying the current flow through the reactor. A TSC consists of capacitors, reactors, and thyristor valves that simply switch the capacitor in and out of service. The fixed capacitor is part of the filter that absorbs the harmonics generated by the thyristor switching, supplying a fixed reactive power to the transmission system.[414] We believe that the deployment of these transmission technologies may reduce interconnection costs by providing lower cost network upgrades to interconnect new generating facilities.

299. Under this proposal, the interconnection customer may request, at the relevant scoping meeting, that the transmission provider consider a single, multiple, or all technologies on this list. The transmission provider would be required to evaluate the

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[411] *Managing Transmission Line Ratings*, Order No. 881, 87 FR 2244 (Jan. 13, 2022), 177 FERC ¶ 61,179, at PP 235, 238 (2021).

[412] A voltage source converter is a self-commutated device that synthesizes a voltage waveform with variable magnitude with respect to the system voltage to control the reactive power production and consumption of the device.

[413] NERC, Reliability Guideline: Reactive Power Planning, at 6 (Dec. 2016) https://www.nerc.com/comm/PC_Reliability_Guidelines_DL/Reliability%20Guideline%20-%20Reactive%20Power%20Planning.pdf.

[414] *Id.* at 7.

transmission technologies identified above for feasibility, cost, and time savings within the cluster study for the LGIP and the system impact study and facilities study for the SGIP, upon request of the interconnection customer. The transmission provider, upon this request, must evaluate the identified transmission technology and, if feasible, determine whether it should be used, consistent with good utility practice and other applicable regulatory standards. Transmission providers continue to retain discretion regarding whether to use the transmission technology. Potential applications of these transmission technologies include deployments either as an alternative to a network upgrade or to go into service on a temporary basis to enable provisional interconnection service[415] pending the completion of a network upgrade. The transmission provider must include evaluation of the requested transmissions technology or technologies in the cluster study report and interconnection facilities study report for the LGIP or the relevant feasibility study, system impact study and/or facilities study reports for the SGIP.

300. We seek comment on whether the list of alternative transmission technologies is sufficient. In particular, we seek comment on whether storage that performs a transmission function, synchronous condensers, and voltage source converters should be included in the list of alternative transmission technologies.

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[415] Provisional interconnection service is "Interconnection Service provided by a Transmission Provider associated with interconnecting the Interconnection Customer's Generating Facility to Transmission Provider's Transmission System and enabling that Transmission System to receive electric energy and capacity from the Generating Facility at the Point of Interconnection, pursuant to the terms of the Provisional Large Generator Interconnection Agreement and, if applicable, the Tariff." *Pro forma* LGIP section 1, *pro forma* LGIA art. 1; *see* Order No. 845, 163 FERC ¶ 61,043 at P 438.

301. We seek comment on whether there are software, operational, or other barriers to the use of these transmission technologies as proposed herein. Additionally, we seek comment on whether the use of alternative transmission technologies as supplements for, in the place of, traditional network upgrades is sufficient to guarantee a level of service to accommodate an interconnection customer seeking NRIS, or whether such a network upgrade can only relate to ERIS. We seek comment on whether the existing study processes and models in the generator interconnection process remain suitable for considering alternative transmission technologies, whether additional processes or models are needed, and if so, which entity should be responsible for developing them. We seek comment on how costs incurred for evaluating alternative transmission technology study requests would be allocated among interconnection customers in the cluster. We also seek comment on what reasonable number of transmission technology study requests from each interconnection customer would be workable, the burden (in terms of both time and resources) on transmission providers required to evaluate such requests, and whether interconnection study deadlines may need to be extended to account for time needed to evaluate the alternative transmission technology study requests. Lastly, we seek comment on whether provisional interconnection service consideration for transmission technologies should be mandatory.

ii. <u>Annual Informational Report</u>

302. In order to add transparency to the evaluation process and deployment of alternative transmission technologies in generator interconnection processes, we propose to revise the *pro forma* LGIP and *pro forma* SGIP to require transmission providers to submit an annual informational report to the Commission that details whether, and if so how, advanced power flow control, transmission switching, dynamic line ratings, static

synchronous compensators, and static VAR compensators were considered in interconnection requests over the last year. We propose to create a new docket to collect all annual informational report filings. Any informational reports that transmission providers file at the Commission would be for informational purposes and would neither be formally noticed nor require additional action by the Commission.[416] In addition, we note that future interconnection customers, as well as transmission providers, may benefit from information as to why an alternative transmission technology that was considered was not deployed. Because identifying common obstacles to the use of these alternative transmission technologies would allow potential interconnection customers to submit more meaningful requests, we seek comment as to whether to require transmission providers to include such explanations in their annual reports. Additionally, we seek comment on the scope of the annual informational report, and whether additional information should be included.

3. Modeling and Performance Requirements for Non-Synchronous Generating Facilities

a. Background

303. The transmission system is experiencing change driven by the differing characteristics of generating facilities seeking to interconnect and the increased penetration of non-synchronous generating facilities.[417] We are concerned that the *pro forma* LGIP and *pro forma* SGIP may be inadequate to address certain challenges

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[416] Order No. 845, 163 FERC ¶ 61,043 at P 305 (citing *Grid Assurance LLC*, 154 FERC ¶ 61,244, at n.106, *order on clarification*, 156 FERC ¶ 61,027 (2016)).

[417] *See, e.g.*, U.S. Energy Info. Admin., *Monthly Energy Review* at section 10.1 (Mar. 2022), https://www.eia.gov/totalenergy/data/monthly/pdf/mer.pdf (EIA March Review).

associated with these changes, which is rendering Commission-jurisdictional rates unjust and unreasonable and unduly discriminatory or preferential through less specific or less strict modeling and performance requirements compared to synchronous generating facilities. We begin with background on: (1) prior Commission action relating to modeling and performance requirements for all interconnection customers; (2) the unique attributes of non-synchronous generating facilities; (3) NERC-documented non-synchronous generation disturbance events; (4) NERC actions to address the impact of non-synchronous generating facilities on the bulk-power system; and (5) initiatives by individual transmission providers to address the reliability challenges associated with non-synchronous generating facilities during the generator interconnection process.

i. Commission Precedent

304. To ensure that transmission providers can model an interconnecting generating facility's impact on the transmission system, Order Nos. 2003 and 2006 established that interconnection customers must submit technical data specified in Attachment A to Appendix 1 of the *pro forma* LGIP or Attachment 2 of the *pro forma* SGIP along with their interconnection request. Order Nos. 2003 and 2006 also established section 4.4 (Modification) of the *pro forma* LGIP and section 1.4 (Modification of the Interconnection Request) of the *pro forma* SGIP, which detail the process for any type of interconnection customer seeking to modify its interconnection request.

305. Additionally, the Commission has imposed certain performance requirements on generating facilities through the generator interconnection process. Order No. 2003 required large generating facilities to ensure that they can "ride through" abnormal over-

frequency and under-frequency deviations.[418] Specifically, article 9.7.3 of the *pro forma* LGIP requires an interconnection customer to implement under-frequency and over-frequency relay set points for a large generating facility as required by the applicable reliability council[419] to ensure "ride through" capability of the transmission system. Article 9.7.3 of the *pro forma* LGIP defines "ride through" as the ability of the large generating facility to stay connected to and synchronized with the transmission system during system disturbances within a range of under-frequency and over-frequency conditions. The *pro forma* LGIA does not define specific voltage ride through capability; rather, article 9.1 of the *pro forma* LGIP requires the interconnection customer to comply with the applicable reliability council requirements.

306. The Commission later extended ride-through requirements in other contexts. In Order Nos. 661 and 661-A, the Commission established uniform standards in Appendix G of the *pro forma* LGIA that require large wind generating facilities to demonstrate low voltage ride through capability.[420] In Order No. 828, the Commission required small generating facilities interconnecting pursuant to the *pro forma* SGIP to have ride through capability in a manner comparable to large generating facilities.[421] In that order, the

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[418] Order No. 2003, 104 FERC ¶ 61,103 at PP 562, 566.

[419] As discussed below, we also propose in this NOPR to update the term "Applicable Reliability Council" to "Electric Reliability Organization" to reflect current terminology.

[420] *Interconnection for Wind Energy*, Order No. 661, 70 FR 34993 (June 16, 2005), 111 FERC ¶ 61,353, *order on reh'g*, Order No. 661-A, 70 FR 75005 (Dec. 19, 2005), 113 FERC ¶ 61,254 (2005).

[421] *Requirements for Frequency & Voltage Ride Through Capability of Small Generating Facilities*, Order No. 828, 81 FR 50290 (Aug. 1, 2016), 156 FERC ¶ 61,062 (2016).

Commission added subsection 1.5.7 to the *pro forma* SGIA, which requires newly interconnecting small generating facilities to have and enable ride through capability so that they shall not disconnect during abnormal frequency and voltage events.[422] The Commission did not establish generic ride through requirements, but required (1) each transmission provider to coordinate the protective equipment settings of small generating facilities with any automatic load shedding programs and (2) that the specific ride through settings be consistent with good utility practice and any standards and guidelines applied by the transmission provider to other generating facilities on a comparable basis.[423]

307. Relatedly, in Order No. 842, the Commission required newly interconnecting large and small generating facilities, both synchronous and non-synchronous, to install, maintain, and operate equipment capable of providing primary frequency response as a condition of interconnection.[424]

ii. <u>Non-Synchronous Generating Facilities</u>

308. While synchronous generating facilities convert rotating mechanical energy into electrical energy, non-synchronous generating facilities convert energy using solid-state switches.[425] Examples of non-synchronous generating facilities include but are not limited to solar photovoltaics (PV), wind, fuel cell, and battery storage.

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[422] *Id.* P 25.

[423] *Id*. P 2.

[424] *Essential Reliability Servs. & the Evolving Bulk-Power Sys.—Primary Frequency Response*, Order No. 842, 83 FR 9639 (Mar. 6, 2018), 162 FERC ¶ 61,128, *order on clarification and reh'g*, 164 FERC ¶ 61,135 (2018).

[425] *See e.g.*, Paul Evans, Engineering Mindset, *Power Inverters Explained* (Apr. 25, 2020), https://theengineeringmindset.com/power-inverters-explained/.

309. Present day non-synchronous generating facilities predominantly use grid-following inverters.[426] This means that they rely on sensed information from the transmission system (e.g., voltage waveform) to achieve the desired AC active and reactive power output. For grid-following inverters, the transmission system state parameters (e.g., voltage angle) are tracked on the order of milliseconds, meaning that the inverters can react almost instantaneously to transmission system conditions. Consequently, non-synchronous generating facilities are sensitive to even the smallest voltage and frequency changes. If non-synchronous generating facilities are not properly configured or programmed to respond to transmission system frequency and voltage fluctuations, they may fail to ride through a system disturbance (e.g., a normally cleared transmission fault) by tripping or entering momentary cessation mode, as observed in several disturbances described below. Because non-synchronous generating facilities often employ similar logic with respect to their response to transmission system disturbances and non-synchronous generating facility operators often do not set and coordinate their inverters and plant controllers[427] to ride through variations in system voltages during fault conditions, they are at greater risk of being lost *en masse* in

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[426] Dinesh Pattabiraman et al., *Comparison of Grid Following and Grid Forming Control for a High Inverter Penetration Power System*, 2018 IEEE Power & Energy Society General Meeting (PESGM), at 1, PESGM 8586162 (citing Thomas Ackermann et al., *Paving the Way: A Future Without Inertia Is Closer Than You Think*, IEEE Power & Energy Mag., November/December 2017, at 61).

[427] The controller governs the plant's performance to achieve the desired aggregate real and reactive power production and performance characteristics. *See* Mills-Price, M., and Hao, K., *The Importance of Coordinated Control Systems in Solar Generation Plants* (May 2018), https://cms-cdn.selinc.com/assets/Literature/Publications/Technical%20Papers/6658_ImportanceCoordinated_KH_20140729_Web3.pdf?v=20190325-150209.

response to a single fault on transmission or sub-transmission systems.[428] In areas of the transmission system where there is a high saturation of non-synchronous generating facilities, the *en masse* response could have an impact greater than the most severe single contingency identified by transmission providers.

iii. Documented Non-Synchronous Generation Disturbance Events

310. As described below, disturbances both on the bulk power system and on distribution systems have resulted in unexpected loss of solar PV non-synchronous generating facilities following normally cleared transmission line faults. NERC and other relevant entities have analyzed these disturbance events to determine the causes.

311. The first documented large-scale reliability event occurred in August 2016 during the Blue Cut Fire Event in California. Until this event, the likelihood for non-synchronous generating facilities to trip or momentarily cease during faults on the bulk-power system was unclear.[429] A NERC/Western Electricity Coordinating Council (WECC) joint task force examined the event and determined that a single 500 kV line-to-line fault, which was cleared normally by relay protection, caused a wide area loss of

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[428] *See, e.g.*, NERC, *San Fernando Disturbance*, at vi (Nov. 2020), https://www.nerc.com/pa/rrm/ea/Documents/San_Fernando_Disturbance_Report.pdf (San Fernando Disturbance Report) ("This event, as with past events, involved a significant number of solar PV reducing power output (either due to momentary cessation or inverter tripping) as a result of normally-cleared [bulk-power system] faults. The widespread nature of power reduction across many facilities poses risks to [bulk-power system] performance and reliability.").

[429] *See, e.g.*, NERC, *Potential Bulk System Reliability Impacts of Distributed Resources*, at 24 (Aug. 2011), https://www.nerc.com/files/IVGTF_TF-1-8_Reliability-Impact-Distributed-Resources_Final-Draft_2011%20(2).pdf (noting NERC's awareness of the practice of utilities in North America to set up distributed generation to trip during off-normal frequency and voltage conditions).

1,200 MW of solar PV non-synchronous generating facilities.[430] The task force report explained that the loss of solar PV generation during the event was primarily due to inverter settings susceptible to unexpected tripping and unanticipated momentary cessation of the non-synchronous generating facilities.[431] The report indicated that planning studies did not predict that the generating facilities would not ride through the disturbance and would fail to provide power during the event. Once aware of the potential for non-synchronous generating facilities to trip or enter momentary cessation in response to faults, Southern California Edison Company and CAISO reviewed the Supervisory Control and Data Acquisition (SCADA) data and discovered that this was not an isolated incident.[432]

312. Subsequently, there have been other documented instances of momentary cessation of non-synchronous generating facilities: the Canyon 2 Fire Event in 2017;[433]

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[430] NERC, *1,200 MW Fault Induced Solar Photovoltaic Resource Interruption Disturbance Report*, at 1 (June 2017), https://www.nerc.com/pa/rrm/ea/1200_MW_Fault_Induced_Solar_Photovoltaic_Resource_/1200_MW_Fault_Induced_Solar_Photovoltaic_Resource_Interruption_Final.pdf (Blue Cut Fire Event Report).

[431] *Id.* at 15-17. Momentary cessation occurs when inverters stop injecting current into the transmission system during high or low voltage/frequency conditions that are outside the continuous operating range. Inverters stop producing power and stop supporting voltage and frequency, effectively shutting themselves down temporarily (typically for up to five minutes). *See* NERC, *BPS-Connected Inverter-Based Resource Performance*, at 11-16 (Sept. 2018), https://www.nerc.com/comm/PC_Reliability_Guidelines_DL/Inverter-Based_Resource_Performance_Guideline.pdf (NERC IBR Performance Guideline).

[432] Southern California Edison Company and CAISO identified seven other instances of solar inverter-based resources either tripping or entering momentary cessation. *See* Blue Cut Fire Event Report at 3.

[433] NERC, *900 MW Fault Induced Solar Photovoltaic Resource Interruption Disturbance Report*, at 1 (Feb. 2018) (Canyon 2 Fire Event Report).

the Angeles Forest and Palmdale Roost Events in 2018;[434] the San Fernando Disturbance in 2020;[435] and multiple events in both ERCOT and CAISO during 2021.[436] Because present-day SCADA systems are not able to capture the full extent of all disturbance events, some smaller-scale events are likely to remain undetected.[437]

iv. NERC Actions to Address Non-Synchronous Generating Facility Impacts on the Bulk-Power System

313. Since the large-scale reliability issues related to non-synchronous generating facilities during the Blue Cut Fire Event, NERC has: (1) published multiple disturbance reports documenting the events described above;[438] (2) issued two NERC Alerts;[439] (3)

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[434] NERC, *April and May 2018 Fault Induced Solar Photovoltaic Resource Interruption Disturbances Report* (Jan. 2019) (Angeles Forest and Palmdale Roost Events Report).

[435] San Fernando Disturbance Report at vi.

[436] *See* NERC, *Odessa Disturbance* (Sept. 2021) https://www.nerc.com/pa/rrm/ea/Documents/Odessa_Disturbance_Report.pdf (Odessa Disturbance Report); *see also* NERC and CAISO, *Multiple Solar PV Disturbances in CAISO* (Apr. 2022), https://www.nerc.com/pa/rrm/ea/Documents/NERC_2021_California_Solar_PV_Disturbances_Report.pdf (NERC/CAISO Joint Report).

[437] The present-day SCADA recording resolution is unable to capture events that occur at less than the scan rate of one to four seconds. *See* NERC, *Reliability Guideline: Improvements to Interconnection Requirements for BPS-Connected Inverter-Based Resources*, at 56 (Sept. 2019), https://www.nerc.com/comm/PC_Reliability_Guidelines_DL/Reliability_Guideline_IBR_Interconnection_Requirements_Improvements.pdf (NERC IBR Interconnection Requirements Guideline).

[438] *See generally* Blue Cut Fire Event Report; Canyon 2 Fire Event Report; Angeles Forest and Palmdale Roost Events Report; San Fernando Disturbance Report; Odessa Disturbance Report; and NERC/CAISO Joint Report.

[439] NERC, *Industry Recommendation Loss of Solar Resources during Transmission Disturbances due to Inverter Settings* (June 2017) (June 2017 NERC

issued two technical reports;[440] (4) issued two reliability guidelines regarding non-synchronous generating facility data collection and performance;[441] and (5) published two white papers about the need to modify Reliability Standards to address this risk.[442] Together, these documents indicate that transmission system planning and operations entities do not have adequate or accurate information about the actual behavior of non-synchronous generating facilities within their areas under all operating conditions, and further that these same entities continue to experience issues that NERC-issued alerts were intended to address.[443]

Alert); NERC, *Industry Recommendation Loss of Solar Resources During Transmission Disturbances due to Inverter Settings – II* (May 2018) (May 2018 NERC Alert).

[440] NERC, *Technical Report* (May 2020) (IRPTF Modeling Report); NERC, *WECC Base Case Review: Inverter-Based Resources* (Aug. 2020).

[441] *See* NERC IBR Performance Guideline; NERC IBR Interconnection Requirements Guideline.

[442] NERC, *IRPTF Review of NERC Reliability Standards* (Mar. 2020), https://www.nerc.com/comm/PC/InverterBased%20Resource%20Performance%20Task%20Force%20IRPT/Review_of_NERC_Reliability_Standards_White_Paper.pdf; NERC, *Odessa Disturbance Follow-Up* (Oct. 2021), https://www.nerc.com/comm/RSTC_Reliability_Guidelines/White_Paper_Odessa_Disturbance_Follow-Up.pdf.

[443] *See, e.g.*, San Fernando Disturbance Report at vi ("Many of the issues identified in this disturbance appear systemic and are not being widely addressed by the solar PV fleet."); NERC/CAISO Joint Report at 30 ("BPS reliability is a critical factor during the interconnection process and presently plants are being interconnected in an unreliable manner based on studies that inadequately identify possible reliability issues prior to commercial operation"); Odessa Disturbance Report at 29 ("While the IRPWG reliability guidelines are some of the most downloaded guidelines produced and most widely used across the industry, it is clear that industry is not adopting the recommendations contained within NERC reliability guidelines.").

314. NERC also formed the Inverter-Based Resources Performance Task Force (IRPTF)[444] in response to the findings and recommendations of the Blue Cut Fire Event Report, to explore the performance characteristics of bulk-power system connected non-synchronous generating facilities. Among other activities, the IRPTF has published a variety of whitepapers and reliability guidelines.[445]

315. In September 2019, NERC issued a Reliability Guideline that recommends improvements to interconnection requirements for non-synchronous generating facilities connected to the bulk-power system.[446] In that Guideline, NERC recommends that transmission owners improve their interconnection requirements for non-synchronous generating facilities that are connected to the bulk-power system. Specifically, NERC recommends that transmission owners "require that newly interconnecting [non-synchronous generating facilities] continuously inject current within the '[n]o [t]rip [z]one' of the currently effective version of Reliability Standard PRC-024" to address issues with momentary cessation.[447] NERC states that non-synchronous generating facilities should be designed and configured to only use momentary cessation outside the

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[444] The IRPTF became the IBR Performance Working Group in October 2020 and then the IBR Performance Subcommittee in March 2022.

[445] NERC, *IRPTF White Papers, Technical Reports, and Assessments*, https://www.nerc.com/comm/PC/Pages/Inverter-Based-Resource-Performance-Task-Force.aspx (providing links to all IRPTF resources).

[446] NERC IBR Interconnection Requirements Guideline at 1.

[447] *Id.* The currently effective version of Reliability Standard PRC-24 establishes the "no trip zone" for frequency and voltage ride-through curves.

"no trip zone" and only to "mitigate potential tripping conditions based on interconnection studies."[448]

v. Individual Transmission Providers' Filings

316. MISO and CAISO recently revised their *pro forma* generator interconnection agreements to account for momentary cessation of non-synchronous generating facilities. The revisions proposed by CAISO (and accepted by the Commission) clarify that momentary cessation of inverters during transient transmission line faults violates the existing requirement in CAISO's *pro forma* generator interconnection agreement to remain online unless transient high voltage conditions rise to 1.20 per unit or more.[449] The CAISO revisions also clarify that asynchronous[450] generating facility inverters may not trip or cease to inject current for momentary loss of synchrony within the "no trip zone" specified in Reliability Standard PRC-024-2.[451] Finally, the revisions require that when generating facilities trip or cease to inject current, they attempt to resynchronize promptly and consistently, going from no output to full output in one second or less.[452]

317. On October 5, 2020, the Commission accepted MISO's proposed revisions to its *pro forma* generator interconnection agreement to adopt recommendations from the NERC Guideline with regard to momentary cessation, phase jump immunity, monitoring,

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[448] *Id.* at 9.

[449] *Cal. Indep. Sys. Operator Corp.,* 168 FERC ¶ 61,003, at P 5 (2019).

[450] While inverter-based resources are often technically "non" synchronous, CAISO uses the term "asynchronous" generally to apply to any resource that does not generate at 60 Hz.

[451] *Cal. Indep. Sys. Operator Corp.*, 168 FERC ¶ 61,003 at P 6.

[452] *Id.* P 7, n.11 (citing CAISO, CAISO Tariff, app. EE, app. H (3.0.0), proposed section A(vi).

and protection settings.[453] As relevant here, MISO added a new subsection to Appendix G to its *pro forma* LGIA that states "[m]omentary cessation (ceasing to inject current into the transmission system during a fault without mechanical isolation) is prohibited in [NERC] reliability standard PRC-024 no trip zone."[454]

b. Need for Reform

i. Modeling Requirements

318. We preliminarily find that the *pro forma* LGIP and *pro forma* SGIP may be unduly discriminatory or preferential to the extent that they do not require non-synchronous generating facilities to provide accurate and validated models to transmission providers during the generator interconnection process. Specifically, while Attachment A to Appendix 1 of the *pro forma* LGIP and Attachment 2 to the *pro forma* SGIP require all generating facilities to submit certain types of information, the information required is only sufficient to accurately model the behavior of synchronous generating facilities. In contrast, given the electrical characteristics of the inverters used by non-synchronous generating facilities, additional information is required to achieve a comparable level of model fidelity.

319. Additionally, we are concerned that, without a reform to require interconnection customers developing non-synchronous generating facilities to provide sufficiently accurate and validated models, interconnection studies may not identify the appropriate interconnection facilities and network upgrades needed for that interconnection request. If the interconnection studies are not able to identify the appropriate interconnection

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[453] *Midcontinent Indep. Sys. Operator, Inc.*, 173 FERC ¶ 61,014 (2020).

[454] *Id.* P 4.

facilities and network upgrades, then the interconnection costs assigned to that interconnection customer may be skewed, resulting in unjust and unreasonable rates for interconnection service.

ii. Ride-Through Requirements

320. We preliminarily find that the *pro forma* LGIA and *pro forma* SGIA ride-through provisions may result in undue discrimination and preferential treatment. While synchronous and non-synchronous generating facilities are different in many respects, both types of facilities are able to "ride through" system events and remain online and continue to provide real and reactive power following a disturbance.[455] Moreover, given the increasing prevalence of non-synchronous generating facilities, it is also clear that the loss of real and reactive power from such generating facilities following a system disturbance can have significant reliability impacts just like the loss of synchronous generating facilities.[456] Therefore, with respect to the issue of ride-through, both synchronous and non-synchronous generating facilities can be considered similarly situated.

321. Nevertheless, the existing *pro forma* LGIA and *pro forma* SGIA currently impose differing ride-through requirements because these provisions fail to account for a non-synchronous generating facilities' ability to engage in momentary cessation. As discussed above, the Blue Cut Fire and other disturbance events revealed that some non-synchronous generating facilities remained physically connected to the transmission

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[455] *See* NERC/CAISO Joint Report at 9 ("Multiple solar PV resources that exhibited momentary cessation . . . [have inverters that are no longer in production] . . . [N]ew inverters are able to provide current injection during low voltage ride-through events.").

[456] *See supra* PP 309-312.

system but, as designed or programmed, stopped or reduced their injection of real or reactive power onto the transmission system and entered into momentary cessation. Such performance by a non-synchronous generating facility can have the same impact on system reliability as would a similarly sized, synchronous generating facility prematurely tripping offline in response to a disturbance; however, this practice of momentary cessation is not expressly prohibited by the existing ride-through requirements because the generating facility still remains "connected to and synchronized with the Transmission System" as required by the *pro forma* LGIA and SGIA.[457]

322. In establishing the current *pro forma* LGIA and *pro forma* SGIA, the Commission did not specifically consider the issue of momentary cessation. When Order No. 2003 was promulgated, non-synchronous generating facilities represented a small proportion of the nation's installed generating capacity.[458] As a result, the momentary cessation of non-synchronous generating facilities was not a mode of operation that the Commission expressly addressed when it added article 9.7.3 to the *pro forma* LGIA and adopted the definition of ride-through in Order No. 2003.[459]

323. While the Commission subsequently implemented separate low-voltage ride-through requirements for wind generating facilities in Order Nos. 661 and 661-A, that requirement also did not address the possibility of momentary cessation. In Order No. 661, the Commission adopted a low voltage ride-through standard for wind generating facilities but explained that wind generating facilities would only be required to satisfy

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[457] *Pro forma* LGIA art. 9.7.3; *pro forma* SGIA art. 1.5.7.

[458] *See, e.g.*, EIA March Review at 176-177.

[459] Order No. 2003, 104 FERC ¶ 61,103 at PP 562, 566.

that ride-through requirement if the system impact study demonstrates that such capability is required to ensure safety or reliability.[460] However, in Order No. 661-A, the Commission granted rehearing and required all wind generating facilities to comply with the low-voltage ride-through provision without the case-by-case analysis.[461] Therefore, pursuant to Order No. 661-A, all wind generating facilities "shall be able to remain online" during voltage disturbances up to certain time periods and associated voltage levels.[462] This requirement to "remain online" does not appear to contemplate the possibility that a facility could remain physically connected to the transmission system but stop injecting real or reactive power.

324. More recently, in Order No. 828, the Commission added article 1.5.7 to the *pro forma* SGIA to require small generating facilities to ensure the capability to ride through system disturbances comparable to large generating facilities.[463] However, the Commission again did not specifically consider the issue of momentary cessation. As a result, neither article 9.7.3 of the *pro forma* LGIA nor article 1.5.7 of the *pro forma* SGIA expressly address whether the momentary cessation of non-synchronous generating facilities is permitted during system disturbances.

325. Given advances in inverter technology, we are concerned that the lack of performance requirements regarding the use of momentary cessation by non-synchronous

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[460] Order No. 661, 111 FERC ¶ 61,353 at P 26.

[461] Order No. 661-A, 113 FERC ¶ 61,254 at P 31.

[462] *Id.* at app. B ("A wind generating plant shall be able to remain online during voltage disturbances up to the time periods and associated voltage levels set forth in the standard below.").

[463] Order No. 828, 156 FERC ¶ 61,062 at P 11.

generating facilities may not be supportable on either a technical basis (as this is largely a control settings issue) or on a cost basis (as implementing the appropriate inverter settings may not be costly).[464] Accordingly, we preliminarily find that the *pro forma* LGIA and *pro forma* SGIA ride-through provisions may be unduly discriminatory or preferential.

iii. Applicability of Ride-Through Requirements

326. We preliminarily find that the *pro forma* LGIA may also result in undue discrimination or preferential treatment due to a gap in the applicability of ride-through requirements to different generating facilities. While article 1.5.7 of the *pro forma* SGIA requires newly interconnecting small generating facilities to ride through abnormal frequency and voltage events and not disconnect during such events, the comparable article 9.7.3 of the *pro forma* LGIA does not explicitly require newly interconnecting large generating facilities to ride through such disturbance events, instead referring to requirements of "the Applicable Reliability Council" to ensure ride-through capability. By referencing the requirements of the "Applicable Reliability Council" rather than explicitly stating the ride-through requirements (as in article 1.5.7 of the *pro forma* SGIA), article 9.7.3 of the *pro forma* LGIA may create a gap in applicability because it would only apply to those generating facilities that are subject to the reliability standards, i.e., entities with facilities that meet the definition of "bulk electric system" facilities and are registered with NERC.[465] While most generating facilities seeking to interconnect to

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[464] *See, e.g.*, Ran Fu, et. al., Nat'l Renewable Energy Lab'y, *U.S. Solar Photovoltaic System Cost Benchmark: Q1 2018*, at viii (Nov. 2018), https://www.nrel.gov/docs/fy19osti/72399.pdf. *See also Cal. Indep. Sys. Operator Corp.,* 168 FERC ¶ 61,003, at P 17.

[465] NERC's Commission-approved bulk electric system definition defines the scope of the Reliability Standards and the entities subject to NERC compliance.

the transmission system are subject to the *pro forma* LGIP and *pro forma* LGIA (i.e, generating facilities above 20 MW) are already subject to the reliability standards, some are not. Specifically, generating facilities are not required to comply with reliability standards unless they have a gross individual nameplate rating greater than 20 MVA or gross plant/facility aggregate nameplate rating of greater than 75 MVA.[466] As a result, we are concerned that there does not appear to be any provision of the *pro forma* LGIA that explicitly requires generating facilities with a capacity above 20 MW but with a gross plant/facility aggregate nameplate rating of 75 MVA or less to ride through frequency or voltage disturbances. Similarly, generating facilities that do not explicitly possess an automatic voltage regulator, such as many non-synchronous generating facilities, are not subject to the provisions of article 9.6.2.1 of the *pro forma* LGIA, which are applicable only to generating facilities with speed governors and voltage regulators.

327. There does not appear to be any clear basis for these distinctions, nor has the Commission previously addressed this potential gap. As discussed above, all generating facilities newly interconnecting under the *pro forma* LGIA are technically capable of riding through such disturbances.[467] Given these facts, there does not appear to be any

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Revisions to Electric Reliability Organization Definition of Bulk Electric System and Rules of Procedure, Order No. 773, 78 FR 804 (Jan. 4, 2013), 141 FERC ¶ 61,236 (2012). NERC's bulk electric system definition includes transmission elements operated at 100 kV and above but does not include facilities used in the local distribution of electric energy. The bulk electric system definition also includes dispersed power producing resources (i.e., non-synchronous generation) that aggregate to a total capacity greater than 75 MVA. NERC, *Glossary of Terms Used in NERC Reliability Standards* (Oct. 8, 2020), https://www.nerc.com/pa/Stand/Glossary%20of%20Terms/Glossary_of_Terms.pdf.

[466] *See* Order No. 773, 141 FERC ¶ 61,236 at PP 12, 38; *see also* NERC Registry Criteria, section I, at 4.

[467] *See supra* note 464.

reason that generating facilities connecting under the *pro forma* LGIA that are subject to the reliability standards should be required to provide a higher level of performance than those that are not. Accordingly, we preliminarily find that the *pro forma* LGIA ride-through provisions may be unduly discriminatory or preferential.

c. Proposal

i. Modeling Requirements

328. We propose to revise the *pro forma* LGIP and *pro forma* SGIP to ensure that all interconnection customers requesting to interconnect a non-synchronous generating facility must provide the transmission provider with the models needed for accurate interconnection studies, as discussed below. This reform is intended to promote a consistent approach among all generating facilities to reliability, such that all interconnection customers are required to submit information sufficient to accurately model the behavior of their proposed generating facility. Pursuant to this proposal, interconnection customers requesting to interconnect a non-synchronous generating facility would be required to provide models that contain the details necessary to accurately model the performance of the generating facility in response to system disturbances in accordance with the control system settings that would be used by the interconnection customer during the commissioning and operation of the generating facility.

329. Specifically, we propose to revise Attachment A to Appendix 1 of the *pro forma* LGIP, and Attachment 2 of the *pro forma* SGIP to require each interconnection customer requesting to interconnect a non-synchronous generating facility to submit to the transmission provider: (1) a validated user-defined root mean square (RMS) positive sequence dynamics model; (2) an appropriately parameterized, generic library RMS

positive sequence dynamics model, including a model block diagram of the inverter control system and plant control system, that corresponds to a model listed in a new table of acceptable models or a model otherwise approved by WECC; and (3) a validated EMT model, if the transmission provider performs an EMT study as part of the interconnection study process.

330. First, regarding the validated user-defined model, we propose to define a "user-defined model" as any set of programming code created by equipment manufacturers or developers that captures the latest features of controllers that are mainly software based and represents the entities' control strategies but does not necessarily correspond to any particular generic library model. In order for this model to be "validated," it must be confirmed that the equipment behavior is consistent with the model behavior. This can involve, for example, an attestation from the interconnection customer that the model accurately represents the entire generating facility, attestations from each equipment manufacturer that the user defined model accurately represents the component of the generating facilities, or test data.

331. Second, regarding the table of acceptable generic library models, this table is based on the current WECC list of approved dynamic models for renewable energy generating facilities.[468] WECC's list of approved dynamic models has also been integrated into NERC Guidelines.[469] These models represent the current state of the art with regard to dynamic modeling requirements for non-synchronous generating facilities.

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[468] *See* WECC, WECC Approved Dynamic Model Library (effective Jan. 28, 2022), https://www.wecc.org/Reliability/Approved%20Dynamic%20Models%20January%202022.pdf.

[469] NERC IBR Interconnection Requirements Guideline at 27 ("[T]he [transmission owner] should be clear in the types of models that are expected to be

332. We believe that these models represent the full spectrum of modeling data that transmission providers need to perform accurate interconnection studies for non-synchronous generating facilities. We recognize that the modeling data we propose to require from non-synchronous generating facilities may be more voluminous than that required of synchronous generating facilities; however, this data submission requirement is intended to result in a comparable level of modeling accuracy among all generating facilities.

333. An interconnection customer's failure to provide the above information within the deadlines established in the *pro forma* LGIP and *pro forma* SGIP would make the interconnection request incomplete and will be considered invalid in accordance with section 3.4.3 of the *pro forma* LGIP and section 1.3 of the *pro forma* SGIP. Pursuant to those provisions, if the interconnection customer does not cure the deficiency within the 10-day cure period, the interconnection request will be considered withdrawn pursuant to section 3.7 of the *pro forma* LGIP and section 1.3 of the *pro forma* SGIP.

334. We also propose to modify subsection 4.4.4 of the *pro forma* LGIP and section 1.4 of the *pro forma* SGIP to require that any proposed modification of the interconnection request be accompanied by updated models of the proposed generating facility. This will ensure that the transmission provider will be able to accurately model the impact of the interconnection request throughout the interconnection process.

335. We seek comment on whether these proposed reforms are necessary and/or sufficient to ensure that interconnection customers proposing non-synchronous

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provided for the interconnection process. These models should, at a minimum, align with the list of acceptable models used for interconnection-wide modeling developed by NERC and the MOD-032 Designees.") (citing WECC Approved Dynamic Model Library).

generating facilities submit models during the generator interconnection process that accurately reflect the behavior of their proposed generating facility. Further, we seek comment on whether the inclusion of the table based on NERC Guidelines that cite WECC-approved models is appropriate. If not, we seek comment on how the Commission could require interconnection customers to submit models that are widely known in industry to be accurate without listing specific models.

ii. Ride-Through Requirements

336. We propose to require newly interconnecting non-synchronous generating facilities to continue current injection inside the "no trip zone" of the frequency and voltage ride-through curves of Reliability Standard PRC-024-3 or its successor standards, in accordance with NERC's recommendation in the NERC IBR Guideline.[470] Specifically, we propose to revise existing article 9.7.3 of the *pro forma* LGIA to require all newly interconnecting large generating facilities to ride through abnormal frequency and voltage conditions. The term "ride-through" is defined in article 9.7.3 of the *pro forma* LGIA as the ability of the large generating facility to stay connected to and synchronized with the transmission system during system disturbances within a range of under-frequency and over-frequency conditions. We propose to expand the ride-through definition to include the ability of the large generating facility to stay connected to and synchronized with the transmission system during system disturbances within under-voltage and over-voltage conditions as well.

337. In addition, we propose to revise article 9.7.3 of the *pro forma* LGIA and article 1.5.7 of the *pro forma* SGIA to require that any newly interconnecting non-synchronous

[470] NERC IBR Interconnection Requirements Guideline at 9.

generating facility must have the ability, during abnormal frequency conditions and voltage conditions within the "no trip zone" defined by Reliability Standard PRC-024-3 or its successor standards, to maintain power production at pre-disturbance levels unless providing primary frequency response or fast frequency response, and must have the ability to provide dynamic reactive power to maintain system voltage in accordance with the generating facility's voltage schedule. We find such a limited exception to be appropriate given Order No. 842, which requires all newly interconnecting generating facilities to provide primary frequency response during frequency deviations outside of the dead band parameter, pursuant to article 9.6.4 of the *pro forma* LGIA and article 1.8.4 of the *pro forma* SGIA.

338. We seek comment on whether adherence to these proposed requirements would be readily achievable through changes to control settings and whether such changes to control settings could be made at a relatively minor cost.

iii. <u>Applicability of Ride-Through Requirements</u>

339. We believe that adding clarity to the expectations for all generating facilities to provide ride-through capability through modifications to the *pro forma* LGIA would ensure that all future interconnection customers are subject to clear and consistent frequency and voltage ride-through requirements. At present, the absence of a clear requirement for all generating facilities to maintain ride-through capability may unfairly place the responsibility for maintaining system reliability on the subset of generating facilities that ride through the disturbance. Furthermore, we have identified no technical

or economic basis to require small and large generating facilities to follow different voltage and frequency ride-through requirements.[471]

340. Accordingly, we propose to revise article 9.7.3 of the *pro forma* LGIA to require that all newly interconnecting large generating facilities must provide ride-through capability consistent with any standards and guidelines that are applied to other generating facilities in the balancing authority area on a comparable basis. This proposed reform is intended to address the existing gap in the applicability of ride-through requirements for large generating facilities with a capacity above 20 MW and with a gross plant/facility aggregate nameplate rating 75 MVA or less. In addition, the proposed reform is consistent with existing language in article 1.5.7 of the *pro forma* SGIA that requires newly interconnecting small generating facilities to ride through abnormal frequency and voltage events and not disconnect during such events.

341. In addition to the substantive changes discussed above, we propose to replace the term "Applicable Reliability Council" with "Electric Reliability Organization," and replace the term "control area" with "Balancing Authority Area" throughout the *pro forma* LGIP and *pro forma* LGIA. These proposed replacements reflect updated terminology.[472]

III. <u>Proposed Compliance Procedures</u>

342. We propose to require each transmission provider to submit a compliance filing within 180 days of the effective date of the final rule in this proceeding revising its LGIP,

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[471] Order No. 828, 156 FERC ¶ 61,062 at P 21.

[472] *See* NERC, *Glossary of Terms Used in NERC Reliability Standards* (Oct. 8, 2020), https://www.nerc.com/pa/Stand/Glossary%20of%20Terms/Glossary_of_Terms.pdf.

LGIA, SGIP, and SGIA, as necessary, to demonstrate that it meets the requirements set forth in any final rule issued in this proceeding. The Commission also proposes to permit appropriate entities to seek "regional reliability variation" or "independent entity variations" from the proposed revisions to the *pro forma*.[473] Some transmission providers may have provisions in their existing LGIPs, LGIAs, SGIPs, and SGIAs subject to the Commission's jurisdiction that the Commission has previously deemed to be consistent with or superior to the *pro forma* LGIP, *pro forma* LGIA, *pro forma* SGIP, and/or *pro forma* SGIA or permissible under the independent entity variation standard or regional reliability standard. Where these provisions would be modified by the final rule, transmission providers must either comply with the final rule or demonstrate that these previously-approved variations continue to be consistent with or superior to the *pro forma* as modified by the final rule or continue to be permissible under the independent entity variation standard or regional reliability standard.[474]

343. The Commission will assess whether each compliance filing satisfies the proposed requirements stated above and issue additional orders as necessary to ensure that each public utility transmission provider meets the requirements of the subsequent final rule.

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[473] *See, e.g.*, Order No. 2003, 104 FERC ¶ 61,103 at PP 822-827; Order No. 2006, 111 FERC ¶ 61,220 at PP 546-550; *see also* May Joint Task Force Tr. 41:3-7, 42:23-43:2 (Gladys Brown Dutrieuille) (expressing support for regional flexibility but also for FERC "encourag[ing] interconnection efficiencies throughout the country by promoting best-in-class processes, such as variations in ways to cluster projects").

[474] *See* May Joint Task Force Tr. 175:13-17 (Jason Stanek) ("I think we heard here today that regional flexibility remains important, but so does having some at least minimal national baseline because many of these generators are not just building in PJM or ISO-New England, but across the country."); *id.* 22:22-25 (Riley Allen). ("[U]ltimately, there needs to be some room for flexibility among the regions, but I think there's some opportunities for more foundational aspects of reform to be common across regions as well.").

344. We propose that transmission providers that are not public utilities will have to adopt the requirements of this Proposed Rule as a condition of maintaining the status of their safe harbor tariff or otherwise satisfying the reciprocity requirement of Order No. 888.[475]

IV. Information Collection Statement

345. The information collection requirements contained in this NOPR are subject to review by the Office of Management and Budget (OMB) under section 3507(d) of the Paperwork Reduction Act of 1995.[476] OMB's regulations require approval of certain information collection requirements imposed by agency rules.[477] Upon approval of a collection of information, OMB will assign an OMB control number and an expiration date. Respondents subject to the filing requirements of a rule will not be penalized for failing to respond to these collections of information unless the collections of information display a valid OMB control number.

346. The reforms proposed in this NOPR would revise the Commission's standard interconnection procedures and agreement (i.e., the *pro forma* LGIP and *pro forma* LGIA) and the standard small generator interconnection procedures and agreement (i.e.,

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[475] *Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission on Servs. by Pub. Utils.; Recovery of Stranded Costs by Pub. Utils. & Transmitting Utils.*, Order No. 888, 61 FR 21540 (May 10, 1996), FERC Stats. & Regs. ¶ 31,036, at 31,760-763 (1996) (cross-referenced at 75 FERC ¶ 61,080), *order on reh'g*, Order No. 888-A, FERC Stats. & Regs. ¶ 31,048 (cross-referenced at 78 FERC ¶ 61,220), *order on reh'g*, Order No. 888-B, 81 FERC ¶ 61,248 (1997), *order on reh'g*, Order No. 888-C, 82 FERC ¶ 61,046 (1998), *aff'd in relevant part sub nom. Transmission Access Policy Study Group v. FERC*, 225 F.3d 667 (D.C. Cir. 2000), *aff'd sub nom. New York v. FERC*, 535 U.S. 1 (2002).

[476] 44 U.S.C. 3507(d).

[477] 5 CFR 1320.11 (2021).

the *pro forma* SGIP and *pro forma* SGIA) that every public utility transmission provider is required to include in their non-discriminatory open access transmission tariff under § 35.28 of the Commission's regulations.[478] This NOPR proposes to require each transmission provider to amend the standard interconnection procedures and agreement and the standard small generator interconnection procedures and agreement in its open access transmission tariff to implement the reforms proposed in this NOPR, which are intended to ensure that the generator interconnection process is just and reasonable and not unduly discriminatory or preferential. We will submit the proposed reporting requirements to OMB for its review and approval under section 3507(d) of the Paperwork Reduction Act.[479] The proposed revisions included in this NOPR would affect the following collections of information: FERC-516, Electric Rate Schedules and Tariff Filings, and FERC-516A, Standardization of Small Generator Interconnection Agreements and Procedures.

347. Interested persons may obtain information on the reporting requirements by contacting Ellen Brown, Office of the Executive Director, Federal Energy Regulatory Commission, 888 First Street, NE, Washington, DC 20426, via email (DataClearance@ferc.gov) or telephone (202) 502-8663.

348. We solicit comments on the Commission's need for this information; whether the information will have practical utility; the accuracy of the burden and cost estimates; ways to enhance the quality, utility, and clarity of the information to be collected or

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[478] 18 CFR 35.28(f)(1) (2021).

[479] 44 U.S.C. 3507(d).

retained; and any suggested methods for minimizing respondents' burden, including the use of automated information techniques.

349. Please send comments concerning the collections of information and the associated burden estimates to the Office of Information and Regulatory Affairs, Office of Management and Budget, through www.reginfo.gov/public/do/PRAMain. Attention: Federal Energy Regulatory Commission Desk Officer. Please identify the OMB Control Numbers 1902-0096 (FERC-516) and 1902-0203 (FERC-516A) in the subject line of your comments. Comments should be sent within 60 days of publication of this notice in the Federal Register.

350. Please submit a copy of your comments on the information collections to the Commission via the eFiling link on the Commission's website at http://www.ferc.gov. Comments on the information collection that are sent to FERC should refer to Docket No. RM22-14-000.

351. Title: Electric Rate Schedules and Tariff Filings (FERC-516) and Standardization of Small Generator Interconnection Agreements and Procedures (FERC-516A).

352. Action: Proposed revisions of collections of information.

353. OMB Control Nos.: 1902-0096 (FERC-516) and 1902-0203 (FERC-516A).

354. Respondents: Public utility transmission providers, including RTOs/ISOs.

355. Frequency of Information Collection: One time during Year 1. Multiple times during subsequent years.

356. Necessity of Information: We propose the reforms in this NOPR to address interconnection queue backlogs, improve certainty, prevent undue discrimination for new technologies, and ensure that the costs of network upgrades are allocated in a manner that is roughly commensurate with benefits. The reforms are intended to ensure that the

generator interconnection process is just and reasonable and not unduly discriminatory or preferential.

357. Internal Review: We have reviewed the proposed reforms that impose information collection burdens and have determined that such reforms are necessary. These proposed reforms conform to the Commission's need for efficient information collection, communication, and management within the energy industry. We have specific, objective support for the burden estimates associated with the proposed information collection requirements.

358. Public Reporting Burden: Our estimates are based on the number of transmission providers that submitted compliance filings in response to Order No. 845, which is the Commission's most recent interconnection rulemaking that required transmission providers to revise their interconnection procedures and agreements. As such, we estimate that 45 transmission providers, including the RTOs/ISOs, will be subject to this rulemaking. The burden[480] and cost estimates below are based on (1) the initial need for transmission providers to file revised versions of the standard interconnection procedures and agreements in Year 1, and (2) ongoing information collection activities in connection with reporting and disclosure requirements in subsequent years. With regards to ongoing information collection activities, the NOPR proposes to add annual and quarterly information collection activities regarding the provision of public interconnection information, compilation and posting of metrics related to completion of cluster studies, compilation and posting of metrics related to penalties for late interconnection studies

[480] "Burden" is the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. For further explanation of what is included in the information collection burden, refer to 5 CFR 1320.3.

following the elimination of the reasonable efforts standard, and reporting related to the consideration of alternative technologies in interconnection requests. The NOPR also proposes an information collection requirement in which transmission providers will provide affected system operators with data monthly, or more frequently as needed, during the affected system study process. For other proposed reforms, we estimate no ongoing information collection burden because there is either no information collection aspect of the reform or the proposed requirements would merely supplant existing ones. We estimate that the reforms proposed in this NOPR would affect the burden and cost of FERC-516 and FERC-516A as follows.

Proposed Changes Due to NOPR in Docket No. RM22-14-000					
Proposed Requirements	**Number of Respondents (1)**	**Annual Number of Responses Per Respondent (2)**	**Total Number of Responses (Rounded) (1) * (2) = (3)**	**Average Burden (Hr.) & Cost ($) Per Response[481] (4)**	**Total Annual Burden Hours & Total Annual Cost ($) (Rounded) (3) * (4) = (5)**
FERC-516:					
Informational Interconnection Study	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Public Interconnection Information	45 (TPs)	Year 1: 1 Ongoing: 2	Year 1: 45 Ongoing: 90	Year 1: 4 hr; $348 Ongoing: 4 hr; $348	Year 1: 180 hr; $15,660 Ongoing: 360 hr; $31,320
Cluster Study	45 (TPs)	Year 1: 1 Ongoing: 4	Year 1: 45 Ongoing: 180	Year 1: 80 hr; $6,960 Ongoing: 4 hr; $348	Year 1: 3600 hr; $313,200 Ongoing: 720 hr; $62,640

[481] Commission staff estimates that respondents' hourly wages plus benefits are comparable to those of FERC employees. Therefore, the hourly cost used in this analysis is $87.00 ($180,703 per year).

Allocation of Cluster Study Costs	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Allocation of Cluster Network Upgrades	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Shared Network Upgrades	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 80 hr; $6,960 Ongoing: 0	Year 1: 3600 hr; $313,200 Ongoing: 0
Increased Study Deposits and LGIA Deposit	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Demonstration of Site Control	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 80 hr; $6,960 Ongoing: 0	Year 1: 3600 hr; $313,200 Ongoing: 0
Commercial Readiness	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Withdrawal Penalties	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Transition Process	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 80 hr; $6,960 Ongoing: 0	Year 1: 3600 hr; $313,200 Ongoing: 0
Elimination of Reasonable Efforts Standard	45 (TPs)	Year 1: 1 Ongoing: 4	Year 1: 45 Ongoing: 180	Year 1: 80 hr; $6,960 Ongoing: 4 hr; $348	Year 1: 3600 hr; $313,200 Ongoing: 720 hr; $62,640
Affected Systems Study Process	45 (TPs)	Year 1: 5 Ongoing: 5[482]	Year 1: 225 Ongoing: 225	Year 1: 80 hr; $6,960 Ongoing: 80 hr; $6960	Year 1: 18,000 hr; $1,566,000 Ongoing: 18,000 hr; $1,566,000
Affected Systems Pro Forma Agreements	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0

[482] The ongoing burden estimated here reflects the estimated yearly average of the requirement to provide affected system operators with data monthly during the affected system study process.

Affected Systems Modeling and Study Assumptions	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Optional Resource Solicitation Study	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Co-Located Generation Sites Behind One Point of Interconnection with Shared Interconnection Requests	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Revisions to Material Modification to Require Consideration of Generating Facility Additions	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 80 hr; $6,960 Ongoing: 0	Year 1: 3600 hr; $313,200 Ongoing: 0
Availability of Surplus Interconnection Service	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Operating Assumptions for Interconnection Studies	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 80 hr; $6,960 Ongoing: 0	Year 1: 3600 hr; $313,200 Ongoing: 0
Consideration of Alternative Transmission Technologies in Interconnection Studies Upon Request of Interconnection Customer	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 80 hr; $6,960 Ongoing: 0	Year 1: 3600 hr; $313,200 Ongoing: 0
Annual Informational Report	45 (TPs)	Year 1: 1 Ongoing: 1	Year 1: 45 Ongoing: 45	Year 1: 4 hr; $348 Ongoing: 4 hr; $348	Year 1: 180 hr; $15,660 Ongoing: 180 hr; $15,660

Modeling Requirements	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Ride Through	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Applicability of Ride Through	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Total for FERC-516			**Year 1: 1305 Ongoing: 720**	**Year 1: 49,680 hr; $4,322,160 Ongoing: 19,980 hr; $1,738,260**	
FERC-516A:					
Consideration of Alternative Transmission Technologies in Interconnection Studies Upon Request of Interconnection Customer	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 80 hr; $6,960 Ongoing: 0	Year 1: 3600 hr; $313,200 Ongoing: 0
Modeling Requirements: Transmission Providers	45 (TPs)	Year 1: 1 Ongoing: 0	Year 1: 45 Ongoing: 0	Year 1: 4 hr; $348 Ongoing: 0	Year 1: 180 hr; $15,660 Ongoing: 0
Total for FERC-516A			**Year 1: 90 Ongoing: 0**	**Year 1: 3780 hr; $328,860 Ongoing: 0**	
Grand Total (FERC-516 plus FERC-516A, including all respondents)			**Year 1: 1395 Ongoing: 0**	**Year 1: 53,460 hr; $4,651,020 Ongoing: 19,980 hr; $1,738,260**	
Grand Total Average Per Entity Cost (45 TPs)				**Year 1: $103,356 Ongoing: $38,628**	

V. Environmental Analysis

359. The Commission is required to prepare an Environmental Assessment or an Environmental Impact Statement for any action that may have a significant adverse

effect on the human environment.[483] We conclude that neither an Environmental Assessment nor an Environmental Impact Statement is required for this NOPR under § 380.4(a)(15) of the Commission's regulations, which provides a categorical exemption for approval of actions under sections 205 and 206 of the FPA relating to the filing of schedules containing all rates and charges for the transmission or sale of electric energy subject to the Commission's jurisdiction, plus the classification, practices, contracts, and regulations that affect rates, charges, classification, and services.[484]

VI. Regulatory Flexibility Act

360. The Regulatory Flexibility Act of 1980[485] generally requires a description and analysis of proposed and final rules that will have significant economic impact on a substantial number of small entities. The Small Business Administration (SBA) sets the threshold for what constitutes a small business. Under SBA's size standards,[486] the RTOs/ISOs all fall under the category of Electric Bulk Power Transmission and Control (NAICS code 221121), with a size threshold of 500 employees (including the entity and its associates).[487] The six RTOs/ISOs (SPP, MISO, PJM, ISO-NE, NYISO, and CAISO) each employ more than 500 employees and are not considered small.

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[483] *Reguls. Implementing Nat'l Envt'l Pol'y Act of 1969*, Order No. 486, 52 FR 47,897 (Dec. 17, 1987), FERC Stats. & Regs. ¶ 30,783 (1987) (cross-referenced at 41 FERC ¶ 61,284).

[484] 18 CFR 380.4(a)(15) (2021).

[485] 5 U.S.C. 601-612.

[486] 13 CFR 121.201.

[487] The RFA definition of "small entity" refers to the definition provided in the Small Business Act, which defines a "small business concern" as a business that is independently owned and operated and that is not dominant in its field of operation. The Small Business Administrations' regulations at 13 CFR 121.201 define the threshold for a small Electric Bulk Power Transmission and Control entity (NAICS code 221121) to be

361. We estimate that 39 additional transmission providers (after removing RTO/ISOs) are affected by the reforms proposed in this NOPR. We estimate that 12 of the 39 transmission providers, approximately 31%, are small entities.

362. We estimate that one-time costs (in Year 1) associated with the reforms proposed in this NOPR for one transmission provider (as shown in the table above) would be $103,356. Following Year 1, we estimate that the annual ongoing costs for one transmission provider would be $38,628.

363. According to SBA guidance, the determination of significance of impact "should be seen as relative to the size of the business, the size of the competitor's business, and the impact the regulation has on larger competitors."[488] We do not consider the estimated cost to be a significant economic impact. As a result, we certify that the reforms proposed in this NOPR would not have a significant economic impact on a substantial number of small entities.

VII. Comment Procedures

364. We invite interested persons to submit comments on the matters and issues proposed in this NOPR to be adopted, including any related matters or alternative proposals that commenters may wish to discuss. Comments are due **[INSERT DATE 100 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]**. Also, reply comments are due **[INSERT DATE 130 DAYS AFTER PUBLICATION IN THE**

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500 employees. *See* 5 U.S.C. 601(3) (citing to Section 3 of the Small Business Act, 15 U.S.C. 632).

[488] U.S. Small Business Administration, *A Guide for Government Agencies How to Comply with the Regulatory Flexibility Act*, at 18 (Aug 2017), https://cdn.advocacy.sba.gov/wp-content/uploads/2019/06/21110349/How-to-Comply-with-the-RFA.pdf.

FEDERAL REGISTER]. Comments must refer to Docket No. RM22-14-000, and must include the commenter's name, the organization they represent, if applicable, and their address.

365. The Commission encourages comments to be filed electronically via the eFiling link on the Commission's web site at http://www.ferc.gov. The Commission accepts most standard word processing formats. Documents created electronically using word processing software should be filed in native applications or print-to-PDF format and not in a scanned format. Commenters filing electronically do not need to make a paper filing.

366. Commenters that are not able to file comments electronically must send an original of their comments to: Federal Energy Regulatory Commission, Secretary of the Commission, 888 First Street, NE, Washington, DC 20426.

367. All comments will be placed in the Commission's public files and may be viewed, printed, or downloaded remotely as described in the Document Availability section below. Commenters on this NOPR are not required to serve copies of their comments on other commenters.

VIII. Document Availability

368. In addition to publishing the full text of this document in the Federal Register, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the Internet through the Commission's Home Page (http://www.ferc.gov). At this time, the Commission has suspended access to the Commission's Public Reference Room due to the President's March 13, 2020 proclamation declaring a National Emergency concerning the Novel Coronavirus Disease (COVID-19).

369. From the Commission's Home Page on the Internet, this information is available on eLibrary. The full text of this document is available on eLibrary in PDF and Microsoft Word format for viewing, printing, and/or downloading. To access this document in eLibrary, type the docket number excluding the last three digits of this document in the docket number field.

370. User assistance is available for eLibrary and the Commission's website during normal business hours from the Commission's Online Support at (202) 502-6652 (toll free at 1-866-208-3676) or email at ferconlinesupport@ferc.gov, or the Public Reference Room at (202) 502-8371, TTY (202) 502-8659. E-mail the Public Reference Room at public.referenceroom@ferc.gov.

By direction of the Commission. Commissioner Danly is concurring with a separate statement attached
Commissioner Christie is concurring with a separate statement attached.

Issued: June 16, 2022.

Debbie-Anne A. Reese,
Deputy Secretary.

Note: The following appendices will not be published in the Code of Federal Regulations.

Appendix A: Interconnection Study Metrics

Table 1: RTOs/ISOs Interconnection Study Metrics 2021[489]

Transmission Provider	Link	Completed Studies	Studies Completed Past Deadline	Current Delayed Studies	Withdrawals
CAISO	http://oasis.caiso.com/mrioasis/logon.do	179	116	0	88
ISO-NE	https://www.oasis.oati.com/isne/	44	31	19	25
MISO	https://cdn.misoenergy.org/MISO%20Generator%20Interconnection%20Study%20Metrics444684.pdf	778	754	385	204
NYISO	https://www.nyiso.com/interconnections	16	13	48	46
PJM	https://www.pjm.com/-/media/planning/services-requests/interconnection-study-statistics.ashx	1,213	149	1,281	297

[489] We do not include data from SPP in the table. SPP's normal interconnection queue processing has been modified to address its large queue backlog and transition to a new interconnection study process, thus its data is not clearly comparable to the other regions.

Table 2: Non-RTOs/ISOs Interconnection Study Metrics 2021[490]

Transmission Provider	Link	Completed Studies	Completed Past Deadline	Current Delayed Studies	Withdrawals
Alabama Power Company (Southern Company)	https://www.oasis.oati.com/SOCO/index.html	157	-	-	61
Arizona Public Service	https://www.oasis.oati.com/azps/	22	20	198	18
Avista Corp.	https://www.oasis.oati.com/avat/	20	19	35	3
Black Hills Colorado	https://www.blackhillscorp.com/utilities-businesses/transmission/electric-transmission-services	3	-	2	2
Black Hills Power	https://www.blackhillscorp.com/utilities-businesses/transmission/electric-transmission-services	1	-	-	-
Dominion Energy South Carolina	https://www.oasis.oati.com/SCEG/	3	3	70	4
Duke Energy Carolinas	http://www.oasis.oati.com/duk/index.html	6	6	16	12
El Paso Electric Co.	https://www.oasis.oati.com/epe/index.html	1	-	-	2
Florida Power & Light	https://www.oasis.oati.com/FPL/index.html	71	42	140	4

[490] This table excludes the following non-RTO/ISO transmission providers that have not reported interconnection study information for 2021: Basin Electric Power Coop., Cheyenne Light, Fuel, and Power Co., Cube Yadkin Transmission, LLC, Deseret Generation and Transmission Coop., Golden Spread Coop, MATL LLP, UNS Electric, Inc., and Versant Power.

Transmission Provider	Link	Completed Studies	Completed Past Deadline	Current Delayed Studies	Withdrawals
Gulf Power Company	https://www.oasis.oati.com/gulf/index.html	24	15	37	-
Idaho Power	https://www.oasis.oati.com/ipco/	42	2	45	9
Louisville Gas and Electric	https://www.oasis.oati.com/LGEE/index.html	21	13	39	12
Nevada Power	http://www.oasis.oati.com/NEVP/	14	-	7	5
Northwestern Corp (Montana)	http://www.oatioasis.com/NWMT/	35	19	8	10
PacifiCorp	https://www.oasis.oati.com/PPW/	73	4	4	19
Portland General Electric Company	https://www.oasis.oati.com/PGE/	5	3	10	4
Public Service Company of Colorado	https://www.oasis.oati.com/psco/index.html	28	7	7	1
Public Service Company of New Mexico	https://www.oasis.oati.com/PNM/	23	23	78	5
Puget Sound Energy	https://www.oasis.oati.com/psei/index.html	27	20	11	11
Tampa Electric Company	https://www.oasis.oati.com/TEC/	34	28	28	5
Tri-State Generation and Transmission	https://www.oasis.oati.com/tsgt/index.html	12	-	-	36

Transmission Provider	Link	Completed Studies	Completed Past Deadline	Current Delayed Studies	Withdrawals
Tucson Electric Power Co.	https://www.oasis.oati.com/tepc/	24	18	6	2

Appendix B: Compilation of proposed changes to the *pro forma* LGIP

Note: Proposed deletions are in brackets and proposed additions are in italics.

Section 1. Definitions

***

Affected System Facilities Construction Agreement *shall mean the form of agreement contained in Appendix 16 of this LGIP for facilitating the construction of necessary Affected System Network Upgrades on Transmission Provider's Transmission System.*

Affected System Interconnection Customer *shall mean any entity that proposes interconnection of a device for the production and/or storage for later injection of electricity to a transmission system other than Transmission Provider's Transmission System.*

Affected System Network Upgrades *shall mean the additions, modifications, and upgrades to Transmission Provider's Transmission System required to accommodate Affected System Interconnection Customer's proposed interconnection to a transmission system other than Transmission Provider's Transmission System.*

***

Affected System Scoping Meeting *shall mean a meeting between representatives of Affected System Interconnection Customer and Transmission Provider for the purpose of discussing the potential impacts on Transmission Provider's Transmission System and how they may be mitigated.*

Affected System Study *shall mean the evaluation of Affected System Interconnection Customers' proposed interconnection(s) to a transmission system other than Transmission Provider's Transmission System that have an impact on Transmission Provider's Transmission System, as described in more detail in Section 9 of this LGIP.*

Affected System Study Agreement *shall mean the agreement contained in Appendix 15 to this LGIP that is made between Transmission Provider and Affected System Interconnection Customer to conduct an Affected System Study pursuant to Section 9 of this LGIP.*

Affected System Study Report *shall mean the report issued following completion of an Affected System Study pursuant to Section 9.6 of this LGIP.*

***

[**Applicable Reliability Council** shall mean the reliability council applicable to the Transmission System to which the Generating Facility is directly interconnected.]

Applicable Reliability Standards shall mean the requirements and guidelines of [NERC,]the [Applicable Reliability Council]*Electric Reliability Organization* and the [Control Area]*Balancing Authority Area* of the Transmission System to which the Generating Facility is directly interconnected.

Balancing Authority *shall mean an entity that integrates resource plans ahead of time, maintains load interchange-generation balance within a Balancing Authority Area, and supports interconnection frequency in real time.*

Balancing Authority Area *shall mean the collection of generation, transmission, and loads within the metered boundaries of the Balancing Authority. The Balancing Authority maintains load-resource balance within this area.*

***

Cluster *shall mean a group of one or more Interconnection Requests that are studied together for the purpose of conducting the Cluster Study or Optional Resource Solicitation Study.*

Cluster Request Window *shall mean the time period set forth in Section 3.4.1 of this LGIP.*

Cluster Re-Study *shall mean a re-study of a Cluster Study conducted pursuant to Section 7.5 of this LGIP.*

Cluster Re-Study Meeting *shall mean the meeting held to discuss the results of a Cluster Re-Study pursuant to Section 7.5 of this LGIP.*

Cluster Re-Study Report *shall mean the report issued following completion of a Cluster Re-Study pursuant to Section 7.5 of this LGIP.*
Cluster Study *shall mean the evaluation of one or more Interconnection Requests within a Cluster as described in more detail in Section 7 of this LGIP.*

Cluster Study Agreement *shall mean the form of agreement contained in Appendix 3 to this LGIP for conducting the Cluster Study.*

Cluster Study Process *shall mean the following processes, conducted in sequence: the Cluster Request Window; the Customer Engagement Window and Scoping Meetings therein; the Cluster Study; any needed Cluster Re-Studies; and the Interconnection Facilities Study.*

Cluster Study Report *shall mean the report issued following completion of a Cluster Study pursuant to Section 7 of this LGIP.*

Cluster Study Report Meeting *shall mean the meeting held to discuss the results of a Cluster Study pursuant to Section 7 of this LGIP.*

Clustering shall mean the process whereby *one or more* [a group of]Interconnection Requests [is]are studied together, instead of serially, [for the purpose of conducting the Interconnection System Impact Study]*as described in more detail in Section 7 of this LGIP.*

Co-Located Resource *shall mean multiple Generating Facilities located on the same site.*

***

Commercial Readiness Demonstration *shall have the meaning set forth in Sections 3.4.2, 7.5, and 8.1 of this LGIP.*

Commercial Readiness Deposit *shall mean a deposit paid in lieu of submitting a Commercial Readiness Demonstration, as set forth in Sections 3.4.2, 7.5, and 8.1 of this LGIP.*

***

[**Control Area** shall mean an electrical system or systems bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other Control Areas and contributing to frequency regulation of the interconnection. A Control Area must be certified by an Applicable Reliability Council.]

Customer Engagement Window *shall mean the time period set forth in Section 3.4.5 of this LGIP.*

***

Electric Reliability Organization *shall mean NERC.*

Electric Storage Resource *shall mean a resource capable of receiving electric energy from the grid and storing it for later injection of electric energy back to the grid.*

***

Generating Facility shall mean Interconnection Customer's device for the production and/or storage for later injection of electricity identified in the Interconnection Request, but shall not include [the]Interconnection Customer's Interconnection Facilities.

***

Informational Interconnection Study *shall mean a sensitivity analysis based on assumptions specified by the prospective Interconnection Customer in the Informational Interconnection Study Agreement and conducted pursuant to Section 6.1-6.3 of this LGIP.*

Informational Interconnection Study Agreement *shall mean the form of agreement contained in Attachment A to Appendix 2 of this LGIP for conducting the Informational Interconnection Study.*

Informational Interconnection Study Request *shall mean a prospective Interconnection Customer's request in the form of Appendix 2 to this LGIP.*

***

Interconnection Facilities shall mean [the]Transmission Provider's Interconnection Facilities and [the]Interconnection Customer's Interconnection Facilities. Collectively, Interconnection Facilities include all facilities and equipment between the Generating Facility and the Point of Interconnection, including any modification, additions or upgrades that are necessary to physically and electrically interconnect the Generating Facility to [the]Transmission Provider's Transmission System. Interconnection Facilities are sole use facilities *by Interconnection Customer* and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades. *Multiple Generating Facilities located on the same site of Interconnection Customer may use Interconnection Facilities.*

Interconnection Facilities Study shall mean a study conducted by [the]Transmission Provider or a third party consultant for [the]Interconnection Customer to determine a list of facilities (including Transmission Provider's Interconnection Facilities and Network Upgrades as identified in the [Interconnection System Impact]*Cluster Study*), the cost of those facilities, and the time required to interconnect the Generating Facility with[the] Transmission Provider's Transmission System. The scope of the study is defined in Section 8 of *this LGIP*[the Standard Large Generator Interconnection Procedures].

***

[**Interconnection Feasibility Study** shall mean a preliminary evaluation of the system impact and cost of interconnecting the Generating Facility to Transmission Provider's Transmission System, the scope of which is described in Section 6 of the Standard Large Generator Interconnection Procedures.]

[**Interconnection Feasibility Study Agreement** shall mean the form of agreement contained in Appendix 2 of the Standard Large Generator Interconnection Procedures for conducting the Interconnection Feasibility Study.]

***

Interconnection Study shall mean any of the following studies: the *Informational* Interconnection [Feasibility]Study, *the Cluster Study,*[the Interconnection System Impact Study,] *the Optional Resource Solicitation Study, the Surplus Interconnection Service System Impact Study*, and the Interconnection Facilities Study, described in this LGIP.

[**Interconnection System Impact Study** shall mean an engineering study that evaluates the impact of the proposed interconnection on the safety and reliability of Transmission

Provider's Transmission System and, if applicable, an Affected System. The study shall identify and detail the system impacts that would result if the Generating Facility were interconnected without project modifications or system modifications, focusing on the Adverse System Impacts identified in the Interconnection Feasibility Study, or to study potential impacts, including but not limited to those identified in the Scoping Meeting as described in the Standard Large Generator Interconnection Procedures.]

[**Interconnection System Impact Study Agreement** shall mean the form of agreement contained in Appendix 3 of the Standard Large Generator Interconnection Procedures for conducting the Interconnection System Impact Study.]

***

Material Modification shall mean those modifications that have a material impact on the cost or timing of any Interconnection Request with a later *or equal Queue Position*[queue priority date].

***

Optional Resource Solicitation Study *shall mean the informational evaluation of one or more Interconnection Requests for a Resource Planning Entity as described in more detail in Section 4.2.2 of this LGIP.*

***

Proportional Impact Method *shall mean a technical analysis conducted by the transmission provider to determine the degree to which each generating facility in the cluster contributes to the need for a specific network upgrade.*

***

Queue Position shall mean the order of a valid Interconnection Request, relative to all other pending valid Interconnection Requests, that is established based upon the date and time [of receipt of the valid]*that* Interconnection[Request by the Transmission Provider] *Customer satisfies all of the requirements of Section 3.4.2 of this LGIP to enter the Cluster Study. All Interconnection Requests within a Cluster are considered equally queued.*

***

Resource Plan *shall mean any process for, inter alia, the selection of Generating Facilities that is competitive, substantively state agency-reviewed and approved, or state agency-managed, and authorized or required by Applicable Laws and Regulations.*

Resource Planning Entity *shall mean any entity required to develop a Resource Plan or conduct a Resource Solicitation Process, including a state entity or load serving entity.*

Resource Solicitation Process *shall mean any process for the acquisition of Network Resources that is competitive, substantively state agency-reviewed and approved, or state agency-managed, and authorized or required by Applicable Laws and Regulations*.

Scoping Meeting shall mean the meeting between representatives of [the]Interconnection Customer*(s)* and Transmission Provider conducted for the purpose of discussing *the proposed interconnection request and any* alternative interconnection options, [to]exchang[e]*ing* information including any transmission data and earlier study evaluations that would be reasonably expected to [impact]*affect* such interconnection options, [to]analyz[e]*ing* such information, and [to]determin[e]*ing* the potential feasible Points of Interconnection.

Shared Network Upgrade *shall mean a Network Upgrade that has been assigned to an Interconnection Customer(s) and is subsequently identified as necessary to accommodate the interconnection of the Large Generating Facility of an Interconnection Customer(s) in a later Cluster and meets the requirements pursuant to the process outlined in Section 3.10 of this LGIP.*

Site Control shall mean [documentation reasonably demonstrating]*the exclusive land right to develop, construct, operate, and maintain the Generating Facility over the term of expected operation of the Generating Facility. Site Control may be demonstrated by documentation establishing:* (1) ownership of, a leasehold interest in, or a right to develop a site [for the purpose of constructing]*of sufficient size to construct and operate* the Generating Facility *or multiple Generating Facilities on a shared site behind one Point of Interconnection;* (2) an option to purchase or acquire a leasehold site for such purpose; [or](3) [an exclusivity or other business relationship between]*site of sufficient size to construct and operate the Generating Facility; or (4) any other documentation that clearly demonstrates the right of Interconnection Customer*[and the entity having the right to sell, lease or grant Interconnection Customer the right to possess or]to exclusively occupy a site [for such purpose.]*of sufficient size to construct and operate the Generating Facility. Site Control for any Co-Located Resource is demonstrated by a contract or other agreement demonstrating shared land use for all Co-Located Resources that meet the aforementioned provisions of this Site Control definition.*

***

Stand Alone Network Upgrades shall mean Network Upgrades that are not part of an Affected System that an Interconnection Customer may construct without affecting day-to-day operations of the Transmission System during their construction *and, as indicated under proportional impact analysis, are only required for a single Interconnection Request*. Both [the]Transmission Provider and [the]Interconnection Customer must agree as to what constitutes Stand Alone Network Upgrades and identify them in Appendix A to the Standard Large Generator Interconnection Agreement. If [the]Transmission Provider and Interconnection Customer disagree about whether a particular Network Upgrade is a Stand Alone Network Upgrade, [the]Transmission Provider must provide [the]Interconnection Customer a written technical explanation

outlining why [the]Transmission Provider does not consider the Network Upgrade to be a Stand Alone Network Upgrade within 15 days of its determination.

***

Transitional Cluster Study *shall mean an Interconnection Study evaluating a Cluster of Interconnection Requests during the transition to the Cluster Study Process, as set forth in Section 5.1.1.2 of this LGIP.*

Transitional Cluster Study Report *shall mean the report issued following completion of a Transitional Cluster Study pursuant to Section 5.1.1.2 of this LGIP.*

Transitional Serial Interconnection Facilities Study *shall mean an Interconnection Facilities Study evaluating an Interconnection Request on a serial basis during the transition to the Cluster Study Process, as set forth in Section 5.1.1.1 of this LGIP.*

***

Transmission Provider's Interconnection Facilities shall mean all facilities and equipment owned, controlled, or operated by [the]Transmission Provider from the Point of Change of Ownership to the Point of Interconnection as identified in Appendix A to the Standard Large Generator Interconnection Agreement, including any modifications, additions or upgrades to such facilities and equipment. Transmission Provider's Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades. *Transmission Provider's Interconnection Facilities may be shared by more than one Generating Facility in a given Cluster Study or by Generating Facilities that are part of a Co-Located resource.*

***

Withdrawal Penalty *shall mean the penalty assessed by Transmission Provider to an Interconnection Customer that chooses to withdraw from the queue or does not otherwise reach Commercial Operation. The calculation of the Withdrawal Penalty is set forth in Section 3.7.1 of this LGIP.*

* * *

Section 2. Scope and Application

***

2.2 Comparability

Transmission Provider shall receive, process and analyze all Interconnection Requests in a timely manner as set forth in this LGIP. Transmission Provider [will use the same Reasonable Efforts]*shall* process[ing] and analyz*e*[ing] Interconnection Requests from all

Interconnection Customers comparably, *regardless of* whether the Generating Facilities are owned by Transmission Provider, its subsidiaries or Affiliates or others.

* * *

Section 3. Interconnection Requests

3.1 [General.] *Interconnection Requests*

3.1.1 Study Deposits

3.1.1.1 Initial Study Deposit

An Interconnection Customer shall submit to Transmission Provider*, during a Cluster Request Window*, an Interconnection Request in the form of Appendix 1 to this LGIP*, an application fee of $5,000,* and a refundable *study* deposit of[$10,000]:

a. *$35,000 plus $1,000 per MW for requests ≥ 20 MW < 80 MW, or*;
b. *$150,000 for requests ≥ 80 MW < 200 MW*; or
c. *$250,000 for requests ≥ 200 MW.*

Transmission Provider shall apply the *initial study* deposit toward the cost of *the Cluster* [an Interconnection Feasibility]Study Process.

3.1.1.2 Additional Study Deposits

Interconnection Customer is required to submit a study deposit of the same amount required in Section 3.1.1.1 of this LGIP at the following points in the interconnection study process:

a. *Within 20 calendar days after the Cluster Study Report Meeting, which Transmission Provider will use towards Cluster Re-Studies, if needed; and*
b. *Simultaneously with the submission of an executed Interconnection Facilities Study Agreement, or with a request to Transmission Provider to file the LGIA unexecuted, which Transmission Provider will use towards the Interconnection Facilities Study.*

3.1.1.3 LGIA Deposit

As also discussed in Section 11.3 of this LGIP, when returning the executed, or requested to be filed unexecuted, LGIA to Transmission Provider, Interconnection Customer is required to submit a deposit equal to nine times the amount required in Section 3.1.1.1 of this LGIP.

An Interconnection Customer that does not provide the study deposit when returning the executed, or requested to be filed unexecuted, LGIA shall be deemed withdrawn from the interconnection queue pursuant to Section 3.7 of this LGIP.

3.1.2 Submission

Interconnection Customer shall submit a separate Interconnection Request for each site and may submit multiple Interconnection Requests for a single site. Interconnection Customer must submit a deposit with each Interconnection Request even when more than one request is submitted for a single site. *If there are Co-Located Resources on the same site, Interconnection Customer may submit separate Interconnection Requests or a single Interconnection Request*. An Interconnection Request to evaluate one site at two different voltage levels shall be treated as two Interconnection Requests *unless the Generating Facility, as it proposes to interconnect, includes technology that Transmission Provider deems acceptable to ensure there is no voltage difference*. *Interconnection Customers evaluating different options (such as different sizes, sites, or voltages) are encouraged but not required to use the Informational Interconnection Study (Section 6.1 of this LGIP) before entering the Cluster Study.*

At Interconnection Customer's option, Transmission Provider and Interconnection Customer will identify alternative Point(s) of Interconnection and configurations at [the]*a* Scoping Meeting *within the Customer Engagement Window* to evaluate in this process and attempt to eliminate alternatives in a reasonable fashion given resources and information available. Interconnection Customer will select the definitive Point[(s)] of Interconnection to be studied no later than the execution of the [Interconnection Feasibility Study Agreement.]*Cluster Study Agreement. For purposes of clustering Interconnection Requests, Transmission Provider may make reasonable changes to the requested Point of Interconnection to facilitate efficient interconnection of Interconnection Customers at common Point(s) of Interconnection. Transmission Provider shall notify Interconnection Customers in writing of any intended changes to the requested Point of Interconnection and the Point of Interconnection shall only change upon mutual agreement.*

Transmission Provider shall have a process in place to consider requests for Interconnection Service below the Generating Facility Capacity. These requests for Interconnection Service shall be studied at the level of Interconnection Service requested for purposes of Interconnection Facilities, Network Upgrades, and associated costs, but may be subject to other studies at the full Generating Facility Capacity to ensure safety and reliability of the system, with the study costs borne by [the]Interconnection Customer. If after the additional studies are complete, Transmission Provider determines that additional Network Upgrades are necessary, then Transmission Provider must: (1) specify which additional Network Upgrade costs are based on which studies; and (2) provide a detailed explanation of why the additional Network Upgrades are necessary. Any Interconnection Facility and/or Network Upgrade costs required for safety and reliability also would be borne by [the]Interconnection Customer. Interconnection Customers may be subject to additional control technologies as well as testing and validation of those technologies consistent with Article 6 of the LGIA. The necessary control technologies and protection systems shall be established in Appendix C of that executed, or requested to be filed unexecuted, LGIA.

Transmission Provider shall have a process in place to study Electric Storage Resources and Co-Located Resources containing Electric Storage Resources (including hybrid resources) using operating assumptions, including charge and discharge parameters, that reflect the proposed operation of the Generating Facility as requested by Interconnection Customer, unless Good Utility Practice, including applicable reliability standards, otherwise requires use of different operating assumptions. These requests for Interconnection Service shall be studied using the requested operating assumptions for purposes of Interconnection Facilities, Network Upgrades, and associated costs, but may be subject to other studies at the full Generating Facility Capacity to ensure safety and reliability of the system, with the study costs borne by Interconnection Customer. Interconnection Customers may be subject to additional control technologies as well as testing and validation of those technologies consistent with Article 6 of the LGIA. The necessary control technologies and protection systems shall be established in Appendix C of that executed, or requested to be filed unexecuted, LGIA.

* * *

3.2.1 Energy Resource Interconnection Service.

* * *

3.2.1.2 The Study. The study consists of short circuit/fault duty, steady state (thermal and voltage) and stability analyses. The short circuit/fault duty analysis would identify direct Interconnection Facilities required and the Network Upgrades necessary to address short circuit issues associated with the Interconnection Facilities. The stability and steady state studies would identify necessary upgrades to allow full output of the proposed Large Generating Facility*, except for Electric Storage Resources and Co-Located Resources containing Electric Storage Resources (including hybrid resources) that request to use operating assumptions pursuant to section 3.1.2,* and would also identify the maximum allowed output, at the time the study is performed, of the interconnecting Large Generating Facility without requiring additional Network Upgrades.* * *

3.2.2 Network Resource Interconnection Service.

* * *

3.2.2.2 The Study. The Interconnection Study for Network Resource Interconnection Service shall assure that Interconnection Customer's Large Generating Facility meets the requirements for Network Resource Interconnection Service and as a general matter, that such Large Generating Facility's interconnection is also studied with Transmission Provider's Transmission System at peak load, under a variety of severely stressed conditions, to determine whether, with the Large Generating Facility at full output, *except for Electric Storage Resources and Co-Located Resources containing Electric Storage Resources (including hybrid resources) that request to use operating assumptions pursuant to section 3.1.2,* the aggregate of generation in the local area can be delivered to the aggregate of load on Transmission Provider's Transmission System, consistent with Transmission Provider's reliability criteria and procedures. This approach

assumes that some portion of existing Network Resources are displaced by the output of Interconnection Customer's Large Generating Facility. Network Resource Interconnection Service in and of itself does not convey any right to deliver electricity to any specific customer or Point of Delivery. The Transmission Provider may also study the Transmission System under non-peak load conditions. However, upon request by the Interconnection Customer, the Transmission Provider must explain in writing to the Interconnection Customer why the study of non-peak load conditions is required for reliability purposes.

*** * ***

3.3 Utilization of Surplus Interconnection Service

3.3.1 Surplus Interconnection Service Request

Surplus Interconnection Service requests may be made by the existing Interconnection Customer [whose Generating Facility is already interconnected]or one of its affiliates or may *be submitted once Interconnection Customer has executed the LGIA or requested that the LGIA be filed unexecuted, even prior to Commercial Operation*. Surplus Interconnection Service requests also may be made by another Interconnection Customer. Transmission Provider shall provide a process for evaluating Interconnection Requests for Surplus Interconnection Service. Studies for Surplus Interconnection Service shall consist of reactive power, short circuit/fault duty, stability analyses, and any other appropriate studies. Steady-state (thermal/voltage) analyses may be performed as necessary to ensure that all required reliability conditions are studied. If the Surplus Interconnection Service was not studied under off-peak conditions, off-peak steady state analyses shall be performed to the required level necessary to demonstrate reliable operation of the Surplus Interconnection Service. If the original System Impact Study *report or Cluster Study Report* is not available for the Surplus Interconnection Service, both off-peak and peak analysis may need to be performed for the existing Generating Facility associated with the request for Surplus Interconnection Service. The reactive power, short circuit/fault duty, stability, and steady-state analyses for Surplus Interconnection Service will identify any additional Interconnection Facilities and/or Network Upgrades necessary.

3.4 Valid Interconnection Request

3.4.1 Cluster Request Window

Transmission Provider shall accept Interconnection Requests during a forty-five (45) Calendar Day period (the Cluster Request Window). The initial Cluster Request Window shall open for Interconnection Requests beginning {Transmission Provider to provide Month and Day (e.g., January 1)} following commencement of the transition process set out in Section 5.1 of this LGIP and successive Cluster Request Windows shall open annually every {Transmission Provider to provide Month and Day (e.g., January 1)} thereafter.

3.4.[1]*2* Initiating an Interconnection Request

An Interconnection Customer seeking to join a Cluster shall submit its Interconnection Request to Transmission Provider within, and no later than the close of, the Cluster Request Window. To initiate an Interconnection Request, Interconnection Customer must submit all of the following *for its proposed Generating Facility*:

(i) [a $10,000 deposit,]*applicable deposit amount, pursuant to Section 3.1.1.1 of this LGIP,*

(ii) a completed application in the form of Appendix 1 *(including applicable technical information),* [and]

(iii) demonstration of Site Control [or a posting of an additional deposit of $10,000.]*{Transmission Provider to insert acreage requirements for each Generating Facility technology type}.*

In the event that regulatory limitations prohibit Interconnection Customer from obtaining Site Control, Interconnection Customer may submit an initial deposit in lieu of Site Control of $10,000 per MW, subject to a floor of $500,000 and a ceiling of $2,000,000. Such deposits shall be applied toward any Interconnection Studies *or Withdrawal Penalty, if applicable,* pursuant to the Interconnection Request. If Interconnection Customer demonstrates Site Control within the cure period specified in Section [3.4.3]*3.4.4 of this LGIP* after submitting its Interconnection Request, the additional deposit shall be refundable; otherwise, all such deposit(s), additional and initial, become non-refundable.

In order to demonstrate regulatory limitations, Interconnection Customer must provide: (1) a signed affidavit from an officer of the company indicating that Site Control is unobtainable due to regulatory requirements; and (2) documentation sufficiently describing and explaining the source and effects of such regulatory restrictions, including a description of any conditions that must be met to satisfy the regulatory restrictions and the anticipated time by which Interconnection Customer expects to satisfy the regulatory restrictions.

An Interconnection Customer that submits a deposit in lieu of site control due to demonstrated regulatory limitations must demonstrate 100% Site Control for its Generating Facility prior to Transmission Provider commencing the Interconnection Facilities Study. If Interconnection Customer does not demonstrate 100% Site Control for its Generating Facility prior to Transmission Provider commencing the Interconnection Facilities Study, its Interconnection Request will be deemed withdrawn, pursuant to Section 3.7 of this LGIP.

(iv) Generating Facility size (MW) (and requested Interconnection Service amount if the requested Interconnection Service is less than the Generating Facility Capacity);

v) If applicable, (1) the requested operating assumptions, such as charge and discharge parameters, to be used by Transmission Provider that reflect the proposed operation of the Electric Storage Resource or Co-Located Resource containing an Electric Storage Resource (including a hybrid resource), and (2) a description of any control technologies (software and/or hardware) that will limit the operation of the Electric Storage Resource or Co-Located Resource containing an Electric Storage Resource (including a hybrid resource) to its intended operation.

(vi) One of the following Commercial Readiness Demonstration options totaling the entire Generating Facility Capacity (or requested Interconnection Service amount if the requested Interconnection Service is less than the Generating Facility Capacity), or in the alternative, a Commercial Readiness Deposit equal to two times the study deposit described in Section 3.1.1.1 of this LGIP in the form of an irrevocable letter of credit or cash in lieu of the Commercial Readiness Demonstration. The security is refunded to Interconnection Customer according to Section 3.7 of this LGIP.

(a) Executed term sheet (or comparable evidence) related to a contract for sale of (1) the constructed Generating Facility to a load-serving entity or to a commercial, industrial, or other large end-use customer, (2) the Generating Facility's energy or capacity where the term of sale is not less than five (5) years, or (3) the Generating Facility's ancillary services where the term of sale is not less than five (5) years;

(b) Reasonable evidence that the Generating Facility has been selected in a Resource Plan or Resource Solicitation Process by or for a load-serving entity, is being developed by a load-serving entity, or is being developed for purposes of a sale to a commercial, industrial, or other large end-use customer;

(c) A Provisional LGIA that has been filed at the Commission executed, or requested to be filed unexecuted, which is not in suspension pursuant to Article 5.16 of the LGIA, and includes a commitment to construct the Generating Facility; or

(vii) A Point of Interconnection; and

(viii) Whether the Interconnection Request shall be studied as a Network Resource Interconnection Service or an Energy Resource Interconnection Service, consistent with Section 3.2 of this LGIP.

Interconnection Customer shall promptly inform Transmission Provider of any material change to Interconnection Customer's demonstration of Site Control under Section 3.4.2(iii) of this LGIP or its satisfaction of a Commercial Readiness Demonstration as selected under Section 3.4.2(vi)(a)-(c) of this LGIP. If Transmission Provider determines, based on Interconnection Customer's information, that Interconnection Customer no longer satisfies Site Control or a Commercial Readiness Demonstration,

Transmission Provider shall give Interconnection Customer ten (10) Business Days to demonstrate the applicable requirement to Transmission Provider's satisfaction. If the material change is related to Interconnection Customer's Commercial Readiness Demonstration, Interconnection Customer has the option to submit a Commercial Readiness Deposit pursuant to Section 3.4.2(vi)(d) of this LGIP before the end of the ten (10) Business Day cure period. Absent such, Transmission Provider will deem the subject Interconnection Request withdrawn pursuant to Section 3.7 of this LGIP.

3.4.[2]*3* Acknowledgment of Interconnection Request

*** * ***

3.4.[3]*4* Deficiencies in Interconnection Request.

An Interconnection Request will not be considered to be a valid request until all items in Section [3.4.1]*3.4.2 of this LGIP* have been received by Transmission Provider. If an Interconnection Request fails to meet the requirements set forth in Section [3.4.1]*3.4.2 of this LGIP*, Transmission Provider shall notify Interconnection Customer within five (5) Business Days of receipt of the initial Interconnection Request of the reasons for such failure and that the Interconnection Request does not constitute a valid request. Interconnection Customer shall provide Transmission Provider the additional requested information needed to constitute a valid request within ten (10) Business Days after receipt of such notice *but no later than the close of the Cluster Request Window. At any time, if Transmission Provider identifies that the technical data provided by Interconnection Customer is incomplete or contains errors, Interconnection Customer and Transmission Provider shall work expeditiously and in good faith to remedy such issues*. Failure by Interconnection Customer to comply with this Section 3.4.[3]*4 of this LGIP* shall be treated in accordance with Section 3.7 *of this LGIP*.

3.4.5 Customer Engagement Window.

Upon the close of each Cluster Request Window, Transmission Provider will open a thirty (30) Calendar Day period (Customer Engagement Window). During the Customer Engagement Window, Transmission Provider shall hold a Scoping Meeting with all interested Interconnection Customers. Notwithstanding the preceding requirements and upon written consent of all Interconnection Customers within a specific Cluster, Transmission Provider may shorten the Customer Engagement Window and begin the Cluster Study. Within the first ten (10) Business Days following the close of the Cluster Request Window, *Transmission Provider shall post on its OASIS site a list of Interconnection Requests for that Cluster. The list shall identify, for each Interconnection Request: (1) the requested amount of Interconnection Service; (2) the location by county and state; (3) the station or transmission line or lines where the interconnection will be made; (4) the projected In-Service Date; (5) the type of Interconnection Service requested; and (6) the type of Generating Facility or Facilities to be constructed, including fuel types, such as wind, natural gas, coal, or solar. During the Customer Engagement Window, Transmission Provider will provide to Interconnection Customer a non-binding updated good faith estimate of the cost and timeframe for*

completing the Cluster Study and a Cluster Study Agreement to be executed prior to the close of the Customer Engagement Window.

At the end of the Customer Engagement Window, all Interconnection Requests deemed valid that have executed a Cluster Study Agreement in the form of Appendix 3 shall be included in that Cluster Study. Any Interconnection Requests not deemed valid at the close of the Customer Engagement Window shall not be included in that Cluster. Immediately following the Customer Engagement Window, Transmission Provider shall initiate the Cluster Study described in more detail in Section 7 of this LGIP.

3.4.[4]*6 Cluster Study* Scoping Meetings.

[Within ten (10) Business Days after receipt of a valid Interconnection Request]*During the Customer Engagement Window*, Transmission Provider shall [establish a date agreeable to]*hold a Scoping Meeting with all Interconnection Customers whose valid Interconnection Requests were received in that Cluster Request Window. If requested by an* Interconnection Customer[for the Scoping Meeting, and such date shall be no later than thirty (30) Calendar]*, Transmission Provider shall also hold individual customer-specific Scoping Meetings, which must be requested no later than fifteen (15) Business* Days [from receipt of the valid Interconnection Request, unless otherwise mutually agreed upon by the Parties.]*after the close of the Cluster Request Window.*

The purpose of the Scoping Meeting shall be to discuss alternative interconnection options, to exchange information including any transmission data that would reasonably be expected to impact such interconnection options, *to discuss the Cluster Study materials posted to OASIS pursuant to Section 3.5 of this LGIP, if applicable, and* to analyze such information[and to determine the potential feasible Points of Interconnection]. *In addition, Interconnection Customer's request to evaluate whether advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, static VAR compensators, and/or electric storage providing a transmission service could provide cost and/or time savings for Interconnection Customer must be submitted at the Cluster Study Scoping Meetings.* Transmission Provider and Interconnection Customer will bring to the meeting such technical data, including, but not limited to: (i) general facility loadings, (ii) general instability issues, (iii) general short circuit issues, (iv) general voltage issues, and (v) general reliability issues as may be reasonably required to accomplish the purpose of the meeting. Transmission Provider and Interconnection Customer will also bring to the meeting personnel and other resources as may be reasonably required to accomplish the purpose of the meeting in the time allocated for the meeting. On the basis of the meeting, Interconnection Customer shall designate its Point of Interconnection.[, pursuant to Section 6.1,] and one or more available alternative Point(s) of Interconnection. The duration of the meeting shall be sufficient to accomplish its purpose.

3.5 OASIS Posting

3.5.1 *OASIS Posting*

Transmission Provider will maintain on its OASIS a list of all Interconnection Requests. The list will identify, for each Interconnection Request: (i) the maximum summer and winter megawatt electrical output; (ii) the location by county and state; (iii) the station or transmission line or lines where the interconnection will be made; (iv) the projected In-Service Date; (v) the status of the Interconnection Request, including Queue Position; (vi) the type of Interconnection Service being requested; and (vii) the availability of any studies related to the Interconnection Request; (viii) the date of the Interconnection Request; (ix) the type of Generating Facility to be constructed[(combined cycle, base load or combustion turbine and fuel type)]; and (x) for Interconnection Requests that have not resulted in a completed interconnection, an explanation as to why it was not completed. Except in the case of an Affiliate, the list will not disclose the identity of Interconnection Customer until Interconnection Customer executes an LGIA or requests that Transmission Provider file an unexecuted LGIA with FERC. Before holding a Scoping Meeting with its Affiliate, Transmission Provider shall post on OASIS an advance notice of its intent to do so. Transmission Provider shall post to its OASIS site any deviations from the study timelines set forth herein. Interconnection Study reports and Optional Interconnection Study reports shall be posted to Transmission Provider's OASIS site subsequent to the meeting between Interconnection Customer and Transmission Provider to discuss the applicable study results. Transmission Provider shall also post any known deviations in the [Large]Generating Facility's In-Service Date.

3.5.2 Requirement to Post Interconnection Study Metrics

Transmission Provider will maintain on its OASIS or its website summary statistics related to processing Interconnection Studies pursuant to Interconnection Requests, updated quarterly. If Transmission Provider posts this information on its website, a link to the information must be provided on Transmission Provider's OASIS site. For each calendar quarter, Transmission Providers must calculate and post the information detailed in [sections]*Sections* 3.5.2.1 through 3.5.2.4 *of this LGIP*.

3.5.2.1 Interconnection [Feasibility Studies]*Cluster Study* Processing Time.

(A) Number of Interconnection Requests that had [Interconnection Feasibility]*Cluster* Studies completed within Transmission Provider's coordinated region during the reporting quarter,

(B) Number of Interconnection Requests that had [Interconnection Feasibility]*Cluster* Studies completed within Transmission Provider's coordinated region during the reporting quarter that were completed more than [[timeline as listed in Transmission Provider's LGIP]]*one hundred fifty (150) Calendar Days* after [receipt by Transmission Provider of the Interconnection Customer's executed Interconnection Feasibility Study Agreement]*the close of the Customer Engagement Window*,

(C) At the end of the reporting quarter, the number of active valid Interconnection Requests with ongoing incomplete [Interconnection Feasibility] *Cluster* Studies where such Interconnection Requests had executed [Interconnection Feasibility]*a Cluster* Study Agreement[s] received by Transmission Provider more than

[[timeline as listed in Transmission Provider's LGIP]]*one hundred fifty (150) Calendar Days* before the reporting quarter end,

(D) Mean time (in days), [Interconnection Feasibility]*Cluster* Studies *were* completed within Transmission Provider's coordinated region during the reporting quarter, from the [date when Transmission Provider received the executed Interconnection Feasibility Study Agreement]*commencement of the Cluster Study* to the date when Transmission Provider provided the completed [Interconnection Feasibility]*Cluster* Study *Report* to [the] Interconnection Customer,

(E) Mean time (in days), Cluster Studies were completed within Transmission Provider's coordinated region during the reporting quarter, from the close of the Cluster Request Window to the date when Transmission Provider provided the completed Cluster Study Report to Interconnection Customer.

[(E)]*(F)* Percentage of [Interconnection Feasibility]*Cluster* Studies exceeding [[timeline as listed in Transmission Provider's LGIP]]*one hundred fifty (150) Calendar Days* to complete this reporting quarter, calculated as the sum of 3.5.2.1(B) plus 3.5.2.1(C) divided by the sum of 3.5.2.1(A) plus 3.5.2.1(C)).

3.5.2.2 [Interconnection System Impact Studies]*Cluster Re-Studies* Processing Time.

(A) Number of Interconnection Requests that had [Interconnection System Impact Studies]*Cluster Re-Studies* completed within Transmission Provider's coordinated region during the reporting quarter,

(B) Number of Interconnection Requests that had [Interconnection System Impact Studies]*Cluster Re-Studies* completed within Transmission Provider's coordinated region during the reporting quarter that were completed more than [[timeline as listed in Transmission Provider's LGIP]]*one hundred fifty (150) Calendar Days* after receipt by Transmission Provider of [the]Interconnection Customer's executed [Interconnection System Impact Study]*Cluster Re-Study* Agreement,

(C) At the end of the reporting quarter, the number of active valid Interconnection Requests with ongoing incomplete [System Impact Studies]*Cluster Re-Studies* where such Interconnection Requests had executed [Interconnection System Impact Study]*Cluster Re-Study* Agreements received by Transmission Provider more than [[timeline as listed in Transmission Provider's LGIP]]*one hundred fifty (150) Calendar Days* before the reporting quarter end,

(D) Mean time (in days), [Interconnection System Impact Studies]*Cluster Re-Studies were* completed within Transmission Provider's coordinated region during the reporting quarter, from the date when Transmission Provider received the executed [Interconnection System Impact Study]*Cluster Re-Study* Agreement to the date when Transmission Provider provided the completed [Interconnection System Impact Study]*Cluster Re-Study Report* to [the]Interconnection Customer,

(E) Mean time (in days), Cluster Re-Studies were completed within Transmission Provider's coordinated region during the reporting quarter, from the close of the Cluster Request Window to the date when Transmission Provider provided the completed Cluster Re-Study Report to Interconnection Customer.

[(E)]*(F)* Percentage of [Interconnection System Impact Studies]*Cluster Re-Studies* exceeding [[timeline as listed in Transmission Provider's LGIP]]*one hundred fifty (150) Calendar Days* to complete this reporting quarter, calculated as the sum of 3.5.2.2(B) plus 3.5.2.2(C) divided by the sum of 3.5.2.2(A) plus 3.5.2.2(C)).

3.5.2.3 Interconnection Facilities Studies Processing Time.

* * *

(E) Mean time (in days), Cluster Re-Studies were completed within Transmission Provider's coordinated region during the reporting quarter, from the close of the Cluster Request Window to the date when Transmission Provider provided the completed Cluster Re-Study Report to Interconnection Customer.

[(E)]*(F)* Percentage of delayed Interconnection Facilities Studies this reporting quarter, calculated as the sum of 3.5.2.3(B) plus 3.5.2.3(C) divided by the sum of 3.5.2.3(A) plus 3.5.2.3(C)).

3.5.2.4 Interconnection Service Requests Withdrawn from Interconnection Queue.

* * *

(C) Number of Interconnection Requests withdrawn from Transmission Provider's interconnection queue during the reporting quarter before completion of [an Interconnection System Impact]*a Cluster* Study,

* * *

3.5.4

* * *

(i) Transmission Provider must submit a report to the Commission describing the reason for each *Cluster Study, Cluster Re-Study, or individual Interconnection Facilities S*[s]tudy [or group of clustered studies]pursuant to[an] *one or more* Interconnection Request*(s)* that exceeded its deadline (i.e., [45,]*150*, 90 or 180 days) for completion [(excluding any allowance for Reasonable Efforts)]. Transmission Provider must describe the reasons for each study delay and any steps taken to remedy these specific issues and, if applicable, prevent such delays in the future. The report must be filed at the Commission within 45 days of the end of the calendar quarter.

* * *

3.6 Coordination with Affected Systems

Transmission Provider will 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 in its applicable Interconnection Study within the time frame specified in this LGIP. Transmission Provider will include such Affected System Operators in all meetings held with Interconnection Customer as required by this LGIP]. Interconnection Customer will cooperate with Transmission Provider *and Affected System Operator* in all matters related to the conduct of studies and the determination of modifications to Affected Systems.

A Transmission Provider which may be an Affected System shall cooperate with the [T]*t*ransmission [P]*p*rovider with whom interconnection has been requested in all matters related to the conduct of studies and the determination of modifications to *Transmission Provider's Transmission System*[Affected Systems].

3.6.1 Initial Notification

Transmission Provider must notify Affected System Operator of a potential Affected System impact caused by the Interconnection Request within ten (10) Business Days of the first event giving rise to the identification of the Affected System impact. Identification of an Affected System impact may occur at the close of the (1) Cluster Request Window, (2) Customer Engagement Window, (3) Cluster Study, or (4) Cluster Re-Study.

Transmission Provider will provide Interconnection Customer with a list of potential Affected Systems, along with relevant contact information.

When Transmission Provider acting as an Affected System receives notification of an impact on Transmission Provider's Transmission System, Transmission Provider must respond in writing within fifteen (15) Business Days whether it intends to conduct an Affected System Study.

3.6.2 Affected System Scoping Meeting

Within seven (7) Business Days of providing written notification that Transmission Provider acting as an Affected System intends to conduct an Affected System Study, Transmission Provider must schedule an Affected System Scoping Meeting with Affected System Interconnection Customer, using best efforts to include the transmission provider with whom interconnection has been requested.

The purpose of the Affected System Scoping Meeting is to allow all attendees to discuss the potential impacts on Transmission Provider's Transmission System and how they may be mitigated. Attendees will bring to the meeting such technical data, personnel, and other resources as may be reasonably required to accomplish the purpose of the meeting. The Affected System Scoping Meeting must be held within seven (7) Business Days of being scheduled. Within fifteen (15) Business Days after the meeting, Transmission

Provider acting as an Affected System must share with the attendees the schedule to complete the Affected System Study.

3.6.3 Affected System Study Process

Transmission Provider must provide data monthly, or more frequently as needed, to any Affected System Operators regarding the amount and location of generation in Transmission Provider's interconnection queue as well as updated information about Transmission Provider's Transmission System.

3.7 Withdrawal.

Interconnection Customer may withdraw its Interconnection Request at any time by written notice of such withdrawal to Transmission Provider. In addition, if Interconnection Customer fails to adhere to all requirements of this LGIP, except as provided in Section 13.5 (Disputes), Transmission Provider shall deem the Interconnection Request to be withdrawn and shall provide written notice to Interconnection Customer of the deemed withdrawal and an explanation of the reasons for such deemed withdrawal. Upon receipt of such written notice, Interconnection Customer shall have fifteen (15) Business Days in which to either respond with information or actions that cures the deficiency or to notify Transmission Provider of its intent to pursue Dispute Resolution.

Withdrawal shall result in the loss of Interconnection Customer's Queue Position. If an Interconnection Customer disputes the withdrawal and loss of its Queue Position, then during Dispute Resolution, Interconnection Customer's Interconnection Request is eliminated from the queue until such time that the outcome of Dispute Resolution would restore its Queue Position. An Interconnection Customer that withdraws or is deemed to have withdrawn its Interconnection Request shall pay to Transmission Provider all costs that Transmission Provider prudently incurs with respect to that Interconnection Request prior to Transmission Provider's receipt of notice described above. Interconnection Customer must pay all monies due to Transmission Provider before it is allowed to obtain any Interconnection Study data or results.

In case of withdrawal, Transmission Provider shall (i) update the OASIS Queue Position posting; (ii) *impose the Withdrawal Penalty described in Section 3.7.1 of this LGIP*; and *(iii)* refund to Interconnection Customer any portion *of the refundable portion of* Interconnection Customer's *study* deposit or [study payments]*Commercial Readiness Deposit* that exceeds the costs that Transmission Provider has incurred *and the cost of any penalties that Transmission Provider has assessed pursuant to Section 3.7.1 of this LGIP*, including interest calculated in accordance with section 35.19a(a)(2) of FERC's regulations. In the event of such withdrawal, Transmission Provider, subject to the confidentiality provisions of Section 13.1 *of this LGIP*, shall provide, at Interconnection Customer's request, all information that Transmission Provider developed for any completed study conducted up to the date of withdrawal of the Interconnection Request.

3.7.1 Withdrawal Penalty.

An Interconnection Customer shall be subject to a Withdrawal Penalty if it withdraws its Interconnection Request or the Generating Facility does not otherwise reach Commercial Operation unless: (1) the withdrawal does not delay the timing of other Generating Facilities within the same Cluster, as determined by Transmission Provider; (2) the withdrawal does not increase the cost of other Generating Facilities within the same Cluster, as determined by Transmission Provider; (3) Interconnection Customer withdraws after receiving the most recent Cluster Study Report and the costs assigned to the Interconnection Request identified in that report have increased by more than twenty-five percent (25%) compared to costs identified in the previous Cluster Study Report or Cluster Re-Study Report; or (4) Interconnection Customer withdraws after receiving the Interconnection Facilities Study report and the costs assigned to the Interconnection Request identified in that report have increased by more than one hundred percent (100%) compared to costs identified in the Cluster Study Report.

3.7.1.1 Calculation of the Withdrawal Penalty.

If the withdrawing Interconnection Customer has demonstrated any of the Commercial Readiness Demonstration options in Sections 3.4.2(vi)(a)-(c) of this LGIP, and is withdrawing prior to executing, or requesting the unexecuted filing of, an LGIA and fully meeting the requirements of Section 11.3 of this LGIP, Interconnection Customer shall be charged one (1) times its actual allocated cost of all studies performed up until that point. If the withdrawing Interconnection Customer only submitted a Commercial Readiness Deposit, and is withdrawing at any point prior to executing, or requesting the unexecuted filing of, an LGIA and fully meeting the requirements of Section 11.3 of this LGIP, that Interconnection Customer's Withdrawal Penalty will be as follows in (a) – (c):

(a) If Interconnection Customer withdraws or is deemed withdrawn during the Cluster Study or after receipt of a Cluster Study Report, Interconnection Customer will be charged two (2) times its actual allocated cost of all studies performed for Interconnection Customers in the Cluster up until that point, regardless of any previous Withdrawal Penalty revenues received. This amount will be capped at one (1) million dollars.

(b) If Interconnection Customer withdraws or is deemed withdrawn during the Cluster Re-Study or after receipt of any applicable re-study reports issued pursuant to Section 7.5 of this LGIP, Interconnection Customer will be charged three (3) times its actual allocated cost of all studies performed for Interconnection Customers in the Cluster up until that point, regardless of any previous Withdrawal Penalty revenues received. This amount shall be capped at one and one half (1.5) million dollars.

(c) If Interconnection Customer withdraws or is deemed withdrawn during the Interconnection Facilities Study, after receipt of the Interconnection Facilities Study report issued pursuant to Section 8.3 of this LGIP, or after receipt of the draft LGIA but before fully meeting requirements of Section 11.3 of this LGIP, Interconnection Customer shall be charged five (5) times its actual allocated cost of all studies performed for Interconnection Customers in the Cluster up until that

point, regardless of any previous Withdrawal Penalty revenues received. This amount shall be capped at two (2) million dollars.

The Withdrawal Penalty for any Interconnection Customer that, before achieving Commercial Operation, withdraws after executing an LGIA and meeting the requirements of Section 11.3 of this LGIP shall be nine (9) times its actual allocated cost of all studies performed for Interconnection Customers in the Cluster up until that point, regardless of any previous Withdrawal Penalty revenues received. In the event that Interconnection Customer suspends its LGIA, Interconnection Customer shall be obligated to pay for costs associated with any studies or re-studies required as a result of the suspension of the LGIA, including any re-studies associated with any affected Interconnection Customers with lower Queue Positions.

3.7.1.2 Distribution of the Withdrawal Penalty.

Any Withdrawal Penalty revenues shall be used to fund studies conducted under the Cluster Study Process. Withdrawal Penalty revenues shall first be applied, in the form of a bill credit, to not-yet-invoiced study costs for other Interconnection Customers in the same Cluster, and to the extent that such studies are fully credited, shall be applied to study costs of future Clusters in order of Queue Position. Withdrawn Interconnection Customers shall not receive a bill credit associated with Withdrawal Penalty revenues. Distribution of Withdrawal Penalty revenues to a specific Cluster Study shall not exceed the total actual Cluster Study costs. Allocation of Withdrawal Penalty revenues within a Cluster to a specific Interconnection Customer shall be (1) ninety percent (90%) on a pro-rata basis based on requested megawatts included in the applicable Cluster; and (2) ten percent (10%) on a per capita basis based on the number of Interconnection Requests in the applicable Cluster. Withdrawal Penalty revenues associated with Section 3.7.1.1(c) of this LGIP shall not be distributed to the remaining Interconnection Customers in that Cluster until all Interconnection Customers in that Cluster have reached Commercial Operation and thereafter shall be distributed as described above. Transmission Provider shall post the balance of Withdrawal Penalty revenue held by transmission provider but not yet dispersed on its OASIS site and update this posting on a quarterly basis.

3.8 Identification of Contingent Facilities.

Transmission Provider shall post in this section a method for identifying the Contingent Facilities to be provided to Interconnection Customer at the conclusion of the [System Impact]*Cluster* Study and included in Interconnection Customer's Large Generator Interconnection Agreement. The method shall be sufficiently transparent to determine why a specific Contingent Facility was identified and how it relates to the Interconnection Request. Transmission Provider shall also provide, upon request of [the]Interconnection Customer, the estimated Interconnection Facility and/or Network Upgrade costs and estimated in-service completion time of each identified Contingent Facility when this information is readily available and not commercially sensitive.

3.9 Penalties for Failure to Meet Study Deadlines.

(1) Transmission Provider is subject to a penalty if it fails to complete a Cluster Study, Cluster Re-Study, Interconnection Facilities Study, or Affected Systems Study by the applicable deadline set forth in this LGIP. Transmission Provider must pay the penalty on a pro rata basis per Interconnection Customer to Interconnection Customer(s) in the delayed study on the last Business Day of each calendar quarter for which a penalty applies, starting with the calendar quarter immediately following the quarter that Transmission Provider exceeded the applicable study deadline. The penalty will continue to be paid the last Business Day of each quarter until Transmission Provider completes the study.

(2) For penalties assessed in accordance with this Section, the penalty amount will be equal to $500 per Business Day Transmission Provider takes to complete that study after the applicable deadline set forth in this LGIP. The total amount of a penalty assessed under this Section will not exceed one hundred percent (100%) of the total deposits paid by Interconnection Customers for the applicable study.

(3) No penalty will be assessed under this Section where a Transmission Provider's failure to complete an Interconnection Study is caused by Force Majeure.

(4) No penalty will be assessed under this Section where a study is delayed by 10 Business Days or less. The penalty amount will be calculated from the first day the Transmission Provider exceeds the appliable study deadline.

(5) If (a) the transmission provider needs to extend the deadline for a particular study subject to penalties under this section and (b) all interconnection customers in the relevant cluster mutually agree to such extension, the deadline for that study shall be extended 30 business days from the original due date. In such a scenario, no penalty will be assessed for missing the original deadline.

(6) No penalties shall be assessed until one Cluster Study cycle after Transmission Provider transitions to the Cluster Study Process.

(7) Transmission Provider must maintain on its OASIS or its website summary statistics related to penalties assessed under this Section, updated quarterly. For each calendar quarter, Transmission Provider must calculate and post (1) the total amount of penalties assessed under this Section during the reporting quarter and (2) the highest amount of the penalties assessed under this Section paid to a single Interconnection Customer during the reporting quarter. Transmission Provider is required to post on its OASIS or its website these penalty amounts for each calendar quarter within 30 calendar days of the end of the calendar quarter. Transmission Provider must maintain the quarterly measures posted on its OASIS or its website for three calendar years with the first required report to be one Cluster Study cycle after Transmission Provider transitions to the Cluster Study Process.

3.10 Identification of Shared Network Upgrades

As part of the Cluster Study, Transmission Provider shall review the proposed configuration of the Generating Facility and perform a test, if required, to determine a

Network Upgrade's eligibility for cost sharing. The set of possible Shared Network Upgrades included in the test will be all Network Upgrades identified through Transmission Provider's study process and In-Service for a period of less than five (5) years. If the Generating Facility directly-connects to (1) a Network Upgrade(s) or (2) a substation where Network Upgrade(s) terminates, then the Network Upgrade(s) is a Shared Network Upgrade and Interconnection Customer shall share the cost of the Shared Network Upgrade. If the aforementioned criteria are not met, Transmission Provider shall perform a power flow analysis to calculate the impacts of the Generating Facility on Network Upgrade(s) under system-intact conditions and will apply the following two-part criteria to determine eligibility. First, Transmission Provider shall analyze if the impact of the Generating Facility on the Network Upgrade(s) is either greater than five (5) MW or greater than one percent (1%) of the transmission facility rating. If the criteria are met, Transmission Provider shall proceed to the second test. Transmission Provider shall analyze if the impact of the Generating Facility on Network Upgrade(s) is greater than five percent (5%) of the facility rating or the power transfer distribution factor is greater than twenty percent (20%). If the criteria listed in both (1) and (2) are met, the Network Upgrade shall be considered a Shared Network Upgrade(s) and Interconnection Customer shall share the cost of the Shared Network Upgrade(s), now designated as a Shared Network Upgrade(s). The Network Upgrade(s) shall be considered Shared Network Upgrade(s) only if they are in-service before the Generating Facility's Commercial Operation Date.

Section 4. *Interconnection Request Evaluation Process* [Queue Position]

Once an Interconnection Customer has submitted a valid Interconnection Request pursuant to Section 3.4 of this LGIP, such Interconnection Request shall be admitted into Transmission Provider's interconnection queue for further processing pursuant to the following procedures.

4.1 *Queue Position* [General]

4.1.1 Assignment of Queue Position.

Transmission Provider shall assign a Queue Position *as follows: the Queue Position within the queue shall be assigned* based upon the date and time of receipt of *all items required pursuant to the provisions of Section 3.4 of this LGIP. All Interconnection Requests submitted and validated in a single Cluster Request Window shall be considered equally queued, but Clusters initiated earlier in time shall be considered to have a higher Queue Position than Clusters initiated later.* [the valid Interconnection Request; provided that, if the sole reason an Interconnection Request is not valid is the lack of required information on the application form, and Interconnection Customer provides such information in accordance with Section 3.4.3, then Transmission Provider shall assign Interconnection Customer a Queue Position based on the date the application form was originally filed. Moving a Point of Interconnection shall result in a lowering of Queue Position if it is deemed a Material Modification under Section 4.4.3.]

[The Queue Position of each Interconnection Request will be used to determine the order of performing the Interconnection Studies and determination of cost responsibility for the facilities necessary to accommodate the Interconnection Request. A higher queued]

4.1.2 Higher Queue Position.

A higher Queue Position assigned to an Interconnection Request is one that has been placed "earlier" in the queue in relation to another Interconnection Request that is [lower queued. Transmission Provider may allocate the cost of the common upgrades for clustered Interconnection Requests without regard to Queue Position.]*assigned a lower Queue Position. All requests studied in a single Cluster shall be considered equally queued, but Clusters initiated earlier in time shall be considered to have a higher Queue Position than Clusters initiated later. Interconnection Requests within the same Cluster shall be equally queued, and therefore Queue Position shall have no bearing on the allocation of the cost of the Network Upgrades identified in the applicable Cluster Study (such costs will be allocated among Interconnection Requests in accordance with Section 4.2.3 of this LGIP).*

[**4.2 Clustering.**

At Transmission Provider's option, Interconnection Requests may be studied serially or in clusters for the purpose of the Interconnection System Impact Study. Clustering shall be implemented on the basis of Queue Position. If Transmission Provider elects to study Interconnection Requests using Clustering, all Interconnection Requests received within a period not to exceed one hundred and eighty (180) Calendar Days, hereinafter referred to as the "Queue Cluster Window" shall be studied together without regard to the nature of the underlying Interconnection Service, whether Energy Resource Interconnection Service or Network Resource Interconnection Service. The deadline for completing all Interconnection System Impact Studies for which an Interconnection System Impact Study Agreement has been executed during a Queue Cluster Window shall be in accordance with Section 7.4 *of this LGIP*, for all Interconnection Requests assigned to the same Queue Cluster Window. Transmission Provider may study an Interconnection Request separately to the extent warranted by Good Utility Practice based upon the electrical remoteness of the proposed Large Generating Facility.]

4.2. General Study Process.

[Clustering Interconnection System Impact Studies]*Interconnection Studies performed within the Cluster Study Process* shall be conducted in such a manner to ensure the efficient implementation of the applicable regional transmission expansion plan in light of the Transmission System's capabilities at the time of each study.

[The Queue Cluster Window shall have a fixed time interval based on fixed annual opening and closing dates. Any changes to the established Queue Cluster Window interval and opening or closing dates shall be announced with a posting on Transmission Provider's OASIS beginning at least one hundred and eighty (180) Calendar Days in

advance of the change and continuing thereafter through the end date of the first Queue Cluster Window that is to be modified.]

4.2.2 Optional Resource Solicitation Study

At any time during the Cluster Request Window, and upon request of a Resource Planning Entity, Transmission Provider may initiate an Optional Resource Solicitation Study. Such request shall demonstrate that the requesting entity meets the definition of a Resource Planning Entity and include all information necessary for Transmission Provider to verify that the requester qualifies as a Resource Planning Entity as defined in Section 1 of this LGIP. Such request shall include a list of Interconnection Requests, which have already been submitted to Transmission Provider in the current Cluster Request Window, that the Resource Planning Entity would like evaluated in the Optional Resource Solicitation Study. In its request, the Resource Planning Entity must group the Interconnection Requests into no more than five (5) combinations of Interconnection Requests for purposes of the Optional Resource Solicitation Study. There is no limit to how many Interconnection Requests may be included in each combination of Interconnection Requests.

Resource Planning Entity may submit for inclusion in the Optional Resource Solicitation Study an Interconnection Request for a Generating Facility that already has a Queue Position pursuant to Section 4.1 of this LGIP, or an Interconnection Request for a Generating Facility that is submitted by Interconnection Customer during the Cluster Request Window in which the Resource Planning Entity submits the request for the Optional Resource Solicitation Study. In any case, Interconnection Customer must meet all requirements associated with maintaining its Queue Position.

Transmission Provider may not delay any Interconnection Study as a result of an Optional Resource Solicitation Study.

Within ten (10) Business Days of receipt of a request to perform an Optional Resource Solicitation Study that includes valid Interconnection Requests as described in Section 3.4 of this LGIP, Transmission Provider and Resource Planning Entity shall meet to determine a mutually agreeable scope for the Optional Resource Solicitation Study.

Transmission Provider shall conduct the Optional Resource Solicitation Study separate from the Cluster Study Process. In conducting the Optional Resource Solicitation Study, Transmission Provider shall evaluate each combination of Interconnection Requests submitted by the Resource Planning Entity as a single group, in the same manner it performs Cluster Studies under Section 7.3 of this LGIP. Such studies in connection with a Resource Plan or Resource Solicitation Process shall be implemented based upon Queue Position (relative to Clusters with higher or lower Queue Positions) and shall consider Resource Planning Entity's interconnection needs identified in the Resource Plan or Resource Solicitation Process. The Resource Planning Entity must act as the point of contact for purposes of the Optional Resource Solicitation Study for all Interconnection Requests submitted to the Optional Resource Solicitation Study. Thereafter, the Optional Resource Solicitation Study shall proceed in parallel with the annual Cluster Study described in Section 7 of this LGIP. The Optional Resource

Solicitation Study shall be completed within 135 days of commencement (15 days before the conclusion of the annual Cluster Study described in Section 7 of this LGIP).

After Transmission Provider completes the Optional Resource Solicitation Study for the requested combinations, the results will be provided to the Resource Planning Entity in an Optional Resource Solicitation Study Report. The results will also be posted on Transmission Provider's OASIS consistent with the posting of other study results.

The provision of the Optional Resource Solicitation Study Report concludes Transmission Provider's responsibilities with regard to the requested Optional Resource Solicitation Study. Interconnection Requests may proceed in the remainder of the Cluster Study Process either as part of the Resource Plan or as independent Interconnection Requests. It is the responsibility of Interconnection Customer to provide Transmission Provider with evidence of being selected in a Resource Plan or Resource Solicitation Process in a manner sufficient to demonstrate commercial readiness following Interconnection Customer's receipt of the Cluster Study Report (pursuant to Section 7.3 of this LGIP) and prior to entering the Interconnection Facilities Study (pursuant to Section 8.3 of this LGIP). Inclusion in an Optional Resource Solicitation Study in no way exempts Interconnection Customer from Withdrawal Penalties under Section 3.7.1 of this LGIP.

4.2.3 Cost Allocation for Transmission Provider's Interconnection Facilities and Network Upgrades.

(1) For Network Upgrades identified in Cluster Studies, Transmission Provider shall calculate each Interconnection Customer's share of the costs based on the proportional impact of each individual Generating Facility in the Cluster Study on the Network Upgrade or Transmission Provider's Interconnection Facilities. {Transmission Provider shall include in this section the thresholds and metrics it uses for its proportional impact method.} An Interconnection Customer that funds Network Upgrades is entitled to transmission credits as provided in Article 11.4 of the LGIA.

(2) The costs of any required Transmission Provider's Interconnection Facilities will be directly assigned to Interconnection Customer(s) using such facilities. The cost of such Transmission Provider's Interconnection Facilities will be shared equally among all Interconnection Customers sharing use of Transmission Provider's Interconnection Facilities.

*** * ***

4.4 Modifications.

Interconnection Customer shall submit to Transmission Provider, in writing, modifications to any information provided in the Interconnection Request. Interconnection Customer shall retain its Queue Position if the modifications are in accordance with Sections 4.4.1, 4.4.2*,* [or]4.4.5 *or 4.4.7 of this LGIP*, or are determined not to be Material Modifications pursuant to Section 4.4.3 *of this LGIP*.

Notwithstanding the above, during the course of the Interconnection Studies, either Interconnection Customer or Transmission Provider may identify changes to the planned interconnection that may improve the costs and benefits (including reliability) of the interconnection, and the ability of the proposed change to accommodate the Interconnection Request. To the extent the identified changes are acceptable to Transmission Provider, Interconnection Customer *and any impacted Interconnection Customer in the same Cluster*, such acceptance not to be unreasonably withheld, Transmission Provider shall modify the Point of Interconnection *prior to return of the executed Cluster Study Agreement, provided, however, such identified changes do not result in a Material Modification* [and/or configuration in accordance with such changes and proceed with any re-studies necessary to do so in accordance with Section 6.4, Section 7.6 and Section 8.5 as applicable]and Interconnection Customer shall retain its Queue Position.

4.4.1 Prior to the return of the executed [Interconnection System Impact]*Cluster* Study Agreement to Transmission Provider, modifications permitted under this Section shall include specifically: (a) a decrease of up to 60 percent of electrical output (MW) of the proposed project, through either (1) a decrease in plant size or (2) a decrease in Interconnection Service level (consistent with the process described in Section 3.1 *of this LGIP*) accomplished by applying Transmission Provider-approved injection-limiting equipment; (b) modifying the technical parameters associated with the[Large] Generating Facility technology or the [Large]Generating Facility step-up transformer impedance characteristics; and (c) modifying the interconnection configuration. For plant increases, the incremental increase in plant output will go [to]*in* the [end of the queue]*next Cluster Study Window* for the purposes of cost allocation and study analysis.

* * *

4.4.3 Prior to making any modification other than those specifically permitted by Sections 4.4.1, 4.4.2, and 4.4.5 *of this LGIP*, Interconnection Customer may first request that Transmission Provider evaluate whether such modification is a Material Modification. In response to Interconnection Customer's request, Transmission Provider shall evaluate the proposed modifications prior to making them and inform Interconnection Customer in writing of whether the modifications would constitute a Material Modification. *Interconnection Customer may request, and Transmission Provider shall evaluate within sixty (60) calendar days, the addition of a Generating Facility with the same Point of Interconnection as indicated in the Interconnection Request to the Interconnection Request if the addition of the Generating Facility does not increase the requested Interconnection Service level.* Any change to the Point of Interconnection, except those deemed acceptable under Sections *3.1.2 or* 4.4 *of this LGIP*[.1, 6.1, 7.2] or so allowed elsewhere, shall constitute a Material Modification. Interconnection Customer may then withdraw the proposed modification or proceed with a new Interconnection Request for such modification.

4.4.4 Upon receipt of Interconnection Customer's request for modification permitted under this Section 4.4, Transmission Provider shall commence and perform any necessary additional studies as soon as practicable, but in no event shall Transmission Provider commence such studies later than thirty (30) Calendar Days after receiving

notice of Interconnection Customer's request. Any additional studies resulting from such modification shall be done at Interconnection Customer's cost. *Any such modification of the Interconnection Request must be accompanied by any resulting updates to the models described in Attachment A to Appendix 1 of this LGIP.*

4.4.5 Extensions of less than three (3) cumulative years in the Commercial Operation Date of the [Large]Generating Facility to which the Interconnection Request relates are not material and should be handled through construction sequencing. *For purposes of this Section, the Commercial Operation Date reflected in the initial Interconnection Request shall be used to calculate the permissible extension. Such cumulative extensions include extensions requested after execution of the, or the filing of an unexecuted, LGIA by Interconnection Customer.*

* * *

4.4.7 *Prior to determining whether the addition of a Generating Facility with the same Point of Interconnection as indicated in the Interconnection Request to an Interconnection Request constitutes a Material Modification, Transmission Provider shall evaluate within sixty (60) Calendar Days the proposed addition of such a Generating Facility if it does not increase the requested Interconnection Service level.*

Section 5. Procedures for Interconnection Requests Submitted Prior to Effective Date of *the Cluster Study Revisions*[Standard Large Generator Interconnection Procedures]

5.1 *Procedures for Transitioning to the Cluster Study Process [*Queue Position for Pending Requests.]

5.1.1

[Any Interconnection Customer assigned a Queue Position prior to the effective date of this LGIP shall retain that Queue Position.]
Any Interconnection Customer assigned a Queue Position prior to the effective date of this LGIP shall retain that Queue Position subject to the requirements in Sections 5.1.1.1 and 5.1.1.2 of this LGIP. Any Interconnection Customer that fails to meet these requirements shall have its Interconnection Request deemed withdrawn without penalty. In such case, all other aspects of Section 3.7 of this LGIP remain applicable. Any unused deposit amounts of withdrawn Interconnection Requests shall be returned to Interconnection Customer pursuant to Section 3.7 of this LGIP. If an Interconnection Customer elects to continue with a Transitional Serial Interconnection Facilities Study or a Transitional Cluster Study, as described below, Transmission Provider shall retain the current study deposits, and Interconnection Customer shall be responsible for the entire cost of all studies pursuant to Sections 4.2.3 and 13.3 of this LGIP.

5.1.1.1 *Transitional Serial Study.*

[If an Interconnection Study Agreement has not been executed as of the effective date of this LGIP, then such Interconnection Study, and any subsequent Interconnection Studies, shall be processed in accordance with this LGIP.]
An Interconnection Customer that has (a) a final System Impact Study Report that identifies facilities required to feasibly interconnect and (b) an Interconnection Facilities Study Agreement that was executed before the effective date of this LGIP, may opt to continue with the Interconnection Facilities Study process if Interconnection Customer: (1) meets each of the following requirements that demonstrate commercial readiness; and (2) executes a Transitional Serial Interconnection Facilities Study Agreement in the form of Appendix 14 of this LGIP within sixty (60) Calendar Days of the effective date of this LGIP. All of the following are required:

(1) A deposit equal to one hundred percent (100%) of the costs identified for Transmission Provider's Interconnection Facilities and Network Upgrades in the final System Impact Study Report. This deposit will be trued up to reflect actual costs after the associated facilities are in-service. If Interconnection Customer does not withdraw, the deposit shall be trued up to actual costs and applied to future construction costs described in Interconnection Customer's eventual LGIA. If Interconnection Customer withdraws or otherwise does not reach Commercial Operation, Transmission Provider shall refund the deposit after the final invoice for study costs and Withdrawal Penalty is settled. The deposit shall be in the form of an irrevocable letter of credit upon which Transmission Provider may draw or cash where cash deposits will be treated according to Section 3.7 of this LGIP.

(2) Exclusive Site Control for the entire Generating Facility and any Interconnection Customer's Interconnection Facilities pursuant to Section 3.4.2 of this LGIP.

(3) One of the following Commercial Readiness Demonstration options totaling the entire Generating Facility Capacity (or requested Interconnection Service amount if the requested Interconnection Service is less than the Generating Facility Capacity):

(a) Executed term sheet (or comparable evidence as determined by Transmission Provider) related to a contract for sale of (1) the constructed Generating Facility to a load-serving entity or to a commercial, industrial, or other large end-use customer, (2) the Generating Facility's energy or capacity where the term of sale is not less than five (5) years, or (3) the Generating Facility's ancillary services where the term of sale is not less than five (5) years;

(b) Reasonable evidence that the Generating Facility has been selected in a Resource Plan or Resource Solicitation Process by or for a load-serving entity, is being developed by a load-serving entity, or is being developed for purposes of a sale to a commercial, industrial, or other large end-use customer;

(c) A Provisional LGIA that has been filed at the Commission executed, or requested to be filed unexecuted, and which is not in suspension pursuant to Article 5.16 of the LGIA, includes a commitment to construct the Generating

Facility, and has a Commercial Operation Date no later than December 31, 2027.

Transmission Provider shall conduct each Transitional Interconnection Facilities Study and issue the associated Transitional Interconnection Facilities Study Report within one hundred fifty (150) Calendar Days of the effective date of this LGIP.

After Transmission Provider issues each Transitional Interconnection Facilities Study Report, the remaining process shall proceed according to Section 11 of this LGIP. All LGIA negotiations shall be completed and the LGIA executed (or filed unexecuted) within sixty (60) Calendar Days of the tender of the draft LGIA or the Interconnection Request shall be deemed withdrawn pursuant to Section 3.7 of this LGIP unless extended by mutual agreement of Transmission Provider and Interconnection Customer. During LGIA negotiation, Transmission Provider shall not grant a request to change the previously-indicated Commercial Operation Date and to delay the construction of Network Upgrades and/or Interconnection Facilities if such delay would negatively affect Interconnection Customers with lower or equal Queue Positions. If Interconnection Customer withdraws or otherwise does not reach Commercial Operation, a Withdrawal Penalty equal to nine (9) times Interconnection Customer's actual allocated cost of all studies performed for the Transitional Cluster Study up until that point will be imposed on Interconnection Customer.

5.1.1.2 *Transitional Cluster Study.*

[If an Interconnection Study Agreement has been executed prior to the effective date of this LGIP, such Interconnection Study shall be completed in accordance with the terms of such agreement. With respect to any remaining studies for which an Interconnection Customer has not signed an Interconnection Study Agreement prior to the effective date of the LGIP, Transmission Provider must offer Interconnection Customer the option of either continuing under Transmission Provider's existing interconnection study process or going forward with the completion of the necessary Interconnection Studies (for which it does not have a signed Interconnection Studies Agreement) in accordance with this LGIP.]

An Interconnection Customer with an assigned Queue Position as of the effective date of this LGIP may opt to enter the combined system impact and interconnection facilities Transitional Cluster Study if Interconnection Customer: (1) meets each of the following requirements listed as (1) – (4) in this section that demonstrate commercial readiness; and (2) executes a Transitional Cluster Study Agreement in the form of Appendix 13 to this LGIP within sixty (60) Calendar Days of the effective date of this LGIP. All Interconnection Requests that enter the Transitional Cluster Study shall be considered to have an equal Queue Position. All identified Network Upgrade costs shall be allocated according to Section 4.2.3 of this LGIP. Transitional Cluster Study costs shall be allocated according to the method described in Section 4.2.3 of this LGIP.

Interconnection Customer may make a one-time extension to its requested Commercial Operation Date upon entry into the Transitional Cluster Study, any such extension not to exceed until the date of December 31, 2027.

All of the following must be included in a request to opt into a Transitional Cluster Study:

(1) A selection of either Energy Resource Interconnection Service or Network Resource Interconnection Service.

(2) A deposit on Transmission Provider's Interconnection Facilities and Network Upgrades expected to be identified in the Transitional Cluster Study. The deposit shall be equal to five million dollars ($5,000,000) and be in the form of an irrevocable letter of credit upon which Transmission Provider may draw or cash where cash deposits will be treated according to Section 3.7 of this LGIP. If Interconnection Customer does not withdraw, the deposit shall be reconciled with and applied towards future construction costs described in the LGIA. Any amounts in excess of the actual construction costs shall be returned to Interconnection Customer within thirty (30) days of the date of Commercial Operation. If Interconnection Customer withdraws or otherwise does not reach Commercial Operation, Transmission Provider must refund the deposit once the final invoice for study costs and Withdrawal Penalty is settled.

(3) Exclusive Site Control for the entire Generating Facility.

(4) One of the following Commercial Readiness Demonstration options totaling the entire Generating Facility Capacity (or requested Interconnection Service amount if the requested Interconnection Service is less than the Generating Facility Capacity):

(a) Executed term sheet (or comparable evidence as determined by Transmission Provider) related to a contract for sale of (1) the constructed Generating Facility to a load-serving entity or to a commercial, industrial, or other large end-use customer, (2) the Generating Facility's energy or capacity where the term of sale is not less than five (5) years, or (3) the Generating Facility's ancillary services where the term of sale is not less than five (5) years;

(b) Reasonable evidence that the Generating Facility has been selected in a Resource Plan or Resource Solicitation Process by or for a load-serving entity, is being developed by a load-serving entity, or is being developed for purposes of a sale to a commercial, industrial, or other large end-use customer;

(c) A Provisional LGIA that has been filed at the Commission executed, or requested to be filed unexecuted, and which is not in suspension pursuant to Article 5.16 of the LGIA, includes a commitment to construct the Generating Facility, and has a Commercial Operation Date no later than December 31, 2027.

Transmission Provider shall conduct the Transitional Cluster Study and issue both an associated interim Transitional Serial Study Report and an associated final Transitional Serial Study Report. The interim Transitional Cluster Study report shall provide the following information:

- *identification of any circuit breaker short circuit capability limits exceeded as a result of the interconnection;*
- *identification of any thermal overload or voltage limit violations resulting from the interconnection;*
- *identification of any instability or inadequately damped response to system disturbances resulting from the interconnection; and*
- *Transmission Provider's Interconnection Facilities and Network Upgrades that are expected to be required as a result of the Interconnection Request(s) and a non-binding, good faith estimate of cost responsibility and a non-binding, good faith estimated time to construct.*

In addition to the information provided in the interim Transitional Cluster Study report, the final Transitional Cluster Study Report shall: (1) provide a description of, estimated cost of, and schedule for required facilities to interconnect the Generating Facility to the Transmission System; and (2) address the short circuit, instability, and power flow issues identified in the interim Transitional Cluster Study report.

The interim and final Transitional Cluster Study Reports shall be issued within three hundred (300) and three hundred sixty (360) Calendar Days of the effective date of this LGIP, respectively, and shall be posted on Transmission Provider's OASIS consistent with the posting of other study results. Interconnection customers included in the Transitional Cluster Study shall have thirty (30) days to comment on the interim Transitional Cluster Study, once it has been issued.

After Transmission Provider issues the final Transitional Cluster Study Report, the remaining process shall proceed according to Section 11 of this LGIP. All LGIA negotiations shall be completed and the LGIA executed (or filed unexecuted) within sixty (60) Calendar Days of the tender of the draft LGIA or the Interconnection Request is deemed withdrawn unless extended by mutual agreement of Transmission Provider and Interconnection Customer. During LGIA negotiations, Transmission Provider shall not grant any request to change the previously-indicated Commercial Operation Date and to delay the construction of Transmission Provider's Interconnection Facilities or Network Upgrades if such delay would negatively affect Interconnection Customers with lower or equal Queue Positions.

If Interconnection Customer withdraws or otherwise does not reach Commercial Operation, a Withdrawal Penalty equal to nine (9) times Interconnection Customer's total study cost will be imposed.

[**5.1.1.3** If an LGIA has been submitted to FERC for approval before the effective date of the LGIP, then the LGIA would be grandfathered.

5.1.2 Transition Period.

To the extent necessary, Transmission Provider and Interconnection Customers with an outstanding request (i.e., an Interconnection Request for which an LGIA has not been submitted to FERC for approval as of the effective date of this LGIP) shall transition to

this LGIP within a reasonable period of time not to exceed sixty (60) Calendar Days. The use of the term "outstanding request" herein shall mean any Interconnection Request, on the effective date of this LGIP: (i) that has been submitted but not yet accepted by Transmission Provider; (ii) where the related interconnection agreement has not yet been submitted to FERC for approval in executed or unexecuted form, (iii) where the relevant Interconnection Study Agreements have not yet been executed, or (iv) where any of the relevant Interconnection Studies are in process but not yet completed. Any Interconnection Customer with an outstanding request as of the effective date of this LGIP may request a reasonable extension of any deadline, otherwise applicable, if necessary to avoid undue hardship or prejudice to its Interconnection Request. A reasonable extension shall be granted by Transmission Provider to the extent consistent with the intent and process provided for under this LGIP.]

* * *

Section 6. Interconnection *Information Access*[Feasibility Study]

6.1 *Informational* Interconnection [Feasibility]Study Agreement.

At any time, any prospective Interconnection Customer may request,[Simultaneously with the acknowledgement of a valid Interconnection Request]*and* Transmission Provider shall *perform, one or more Informational Interconnection Studies.* [provide to Interconnection Customer an Interconnection Feasibility Study Agreement in the form of Appendix 2.]*Any prospective Interconnection Customer (including affiliates) shall have no more than five (5) requests for Informational Interconnection Studies pending at one time. The requesting party shall submit a separate Informational Interconnection Study Request for each site and may submit multiple Informational Interconnection Study Requests for a single site. The requesting party must submit a $10,000 deposit with each Informational Interconnection Study Request even when more than one request is submitted for a single site. An Informational Interconnection Study Request to evaluate one site at two different voltage levels shall be treated as two Informational Interconnection Study Requests. At the time the Informational Interconnection Study Request is submitted, the requesting party must request either Energy Resource Interconnection Service or Network Resource Interconnection Service, as described in Section 3.2 of this LGIP; provided, however, any prospective Interconnection Customer requesting an Informational Interconnection Study for Network Resource Interconnection Service may also request that it be concurrently studied for Energy Resource Interconnection Service. The request shall use the Informational Interconnection Study Request form in Appendix 2 of this LGIP and shall describe the assumptions to be used in the Informational Interconnection Study within the scope described in Section 6.2 of this LGIP.*

Within seven (7) Business Days after receipt of an Informational Interconnection Study Request, Transmission Provider shall provide to the requesting party an Informational Interconnection Study Agreement in the form of Attachment A to Appendix 2. The *Informational* Interconnection [Feasibility]Study Agreement shall*: (1)* specify *the scope of work for the Informational Interconnection Study, subject to other requirements in Section 6.2 of this LGIP, (2) specify the technical data that the requesting party must*

provide, and (3) Transmission Provider's estimate of the cost of the Informational Interconnection Study. To the extent known by Transmission Provider, such estimate shall include any study costs expected to be incurred by any Affected System whose participation may be necessary to complete the Informational Interconnection Study. The requesting party shall execute the Informational Interconnection Study Agreement within ten (10) Business Days of receipt and deliver the Informational Interconnection Study Agreement, all required technical data, and a $10,000 deposit to Transmission Provider. [that Interconnection Customer is responsible for the actual cost of the Interconnection Feasibility Study. Within five (5) Business Days following the Scoping Meeting Interconnection Customer shall specify for inclusion in the attachment to the Interconnection Feasibility Study Agreement the Point(s) of Interconnection and any reasonable alternative Point(s) of Interconnection. Within five (5) Business Days following Transmission Provider's receipt of such designation, Transmission Provider shall tender to Interconnection Customer the Interconnection Feasibility Study Agreement signed by Transmission Provider, which includes a good faith estimate of the cost for completing the Interconnection Feasibility Study. Interconnection Customer shall execute and deliver to Transmission Provider the Interconnection Feasibility Study Agreement along with a $10,000 deposit no later than thirty (30) Calendar Days after its receipt.]

[On or before the return of the executed Feasibility Study Agreement to Transmission Provider, Interconnection Customer shall provide the technical data called for in Appendix 1, Attachment A.

If the Interconnection Feasibility Study uncovers any unexpected result(s) not contemplated during the Scoping Meeting, a substitute Point of Interconnection identified by either Interconnection Customer or Transmission Provider, and acceptable to the other, such acceptance not to be unreasonably withheld, will be substituted for the designated Point of Interconnection specified above without loss of Queue Position, and Re-studies shall be completed pursuant to Section 6.4 as applicable. For the purpose of this Section 6.1, if Transmission Provider and Interconnection Customer cannot agree on the substituted Point of Interconnection, then Interconnection Customer may direct that one of the alternatives as specified in the Interconnection Feasibility Study Agreement, as specified pursuant to Section 3.4.4, shall be the substitute.

If Interconnection Customer and Transmission Provider agree to forgo the Interconnection Feasibility Study, Transmission Provider will initiate an Interconnection System Impact Study under Section 7 of this LGIP and apply the $10,000 deposit towards the Interconnection System Impact Study.]

6.2 Scope of *Informational* Interconnection [Feasibility]Study.

The *Informational* Interconnection [Feasibility]Study shall preliminarily evaluate the feasibility of the proposed interconnection to the Transmission System.

The *Informational* Interconnection [Feasibility]Study will *consist of a sensitivity analysis based on the assumptions specified by the requesting party in the Informational Interconnection Study Agreement. The Informational Interconnection Study will identify*

the prospective Transmission Provider's Interconnection Facilities and the Network Upgrades, and the estimated cost thereof, that may be required to provide transmission service or Interconnection Service based upon the results of the Informational Interconnection Study. The Informational Interconnection Study shall be performed solely for informational purposes. Transmission Provider shall coordinate the study with any Affected Systems that may be affected by the types of Interconnection Services that are being studied. Transmission Provider shall utilize existing studies to the extent practicable in conducting the Informational Interconnection Study. The Informational Interconnection Study will consider the Base Case as well as all generating facilities (and with respect to (iii), any identified Network Upgrades) that, on the date the Interconnection Feasibility Study is commenced: (i) are directly interconnected to the Transmission System; (ii) are interconnected to Affected Systems and may have an impact on the Interconnection Request; (iii) have a pending higher queued Interconnection Request to interconnect to the Transmission System; and (iv) have no Queue Position but have executed an LGIA or requested that an unexecuted LGIA be filed with FERC. The *Informational* Interconnection [Feasibility] Study will consist of a power flow and short circuit analysis. [The Interconnection Feasibility Study will provide a list of facilities and a non-binding good faith estimate of cost responsibility and a non-binding good faith estimated time to construct.]

6.3 *Informational* Interconnection Feasibility Study Procedures.

[Transmission Provider shall utilize existing studies to the extent practicable when it performs the study.] Transmission Provider shall [use Reasonable Efforts to]complete the *Informational* Interconnection [Feasibility]Study no later than forty-five (45) Calendar Days after Transmission Provider receives the fully executed *Informational* Interconnection [Feasibility]Study Agreement. *If Transmission Provider is unable to complete the Informational Interconnection Study within such time period, it will notify the requesting party and provide an estimated completion date and an explanation of the reasons why additional time is required.* [At the request of Interconnection Customer or at any time Transmission Provider determines that it will not meet the required time frame for completing the Interconnection Feasibility Study, Transmission Provider shall notify Interconnection Customer as to the schedule status of the Interconnection Feasibility Study. If Transmission Provider is unable to complete the Interconnection Feasibility Study within that time period, it shall notify Interconnection Customer and provide an estimated completion date with an explanation of the reasons why additional time is required. Upon request, Transmission Provider shall provide Interconnection Customer supporting documentation, workpapers and relevant power flow, short circuit and stability databases for the Interconnection Feasibility Study, subject to confidentiality arrangements consistent with Section 13.1.

Transmission Provider shall study the Interconnection Request at the level of service requested by the Interconnection Customer, unless otherwise required to study the full Generating Facility Capacity due to safety or reliability concerns.

6.3.1 Meeting with Transmission Provider.

Within ten (10) Business Days of providing an Interconnection Feasibility Study report to Interconnection Customer, Transmission Provider and Interconnection Customer shall meet to discuss the results of the Interconnection Feasibility Study.]

6.4 *Publicly Posted Interconnection Information.* [Re-Study.]

[If Re-Study of the Interconnection Feasibility Study is required due to a higher queued project dropping out of the queue, or a modification of a higher queued project subject to Section 4.4, or re-designation of the Point of Interconnection pursuant to Section 6.1 Transmission Provider shall notify Interconnection Customer in writing. Such Re-Study shall take not longer than forty-five (45) Calendar Days from the date of the notice. Any cost of Re-Study shall be borne by [the] Interconnection Customer being re-studied.] *Transmission Provider shall maintain and make available on its public website: (1) an interactive visual representation of the estimated incremental injection capacity (in megawatts) available at each bus in Transmission Provider's footprint under N-1 conditions, and (2) a table of metrics concerning the estimated impact of a potential generating facility on Transmission Provider's Transmission System based on a user-specified addition of a particular number of megawatts at a particular voltage level at a particular point of interconnection. At a minimum, for each monitored facility impacted by the user-specified generation addition, the following information will be provided in the table: (1) the distribution factor; (2) the megawatt impact (based on the proposed project size and the distribution factor); (3) the percentage impact on the monitored facility (based on the megawatt values of the proposed project and the monitored facility rating); (4) the percentage of power flow on the monitored facility before the proposed project; (5) the percentage power flow on the monitored facility after the injection of the proposed project. These metrics must be calculated based on the power flow model of the Transmission System with the transfer simulated from each bus to the whole Transmission Provider's footprint (to approximate Network Resource Interconnection Service), and with the incremental capacity at each bus decremented by the existing and queued generation (based on the existing or requested interconnection service limit of the generation). These metrics must be updated within 30 days after the completion of each Cluster Study and Cluster Re-Study period. This information must be made available on Transmission Provider's public website, without a password or a fee. The website will define all underlying assumptions, including the name of the most recent Cluster Study or Re-Study used in the base case and disclaimers for any interconnection constraints not included or considered.*

Section 7. [Interconnection System Impact]*Cluster* Study

7.1 [Interconnection System Impact]*Cluster* Study Agreement.

[Unless otherwise agreed, pursuant to the Scoping Meeting provided in Section 3.4.4, simultaneously with the delivery of the Interconnection Feasibility Study to Interconnection Customer]*No later than five (5) Business Days after the close of a Cluster Request Window*, Transmission Provider shall [provide]*tender* to *each* Interconnection Customer [an]*that submitted a valid* Interconnection[System Impact] *Request a Cluster* Study Agreement in the form of Appendix 3 to this LGIP. The [Interconnection System Impact]*Cluster* Study Agreement shall [provide that]*require*

Interconnection Customer [shall]*to* compensate Transmission Provider for the actual cost of the [Interconnection System Impact Study.]*Cluster Study pursuant to Section 13.3 of this LGIP. The specifications, assumptions, or other provisions in the appendices of the Cluster Study Agreement provided pursuant to Section 7.1 of this LGIP shall be subject to change by Transmission Provider following the conclusion of the Scoping Meeting.* [Within three (3) Business Days following the Interconnection Feasibility Study results meeting, Transmission Provider shall provide to Interconnection Customer a non-binding good faith estimate of the cost and timeframe for completing the Interconnection System Impact Study.]

7.2 Execution of [Interconnection System Impact]*Cluster* Study Agreement.

Interconnection Customer shall execute the [Interconnection System Impact]*Cluster* Study Agreement and deliver the executed [Interconnection System Impact]*Cluster* Study Agreement to Transmission Provider no later than [thirty (30) Calendar Days after its receipt along with demonstration of Site Control, and a $50,000 deposit]*the close of the Customer Engagement Window*.

If Interconnection Customer does not provide all such technical data when it delivers the [Interconnection System Impact]*Cluster* Study Agreement, Transmission Provider shall notify Interconnection Customer of the deficiency within five (5) Business Days of the receipt of the executed [Interconnection System Impact]*Cluster* Study Agreement and Interconnection Customer shall cure the deficiency within ten (10) Business Days of receipt of the notice, provided, however, such deficiency does not include failure to deliver the executed [Interconnection System Impact]*Cluster* Study Agreement or deposit.

[If the Interconnection System Impact Study uncovers any unexpected result(s) not contemplated during the Scoping Meeting and the Interconnection Feasibility Study, a substitute Point of Interconnection identified by either Interconnection Customer or Transmission Provider, and acceptable to the other, such acceptance not to be unreasonably withheld, will be substituted for the designated Point of Interconnection specified above without loss of Queue Position, and restudies shall be completed pursuant to Section 7.6 as applicable. For the purpose of this Section 7.2, if Transmission Provider and Interconnection Customer cannot agree on the substituted Point of Interconnection, then Interconnection Customer may direct that one of the alternatives as specified in the Interconnection Feasibility Study Agreement, as specified pursuant to Section 3.4.4, shall be the substitute.]

7.3 Scope of [Interconnection System Impact]*Cluster* Study.

The [Interconnection System Impact]*Cluster* Study shall evaluate the impact of the proposed interconnection on the reliability of the Transmission System. The [Interconnection System Impact]*Cluster* Study will consider the Base Case as well as all generating facilities (and with respect to (iii) below, any identified Network Upgrades associated with such higher queued interconnection) that, on the date the [Interconnection System Impact]*Cluster* Study is commenced: (i) are directly interconnected to the Transmission System; (ii) are interconnected to Affected Systems and may have an

impact on the Interconnection Request; (iii) have a pending higher queued Interconnection Request to interconnect to the Transmission System; and (iv) have no Queue Position but have executed an LGIA or requested that an unexecuted LGIA be filed with FERC.

For purposes of determining necessary Interconnection Facilities and Network Upgrades, the Cluster Study shall consider the level of Interconnection Service requested by Interconnection Customers in the Cluster, unless otherwise required to study the full Generating Facility Capacity due to safety or reliability concerns.

The [Interconnection System Impact]*Cluster* Study will consist of [a short circuit analysis, a]*power flow*, stability [analysis, and a power flow analysis. The Interconnection System Impact Study],*and short circuit analyses, the results of which are documented in a single Cluster Study Report, or Cluster Re-Study Report, as applicable. At the conclusion of the Cluster Study, Transmission Provider will issue a Cluster Study Report. The Cluster Study Report* will state the assumptions upon which it is based; state the results of the analyses; and provide the requirements 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. [For purposes of determining necessary]*The Cluster Study Report shall identify Transmission Provider's* Interconnection Facilities and Network Upgrades [, the System Impact Study shall consider the level of Interconnection Service requested by the Interconnection Customer, unless otherwise required to study the full Generating Facility Capacity due to safety or reliability concerns.]*expected to be required to reliably interconnect the Generating Facilities in that Cluster Study at the requested Interconnection Service level and shall provide non-binding estimates for required Network Upgrades. The Cluster Study Report shall identify each Interconnection Customer's estimated allocated costs for Transmission Provider's Interconnection Facilities and Network Upgrades pursuant to the method in Section 4.2.3 of this LGIP. Transmission Provider shall hold an open stakeholder meeting pursuant to Section 7.4 of this LGIP.*

For purposes of determining necessary Interconnection Facilities and Network Upgrades, the Cluster Study shall use operating assumptions, including charge and discharge parameters, that reflect the proposed operation of the Electric Storage Resource or Co-Located Resource containing an Electric Storage Resource (including a hybrid resource) as requested by Interconnection Customer, unless Good Utility Practice, including applicable reliability standards, otherwise require the use of different operating assumptions. If Interconnection Customer makes this request, Transmission Provider may (1) require that Interconnection Customer specify the intended operation of the resource in the LGIA, (2) require that Interconnection Customer demonstrate that the resource has control technologies sufficient to limit its operation as intended and to respond to dispatch instructions by Transmission Provider, and/or (3) pursue termination of the LGIA pursuant to Article 17 of the LGIA if Interconnection Customer fails to operate the Electric Storage Resource or Co-Located Resource containing an Electric Storage Resource (including a hybrid resource) in accordance with its intended operation as specified in the LGIA.

[The Interconnection System Impact Study]*The Cluster Study Report* will provide a list of facilities that are required as a result of the Interconnection [Request]*Requests within the cluster* and a non-binding good faith estimate of cost responsibility and a non-binding good faith estimated time to construct.

Upon issuance of a Cluster Study Report, or Cluster Re-Study Report, if any, Transmission Provider shall simultaneously tender a draft Facilities Study Agreement to each Interconnection Customer within the Cluster, subject to the conditions in Section 8.1 of this LGIP.

At the request of any Interconnection Customer within the Cluster, the Cluster Study will evaluate advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, static VAR compensators, and/or electric storage resource that provides a transmission service for feasibility, cost, and time savings as either an alternative to the Network Upgrade(s) identified by the Cluster Study or to provide Provisional Interconnection Service. Transmission Provider shall include the evaluation in the Cluster Study Report.

7.4 [Interconnection System Impact]*Cluster* Study Procedures.

Transmission Provider shall coordinate the [Interconnection System Impact]*Cluster* Study with any Affected System that is affected by the Interconnection Request pursuant to Section 3.6 [above]*of this LGIP*. Transmission Provider shall utilize existing studies to the extent practicable when it performs the [study]*Cluster Study. Interconnection Requests for a Cluster Study may be submitted only within the Cluster Request Window and* Transmission Provider shall [use Reasonable Efforts to complete the Interconnection System Impact Study within ninety (90) Calendar Days after the receipt of the Interconnection System Impact Study Agreement or notification to proceed, study payment, and technical data. If Transmission Provider uses Clustering, Transmission Provider shall use Reasonable Efforts to deliver a completed Interconnection System Impact Study within ninety (90) Calendar Days after the close of the Queue Cluster Window.]*initiate the Cluster Study process pursuant to Section 7 of this LGIP.*

Unless re-studies are required pursuant to Section 7.5 of this LGIP, Transmission Provider shall complete the Cluster Study within one hundred fifty (150) Calendar Days of the close of the Customer Engagement Window.

Within ten (10) Business Days of simultaneously furnishing a Cluster Study Report (or, as applicable, Cluster Re-Study Report) and a draft Interconnection Facilities Study Agreement to each Interconnection Customer within the Cluster and posting such report on OASIS, Transmission Provider shall convene an open meeting to discuss the study results (a Cluster Study Report Meeting or Cluster Re-Study Report Meeting). Transmission Provider shall, upon request, also make itself available to meet with individual Interconnection Customers after the report is provided.

At the request of Interconnection Customer or at any time Transmission Provider determines that it will not meet the required time frame for completing the [Interconnection System Impact]*Cluster* Study, Transmission Provider shall notify

Interconnection Customer*s* as to the schedule status of the [Interconnection System Impact]*Cluster* Study. If Transmission Provider is unable to complete the [Interconnection System Impact]*Cluster* Study within the time period, it shall notify Interconnection Customer*s* and provide an estimated completion date with an explanation of the reasons why additional time is required. Upon request, Transmission Provider shall provide *to* Interconnection Customer*s* all supporting documentation, workpapers and relevant pre-Interconnection Request and post-Interconnection Request power flow, short circuit and stability databases for the [Interconnection System Impact]*Cluster* Study, subject to confidentiality arrangements consistent with Section 13.1 *of this LGIP*.

*7.***5** ***Cluster Study Re-Studies***

(1) Within twenty (20) Calendar Days after the Cluster Study Report Meeting, Interconnection Customer must provide the following:

(a) Study deposit pursuant to Section 3.1.1.1 of this LGIP;

(b) Demonstration of Site Control pursuant to Section 3.4.2(iii) of this LGIP; and

(c) One of the Commercial Readiness Demonstration options in Section 3.4.2(vi)(a)-(c) of this LGIP totaling the entire Generating Facility Capacity (or requested Interconnection Service amount if the requested Interconnection Service is less than the Generating Facility Capacity), or, in the alternative, a Commercial Readiness Deposit equal to five (5) times the study deposit described in Section 3.1.1.1 of this LGIP in the form of an irrevocable letter of credit or cash in lieu of the Commercial Readiness Demonstration. Transmission Provider shall refund the security to Interconnection Customer upon withdrawal in accordance with Section 3.7 of this LGIP.

Interconnection Customer shall promptly inform Transmission Provider of any material change to Interconnection Customer's demonstration of Site Control under Section 3.4.2(iii) of this LGIP or its satisfaction of a Commercial Readiness Demonstration as selected under Section 3.4.2(vi)(a)-(c) of this LGIP. Upon Transmission Provider determining separately that Interconnection Customer no longer satisfies Site Control or a Commercial Readiness Demonstration, Transmission Provider shall notify Interconnection Customer. Within ten (10) Business Days of such notification, Interconnection Customer must demonstrate satisfaction with the applicable requirement subject to Transmission Provider's approval, not to be unreasonably withheld. If the material change is related to Interconnection Customer's Commercial Readiness Demonstration, Interconnection Customer has the option to submit a Commercial Readiness Deposit pursuant to Section 7.5(1)(c) of this LGIP before the end of the ten (10) Business Day cure period. Absent such demonstration, Transmission Provider will deem the subject Interconnection Request withdrawn.

(2) If no Interconnection Customer withdraws from the Cluster after completion of the Cluster Study or Cluster Re-Study or is deemed withdrawn pursuant to Section 3.7 of this LGIP after completion of the Cluster Study or Cluster Re-Study, Transmission Provider

shall electronically notify Interconnection Customers in the Cluster that a Cluster Re-Study is not required.

(3) If one or more Interconnection Customers withdraws from the Cluster, Transmission Provider shall determine if a Cluster Re-Study is necessary. If Transmission Provider determines a Cluster Re-Study is not necessary, Transmission Provider shall provide an updated Cluster Study Report within thirty (30) Calendar Days of such determination. When the updated Cluster Study Report is issued, Transmission Provider shall electronically notify Interconnection Customers in the Cluster that a Cluster Re-Study is not required.

(4) If one or more Interconnection Customers withdraws from the Cluster and Transmission Provider determines a Cluster Re-Study is necessary as a result, Transmission Provider will continue with such re-studies until Transmission Provider determines that no further re-studies are required. If an Interconnection Customer withdraws during the Interconnection Facilities Study, or after other Interconnection Customers in the same Cluster have executed LGIAs, or requested that unexecuted LGIAs be filed with FERC, and Transmission Provider determines a Cluster Re-Study is necessary, the Cluster shall be re-studied. Transmission Provider shall electronically notify Interconnection Customers in the Cluster and post on OASIS that a Cluster Re-Study is required.

(5) The scope of any Cluster Re-study shall be consistent with the scope of an initial Cluster Study pursuant to Section 7.3 of this LGIP. Transmission Provider shall complete the Cluster Re-Study within one hundred fifty (150) Calendar Days of the commencement of the first Cluster Re-Study. The results of the Cluster Re-Study shall be combined into a single report (Cluster Re-Study Report). Transmission Provider shall hold an open stakeholder meeting (Cluster Re-Study Report Meeting) within ten (10) Business Days of publishing the Cluster Re-Study Report on OASIS.

If additional re-studies are required, Interconnection Customer and Transmission Provider shall follow the procedures of this Section 7.5 of this LGIP until such time that Transmission Provider determines that no further re-studies are required. Transmission Provider shall electronically notify each Interconnection Customer within the Cluster when no further re-studies are required.

[**Meeting with Transmission Provider.**

Within ten (10) Business Days of providing an Interconnection System Impact Study report to Interconnection Customer, Transmission Provider and Interconnection Customer shall meet to discuss the results of the Interconnection System Impact Study.

7.6 Re-Study.]*(6)* If Re-Study of the [Interconnection System Impact Study]*Cluster Study other than the Re-Study described in Section 7.5(1)-(5) of this LGIP* is required due to a higher *or equal priority* queued project [dropping out of]*withdrawing from* the queue, or a modification of a higher *or equal priority* queued project subject to *Section* 4.4 *of this LGIP*, [or re-designation of the Point of Interconnection pursuant to Section 7.2]Transmission Provider shall notify Interconnection Customer*(s)* in writing.

[Such]*Transmission Provider shall complete such* Re-Study [shall]within [sixty (60]*one hundred fifty (150*) Calendar Days from the date of notice. [Any]*Except as provided in Section 3.7 of this LGIP in the case of withdrawing Interconnection Customers, any* cost of Re-Study shall be borne by [the]Interconnection Customer*(s)* being re-studied.

Section 8. Interconnection Facilities Study

8.1 Interconnection Facilities Study Agreement.

Simultaneously with the delivery of the [Interconnection System Impact Study to Interconnection Customer]*final Cluster Study Report, or Cluster Re-Study Report if applicable*, Transmission Provider shall provide to Interconnection Customer an Interconnection Facilities Study Agreement in the form of Appendix 4 to this LGIP. The Interconnection Facilities Study Agreement shall provide that Interconnection Customer shall compensate Transmission Provider for the actual cost of the Interconnection Facilities Study. [Within three (3) Business Days following the Interconnection System Impact Study results meeting,]Transmission Provider shall provide to Interconnection Customer a non-binding good faith estimate of the cost and timeframe for completing the Interconnection Facilities Study.

Interconnection Customer shall execute the Interconnection Facilities Study Agreement and deliver the executed Interconnection Facilities Study Agreement to Transmission Provider within thirty (30) Calendar Days after its receipt, together with[the]*:*

(1) any required technical data[and the greater of $100,000 or Interconnection Customer's portion of the estimated monthly cost of conducting the Interconnection Facilities Study.]*;*

(2) Study deposit pursuant to Section 3.1.1.1 of this LGIP;

(3) Demonstration of Site Control pursuant to Section 3.4.2(iii) of this LGIP; and

(4) One of the following Commercial Readiness Demonstration options totaling the entire capacity of the Generating Facility (or requested Interconnection Service amount if the requested Interconnection Service is less than the Generating Facility Capacity), or a Commercial Readiness Deposit security equal to seven (7) times the study deposit described in Section 3.1.1.1 of this LGIP in the form of an irrevocable letter of credit or cash in lieu of the Commercial Readiness Demonstration. Transmission Provider shall refund the security to Interconnection Customer according to Section 3.7 of this LGIP.

> *(a) Executed contract binding on the parties for sale of (1) the constructed Generating Facility to a load-serving entity or to a commercial, industrial, or other large end-use customer, (2) the Generating Facility's energy or capacity where the term of sale is not less than five (5) years, or (3) the Generating Facility's ancillary services where the term of sale is not less than five (5) years;*
>
> *(b) Reasonable evidence that the Generating Facility has been selected in an Resource Plan or Resource Solicitation Process by or for a load-serving entity, is*

being developed by a load-serving entity, or is being developed for purposes of a sale to a commercial, industrial, or other large end-use customer; or

(c) A Provisional LGIA that has been filed at the Commission executed, or requested to be filed unexecuted, which is not in suspension pursuant to Article 5.16 of the LGIA, and includes a commitment to construct the Generating Facility.

Interconnection Customer shall promptly inform Transmission Provider of any material change to Interconnection Customer's demonstration of Site Control under Section 3.4.2(iii) of this LGIP or its satisfaction of a Commercial Readiness Demonstration.

Upon Transmission Provider determining separately that Interconnection Customer no longer satisfies Site Control or a Commercial Readiness Option, Transmission Provider shall give Interconnection Customer ten (10) Business Days to demonstrate satisfaction with the applicable requirement subject to Transmission Provider's approval, not to be unreasonably withheld. If the material change is related to Interconnection Customer's Commercial Readiness Demonstration, Interconnection Customer has the option to submit a Commercial Readiness Deposit pursuant before the end of the ten (10) Business Day cure period. Absent such demonstration, Transmission Provider will deem the subject Interconnection Request withdrawn.
[**8.1.1** Transmission Provider shall invoice Interconnection Customer on a monthly basis for the work to be conducted on the Interconnection Facilities Study each month. Interconnection Customer shall pay invoiced amounts within thirty (30) Calendar Days of receipt of invoice. Transmission Provider shall continue to hold the amounts on deposit until settlement of the final invoice.]

8.2 Scope of Interconnection Facilities Study.

The Interconnection Facilities Study *shall be specific to each Interconnection Request and performed on an individual, i.e., non-clustered, basis. The Interconnection Facilities Study* shall specify and *provide a non-binding* estimate *of* the cost of the equipment, engineering, procurement and construction work needed to implement the conclusions of the [Interconnection System Impact Study]*Cluster Study Report (and any associated re-studies)* in accordance with Good Utility Practice to physically and electrically connect the Interconnection [Facility]*Facilities* to the Transmission System. The Interconnection Facilities Study shall also identify the electrical switching configuration of the connection equipment, including, without limitation: the transformer, switchgear, meters, and other station equipment; the nature and estimated cost of any Transmission Provider's Interconnection Facilities and Network Upgrades necessary to accomplish the interconnection; and an estimate of the time required to complete the construction and installation of such facilities. The *Interconnection* Facilities Study will also identify any potential control equipment for [requests for]*(1)* requests for Interconnection Service that are lower than the Generating Facility Capacity[.]*, and/or (2) requests to model an Electric Storage Resource or Co-Located Resource containing an Electric Storage Resource (including a hybrid resource) using operating assumptions that reflect its proposed operation, as requested by Interconnection Customer, unless Good Utility Practice, including applicable reliability standards, otherwise require the use of different operating assumptions. . At the request of any Interconnection Customer, the*

Interconnection Facilities Study will evaluate advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and/or static VAR compensators, for feasibility, cost, and time savings as either an alternative to the Network Upgrade(s) identified by the Cluster Study or to provide Provisional Interconnection Service. Transmission Provider shall include the evaluation in the Interconnection Facilities Study report.

8.3 Interconnection Facilities Study Procedures

Transmission Provider shall coordinate the Interconnection Facilities Study with any Affected System pursuant to Section 3.6 *of this LGIP*. Transmission Provider shall utilize existing studies to the extent practicable in performing the Interconnection Facilities Study. Transmission Provider shall [use Reasonable Efforts to]complete the study and issue a draft Interconnection Facilities Study report to Interconnection Customer within the following number of days after receipt of an executed Interconnection Facilities Study Agreement: ninety (90) Calendar Days *after receipt of an executed Interconnection Facilities Study Agreement*, with no more than a +/- 20 percent cost estimate contained in the report; or one hundred eighty (180) Calendar Days, if Interconnection Customer requests a +/- 10 percent cost estimate.

* * *

Interconnection Customer may, within thirty (30) Calendar Days after receipt of the draft *Interconnection Facilities Study* report, provide written comments to Transmission Provider, which Transmission Provider shall include in *completing* the final *Interconnection Facilities Study* report. Transmission Provider shall issue the final Interconnection Facilities Study report within fifteen (15) Business Days of receiving Interconnection Customer's comments or promptly upon receiving Interconnection Customer's statement that it will not provide comments. Transmission Provider may reasonably extend such fifteen[-day] *(15) Business Day* period upon notice to Interconnection Customer if Interconnection Customer's comments require Transmission Provider to perform additional analyses or make other significant modifications prior to the issuance of the final Interconnection Facilities *Study* Report. Upon request, Transmission Provider shall provide Interconnection Customer supporting documentation, workpapers, and databases or data developed in the preparation of the Interconnection Facilities Study, subject to confidentiality arrangements consistent with Section 13.1 *of this LGIP*.

* * *

8.5 Re-Study.

If Re-Study of the Interconnection Facilities Study is required due to a higher *or equal priority* queued project dropping out of the queue or a modification of a higher *or equal priority* queued project pursuant to Section 4.4 *of this LGIP*, Transmission Provider shall so notify Interconnection Customer in writing. [Such]*Transmission Provider shall ensure that such* Re-Study [shall]takes no longer than sixty (60) Calendar Days from the date of notice. *Except as provided in Section 3.7 of this LGIP in the case of withdrawing*

Interconnection Customers, any cost of Re-Study shall be borne by [the]Interconnection Customer being re-studied.

Section 9 [Engineering & Procurement ('E&P') Agreement]*Affected System Study*.

9.1 Applicability

This section 9 applies to Transmission Provider when acting as an Affected System.

9.2 Affected System Queue Position.

Transmission Provider must assign a Queue Position to Affected System Interconnection Customer(s) that require(s) an Affected System Study. This Queue Position shall be higher-queued than any Cluster that has not yet received its Cluster Study results and shall be lower-queued than any Cluster that has already received its Cluster Study results.

9.3 Affected System Study Agreement.

Unless otherwise agreed, pursuant to the Affected System Scoping Meeting provided in Section 3.6.2, Transmission Provider shall provide to Affected System Interconnection Customer an Affected System Study Agreement in the form of Appendix 15 to this LGIP within five (5) Business Days of Transmission Provider sharing the schedule for the Affected System Study. The Affected System Study Agreement shall provide that Affected System Interconnection Customer shall compensate Transmission Provider for the actual cost of the Affected System Study. Within fifteen (15) Business Days after the Affected System Scoping Meeting, Transmission Provider shall provide to Affected System Interconnection Customer a non-binding good faith estimate of the cost and timeframe for completing the Affected System Study.

9.4 Execution of Affected System Study Agreement.

Affected System Interconnection Customer shall execute the Affected System Study Agreement and deliver the executed Affected System Study Agreement to Transmission Provider within ten (10) Business Days of receipt.

If Affected System Interconnection Customer does not provide all required technical data when it delivers the Affected System Study Agreement, Transmission Provider shall notify Affected System Interconnection Customer of the deficiency within five (5) Business Days of the receipt of the executed Affected System Study Agreement and Affected System Interconnection Customer shall cure the deficiency within ten (10) Business Days of receipt of the notice, provided, however, that such deficiency does not include failure to deliver the executed Affected System Study Agreement or deposit.

9.5 Scope of Affected System Study.

The Affected System Study shall evaluate the impact of the Affected System Interconnection Customer's proposed interconnection on the reliability of Transmission

Provider's Transmission System. The Affected System Study will consider the Base Case as well as all generating facilities (and with respect to (iii) below, any identified Affected System Network Upgrades associated with such higher-queued interconnection) that, on the date the Affected System Study is commenced: (i) are directly interconnected to Transmission Provider's Transmission System; (ii) are interconnected to Affected Systems and may have an impact on Affected System Interconnection Customer's interconnection request; (iii) have a pending higher-queued Interconnection Request to interconnect to Transmission Provider's Transmission System; and (iv) have no Queue Position but have executed an LGIA or requested that an unexecuted LGIA be filed with FERC.

The Affected System Study will consist of a short circuit analysis, thermal overload or voltage limit identification, a stability analysis, and a power flow analysis. The Affected System Study will state the assumptions upon which it is based; state the results of the analyses; and provide the requirements 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. For purposes of determining necessary Affected System Network Upgrades, the Affected System Study shall consider the level of interconnection service requested in megawatts by Affected System Interconnection Customer, unless otherwise required to study the full generating facility capacity due to safety or reliability concerns. The Affected System Study will provide a list of facilities that are required as a result of Affected System Interconnection Customer's proposed interconnection and a non-binding good faith estimate of cost responsibility and a non-binding good faith estimated time to construct.

9.6 Affected System Study Procedures.

Transmission Provider shall utilize existing studies to the extent practicable when it performs the Affected System Study. Transmission Provider will use the same Energy Resource Interconnection Service modeling standard used for Interconnection Customers on its own Transmission System. Transmission Provider shall complete the Affected System Study and provide the Affected System Study Report to Affected System Interconnection Customer within ninety (90) Calendar Days after the receipt of the Affected System Study Agreement.

At the request of Affected System Interconnection Customer, or at any time Transmission Provider determines that it will not meet the required time frame for completing the Affected System Study, Transmission Provider shall notify Affected System Interconnection Customer as to the schedule status of the Affected System Study. If Transmission Provider is unable to complete the Affected System Study within the requisite time period, it shall notify Affected System Interconnection Customer and provide an estimated completion date with an explanation of the reasons why additional time is required. If Transmission Provider does not meet the deadlines in this section, Transmission Provider will be subject to the financial penalties as described in Section 3.9 of this LGIP. Upon request, Transmission Provider shall provide Affected System Interconnection Customer all supporting documentation, workpapers and relevant power

flow, short circuit and stability databases for the Affected System Study, subject to confidentiality arrangements consistent with Section 13.1 of this LGIP.

Transmission Provider must study an Affected System Interconnection Customer using an Energy Resource Interconnection Service modeling standard, regardless of the level of service that Affected System Interconnection Customer is seeking from the transmission provider with whom interconnection has been requested. In the event Transmission Provider believes that it is necessary to study an Affected System Interconnection Customer that is requesting Network Resource Interconnection Service using Network Resource Interconnection Service modeling standards, Transmission Provider may make such a request to the Commission by filing under section 205 of the Federal Power Act.

9.7 Meeting with Transmission Provider.

Within ten (10) Business Days of providing the Affected System Study Report to Affected System Interconnection Customer, Transmission Provider and Affected System Interconnection Customer shall meet to discuss the results of the Affected System Study.

9.8 Affected System Cost Allocation.

Transmission Provider will allocate Affected System Network Upgrade costs identified during the Affected System Study to Affected System Interconnection Customer(s) using a proportional impact as described in Section 4.2.3 of this LGIP.

9.9 Tender of Affected Systems Facilities Construction Agreement.

Transmission Provider will tender to Affected System Interconnection Customer an Affected System Facilities Construction Agreement within thirty (30) Calendar Days of providing the Affected System Study Report. Affected System Interconnection Customer must notify Transmission Provider within five (5) Business Days of executing Affected System Interconnection Customer's LGIA whether it would like to execute the agreement or if it requests the agreement to be filed unexecuted with FERC. Transmission Provider will execute the agreement or file the agreement unexecuted within five (5) Business Days after receiving direction from Affected System Interconnection Customer.

9.10 Re-Study.

If Re-Study of the Affected System Study is required, Transmission Provider shall notify Affected System Interconnection Customer in writing. Such Re-Study shall take no longer than sixty (60) Calendar Days from the date of notice. Any cost of Re-Study shall be borne by the Affected System Interconnection Customer being re-studied.
[Prior to executing an LGIA, an Interconnection Customer may, in order to advance the implementation of its interconnection, request and Transmission Provider shall offer the Interconnection Customer, an E&P Agreement that authorizes Transmission Provider to begin engineering and procurement of long lead-time items necessary for the establishment of the interconnection. However, Transmission Provider shall not be obligated to offer an E&P Agreement if Interconnection Customer is in Dispute Resolution as a result of an allegation that Interconnection Customer has failed to meet

any milestones or comply with any prerequisites specified in other parts of the LGIP. The E&P Agreement is an optional procedure and it will not alter the Interconnection Customer's Queue Position or In-Service Date. The E&P Agreement shall provide for Interconnection Customer to pay the cost of all activities authorized by Interconnection Customer and to make advance payments or provide other satisfactory security for such costs.

Interconnection Customer shall pay the cost of such authorized activities and any cancellation costs for equipment that is already ordered for its interconnection, which cannot be mitigated as hereafter described, whether or not such items or equipment later become unnecessary. If Interconnection Customer withdraws its application for interconnection or either Party terminates the E&P Agreement, to the extent the equipment ordered can be canceled under reasonable terms, Interconnection Customer shall be obligated to pay the associated cancellation costs. To the extent that the equipment cannot be reasonably canceled, Transmission Provider may elect: (i) to take title to the equipment, in which event Transmission Provider shall refund Interconnection Customer any amounts paid by Interconnection Customer for such equipment and shall pay the cost of delivery of such equipment, or (ii) to transfer title to and deliver such equipment to Interconnection Customer, in which event Interconnection Customer shall pay any unpaid balance and cost of delivery of such equipment.]

* * *

Section 11. Standard Large Generator Interconnection Agreement (LGIA)

11.1 Tender.

Interconnection Customer shall tender comments on the draft Interconnection Facilities Study Report within thirty (30) Calendar Days of receipt of the report. Within thirty (30) Calendar Days after the comments are submitted *or after Interconnection Customer notifies Transmission Provider that it will not provide comments*, Transmission Provider shall tender a draft LGIA, together with draft appendices. The draft LGIA shall be in the form of Transmission Provider's FERC-approved standard form LGIA, which is in Appendix 6. Interconnection Customer shall execute and return the completed draft appendices within thirty (30) Calendar Days*, unless the (60) Calendar Day negotiation period under Section 11.2 of this LGIP has commenced*.

* * *

11.3 Execution and Filing.

Simultaneously with submitting the executed LGIA to Transmission Provider, [Within fifteen (15) Business Days after receipt of the final executed LGIA,]Interconnection Customer shall provide Transmission Provider *with* [(A) reasonable evidence that continued Site Control or (B) posting of $250,000, non-refundable additional security, which shall be applied toward future construction costs]*(1) demonstration of continued Site Control pursuant to Section 3.4.2(iii) of this LGIP; and (2) per Section 3.1.1.3 of this LGIP, a deposit equal to nine (9) times the amount required in Section 3.1.1.1 of this*

LGIP. If Interconnection Customer reaches Commercial Operation, this deposit will be refunded to Interconnection Customer, including any accumulated interest. Transmission Provider must not suspend the LGIA under LGIA Article 5.16 until Interconnection Customer has provided 1 and 2 to Transmission Provider. If Interconnection Customer fails to provide 1 and 2 to Transmission Provider with fifteen (15) Business Days, the Interconnection Request will be deemed withdrawn, subject to Withdrawal Penalties per Section 3.7.1 of this LGIP.

At the same time, Interconnection Customer also shall provide reasonable evidence that one or more of the following milestones*, unless such milestone is inapplicable due to the characteristics of the Generating Facility*, in the development of the [Large]Generating Facility, at Interconnection Customer election, has been achieved: (i) the execution of a contract for the supply or transportation of fuel to the [Large]Generating Facility ; (ii) the execution of a contract for the supply of cooling water to the [Large]Generating Facility; (iii) execution of a contract for the engineering for, procurement of major equipment for, or construction of, the [Large]Generating Facility; (iv) execution of a contract *(or comparable evidence)* for the sale of electric energy or capacity from the [Large]Generating Facility; [or] (v) application for an air, water, or land use permit[.]*; or (vi) Commercial Readiness Demonstration pursuant to Section 8.1 of this LGIP (Commercial Readiness Deposit is not allowed).*

* * *

Section 12. Construction of Transmission Provider's Interconnection Facilities and Network Upgrades

* * *

12.2.4 Amended Interconnection [System Impact]*Cluster* Study *Report*.

An Interconnection [System Impact]*Cluster* Study Report will be amended to determine the facilities necessary to support the requested In-Service Date. This amended study *report* will include those transmission and [Large]Generating Facilities that are expected to be in service on or before the requested In-Service Date.

* * *

Section 13. Miscellaneous

13.1 Confidentiality

* * *

13.1.9 Subject to the exception in Section 13.1.8 *of this LGIP*, any information that a Party claims is competitively sensitive, commercial or financial information ("Confidential Information") shall not be disclosed by the other Party to any person not employed or retained by the other Party, except to the extent disclosure is (i) required by law; (ii) reasonably deemed by the disclosing Party to be required to be disclosed in

connection with a dispute between or among the Parties, or the defense of litigation or dispute; (iii) otherwise permitted by consent of the other Party, such consent not to be unreasonably withheld; or (iv) necessary to fulfill its obligations under this LGIP or as a transmission service provider or a [Control Area]*Balancing Authority Area* operator including disclosing the Confidential Information to an RTO or ISO or to a subregional, regional or national reliability organization or planning group. The Party asserting confidentiality shall notify the other Party in writing of the information it claims is confidential. Prior to any disclosures of the other Party's Confidential Information under this subparagraph, or if any third party or Governmental Authority makes any request or demand for any of the information described in this subparagraph, the disclosing Party agrees to promptly notify the other Party in writing and agrees to assert confidentiality and cooperate with the other Party in seeking to protect the Confidential Information from public disclosure by confidentiality agreement, protective order or other reasonable measures.

* * *

13.3 Obligation for Study Costs

In the event an Interconnection Customer withdraws its Interconnection Request prior to the commencement of the Cluster Study, Interconnection Customer must pay Transmission Provider the actual costs of processing its Interconnection Request. Interconnection Customer will not be assessed a Withdrawal Penalty in this case. Transmission Provider shall charge and Interconnection Customer shall pay the actual costs of the Interconnection Studies. *The costs of Cluster Studies and Cluster Re-Studies shall be allocated among each Interconnection Customer within the Cluster as follows: (1) ninety percent (90%) of the applicable study costs on a pro-rata basis based on requested megawatts included in the applicable Cluster; and (2) ten percent (10%) of the applicable study costs on a per capita basis based on the number of Interconnection Requests included in the applicable Cluster.*

Any difference between the study deposit and the actual cost of the applicable Interconnection Study shall be paid by or refunded, except as otherwise provided herein, to Interconnection [Customer]*Customers* or offset against the cost of any future Interconnection Studies associated with the applicable [Interconnection Request]*Cluster* prior to beginning of any such future Interconnection Studies. Any invoices for Interconnection Studies shall include a detailed and itemized accounting of the cost of each Interconnection Study. Interconnection [Customer]*Customers* shall pay any such undisputed costs within thirty (30) Calendar Days of receipt of an invoice therefor. *Any Interconnection Customer that fails to pay such undisputed costs within the time allotted shall be deemed withdrawn from the Cluster Study and will be subject to Withdrawal Penalties pursuant to Section 3.7.1 of this LGIP.* [Transmission Provider shall not be obligated to perform or continue to perform any studies unless Interconnection Customer has paid all undisputed amounts in compliance herewith.]

* * *

Section [9]*13.7* Engineering & Procurement ('E&P') Agreement.

Prior to executing an LGIA, an Interconnection Customer may, in order to advance the implementation of its interconnection, request and Transmission Provider shall offer Interconnection Customer, an E&P Agreement that authorizes Transmission Provider to begin engineering and procurement of long lead-time items necessary for the establishment of the interconnection. However, Transmission Provider shall not be obligated to offer an E&P Agreement if Interconnection Customer is in Dispute Resolution as a result of an allegation that Interconnection Customer has failed to meet any milestones or comply with any prerequisites specified in other parts of the LGIP. The E&P Agreement is an optional procedure and it will not alter Interconnection Customer's Queue Position or In-Service Date. The E&P Agreement shall provide for Interconnection Customer to pay the cost of all activities authorized by Interconnection Customer and to make advance payments or provide other satisfactory security for such costs.

Interconnection Customer shall pay the cost of such authorized activities and any cancellation costs for equipment that is already ordered for its interconnection, which cannot be mitigated as hereafter described, whether or not such items or equipment later become unnecessary. If Interconnection Customer withdraws its application for interconnection or either Party terminates the E&P Agreement, to the extent the equipment ordered can be canceled under reasonable terms, Interconnection Customer shall be obligated to pay the associated cancellation costs. To the extent that the equipment cannot be reasonably canceled, Transmission Provider may elect: (i) to take title to the equipment, in which event Transmission Provider shall refund Interconnection Customer any amounts paid by Interconnection Customer for such equipment and shall pay the cost of delivery of such equipment, or (ii) to transfer title to and deliver such equipment to Interconnection Customer, in which event Interconnection Customer shall pay any unpaid balance and cost of delivery of such equipment.

* * *

13.8 Alternative Transmission Technologies Annual Report

Each Transmission Provider shall submit an annual informational report to the Commission that details whether, and if so how, advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and/or static VAR compensators were considered in interconnection requests over the last year. The report must be submitted by the last calendar day of December annually.

APPENDIX 1 to LGIP
INTERCONNECTION REQUEST FOR A LARGE GENERATING FACILITY

* * *

5. Interconnection Customer provides the following information:

a. Address or location or the proposed new [Large]Generating Facility site (to the extent known) or, in the case of an existing Generating Facility, the name and specific location of the existing Generating Facility;

b. Maximum summer at ____ degrees C and winter at _____ degrees C megawatt electrical output of the proposed new [Large]Generating Facility or the amount of megawatt increase in the generating capacity of an existing Generating Facility*;*

c. General description of the equipment configuration;

d. Commercial Operation Date (Day, Month, and Year);

e. Name, address, telephone number, and e-mail address of Interconnection Customer's contact person;

f. Approximate location of the proposed Point of Interconnection (optional);

g. Interconnection Customer Data (set forth in Attachment A);

h. Primary frequency response operating range for electric storage resources;

i. Requested capacity (in MW) of Interconnection Service (if lower than the Generating Facility Capacity)[.]*;*

j. If applicable, (1) the requested operating assumptions, such as charge and discharge parameters, to be used by Transmission Provider that reflect the proposed operation of the Electric Storage Resource or Co-Located Resource containing an Electric Storage Resource (including a hybrid resource), and (2) a description of any control technologies (software and/or hardware) that will limit the operation of the Electric Storage Resource or Co-Located Resource containing an Electric Storage Resource (including a hybrid resource) to its intended operation.

* * *

Attachment A to Appendix 1
Interconnection Request

LARGE GENERATING FACILITY DATA

* * *

For a non-synchronous Generating Facility, Interconnection Customer must provide (1) a validated user-defined root mean squared (RMS) positive sequence dynamics model; (2) an appropriately parameterized generic library RMS positive sequence dynamics model, including model block diagram of the inverter control and plant control systems, as defined by the selection in Table 1 or a model otherwise approved by the Western Electricity Coordinating Council, that corresponds to Interconnection Customer's

Generating Facility; and (3) an electromagnetic transient model if Transmission Provider performs an electromagnetic transient study as part of the interconnection study process. {Transmission Provider to insert whether they perform an electromagnetic transient study.} A user-defined model is a set of programming code created by equipment manufacturers or developers that captures the latest features of controllers that are mainly software based and represents the entities' control strategies but does not necessarily correspond to any generic library model. For a model to be validated, there must be confirmation by Interconnection Customer that the equipment behavior is consistent with the model behavior (e.g., an attestation from Interconnection Customer that the model accurately represents the entire Generating Facility; attestations from each equipment manufacturer that the user defined model accurately represents the component of the Generating Facility; or test data).

Table 1

GE PSLF	***Siemens PSS/E****	***PowerWorld Simulator***	***Description***
pvd1		*PVD1*	*Distributed PV system model*
der_a	*DERAU1*	*DER_A*	*Distributed energy resource model*
regc_a	*REGCAU1, REGCA1*	*REGC_A*	*Generator/converter model*
regc_b	*REGCBU1*	*REGC_B*	*Generator/converter model*
wt1g	*WT1G1*	*WT1G and WT1G1*	*Wind turbine model for Type-1 wind turbines (conventional directly connected induction generator)*
wt2g	*WT2G1*	*WT2G and WT2G1*	*Generator model for generic Type-2 wind turbines*
wt2e	*WT2E1*	*WT2E and WT2E1*	*Rotor resistance control model for wound-rotor induction wind-turbine generator wt2g*
reec_a	*REECAU1, REECA1*	*REEC_A*	*Renewable energy electrical control model*
reec_c	*REECCU1*	*REEC_C*	*Electrical control model for battery energy storage System*
reec_d	*REECDU1*	*REEC_D*	*Renewable energy electrical control model*

GE PSLF	***Siemens PSS/E****	***PowerWorld Simulator***	***Description***
wt1t	*WT12T1*	*WT1T and WT12T1*	*Wind turbine model for Type-1 wind turbines (conventional directly connected induction generator)*
wt1p_b	*wt1p_b*	*WT12A1U_B*	*Generic wind turbine pitch controller for WTGs of Type 1 and 2*
wt2t	*WT12T1*	*WT2T*	*Wind turbine model for Type-2 wind turbines (directly connected induction generator wind turbines with an external rotor resistance)*
wtgt_a	*WTDTAU1, WTDTA1*	*WTGT_A*	*Wind turbine drive train model*
wtga_a	*WTARAU1, WTARA1*	*WTGA_A*	*Simple aerodynamic model*
wtgp_a	*WTPTAU1, WTPTA1*	*WTGPT_A*	*Wind Turbine Generator Pitch controller*
wtgq_a	*WTTQAU1, WTTQA1*	*WTGTRQ_A*	*Wind Turbine Generator Torque controller*
wtgwgo_a	*WTGWGOAU*	*WTGWGO_A*	*Supplementary control model for Weak Grids*
wtgibffr_a	*WTGIBFFRA*	*WTGIBFFR_A*	*Inertial-base fast frequency response control*
wtgp_b	*WTPTBU1*	*WTGPT_B*	*Wind Turbine Generator Pitch controller*
wtgt_b	*WTDTBU1*	*WTGT_B*	*Drive train model*

GE PSLF	***Siemens PSS/E****	***PowerWorld Simulator***	***Description***
repc_a	*Type 4: REPCAU1 (v33),* *REPCA1 (v34)* *Type 3: REPCTAU1 (v33),* *REPCTA1 (v34)*	*REPC_A*	*Power Plant Controller*
repc_b	*PLNTBU1*	*REPC_B*	*Power Plant Level Controller for controlling several* *plants/devices* *In regards to Siemens PSS/E*:* *Names of other models for interface with other devices:* *REA3XBU1, REAX4BU1- for interface with Type 3 and 4 renewable machines* *SWSAXBU1- for interface with SVC (modeled as switched shunt in powerflow)* *SYNAXBU1- for interface with synchronous condenser* *FCTAXBU1- for interface with FACTS device*
repc_c	*REPCCU*	*REPC_C*	*Power plant controller*

APPENDIX 2 to LGIP
[INTERCONNECTION FEASIBILITY STUDY AGREEMENT]
INFORMATIONAL INTERCONNECTION STUDY REQUEST

1. *The undersigned prospective Interconnection Customer submits this request for an Informational Interconnection Study to evaluate the interconnection of its Generating Facility with Transmission Provider's Transmission System pursuant to Section 6.1 of this LGIP, to be performed in accordance with Transmission Provider's Tariff.*

2. *The type of interconnection service to be evaluated (check one):*
_____ *Energy Resource Interconnection Service*
_____ *Network Resource Interconnection Service*
_____ *Both*

3. *Prospective Interconnection Customer provides the following information:*

   a. *Address or location of the proposed new Generating Facility site to be studied or, in the case of an existing Generating Facility, the name and specific location of the existing Generating Facility;*

   b. *Maximum summer at ____ degrees C and winter at ____ degrees C megawatt electrical output of the proposed new Generating Facility or the amount of megawatt increase in the generating capacity of an existing Generating Facility;*

   c. *General description of the equipment configuration;*

   d. *Commercial Operation Date to be studied (Day, Month, and Year);*

   e. *Name, address, telephone number, and e-mail address of prospective Interconnection Customer's contact person;*

   f. *Approximate location of the proposed Point of Interconnection and any alternate Point(s) of Interconnection;*

   g. *Prospective Interconnection Customer Data (set forth in Attachment A to Appendix 1, Generating Facility Data);*

   h. *Primary frequency response operating range for electric storage resources;*

   i. *Requested capacity (in MW) of Interconnection Service to be studied (if lower than the Generating Facility Capacity);*

   j. *A Scope of Work including any additional information that may be reasonably required;*

   k. *$10,000 study deposit; and*

   l. *If applicable, requested operating assumptions to be studied, such as charge and discharge parameters, that reflect the proposed operation of*

the Electric Storage Resource or Co-Located Resource containing an Electric Storage Resource (including a hybrid resource).

6. This Informational Interconnection Study Request shall be submitted to the representative indicated below:

{To be completed by Transmission Provider}

7. Representative of prospective Interconnection Customer to contact:

{To be completed by prospective Interconnection Customer}

8. This Informational Interconnection Request is submitted by:

Name of prospective Interconnection Customer: _____

By (signature): _____

Name (type or print): _____

Title: _____

Date: _____

Attachment A to Appendix 2
Informational Interconnection 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 _____ ("*Prospective* Interconnection Customer"), and _____, a _____ existing under the laws of the State of _____ ("Transmission Provider"). *Prospective* Interconnection Customer and Transmission Provider each may be referred to as a "Party," or collectively as the "Parties."

RECITALS

WHEREAS, *Prospective* Interconnection Customer is proposing to develop a [Large]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 Large Generating Facility with the Transmission System; and]

[WHEREAS, Interconnection Customer has requested Transmission Provider to perform an Interconnection Feasibility Study to assess the feasibility of interconnecting the proposed Large Generating Facility to the Transmission System, and of any Affected Systems;]

WHEREAS*, Prospective Interconnection Customer is proposing to evaluate an interconnection with Transmission Provider's Transmission System; and*

WHEREAS*, Prospective Interconnection Customer has submitted to Transmission Provider an Informational Interconnection Study Request;*

NOW, THEREFORE, in consideration of and subject to the mutual covenants contained herein the Parties agree as follows:

1.0 When used in this Agreement, with initial capitalization, the terms specified shall have the meanings indicated in [Transmission Provider's FERC-approved LGIP]*this LGIP.*

2.0 *Prospective* Interconnection Customer elects and Transmission Provider shall cause to be performed an *Informational* Interconnection[Feasibility] Study consistent with Section 6.[0]*1* of this LGIP[in accordance with the Tariff].

3.0 The scope of the *Informational* Interconnection [Feasibility]Study shall be subject to the assumptions set forth in Attachment [A]*B* 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 the Scoping Meeting. Transmission Provider 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 and as designated in accordance with Section 3.4.4 of the LGIP. If, after the designation of the Point of Interconnection pursuant to Section 3.4.4 of the LGIP, Interconnection Customer modifies its Interconnection Request pursuant to Section 4.4, the time to complete the Interconnection Feasibility Study may be extended.] *The Informational Interconnection Study shall be performed solely for informational purposes and is not binding on either Party.*

5.0 *The Informational Interconnection Study report shall provide a sensitivity analysis based on the assumptions specified by prospective Interconnection Customer in this Agreement and the technical information provided by prospective Interconnection Customer. Transmission Provider reserves the right to request additional technical information from prospective Interconnection Customer as may reasonably become necessary consistent with Good Utility Practice during the course of the Informational Interconnection Study. If prospective Interconnection Customer modifies*

its Informational Interconnection Study Request, the time to complete the Informational Interconnection Study may be extended.

The *Informational* Interconnection [Feasibility]Study report shall provide the following information:

- preliminary identification of any circuit breaker short circuit capability limits exceeded as a result of the interconnection;

- preliminary identification of any thermal overload or voltage limit violations resulting from the interconnection; and

- [preliminary description and non-bonding estimated cost of facilities required to interconnect the Large Generating Facility to the Transmission System and to address the identified short circuit and power flow issues.]*Transmission Provider's Interconnection Facilities and Network Upgrades, and the estimated cost thereof, that may be required to provide transmission service or Interconnection Service based upon the assumptions specified by prospective Interconnection Customer in this agreement.*

6.0 *Prospective* Interconnection Customer shall provide a deposit of $10,000 for the performance of the *Informational* Interconnection[Feasibility] Study. *Transmission Provider's good faith estimate for the time of completion of the Informational Interconnection Study is {insert date}.*

Upon [receipt of]*providing* the *Informational* Interconnection [Feasibility]Study *report to prospective Interconnection Customer,* Transmission Provider shall charge and *prospective* Interconnection Customer shall pay the actual costs of the *Informational* Interconnection [Feasibility]Study.

Any difference between the [deposit]*initial payment* and the actual cost of the study shall be paid by or refunded to *prospective* Interconnection Customer, as appropriate.

7.0 Miscellaneous. The *Informational* Interconnection [Feasibility]Study Agreement shall include standard miscellaneous terms including, but not limited to, indemnities, representations, disclaimers, warranties, governing law, amendment, execution, waiver, enforceability and assignment, that reflect best practices in the electric industry, and that are consistent with regional practices, Applicable Laws and Regulations, and the organizational nature of each Party. All of these provisions, to the extent practicable, shall be consistent with the provisions of this LGIP and the LGIA.

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.

{Insert name of Transmission Provider or Transmission Owner, if applicable}

By: _____ By: _____

Title: _____ Title: _____

Date: _____ Date: _____

{Insert name of *prospective* Interconnection Customer}

By: _____

Title: _____

Date: _____

Attachment [A]*B* to Appendix 2
***Informational* Interconnection[Feasibility]**
Study Agreement

ASSUMPTIONS USED IN CONDUCTING THE
***INFORMATIONAL* INTERCONNECTION [FEASIBILITY]STUDY**

The *Informational* Interconnection [Feasibility]Study will be based upon the information set forth in the Interconnection Request and agreed upon in the Scoping Meeting held on
_____:

Designation of Point of Interconnection and configuration to be studied.
Designation of alternative Point(s) of Interconnection and configuration.

{Above assumptions to be completed by Interconnection Customer and other assumptions to be provided by Interconnection Customer and Transmission Provider}

APPENDIX 3 to LGIP
[INTERCONNECTION SYSTEM IMPACT]*CLUSTER* 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

_____, a _____ organized and existing under the laws of the State of _____ ("Transmission Provider"). Interconnection Customer and Transmission Provider each may be referred to as a "Party," or collectively as the "Parties."

RECITALS

WHEREAS, Interconnection Customer is proposing to develop a [Large]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[Large] Generating Facility with the Transmission System;

WHEREAS, Transmission Provider has completed an *Informational* Interconnection [Feasibility]Study (the "[Feasibility] *Informational* Study") and provided the results of said study to Interconnection Customer (This recital to be omitted if Transmission Provider [does not require]*did not conduct* the *Informational* Interconnection [Feasibility]Study.); and

WHEREAS, Interconnection Customer has requested Transmission Provider to perform [an Interconnection System Impact]*a Cluster* Study to assess the impact of interconnecting the [Large]Generating Facility to the Transmission 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 this LGIP.

2.0 Interconnection Customer elects and Transmission Provider shall cause to be performed [an Interconnection System Impact]*a Cluster* Study consistent with Section 7.0 of this LGIP in accordance with the Tariff.

3.0 The scope of the [Interconnection System Impact]*Cluster* Study shall be subject to the assumptions set forth in Attachment A to this Agreement.

4.0 The [Interconnection System Impact]*Cluster* Study will be based upon the results of the *Informational* Interconnection [Feasibility]Study and the technical information provided by Interconnection Customer in the Interconnection Request, subject to any modifications in accordance with Section 4.4 of this LGIP. Transmission Provider 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 Customer System Impact]*Cluster* Study. If Interconnection Customer modifies its designated Point of

Interconnection, Interconnection Request, or the technical information provided therein, the time to complete the[Interconnection System Impact] *Cluster* Study may be extended.

5.0 The [Interconnection System Impact]*Cluster* Study [report]*Report* shall provide the following information:

- identification of any circuit breaker short circuit capability limits exceeded as a result of the interconnection;

- identification of any thermal overload or voltage limit violations resulting from the interconnection;

- identification of any instability or inadequately damped response to system disturbances resulting from the interconnection; and

- description and non-binding, good faith estimated cost of facilities required to interconnect the [Large]Generating Facility to the Transmission System and to address the identified short circuit, instability, and power flow issues.

6.0 [Interconnection Customer shall provide a deposit of $50,000 for the performance of the Interconnection System Impact Study.]Transmission Provider's good faith estimate for the time of completion of the [Interconnection System Impact]*Cluster* Study is {insert date}.

Upon receipt of the [Interconnection System Impact]*Cluster* Study, Transmission Provider shall charge and Interconnection Customer shall pay *its share of* the actual costs of the [Interconnection System Impact]*Cluster* Study*, consistent with Section 13.3 of this LGIP*.

Any difference between the deposit and the actual cost of the study shall be paid by or refunded to Interconnection Customer, as appropriate.

7.0 Miscellaneous. The [Interconnection System Impact]*Cluster* Study Agreement shall include standard miscellaneous terms including, but not limited to, indemnities, representations, disclaimers, warranties, governing law, amendment, execution, waiver, enforceability and assignment, that reflect best practices in the electric industry, that are consistent with regional practices, Applicable Laws and Regulations and the organizational nature of each Party. All of these provisions, to the extent practicable, shall be consistent with the provisions of this LGIP and LGIA.

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.

{Insert name of Transmission Provider or Transmission Owner, if applicable}

By: _____

Title: _____

Date: _____

{Insert name of Interconnection Customer}

By: _____

Title: _____

Date: _____

Attachment A to Appendix 3
[Interconnection System Impact]*Cluster* Study Agreement

ASSUMPTIONS USED IN CONDUCTING THE [INTERCONNECTION SYSTEM IMPACT]*CLUSTER* STUDY

The [Interconnection System Impact]*Cluster* Study will be based upon the results of the *Informational* Interconnection [Feasibility] Study, subject to any modifications in accordance with Section 4.4 of th*is*[e] LGIP, and the following assumptions:

Designation of Point of Interconnection and configuration to be studied.
Designation of alternative Point(s) of Interconnection and configuration.

{Above assumptions to be completed by Interconnection Customer and other assumptions to be provided by Interconnection Customer and Transmission Provider}

APPENDIX 4 to LGIP
INTERCONNECTION FACILITIES STUDY AGREEMENT

* * *

WHEREAS, Transmission Provider has completed an Interconnection [System Impact]*Cluster* Study (the "[System Impact]*Cluster* Study") and provided the results of said study to Interconnection Customer; and

WHEREAS, Interconnection Customer has requested Transmission Provider to perform an Interconnection Facilities Study to specify and estimate the cost of the equipment, engineering, procurement and construction work needed to implement the conclusions of the Interconnection [System Impact]*Cluster* Study in accordance with Good

Utility Practice to physically and electrically connect the [Large]Generating Facility to the Transmission System.

* * *

4.0 The Interconnection Facilities Study report (i) shall provide a description, estimated cost of (consistent with Attachment A), schedule for required facilities to interconnect the [Large] Generating Facility to the Transmission System and (ii) shall address the short circuit, instability, and power flow issues identified in the Interconnection [System Impact]*Cluster* Study.

* * *

Attachment A to Appendix 4
Interconnection Facilities
Study Agreement

INTERCONNECTION CUSTOMER SCHEDULE ELECTION FOR CONDUCTING THE INTERCONNECTION FACILITIES STUDY

Transmission Provider shall [use Reasonable Efforts to]complete the study and issue a draft Interconnection Facilities Study report to Interconnection Customer within the following number of days after [of]receipt of an executed copy of this Interconnection Facilities Study Agreement.

* * *

APPENDIX 13 to LGIP
TRANSITIONAL CLUSTER 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 _____, a _____ organized and existing under the laws of the State of _____ ("Transmission Provider"). Interconnection Customer and Transmission Provider 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 _____;*

WHEREAS, *Interconnection Customer desires to interconnect the Generating Facility with Transmission Provider's Transmission System; and*

WHEREAS*, Interconnection Customer has requested Transmission Provider to perform a "Transitional Cluster Study," which is a combined system impact and facility Cluster Study to specify and estimate the cost of the equipment, engineering, procurement, and construction work needed to physically and electrically connect the Generating Facility to Transmission Provider's Transmission System; and*

WHEREAS*, Interconnection Customer has a valid Queue Position as of the effective date of this LGIP.*

NOW, THEREFORE, *in consideration of and subject to the mutual covenants contained herein, the Parties agree as follows:*

1.0 When used in this Agreement, with initial capitalization, the terms specified shall have the meanings indicated in this LGIP.

2.0 Interconnection Customer elects, and Transmission Provider shall cause to be performed, a Transitional Cluster Study.

3.0 The Transitional Cluster Study shall be based upon the technical information provided by Interconnection Customer in the Interconnection Request. Transmission Provider 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 Transitional Cluster Study and Interconnection Customer shall provide such data as quickly as reasonable.

4.0 Pursuant to Section 5.1.1.2 of this LGIP, the interim Transitional Cluster Study report shall provide the information below:

- *identification of any circuit breaker short circuit capability limits exceeded as a result of the interconnection;*

- *identification of any thermal overload or voltage limit violations resulting from the interconnection;*

- *identification of any instability or inadequately damped response to system disturbances resulting from the interconnection; and*

- *Transmission Provider's Interconnection Facilities and Network Upgrades that are expected to be required as a result of the Interconnection Request(s) and a non-binding, good faith estimate of cost responsibility and a non-binding, good faith estimated time to construct.*

5.0 Pursuant to Section 5.1.1.2 of this LGIP, the final Transitional Cluster Study Report shall: (1) provide all the information included in the interim Transitional Cluster Study report; (2) provide a description of, estimated cost of, and schedule for required facilities to interconnect the Generating Facility to the Transmission System; and (3) address the short circuit, instability, and power flow issues identified in the interim Transitional Cluster Study report.

6.0 Interconnection Customer has met certain requirements described in Section 5.1.1.2 of this LGIP.

7.0 Interconnection Customer previously provided a deposit for the performance of Interconnection Studies. Upon receipt of the final Transitional Cluster Study Report, Transmission Provider shall charge and Interconnection Customer shall pay the actual costs of the Transitional Cluster Study. Any difference between the study deposit and the actual cost of the study shall be paid by or refunded to Interconnection Customer, in accordance with the provisions of Section 13.3 of this LGIP.

8.0 Miscellaneous. The Transitional Cluster Study Agreement shall include standard miscellaneous terms including, but not limited to, indemnities, representations, disclaimers, warranties, governing law, amendment, execution, waiver, enforceability and assignment, that reflect best practices in the electric industry, and that are consistent with regional practices, Applicable Laws and Regulations, and the organizational nature of each Party. All of these provisions, to the extent practicable, shall be consistent with the provisions of this LGIP and the LGIA.

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.*

{Insert name of Transmission Provider or Transmission Owner, if applicable}

By: __

Title: .

Date: _____

{Insert name of Interconnection Customer}

By: __

Title: .

Date: _____

APPENDIX 14 to LGIP
TRANSITIONAL SERIAL INTERCONNECTION 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 _____, a _____ organized and existing under the laws of the State of _____ ("Transmission Provider"). Interconnection Customer and Transmission Provider 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 Transmission Provider's Transmission System; and*

WHEREAS, *Interconnection Customer has requested Transmission Provider to continue processing its Interconnection Facilities Study to specify and estimate the cost of the equipment, engineering, procurement, and construction work needed to implement the conclusions of the final Interconnection System Impact Study in accordance with Good Utility Practice to physically and electrically connect the Generating Facility to the Transmission System; and*

WHEREAS*, Interconnection Customer has executed, and Transmission Provider has accepted an Interconnection Facilities Study Agreement on or before the effective date of this LGIP.*

NOW, THEREFORE, *in consideration of and subject to the mutual covenants contained herein, the Parties agree as follows:*

1.0 When used in this Agreement, with initial capitalization, the terms specified shall have the meanings indicated in this LGIP.

2.0 Interconnection Customer elects and Transmission Provider shall cause to be performed an Interconnection Facilities Study consistent with Section 8 of this LGIP.

3.0 The scope of the Interconnection Facilities Study shall be subject to the assumptions set forth in Attachment A to this Agreement, which shall be the same assumptions as the previous Interconnection Facilities Study Agreement.

4.0 The Interconnection Facilities Study report shall: (1) provide a description, estimated cost of (consistent with Attachment A), and schedule for required facilities to interconnect the Generating Facility to the Transmission System; and (2) address the short circuit, instability, and power flow issues identified in the most recently published Cluster Study Report.

5.0 Interconnection Customer has met certain requirements described in Section 5.1.1.1 of this LGIP. The time for completion of the Interconnection Facilities Study is specified in Attachment A.

6.0 Interconnection Customer previously provided a deposit of _____ dollars ($___) for the performance of the Interconnection Facilities Study.

7.0 Upon receipt of the Interconnection Facilities Study results, Transmission Provider shall charge and Interconnection Customer shall pay the actual costs of the Interconnection Facilities Study.

8.0 Any difference between the study deposit and the actual cost of the study shall be paid by or refunded to Interconnection Customer, as appropriate.

9.0 Miscellaneous. The Interconnection Facilities Study Agreement shall include standard miscellaneous terms including, but not limited to, indemnities, representations, disclaimers, warranties, governing law, amendment, execution, waiver, enforceability and assignment, that reflect best practices in the electric industry, and that are consistent with regional practices, Applicable Laws and Regulations, and the organizational nature of each Party. All of these provisions, to the extent practicable, shall be consistent with the provisions of this LGIP and this LGIA.

***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.*

{Insert name of Transmission Provider or Transmission Owner, if applicable}
By: __

Title: .

Date: _____

{Insert name of Interconnection Customer}

By: __

Title: .

Date: _____

ASSUMPTIONS USED IN CONDUCTING THE TRANSITIONAL SERIAL INTERCONNECTION FACILITIES STUDY

{Assumptions to be completed by Interconnection Customer and Transmission Provider}

APPENDIX 15 to LGIP
AFFECTED SYSTEM STUDY AGREEMENT

THIS AGREEMENT *is made and entered into this ___ day of _____, 20___, by and among _____, a _____ organized and existing under the laws of the State of _____ (Affected System Interconnection Customer) and _____, a _____ organized and existing under the laws of the State of _____ (Transmission Provider acting as Affected System). Affected System Interconnection Customer and Transmission Provider each may be referred to as a "Party," or collectively as the "Parties."*

RECITALS

WHEREAS, *Affected System Interconnection Customer is proposing to develop a {description of generating facility or generating capacity addition to an existing generating facility} consistent with the interconnection request submitted by Affected System Interconnection Customer to {name of transmission provider}, dated _____, for which {name of transmission provider} found impacts on Transmission Provider's Transmission System; and*

WHEREAS, *Affected System Interconnection Customer desires to interconnect the {description of generating facility} with {name of transmission provider}'s transmission system;*

NOW, THEREFORE, *in consideration of and subject to the mutual covenants contained herein, the Parties agree as follows:*

1.0 When used in this Agreement, with initial capitalization, the terms specified shall have the meanings indicated in this LGIP.

2.0 Transmission Provider shall coordinate with Affected System Interconnection Customer to perform an Affected System Study consistent with Section 9 of this LGIP.

3.0 The scope of the Affected System Study shall be subject to the assumptions set forth in Attachment A to this Agreement.

4.0 The Affected System Study will be based upon the technical information provided by Affected System Interconnection Customer and {name of transmission provider}. Transmission Provider reserves the right to request additional technical information from Affected System Interconnection Customer as may reasonably become necessary consistent with Good Utility Practice during the course of the Affected System Study. If Affected System Interconnection Customer modifies its designated point of interconnection, interconnection request, or the technical information provided therein is modified, the time to complete the Affected System Study may be extended by Transmission Provider.

5.0 The Affected System Study shall provide the following information:

- *identification of any circuit breaker short circuit capability limits exceeded as a result of the interconnection;*
- *identification of any thermal overload or voltage limit violations resulting from the interconnection;*
- *identification of any instability or inadequately damped response to system disturbances resulting from the interconnection;*
- *non-binding, good faith estimated cost of facilities required to interconnect the {description of generating facility} to the transmission provider with whom interconnection has been requested; and*
- *description of how such facilities will address the identified short circuit, instability, and power flow issues.*

6.0 Upon receipt of this Agreement, Transmission Provider shall charge, and Affected System Interconnection Customer shall pay, an initial Affected System Study deposit. Any difference between the deposit and the actual cost of the Study shall be paid by or refunded to Affected System Interconnection Customer, as appropriate, including interest calculated in accordance with section 35.19a(a)(2) of FERC's regulations.

7.0 This Agreement shall include standard miscellaneous terms including, but not limited to, indemnities, representations, disclaimers, warranties, governing law, amendment, execution, waiver, enforceability and assignment, which reflect best practices in the electric industry, that are consistent with regional practices, Applicable Laws and Regulations and the organizational nature of each Party. All of these provisions, to the extent practicable, shall be consistent with the provisions of this LGIP and this LGIA.

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.*

{Insert name of Transmission Provider acting as Affected System}

By: _____ *By:* _____

Title: _____ *Title:* _____

Date: _____ *Date:* _____

{Insert name of Affected System Interconnection Customer}

By: _____

Title: _____

Date: _____

Attachment A to the
Affected System Study Agreement

ASSUMPTIONS USED IN CONDUCTING THE AFFECTED SYSTEM STUDY

The Affected System Study will be based upon the following assumptions: {Assumptions to be completed by Affected System Interconnection Customer and Transmission Provider acting as Affected System}

APPENDIX 16 TO LGIP AFFECTED SYSTEMS FACILITIES CONSTRUCTION AGREEMENT

THIS AGREEMENT *is made and entered into this ____ day of _____, 20__, by and among _____, organized and existing under the laws 20__, of the State of _____ (Affected System Interconnection Customer) and_____, an entity organized under the laws of the State of _____ (Transmission Provider acting as Affected System). Affected System Interconnection Customer and Transmission Provider each may be referred to as a "Party" or collectively as the "Parties."*

RECITALS

WHEREAS, *Affected System Interconnection Customer is proposing to develop a {description of generating facility or generating capacity addition to an existing generating facility} consistent with the interconnection request submitted by Affected System Interconnection Customer to {name of transmission provider}, dated*

_____, for which {name of transmission provider} found impacts on Transmission Provider's Transmission System; and

WHEREAS, *Affected System Interconnection Customer desires to interconnect the {description of generating facility} with {name of transmission provider}'s transmission system; and*

WHEREAS*, additions, modifications, and upgrades must be made to certain existing facilities of Transmission Provider's Transmission System to accommodate such interconnection; and*

WHEREAS, *Affected System Interconnection Customer has requested, and Transmission Provider has agreed, to enter into this Agreement for the purpose of facilitating the construction of necessary Affected System Network Upgrades;*

NOW, THEREFORE, *in consideration of and subject to the mutual covenants contained herein, the Parties agree as follows:*

ARTICLE 1
DEFINITIONS

When used in this Agreement, with initial capitalization, the terms specified shall have the meanings indicated in this LGIP.

ARTICLE 2
TERM OF AGREEMENT

2.1 Effective Date. *This Agreement shall become effective upon execution by the Parties subject to acceptance by FERC (if applicable), or if filed unexecuted, upon the date specified by FERC.*

2.2 Term.

2.2.1 General. *This Agreement shall become effective as provided in Article 2.1 and shall continue in full force and effect until the earlier of (1) the final repayment, where applicable, by Transmission Provider of the amount funded by Affected System Interconnection Customer for Transmission Provider's design, procurement, construction and installation of the Affected System Network Upgrades provided in Appendix A; (2) the Parties agree to mutually terminate this Agreement; (3) earlier termination is permitted or provided for under Appendix A of this Agreement; or (4) Affected System Interconnection Customer terminates this Agreement after providing Transmission Provider with written notice at least sixty (60) Calendar Days prior to the proposed termination date, provided that Affected System Interconnection Customer has no outstanding contractual obligations to Transmission Provider under this Agreement. No termination of this Agreement shall be effective until the Parties have complied with all Applicable Laws and Regulations applicable to such*

termination. The term of this Agreement may be adjusted upon mutual agreement of the Parties if the commercial operation date for the {description of generating facility} or the In-Service Date for the Affected System Network Upgrades is adjusted in accordance with the rules and procedures established by Transmission Provider.

2.2.2 ***Termination Upon Default.*** *In the event of a Default by a Party, the Non-Breaching Party shall have the termination rights described in Articles 5 and 6; provided, however, if the Default does not pose a threat to the reliability of Transmission Provider's Transmission System, Transmission Provider may not terminate this Agreement if Affected System Interconnection Customer is the Breaching Party and Affected System Interconnection Customer (1) has undertaken, in accordance with Article 5.2, to cure the Breach that led to the Default and has failed to cure the Breach for reasons other than Affected System Interconnection Customer's failure to diligently commence reasonable and appropriate steps to cure the Breach within the thirty (30) Calendar Days allowed by Article 5.2, and (2) compensates Transmission Provider within thirty (30) Calendar Days for the amount of damage billed to Affected System Interconnection Customer by Transmission Provider for any damages, including costs and expenses, incurred by Transmission Provider as a result of such Default.*

2.2.3 ***Consequences of Termination.*** *In the event of a termination by either Party, other than a termination by Affected System Interconnection Customer due to a Breach by Transmission Provider, Affected System Interconnection Customer must pay Transmission Provider all amounts still due and payable for construction and installation of the Affected System Network Upgrades (including, without limitation, any equipment ordered related to such construction), plus all out-of-pocket expenses incurred by Transmission Provider in connection with the construction and installation of the Affected System Network Upgrades, through the date of termination, plus any actual costs which Transmission Provider reasonably incurs in (1) winding up work and construction demobilization and (2) ensuring the safety of persons and property and the integrity and safe and reliable operation of Transmission Provider's Transmission System. Transmission Provider must minimize such costs.*

Affected System Interconnection Customer is responsible for the cost of additional facilities that is caused to another Interconnection Customer due to the termination of this Agreement, Affected System Interconnection Customer's LGIA, or any of Affected System Interconnection Customer's other Affected System Facilities Construction Agreement(s).

2.2.4 ***Reservation of Rights.*** *Transmission Provider shall have the right to make a unilateral filing with FERC to modify this Agreement with respect to any rates, terms and conditions, charges, classifications of service, rule or regulation under section 205 or any other applicable provision of the Federal Power Act and FERC's rules and regulations thereunder, and*

Affected System Interconnection Customer shall have the right to make a unilateral filing with FERC to modify this Agreement pursuant to section 206 or any other applicable provision of the Federal Power Act and FERC's rules and regulations thereunder; provided that each Party shall have the right to protest any such filing by the other Party and to participate fully in any proceeding before FERC in which such modifications may be considered. Nothing in this Agreement shall limit the rights of the Parties or of FERC under sections 205 or 206 of the Federal Power Act and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein.

2.3 ***Filing.*** *Transmission Provider shall file this Agreement (and any amendment hereto) with the appropriate Governmental Authority, if required. Affected System Interconnection Customer may request that any information so provided be subject to the confidentiality provisions of Article 8. If Affected System Interconnection Customer has executed this Agreement, or any amendment thereto, Affected System Interconnection Customer shall reasonably cooperate with Transmission Provider with respect to such filing and to provide any information reasonably requested by Transmission Provider needed to comply with applicable regulatory requirements.*

2.4 ***Survival.*** *This Agreement shall continue in effect after termination to the extent necessary to provide for final billings and payments and for costs incurred hereunder, including billings and payments pursuant to this Agreement; to permit the determination and enforcement of liability and indemnification obligations arising from acts or events that occurred while this Agreement was in effect; and to permit each Party to have access to the lands of the other Party pursuant to this Agreement or other applicable agreements, to disconnect, remove or salvage its own facilities and equipment.*

2.5 ***Termination Obligations.*** *Upon any termination pursuant to this Agreement, Affected System Interconnection Customer shall be responsible for the payment of all costs or other contractual obligations incurred prior to the termination date including previously incurred capital costs, penalties for early termination, costs of removal and site restoration.*

ARTICLE 3
CONSTRUCTION OF NETWORK UPGRADES

3.1 ***Construction.***

3.1.1 ***Transmission Provider Obligations.*** *Transmission Provider will (or will cause such action to) design, procure, construct and install, and Affected System Interconnection Customer shall pay, consistent with Article 3.2, the cost of all Affected System Network Upgrades identified in Appendix A. All Affected System Network Upgrades designed, procured, constructed and installed by Transmission Provider pursuant to this Agreement shall satisfy all requirements of applicable safety and/or engineering codes and comply*

with Good Utility Practice, and further, shall satisfy all Applicable Laws and Regulations.

3.1.2 Suspension of Work.

3.1.2.1 Right to Suspend for Force Majeure Event. *Provided that such suspension is permissible under the authorizations, permits or approvals granted for the construction of the Affected System Network Upgrades, Affected System Interconnection Customer shall not suspend unless a Force Majeure event occurs. Affected System Interconnection Customer must provide to Transmission Provider (1) written notice of its request for suspension and (2) a sufficient description, as determined by Transmission Provider, of the Force Majeure event. Only the Affected System Interconnection Customer milestones described in the Appendices of this Agreement are subject to suspension under this Article 3.1.2. Prior to suspension, Affected System Interconnection Customer must also provide security acceptable to Transmission Provider, equivalent to the higher of five million dollars ($5,000,000) or the total cost of all Affected System Network Upgrades listed in Appendix A of this Agreement. Affected System Network Upgrades will be constructed on the schedule described in the Appendices of this Agreement unless: (1) construction is prevented by the order of a Governmental Authority; (2) the Affected System Network Upgrades are not needed by any other Interconnection Customer; or (3) Transmission Provider determines that a Force Majeure event prevents construction. In the event of (1), (2), or (3), security shall be released by Transmission Provider upon the determination by Transmission Provider that the Network Upgrades will no longer be constructed. If suspension occurs, Affected System Interconnection Customer shall be responsible for the costs which Transmission Provider incurs (i) in accordance with this Agreement prior to the suspension, (ii) in suspending such work, including any costs incurred to perform such work as may be necessary to ensure the safety of persons and property and the integrity of Transmission Provider's Transmission System and, if applicable, any costs incurred in connection with the cancellation of contracts and orders for material which Transmission Provider cannot reasonably avoid, and (iii) reasonably incurs in winding up work and construction demobilization; provided, however, that, prior to canceling any such contracts or orders, Transmission Provider shall obtain Affected System Interconnection Customer's authorization. Affected System Interconnection Customer shall be responsible for all costs incurred in connection with Affected System Interconnection Customer's failure to authorize cancellation of such contracts or orders.*

Interest on amounts paid by Affected System Interconnection Customer to Transmission Provider for the design, procurement,

construction, and installation of the Affected System Network Upgrades, shall not accrue during periods in which Affected System Interconnection Customer has suspended construction under this Article 3.1.2. Transmission Provider shall invoice Affected System Interconnection Customer pursuant to Article 4 and will use reasonable efforts to minimize its costs. In the event that Affected System Interconnection Customer suspends work pursuant to this Article, no construction duration, timelines and schedules set forth in Appendix A shall be suspended during the period of suspension unless ordered by a Governmental Authority, with such order being the Force Majeure event causing the suspension.

3.1.2.2 Recommencing of Work. *If Affected System Interconnection Customer requests that Transmission Provider recommence such work, Transmission Provider shall have no obligation to afford such work the priority it would have had but for the prior actions of Affected System Interconnection Customer to suspend the work. In such event, Affected System Interconnection Customer shall be responsible for any costs incurred in recommencing the work. All recommenced work shall be completed pursuant to an amended schedule for the interconnection agreed to by the Parties. Transmission Provider has the right to conduct a Re-Study of the Affected System Study if conditions have materially changed subsequent to the request to suspend. Affected System Interconnection Customer shall be responsible for the costs of any studies required.*

3.1.2.3 Right to Suspend Due to Default. *Transmission Provider reserves the right, upon written notice to Affected System Interconnection Customer, to suspend, at any time, work by Transmission Provider due to an Event of Default by Affected System Interconnection Customer. The incurrence of additional expenses associated with the construction and installation of the Affected System Network Upgrades upon the occurrence of either a Breach that Affected System Interconnection Customer is unable to cure pursuant to Article 5 or an Event of Default pursuant to Article 5. Any form of suspension by Transmission Provider shall not be barred by Articles 2.2.2, 2.2.3 or 5.2.2, nor shall it affect Transmission Provider's right to terminate the work or this Agreement pursuant to Article 6. In such events, Affected System Interconnection Customer shall be responsible for costs which Transmission Provider incurs as set forth in Article 2.2.3.*

3.1.3 Construction Status. *Transmission Provider shall keep Affected System Interconnection Customer advised periodically as to the progress of its respective design, procurement and construction efforts as described in Appendix A. Affected System Interconnection Customer may, at any time and reasonably, request a progress report from Transmission Provider. If,*

at any time, Affected System Interconnection Customer determines that the completion of the Affected System Network Upgrades will not be required until after the specified In-Service Date, Affected System Interconnection Customer will provide written notice to Transmission Provider of such later date upon which the completion of the Affected System Network Upgrades would be required. Transmission Provider may delay the In-Service Date of the Affected System Network Upgrades accordingly.

3.1.4 Timely Completion. *Transmission Provider shall use reasonable efforts to design, procure, construct, install, and test the Affected System Network Upgrades in accordance with the schedule set forth in Appendix A, which schedule may be revised from time to time by mutual agreement of the Parties. If any event occurs that will affect the time or ability to complete the Affected System Network Upgrades, Transmission Provider shall promptly notify Affected System Interconnection Customer. In such circumstances, Transmission Provider shall, within fifteen (15) Calendar Days of such notice, convene a meeting with Affected System Interconnection Customer to evaluate the alternatives available to Affected System Interconnection Customer. Transmission Provider shall also make available to Affected System Interconnection Customer all studies and work papers related to the event and corresponding delay, including all information that is in the possession of Transmission Provider that is reasonably needed by Affected System Interconnection Customer to evaluate alternatives. Transmission Provider shall, at Affected System Interconnection Customer's request and expense, use reasonable efforts to accelerate its work under this Agreement to meet the schedule set forth in Appendix A, provided that Affected System Interconnection Customer authorizes such actions and the costs associated therewith in advance.*

3.2 Interconnection Costs.

3.2.1 Costs. *Affected System Interconnection Customer shall pay to Transmission Provider costs (including taxes and financing costs) associated with seeking and obtaining all necessary approvals and of designing, engineering, constructing, and testing the Affected System Network Upgrades, as identified in Appendix A, in accordance with the cost recovery method provided herein. Unless Transmission Provider elects to fund the Affected System Network Upgrades, they shall be initially funded by Affected System Interconnection Customer.*

3.2.1.1 Lands of Other Property Owners. *If any part of the Affected System Network Upgrades is to be installed on property owned by persons other than Affected System Interconnection Customer or Transmission Provider, Transmission Provider shall, at Affected System Interconnection Customer's expense, use efforts similar in nature and extent to those that it typically undertakes on its own behalf or on behalf of its Affiliates, including use of its eminent domain authority to the extent permitted and consistent with*

Applicable Laws and Regulations and, to the extent consistent with such Applicable Laws and Regulations, to procure from such persons any rights of use, licenses, rights of way and easements that are necessary to construct, operate, maintain, test, inspect, replace or remove the Affected System Network Upgrades upon such property.

3.2.2 Repayment.

3.2.2.1 Repayment. *Affected System Interconnection Customer shall be entitled to a cash repayment by Transmission Provider(s) that owns the Affected System Network Upgrades, of the amount paid respectively to Transmission Provider, if any, for the Affected System Network Upgrades, and including any tax gross-up or other tax-related payments associated with the repayable portion of the Affected System Network Upgrades, and not refunded to Affected System Interconnection Customer pursuant to Article 3.3.1 or otherwise. The Parties may mutually agree to a repayment schedule, to be outlined in Appendix A, not to exceed twenty (20) years from the Commercial Operation Date of the Affected System Network Upgrades, for the complete repayment for all applicable costs associated with the Affected System Network Upgrades. Any repayment shall include interest calculated in accordance with the methodology set forth in FERC's regulations at 18 CFR 35.19 a(a)(2)(iii) from the date of any payment for Affected System Network Upgrades through the date on which Affected System Interconnection Customer receives a repayment of such payment pursuant to this subparagraph. Interest shall not accrue during periods in which Affected System Interconnection Customer has suspended construction pursuant to Article 3.1.2.1 or the Affected System Network Upgrades have been determined not to be needed pursuant to this Article 3.2.2.1. Affected System Interconnection Customer may assign such repayment rights to any person.*

3.2.2.2 Impact of Failure to Achieve Commercial Operation. *If the {description of generating facility} fails to achieve commercial operation, but it or another generating facility is later constructed and makes use of the Affected System Network Upgrades, Transmission Provider shall at that time reimburse Affected System Interconnection Customer. Before any such reimbursement can occur, Affected System Interconnection Customer (or the entity that ultimately constructs the {description of generating facility}), if different, is responsible for identifying the entity to which the reimbursement must be made.*

3.3 Taxes.

3.3.1 Indemnification for Contributions in Aid of Construction. *With regard only to payments made by Affected System Interconnection Customer to Transmission Provider for the installation of the Affected System Network Upgrades, Transmission Provider shall not include a gross-up for income taxes in the amounts it charges Affected System Interconnection Customer for the installation of the Affected System Network Upgrades unless (1) Transmission Provider has determined, in good faith, that the payments or property transfers made by Affected System Interconnection Customer to Transmission Provider should be reported as income subject to taxation or (2) any Governmental Authority directs Transmission Provider to report payments or property as income subject to taxation. Affected System Interconnection Customer shall reimburse Transmission Provider for such costs on a fully grossed-up basis, in accordance with this Article, within thirty (30) Calendar Days of receiving written notification from Transmission Provider of the amount due, including detail about how the amount was calculated.*

The indemnification obligation shall terminate at the earlier of (1) the expiration of the ten (10)-year testing period and the applicable statute of limitation, as it may be extended by Transmission Provider upon request of the Internal Revenue Service, to keep these years open for audit or adjustment, or (2) the occurrence of a subsequent taxable event and the payment of any related indemnification obligations as contemplated by this Article. Notwithstanding the foregoing provisions of this Article 3.3.1, and to the extent permitted by law, to the extent that the receipt of such payments by Transmission Provider is determined by any Governmental Authority to constitute income by Transmission Provider subject to taxation, Affected System Interconnection Customer shall protect, indemnify and hold harmless Transmission Provider and its Affiliates, from all claims by any such Governmental Authority for any tax, interest and/or penalties associated with such determination. Upon receiving written notification of such determination from the Governmental Authority, Transmission Provider shall provide Affected System Interconnection Customer with written notification within thirty (30) Calendar Days of such determination and notification. Transmission Provider, upon the timely written request by Affected System Interconnection Customer and at Affected System Interconnection Customer's expense, shall appeal, protest, seek abatement of, or otherwise oppose such determination. Transmission Provider reserves the right to make all decisions with regard to the prosecution of such appeal, protest, abatement or other contest, including the compromise or settlement of the claim; provided that Transmission Provider shall cooperate and consult in good faith with Affected System Interconnection Customer regarding the conduct of such contest. Affected System Interconnection Customer shall not be required to pay Transmission Provider for the tax, interest and/or penalties prior to the seventh (7th) Calendar Day before the date on which Transmission Provider (1) is required to pay the tax, interest and/or penalties or other amount in lieu thereof pursuant to a compromise or settlement of the

appeal, protest, abatement or other contest; (2) is required to pay the tax, interest and/or penalties as the result of a final, non-appealable order by a Governmental Authority; or (3) is required to pay the tax, interest and/or penalties as a prerequisite to an appeal, protest, abatement or other contest. In the event such appeal, protest, abatement or other contest results in a determination that Transmission Provider is not liable for any portion of any tax, interest and/or penalties for which Affected System Interconnection Customer has already made payment to Transmission Provider, Transmission Provider shall promptly refund to Affected System Interconnection Customer any payment attributable to the amount determined to be non-taxable, plus any interest or other payments Transmission Provider receives or which Transmission Provider may be entitled with respect to such payment. Affected System Interconnection Customer shall provide Transmission Provider with credit assurances sufficient to meet Affected System Interconnection Customer's estimated liability for reimbursement of Transmission Provider for taxes, interest and/or penalties under this Article 3.3.1. Such estimated liability shall be stated in Appendix A.

To the extent that Transmission Provider is a limited liability company and not a corporation, and has elected to be taxed as a partnership, then the following shall apply: Transmission Provider represents, and the Parties acknowledge, that Transmission Provider is a limited liability company and is treated as a partnership for federal income tax purposes. Any payment made by Affected System Interconnection Customer to Transmission Provider for Affected System Network Upgrades is to be treated as an upfront payment. It is anticipated by the Parties that any amounts paid by Affected System Interconnection Customer to Transmission Provider for Affected System Network Upgrades will be reimbursed to Affected System Interconnection Customer in accordance with the terms of this Agreement, provided Affected System Interconnection Customer fulfills its obligations under this Agreement.

3.3.2 Private Letter Ruling. *At Affected System Interconnection Customer's request and expense, Transmission Provider shall file with the Internal Revenue Service a request for a private letter ruling as to whether any property transferred or sums paid, or to be paid, by Affected System Interconnection Customer to Transmission Provider under this Agreement are subject to federal income taxation. Affected System Interconnection Customer will prepare the initial draft of the request for a private letter ruling and will certify under penalties of perjury that all facts represented in such request are true and accurate to the best of Affected System Interconnection Customer's knowledge. Transmission Provider and Affected System Interconnection Customer shall cooperate in good faith with respect to the submission of such request.*

3.3.3 Other Taxes. *Upon the timely request by Affected System Interconnection Customer, and at Affected System Interconnection Customer's sole expense,*

Transmission Provider shall appeal, protest, seek abatement of, or otherwise contest any tax (other than federal or state income tax) asserted or assessed against Transmission Provider for which Affected System Interconnection Customer may be required to reimburse Transmission Provider under the terms of this Agreement. Affected System Interconnection Customer shall pay to Transmission Provider on a periodic basis, as invoiced by Transmission Provider, Transmission Provider's documented reasonable costs of prosecuting such appeal, protest, abatement, or other contest. Affected System Interconnection Customer and Transmission Provider shall cooperate in good faith with respect to any such contest. Unless the payment of such taxes is a prerequisite to an appeal or abatement or cannot be deferred, no amount shall be payable by Affected System Interconnection Customer to Transmission Provider for such taxes until they are assessed by a final, non-appealable order by any court or agency of competent jurisdiction. In the event that a tax payment is withheld and ultimately due and payable after appeal, Affected System Interconnection Customer will be responsible for all taxes, interest and penalties, other than penalties attributable to any delay caused by Transmission Provider. Each Party shall cooperate with the other Party to maintain each Party's tax status. Nothing in this Agreement is intended to adversely affect any Party's tax-exempt status with respect to the issuance of bonds including, but not limited to, local furnishing bonds, as described in section 142(f) of the Internal Revenue Code.

ARTICLE 4
SECURITY, BILLING AND PAYMENTS

4.1 Provision of Security. *By the earlier of (1) thirty (30) Calendar Days prior to the due date for Affected System Interconnection Customer's first payment under the payment schedule specified in Appendix A or (2) the first date specified in Appendix A for the ordering of equipment by Transmission Provider for installing the Affected System Network Upgrades, Affected System Interconnection Customer shall provide Transmission Provider, at Affected System Interconnection Customer's option, a guarantee, a surety bond, letter of credit or other form of security that is reasonably acceptable to Transmission Provider. Such security for payment shall be in an amount sufficient to cover the costs for constructing, procuring and installing the applicable portion of Affected System Network Upgrades and shall be reduced on a dollar-for-dollar basis for payments made to Transmission Provider for these purposes.*

The guarantee must be made by an entity that meets the creditworthiness requirements of Transmission Provider and contain terms and conditions that guarantee payment of any amount that may be due from Affected System Interconnection Customer, up to an agreed-to maximum amount. The letter of credit must be issued by a financial institution reasonably acceptable to Transmission Provider and must specify a reasonable expiration date. The surety bond must be issued by an insurer reasonably acceptable to Transmission Provider and must specify a reasonable expiration date.

4.2 ***Invoice.*** *Each Party shall submit to the other Party, on a monthly basis, invoices of amounts due, if any, for the preceding month. Each invoice shall state the month to which the invoice applies and fully describe the services and equipment provided. The Parties may discharge mutual debts and payment obligations due and owing to each other on the same date through netting, in which case all amounts a Party owes to the other Party under this Agreement, including interest payments, shall be netted so that only the net amount remaining due shall be paid by the owing Party.*

4.3 ***Payment.*** *Invoices shall be rendered to the paying Party at the address specified by the Parties. The Party receiving the invoice shall pay the invoice within thirty (30) Calendar Days of receipt. All payments shall be made in immediately available funds payable to the other Party, or by wire transfer to a bank named and account designated by the invoicing Party. Payment of invoices by a Party will not constitute a waiver of any rights or claims that Party may have under this Agreement.*

4.4 ***Final Invoice.*** *Within six (6) months after completion of the construction of the Affected System Network Upgrades, Transmission Provider shall provide an invoice of the final cost of the construction of the Affected System Network Upgrades and shall set forth such costs in sufficient detail to enable Affected System Interconnection Customer to compare the actual costs with the estimates and to ascertain deviations, if any, from the cost estimates. Transmission Provider shall refund, with interest (calculated in accordance with 18 CFR 35.19a(a)(2)(iii)), to Affected System Interconnection Customer any amount by which the actual payment by Affected System Interconnection Customer for estimated costs exceeds the actual costs of construction within thirty (30) Calendar Days of the issuance of such final construction invoice.*

4.5 ***Interest.*** *Interest on any unpaid amounts shall be calculated in accordance with 18 CFR 35.19a(a)(2)(iii).*

4.6 ***Payment During Dispute.*** *In the event of a billing dispute among the Parties, Transmission Provider shall continue to construct the Affected System Network Upgrades under this Agreement as long as Affected System Interconnection Customer: (1) continues to make all payments not in dispute; and (2) pays to Transmission Provider or into an independent escrow account the portion of the invoice in dispute, pending resolution of such dispute. If Affected System Interconnection Customer fails to meet these two requirements, then Transmission Provider may provide notice to Affected System Interconnection Customer of a Default pursuant to Article 5. Within thirty (30) Calendar Days after the resolution of the dispute, the Party that owes money to another Party shall pay the amount due with interest calculated in accord with the methodology set forth in 18 CFR 35.19a(a)(2)(iii).*

ARTICLE 5
BREACH, CURE AND DEFAULT

5.1 ***Events of Breach.*** *A Breach of this Agreement shall include:*

(a) The failure to pay any amount when due;

(b) The failure to comply with any material term or condition of this Agreement, including but not limited to any material Breach of a representation, warranty or covenant made in this Agreement;

(c) Failure of a Party to provide such access rights, or a Party's attempt to revoke access or terminate such access rights, as provided under this Agreement; or

(d) Failure of a Party to provide information or data to another Party as required under this Agreement, provided the Party entitled to the information or data under this Agreement requires such information or data to satisfy its obligations under this Agreement.

5.2 ***Notice of Breach, Cure and Default.*** *Upon the occurrence of an event of Breach, the Party not in Breach, when it becomes aware of the Breach, shall give written notice of the Breach to the Breaching Party and to any other person representing a Party to this Agreement identified in writing to the other Party in advance. Such notice shall set forth, in reasonable detail, the nature of the Breach, and where known and applicable, the steps necessary to cure such Breach.*

5.2.1 *Upon receiving written notice of the Breach hereunder, the Breaching Party shall have a period to cure such Breach (sometimes hereinafter referred as "Cure Period") which shall be thirty (30) Calendar Days unless such Breach is due to an occurrence under Article 5.1(a) in which case the cure period will be five (5) Business Days.*

5.2.2 *If the Breach is such that it cannot be cured within the Cure Period, the Breaching Party will commence in good faith all steps as are reasonable and appropriate to cure the Breach within such Cure Period and thereafter diligently pursue such action to completion. In the event the Breaching Party fails to: (1) cure the Breach, or to commence reasonable and appropriate steps to cure the Breach, within the Cure Period; or (2) completely cure the Breach within sixty (60) Calendar Days if the Breach occurs pursuant to Article 5.1(b), (c), or (d), the Breaching Party will be in Default of this Agreement and the non-Breaching Party may terminate this Agreement for cause by notifying the other Party in writing or take whatever action at law or in equity as may appear necessary or desirable to enforce the performance or observance of any rights, remedies, obligations, agreement, or covenants under this Agreement.*

5.3 ***Rights in the Event of Default.*** *Notwithstanding the foregoing, upon the occurrence of an event of Default, the non-Defaulting Party shall be entitled to exercise all rights and remedies it may have in equity or at law.*

ARTICLE 6
TERMINATION OF AGREEMENT

6.1 ***Expiration of Term.*** *Except as otherwise specified in this Article 6, the Parties' obligations under this Agreement shall terminate at the conclusion of the term of this Agreement.*

6.2 ***Termination.*** *In addition to the termination provisions set forth in Article 2.2, a Party may terminate this Agreement upon the Default of the other Party in accordance with this Agreement. Subject to the limitations set forth in Article 6.3, in the event of a Default, the non-Defaulting Party may terminate this Agreement only upon the later of (1) its giving of written notice of termination to the other Party; and (2) unless no longer required by FERC, the filing at FERC of a notice of termination for this Agreement, which filing must be accepted for filing by FERC.*

6.3 ***Disposition of Facilities Upon Termination of Agreement.***

6.3.1 ***Transmission Provider Obligations.*** *Upon termination of this Agreement, unless otherwise agreed by the Parties in writing, Transmission Provider:*

(a) *shall, prior to the construction and installation of any portion of the Affected System Network Upgrades and to the extent possible, cancel any pending orders of, or return, such equipment or material for such Affected System Network Upgrades;*

(b) *may keep in place any portion of the Affected System Network Upgrades already constructed and installed; and,*

(c) *shall perform such work as may be necessary to ensure the safety of persons and property and to preserve the integrity of Transmission Provider's Transmission System (e.g., construction demobilization to return the system to its original state, wind-up work).*

6.3.2 ***Customer Obligations.*** *Upon billing by Transmission Provider, Affected System Interconnection Customer shall reimburse Transmission Provider for any costs incurred by Transmission Provider in performance of the actions required or permitted by Article 6.3.1 and for the cost of any Affected System Network Upgrades described in Appendix A. Transmission Provider shall use reasonable efforts to minimize costs and shall offset the amounts owed by any salvage value of facilities, if applicable. Affected System Interconnection Customer shall pay these costs pursuant to Article 4.3 of this Agreement.*

6.3.3 ***Pre-construction or Installation.*** *Upon termination of this Agreement and prior to the construction and installation of any portion of the Affected System Network Upgrades, Transmission Provider may, at its option, retain*

any portion of such Affected System Network Upgrades not cancelled or returned in accordance with Article 6.3.1(a), in which case Transmission Provider shall be responsible for all costs associated with procuring such Affected System Network Upgrades. To the extent that Affected System Interconnection Customer has already paid Transmission Provider for any or all of such costs, Transmission Provider shall refund Affected System Interconnection Customer for those payments. If Transmission Provider elects to not retain any portion of such facilities, Transmission Provider shall convey and make available to Affected System Interconnection Customer such facilities as soon as practicable after Affected System Interconnection Customer's payment for such facilities.

6.4 ***Survival of Rights.*** *Termination or expiration of this Agreement shall not relieve either Party of any of its liabilities and obligations arising hereunder prior to the date termination becomes effective, and each Party may take whatever judicial or administrative actions as appear necessary or desirable to enforce its rights hereunder. The applicable provisions of this Agreement will continue in effect after expiration, or early termination hereof to the extent necessary to provide for (1) final billings, billing adjustments and other billing procedures set forth in this Agreement; (2) the determination and enforcement of liability and indemnification obligations arising from acts or events that occurred while this Agreement was in effect; and (3) the confidentiality provisions set forth in Article 8.*

ARTICLE 7
SUBCONTRACTORS

7.1 ***Subcontractors.*** *Nothing in this Agreement shall prevent a Party from utilizing the services of subcontractors, 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.*

7.1.1 ***Responsibility of Principal.*** *The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under this Agreement. In accordance with the provisions of this Agreement, each Party shall be fully responsible to the other Party for the acts or omissions of any subcontractor it hires as if no subcontract had been made. Any applicable obligation imposed by this Agreement upon a Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of such Party.*

7.1.2 ***No Third-Party Beneficiary.*** *Except as may be specifically set forth to the contrary herein, no subcontractor or any other party is intended to be, nor will it be deemed to be, a third-party beneficiary of this Agreement.*

7.1.3 No Limitation by Insurance. *The obligations under this Article 7 will not be limited in any way by any limitation of any insurance policies or coverages, including any subcontractor's insurance.*

ARTICLE 8
CONFIDENTIALITY

8.1 Confidentiality. *Confidential Information shall include, without limitation, all information relating to a Party's technology, research and development, business affairs, and pricing, and any information supplied to the other Party prior to the execution of this Agreement.*

Information is Confidential Information only if it is clearly designated or marked in writing as confidential on the face of the document, or, if the information is conveyed orally or by inspection, if the Party providing the information orally informs the Party receiving the information that the information is confidential. The Parties shall maintain as confidential any information that is provided and identified by a Party as Critical Energy Infrastructure Information (CEII), as that term is defined in 18 CFR 388.113(c).

Such confidentiality will be maintained in accordance with this Article 8. If requested by the receiving Party, the disclosing Party shall provide in writing, the basis for asserting that the information referred to in this Article warrants confidential treatment, and the requesting Party may disclose such writing to the appropriate Governmental Authority. Each Party shall be responsible for the costs associated with affording confidential treatment to its information.

8.1.1 Term. *During the term of this Agreement, and for a period of three (3) years after the expiration or termination of this Agreement, except as otherwise provided in this Article 8 or with regard to CEII, each Party shall hold in confidence and shall not disclose to any person Confidential Information. CEII shall be treated in accordance with FERC policies and regulations.*

8.1.2 Scope. *Confidential Information shall not include information that the receiving Party can demonstrate: (1) is generally available to the public other than as a result of a disclosure by the receiving Party; (2) was in the lawful possession of the receiving Party on a non-confidential basis before receiving it from the disclosing Party; (3) was supplied to the receiving Party without restriction by a non-Party, who, to the knowledge of the receiving Party after due inquiry, was under no obligation to the disclosing Party to keep such information confidential; (4) was independently developed by the receiving Party without reference to Confidential Information of the disclosing Party; (5) is, or becomes, publicly known, through no wrongful act or omission of the receiving Party or Breach of this Agreement; or (6) is required, in accordance with Article 8.1.6 of this Agreement, to be disclosed by any Governmental Authority or is otherwise required to be disclosed by law or subpoena, or is necessary in any legal*

proceeding establishing rights and obligations under this Agreement. Information designated as Confidential Information will no longer be deemed confidential if the Party that designated the information as confidential notifies the receiving Party that it no longer is confidential.

8.1.3 ***Release of Confidential Information.*** *No Party shall release or disclose Confidential Information to any other person, except to its Affiliates (limited by the Standards of Conduct requirements), subcontractors, employees, agents, consultants, or to non-Parties that may be or are considering providing financing to or equity participation with Affected System Interconnection Customer, or to potential purchasers or assignees of Affected System Interconnection Customer, on a need-to-know basis in connection with this Agreement, unless such person has first been advised of the confidentiality provisions of this Article 8 and has agreed to comply with such provisions. Notwithstanding the foregoing, a Party providing Confidential Information to any person shall remain primarily responsible for any release of Confidential Information in contravention of this Article 8.*

8.1.4 ***Rights.*** *Each Party shall retain all rights, title, and interest in the Confidential Information that it discloses to the receiving Party. The disclosure by a Party to the receiving Party of Confidential Information shall not be deemed a waiver by the disclosing Party or any other person or entity of the right to protect the Confidential Information from public disclosure.*

8.1.5 ***Standard of Care.*** *Each Party shall use at least the same standard of care to protect Confidential Information it receives as it uses to protect its own Confidential Information from unauthorized disclosure, publication or dissemination. Each Party may use Confidential Information solely to fulfill its obligations to the other Party under this Agreement or its regulatory requirements.*

8.1.6 ***Order of Disclosure.*** *If a court or a Government Authority or entity with the right, power, and apparent authority to do so requests or requires either Party, by subpoena, oral deposition, interrogatories, requests for production of documents, administrative order, or otherwise, to disclose Confidential Information, that Party shall provide the disclosing Party with prompt notice of such request(s) or requirement(s) so that the disclosing Party may seek an appropriate protective order or waive compliance with the terms of this Agreement. Notwithstanding the absence of a protective order or waiver, the Party may disclose such Confidential Information which, in the opinion of its counsel, the Party is legally compelled to disclose. Each Party will use reasonable efforts to obtain reliable assurance that confidential treatment will be accorded any Confidential Information so furnished.*

8.1.7 Termination of Agreement. *Upon termination of this Agreement for any reason, each Party shall, within ten (10) Business Days of receipt of a written request from the other Party, use reasonable efforts to destroy, erase, or delete (with such destruction, erasure, and deletion certified in writing to the requesting Party) or return to the requesting Party any and all written or electronic Confidential Information received from the requesting Party, except that each Party may keep one copy for archival purposes, provided that the obligation to treat it as Confidential Information in accordance with this Article 8 shall survive such termination.*

8.1.8 Remedies. *The Parties agree that monetary damages would be inadequate to compensate a Party for the other Party's Breach of its obligations under this Article 8. Each Party accordingly agrees that the disclosing Party shall be entitled to equitable relief, by way of injunction or otherwise, if the receiving Party Breaches or threatens to Breach its obligations under this Article 8, which equitable relief shall be granted without bond or proof of damages, and the breaching Party shall not plead in defense that there would be an adequate remedy at law. Such remedy shall not be deemed an exclusive remedy for the Breach of this Article 8, but it shall be in addition to all other remedies available at law or in equity. The Parties further acknowledge and agree that the covenants contained herein are necessary for the protection of legitimate business interests and are reasonable in scope. Neither Party, however, shall be liable for indirect, incidental, or consequential or punitive damages of any nature or kind resulting from or arising in connection with this Article 8.*

8.1.9 Disclosure to FERC, its Staff or a State. *Notwithstanding anything in this Article 8 to the contrary, and pursuant to 18 CFR 1b.20, if FERC or its staff, during the course of an investigation or otherwise, requests information from a Party that is otherwise required to be maintained in confidence pursuant to this Agreement, the Party shall provide the requested information to FERC or its staff, within the time provided for in the request for information. In providing the information to FERC or its staff, the Party must, consistent with 18 CFR 388.112, request that the information be treated as confidential and non-public by FERC and its staff and that the information be withheld from public disclosure. Parties are prohibited from notifying the other Party to this Agreement prior to the release of the Confidential Information to FERC or its staff. The Party shall notify the other Party to the Agreement when it is notified by FERC or its staff that a request to release Confidential Information has been received by FERC, at which time either of the Parties may respond before such information would be made public, pursuant to 18 CFR 388.112. Requests from a state regulatory body conducting a confidential investigation shall be treated in a similar manner if consistent with the applicable state rules and regulations.*

8.1.10 *Subject to the exception in Article 8.1.9, any information that a disclosing Party claims is competitively sensitive, commercial or financial information under this Agreement shall not be disclosed by the receiving Party to any person not employed or retained by the receiving Party, except to the extent disclosure is (1) required by law; (2) reasonably deemed by the disclosing Party to be required to be disclosed in connection with a dispute between or among the Parties, or the defense of litigation or dispute; (3) otherwise permitted by consent of the disclosing Party, such consent not to be unreasonably withheld; or (4) necessary to fulfill its obligations under this Agreement or as the Regional Transmission Organization or a Local Balancing Authority operator including disclosing the Confidential Information to a regional or national reliability organization. The Party asserting confidentiality shall notify the receiving Party in writing of the information that Party claims is confidential. Prior to any disclosures of that Party's Confidential Information under this subparagraph, or if any non-Party or Governmental Authority makes any request or demand for any of the information described in this subparagraph, the Party that received the Confidential Information from the disclosing Party agrees to promptly notify the disclosing Party in writing and agrees to assert confidentiality and cooperate with the disclosing Party in seeking to protect the Confidential Information from public disclosure by confidentiality agreement, protective order or other reasonable measures.*

ARTICLE 9
INFORMATION ACCESS AND AUDIT RIGHTS

9.1 ***Information Access.*** *Each Party shall make available to the other Party information necessary to verify the costs incurred by the other Party for which the requesting Party is responsible under this Agreement and carry out obligations and responsibilities under this Agreement, provided that the Parties shall not use such information for purposes other than those set forth in this Article 9.1 and to enforce their rights under this Agreement.*

9.2 ***Audit Rights.*** *Subject to the requirements of confidentiality under Article 8 of this Agreement, the accounts and records related to the design, engineering, procurement, and construction of the Affected System Network Upgrades shall be subject to audit during the period of this Agreement and for a period of twenty-four (24) months following Transmission Provider's issuance of a final invoice in accordance with Article 4.4. Affected System Interconnection Customer at its expense shall have the right, during normal business hours, and upon prior reasonable notice to Transmission Provider, to audit such accounts and records. Any audit authorized by this Article 9.2 shall be performed at the offices where such accounts and records are maintained and shall be limited to those portions of such accounts and records that relate to obligations under this Agreement.*

ARTICLE 10
NOTICES

10.1 ***General.*** *Any notice, demand or request required or permitted to be given by a Party to the other Party and any instrument required or permitted to be tendered or delivered by a Party in writing to another Party may be so given, tendered or delivered, as the case may be, by depositing the same with the United States Postal Service with postage prepaid, for transmission by certified or registered mail, addressed to the Parties, or personally delivered to the Parties, at the address set out below:*

To Transmission Provider:

To Affected System Interconnection Customer:

10.2 ***Billings and Payments.*** *Billings and payments shall be sent to the addresses shown in Article 10.1 unless otherwise agreed to by the Parties.*

10.3 ***Alternative Forms of Notice.*** *Any notice or request required or permitted to be given by a Party to the other Party and not required by this Agreement to be given in writing may be so given by telephone, facsimile or email to the telephone numbers and email addresses set out below:*

To Transmission Provider:

To Affected System Interconnection Customer:

ARTICLE 11
MISCELLANEOUS

11.1 *This Agreement shall include standard miscellaneous terms including, but not limited to, indemnities, representations, disclaimers, warranties, governing law, amendment, execution, waiver, enforceability and assignment, which reflect best practices in the electric industry, that are consistent with regional practices, Applicable Laws and Regulations and the organizational nature of each Party. All of these provisions, to the extent practicable, shall be consistent with the provisions of this LGIP and this LGIA.*

IN WITNESS WHEREOF, *the Parties have executed this Agreement in multiple originals, each of which shall constitute and be an original Agreement among the Parties.*

Transmission Provider
{ Transmission Provider Acting As Affected System}
By: _____
Name: _____
Title: _____

Affected System Interconnection Customer
{Affected System Interconnection Customer}
By: _____
Name: _____
Title: _____

Project No. ____

AFFECTED SYSTEM NETWORK UPGRADES, COST ESTIMATES AND RESPONSIBILITY, CONSTRUCTION SCHEDULE AND MONTHLY PAYMENT SCHEDULE

This Appendix A is a part of the Affected Systems Facilities Construction Agreement between Affected System Interconnection Customer and Transmission Provider.

1.1 Affected System Network Upgrades to be installed by Transmission Provider.

1.2 First Equipment Order (including permitting).

1.2.1. Permitting and Land Rights – Transmission Provider Affected System Network Upgrades

1.3 Construction Schedule. *Where applicable, construction of the Affected System Network Upgrades is scheduled as follows and will be periodically updated as necessary:*

Table 1: Transmission Provider Construction Activities

MILESTONE NUMBER	*DESCRIPTION*	*START DATE*	*END DATE*
	Initial Synchronization Date		
	Commercial Operation Date		

Note: Construction schedule assumes that Transmission Provider has obtained final authorizations and security from Affected System Interconnection Customer and all necessary permits from Governmental Authorities as necessary prerequisites to commence construction of any of the Affected System Network Upgrades.

1.4 Payment Schedule.

1.4.1 Timing of and Adjustments to Affected System Interconnection Customer's Payments and Security.

1.4.2 Monthly Payment Schedule. *Affected System Interconnection Customer's payment schedule is as follows.*

Table 2: Affected System Interconnection Customer's Payment/Security Obligations for Affected System Network Upgrades.

MILESTONE NUMBER	*DESCRIPTION*	*DATE*
*		
	Initial Synchronization Date	
	Commercial Operation Date	

Note: Affected System Interconnection Customer's payment or provision of security as provided in this Agreement operates as a condition precedent to Transmission Provider's obligations to construct any Affected System Network Upgrades, and failure to meet this schedule will constitute a Breach pursuant to Article 5.1 of this Agreement.

1.5 Permits, Licenses, and Authorizations.

Appendix B to the Affected Systems Facilities Construction Agreement

NOTIFICATION OF COMPLETED CONSTRUCTION

This Appendix B is a part of the Affected Systems Facilities Construction Agreement among Affected System Interconnection Customer and Transmission Provider. Where applicable, when Transmission Provider has completed construction of the Affected System Network Upgrades, Transmission Provider shall send notice to Affected System Interconnection Customer in substantially the form following:

{Date}

{Affected System Interconnection Customer Address}

Re: Completion of Affected System Network Upgrade

Dear {Name or Title}:

This letter is sent pursuant to the Affected Systems Facilities Construction Agreement among {Transmission Provider} and {Affected System Interconnection Customer}, dated _____, 20___.

On {Date}, Transmission Provider completed to its satisfaction all work on the Affected System Network Upgrades required to facilitate the safe and reliable interconnection and operation of Affected System Interconnection Customer's {description of generating facility}. Transmission Provider confirms that the Affected System Network Upgrades are in place.

Thank you.

{Signature}
{Transmission Provider acting as Affected System Representative}

EXHIBITS

This Appendix C is a part of the Affected Systems Facilities Construction Agreement among Affected System Interconnection Customer and Transmission Provider.

Exhibit A1
Transmission Provider Site Map

Exhibit A2
Site Plan

Exhibit A3
Affected System Network Upgrades Plan & Profile

Exhibit A4
Estimated Cost of Affected System Network Upgrades

	Location	***Facilities to Be Constructed by Transmission Provider***	***Estimate in Dollars***
		Total:	

APPENDIX 17 to LGIP
SHARED NETWORK UPGRADES PAYMENT SCHEDULE

Interconnection Customer is required to contribute to the cost of Shared Network Upgrades, as identified pursuant to LGIP Section 3.10, that are funded by another Interconnection Customer pursuant to the LGIP. Each Interconnection Customer with one or more Shared Network Upgrade(s) identified in Appendix A of its Large Generator Interconnection Agreement shall make a one-time payment under this Appendix 17 to the LGIP to Transmission Provider in accordance with the terms in the Large Generator Interconnection Agreement. The one-time payment will reflect the cost of the Shared Network Upgrade(s) assigned to Interconnection Customer as determined by Transmission Provider. All revenue collected by Transmission Provider through this Appendix shall be distributed to the appropriate Interconnection Customer(s). When applicable, the transmission credit requirement under Article 11.4 of the Large

Generator Interconnection Agreement applies to Interconnection Customer's contribution to the cost of Shared Network Upgrades.

Project Number	*Funding Interconnection Customer*	*NERC ID*	*Amount of Shared Network Upgrade being Funded*

Project Number	*Recipient Interconnection Customer*	*NERC ID*	*Amount of Shared Network Upgrade being Refunded*

Appendix C: Compilation of proposed changes to the *pro forma* SGIP

Note: Proposed deletions are in brackets and proposed additions are in italics.

Section 1. Application

* * *

1.4 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]Transmission Provider and [the]Interconnection Customer 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. *Any such modification of the Interconnection Request must be accompanied by any resulting updates to the models described in Attachment 2 of this SGIP.*

* * *

Section 3. Study Process

* * *

3.2 Scoping Meeting

3.2.1 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]Transmission Provider 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.

3.2.2 The purpose of the scoping meeting is to discuss the Interconnection Request and review existing studies relevant to the Interconnection Request. The Parties shall further discuss whether [the]Transmission Provider 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]Transmission Provider shall provide [the]Interconnection Customer, as soon as possible, but not later than five Business Days after the scoping meeting, a feasibility study agreement (Attachment 6) including an outline of the scope of the study and a non-binding good faith estimate of the cost to perform the study. *In addition, Interconnection Customer's request to evaluate whether advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and/or static VAR compensators are feasible alternatives that could provide cost and/or time*

savings for Interconnection Customer must be submitted at the scoping meeting.

3.2.3 The scoping meeting may be omitted by mutual agreement. In order to remain in consideration for interconnection, an Interconnection Customer [who]*that* 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]Transmission Provider shall provide [the]Interconnection Customer, no later than five Business Days after the scoping meeting, a system impact study agreement (Attachment 7) including an outline of the scope of the study, a non-binding good faith estimate of the cost to perform the study, *and whether Interconnection Customer requested an evaluation of whether advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and/or static VAR compensators are feasible alternatives that could provide cost and/or time savings for Interconnection Customer.*

3.3 Feasibility Study

3.3.1 The feasibility study shall identify any potential adverse system impacts that would result from the interconnection of the Small Generating Facility.

3.3.2 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.

3.3.3 The scope of and cost responsibilities for the feasibility study are described in the attached feasibility study agreement (Attachment 6).

3.3.4 If the feasibility study shows no potential for adverse system impacts,[the] Transmission Provider 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. If no additional facilities are required,[the] Transmission Provider shall send [the]Interconnection Customer an executable interconnection agreement within five Business Days.

3.3.5 If the feasibility study shows the potential for adverse system impacts, the review process shall proceed to the appropriate system impact study(s).

3.3.6 At the request of any Interconnection Customer, the feasibility study will evaluate advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and/or static VAR compensators for feasibility, cost, and time savings as either an alternative to the Network Upgrade(s) or to provide Provisional Interconnection Service. Transmission Provider shall include the evaluation in the feasibility study report.

3.4 System Impact Study

3.4.1 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.

3.4.2 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]Transmission Provider shall send [the] Interconnection Customer 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.

3.4.3 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]Transmission Provider shall send [the]Interconnection Customer 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.

3.4.4 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]Transmission Provider shall send [the]Interconnection Customer a distribution system impact study agreement.

3.4.5 If the feasibility study shows no potential for transmission system or Distribution System adverse system impacts, [the]Transmission Provider shall send [the]Interconnection Customer either a facilities study agreement (Attachment 8), 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.

3.4.6 In order to remain under consideration for interconnection,[the] Interconnection Customer must return executed system impact study agreements, if applicable, within 30 Business Days.

3.4.7 A deposit of the good faith estimated costs for each system impact study may be required from [the]Interconnection Customer.

3.4.8 The scope of and cost responsibilities for a system impact study are described in the attached system impact study agreement.

3.4.9 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]Interconnection Customer may apply to the nearest Transmission Provider (Transmission Owner, Regional Transmission Operator, or Independent Transmission Provider) 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.

3.4.10 At the request of Interconnection Customer, the system impact study will evaluate advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and/or static VAR compensators for feasibility, cost, and time savings as either an alternative to the Network Upgrade(s) or to provide Provisional Interconnection Service. Transmission Provider shall include the evaluation in the system impact study report.

3.5 Facilities Study

3.5.1 Once the required system impact study(s) is completed, a system impact study report shall be prepared and transmitted to [the]Interconnection Customer 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]Interconnection Customer within the same timeframe.

3.5.2 In order to remain under consideration for interconnection, or, as appropriate, in [the]Transmission Provider's interconnection queue,[the] Interconnection Customer must return the executed facilities study agreement or a request for an extension of time within 30 Business Days.

3.5.3 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).

3.5.4 Design for any required Interconnection Facilities and/or Upgrades shall be performed under the facilities study agreement. [The]Transmission Provider may contract with consultants to perform activities required under the facilities study agreement. [The]Interconnection Customer and[the] Transmission Provider may agree to allow [the]Interconnection Customer 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]Transmission Provider, 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]Transmission Provider shall make sufficient information available to [the]Interconnection Customer in accordance with confidentiality and critical infrastructure requirements to permit[the] Interconnection Customer to obtain an independent design and cost estimate for any necessary facilities.

3.5.5 A deposit of the good faith estimated costs for the facilities study may be required from [the]Interconnection Customer.

3.5.6 The scope of and cost responsibilities for the facilities study are described in the attached facilities study agreement.

3.5.7 Upon completion of the facilities study, and with the agreement of[the] Interconnection Customer to pay for Interconnection Facilities and Upgrades identified in the facilities study, [the]Transmission Provider shall provide [the]Interconnection Customer an executable interconnection agreement within five Business Days.

3.5.8 At the request of Interconnection Customer, the facilities study will evaluate advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and/or static VAR compensators for feasibility, cost, and time savings as either an alternative to the Network Upgrade(s) or to provide Provisional Interconnection Service. Transmission Provider shall include the evaluation in the facilities study report.

Section 4. Provisions that Apply to All Interconnection Requests

* * *

4.11 Alternative Transmission Technologies Annual Report

Each Transmission Provider shall submit an annual informational report to the Commission that details whether, and if so how, advanced power flow control, transmission switching, dynamic line ratings, static synchronous compensators, and/or static VAR compensators were considered in interconnection requests over the last year. The report must be submitted by the last calendar day of December annually.

* * *

Attachment 2
SMALL GENERATOR INTERCONNECTION REQUEST
(Application Form)

* * *

Models for Non-synchronous Generators
Interconnection Customer shall provide (1) a validated user-defined root mean squared (RMS) positive sequence dynamics model; (2) an appropriately parameterized generic library RMS positive sequence dynamics model, including model block diagram of the inverter control and plant control systems, as defined by the selection in Table 1 or a model otherwise approved by the Western Electricity Coordinating Council, that corresponds to Interconnection Customer's Generating Facility; and (3) an electromagnetic transient model if Transmission Provider performs an electromagnetic transient study as part of the interconnection study process. {Transmission Provider to insert whether they perform an electromagnetic transient study.} A user-defined model is a set of programming code created by equipment manufacturers or developers that captures the latest features of controllers that are mainly software based and represents the entities' control strategies but does not necessarily correspond to any generic library model. For a model to be validated, there must be confirmation that the equipment behavior is consistent with the model behavior (e.g., an attestation from Interconnection Customer that the model accurately represents the entire plant; attestations from each equipment manufacturer that the user defined model accurately represents the component of the plant; or test data).

Table 1

GE PSLF	***Siemens PSS/E****	***PowerWorld Simulator***	***Description***
pvd1		*PVD1*	*Distributed PV system model*
der_a	*DERAU1*	*DER_A*	*Distributed energy resource model*
regc_a	*REGCAU1, REGCA1*	*REGC_A*	*Generator/converter model*
regc_b	*REGCBU1*	*REGC_B*	*Generator/converter model*
wt1g	*WT1G1*	*WT1G and WT1G1*	*Wind turbine model for Type-1 wind turbines (conventional directly connected induction generator)*
wt2g	*WT2G1*	*WT2G and WT2G1*	*Generator model for generic Type-2 wind turbines*
wt2e	*WT2E1*	*WT2E and WT2E1*	*Rotor resistance control model for wound-rotor induction wind-turbine generator wt2g*
reec_a	*REECAU1, REECA1*	*REEC_A*	*Renewable energy electrical control model*
reec_c	*REECCU1*	*REEC_C*	*Electrical control model for battery energy storage system*
reec_d	*REECDU1*	*REEC_D*	*Renewable energy electrical control model*

GE PSLF	***Siemens PSS/E****	***PowerWorld Simulator***	***Description***
wt1t	*WT12T1*	*WT1T and WT12T1*	*Wind turbine model for Type-1 wind turbines (conventional directly connected induction generator)*
wt1p_b	*wt1p_b*	*WT12A1U_B*	*Generic wind turbine pitch controller for WTGs of Type 1 and 2*
wt2t	*WT12T1*	*WT2T*	*Wind turbine model for Type-2 wind turbines (directly connected induction generator wind turbines with an external rotor resistance)*
wtgt_a	*WTDTAU1, WTDTA1*	*WTGT_A*	*Wind turbine drive train model*
wtga_a	*WTARAU1, WTARA1*	*WTGA_A*	*Simple aerodynamic model*
wtgp_a	*WTPTAU1, WTPTA1*	*WTGPT_A*	*Wind Turbine Generator Pitch controller*
wtgq_a	*WTTQAU1, WTTQA1*	*WTGTRQ_A*	*Wind Turbine Generator Torque controller*
wtgwgo_a	*WTGWGOAU*	*WTGWGO_A*	*Supplementary control model for Weak Grids*
wtgibffr_a	*WTGIBFFRA*	*WTGIBFFR_A*	*Inertial-base fast frequency response control*
wtgp_b	*WTPTBU1*	*WTGPT_B*	*Wind Turbine Generator Pitch controller*
wtgt_b	*WTDTBU1*	*WTGT_B*	*Drive train model*
repc_a	*Type 4: REPCAU1 (v33), REPCA1 (v34)* *Type 3: REPCTAU1 (v33), REPCTA1 (v34)*	*REPC_A*	*Power Plant Controller*

GE PSLF	***Siemens PSS/E****	***PowerWorld Simulator***	***Description***
repc_b	*PLNTBU1*	*REPC_B*	*Power Plant Level Controller for controlling several plants/devices* *In regards to Siemens PSS/E*:* *Names of other models for interface with other devices: REA3XBU1, REAX4BU1- for interface with Type 3 and 4 renewable machines* *SWSAXBU1- for interface with SVC (modeled as switched shunt in powerflow)* *SYNAXBU1- for interface with synchronous condenser* *FCTAXBU1- for interface with FACTS device*
repc_c	*REPCCU*	*REPC_C*	*Power plant controller*

General Information

Enclose copy of site electrical one-line diagram showing the configuration of all Small Generating Facility equipment, current and potential circuits, and protection and control schemes. This one-line diagram must be signed and stamped by a licensed Professional Engineer if the Small Generating Facility is larger than 50 kW. Is One-Line Diagram Enclosed? _
___Yes ____No

Enclose copy of any site documentation that indicates the precise physical location of the proposed Small Generating Facility (e.g., USGS topographic map or other diagram or documentation).

Proposed location of protective interface equipment on property (include address if different from [the]Interconnection Customer's Address)_____

Enclose copy of any site documentation that describes and details the operation of the protection and control schemes. Is Available Documentation Enclosed? ___Yes ____No

Enclose copies of schematic drawings for all protection and control circuits, relay current circuits, relay potential circuits, and alarm/monitoring circuits (if applicable). Are Schematic Drawings Enclosed? ___Yes ____No

Applicant Signature

I hereby certify that, to the best of my knowledge, all the information provided in this Interconnection Request is true and correct.

For Interconnection Customer: _____ Date: _____

Appendix D: Compilation of proposed changes to the *pro forma* LGIA

Note: Proposed deletions are in brackets and proposed additions are in italics.

Article 1. Definitions

***

[**Applicable Reliability Council** shall mean the reliability council applicable to the Transmission System to which the Generating Facility is directly interconnected.]

Applicable Reliability Standards shall mean the requirements and guidelines of [NERC,]the [Applicable Reliability Council]*Electric Reliability Organization* and the [Control Area]*Balancing Authority Area* of the Transmission System to which the Generating Facility is directly interconnected.

Balancing Authority *shall mean an entity that integrates resource plans ahead of time, maintains load interchange-generation balance within a Balancing Authority Area, and supports interconnection frequency in real time.*

Balancing Authority Area *shall mean the collection of generation, transmission, and loads within the metered boundaries of the Balancing Authority. The Balancing Authority maintains load-resource balance within this area.*

***

Cluster *shall mean a group of one or more Interconnection Requests that are studied together for the purpose of conducting the Cluster Study.*

Cluster Study *shall mean the evaluation of one or more Interconnection Requests within a Cluster as described in more detail in Section 7 of the LGIP.*

Clustering shall mean the process whereby *one or more* [a group of]Interconnection Requests [is] are studied together, instead of serially, [for the purpose of conducting the Interconnection System Impact Study]*as described in more detail in Section 7 of the LGIP.*

Co-Located Resource *shall mean multiple Generating Facilities located on the same site.*

***

[**Control Area** shall mean an electrical system or systems bounded by interconnection metering and telemetry, capable of controlling generation to maintain its interchange schedule with other Control Areas and contributing to frequency regulation of the interconnection. A Control Area must be certified by an Applicable Reliability Council.]

***

Electric Reliability Organization *shall mean NERC.*

***

Generating Facility shall mean Interconnection Customer's device for the production and/or storage for later injection of electricity identified in the Interconnection Request, but shall not include [the]Interconnection Customer's Interconnection Facilities.

***

Interconnection Facilities shall mean [the]Transmission Provider's Interconnection Facilities and [the]Interconnection Customer's Interconnection Facilities. Collectively, Interconnection Facilities include all facilities and equipment between the Generating Facility and the Point of Interconnection, including any modification, additions or upgrades that are necessary to physically and electrically interconnect the Generating Facility to [the]Transmission Provider's Transmission System. Interconnection Facilities are sole use facilities *by Interconnection Customer* and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades. *Multiple Generating Facilities located on the same site of Interconnection Customer may share Interconnection Facilities.*

Interconnection Facilities Study shall mean a study conducted by [the]Transmission Provider or a third party consultant for [the]Interconnection Customer to determine a list of facilities (including Transmission Provider's Interconnection Facilities and Network Upgrades as identified in the [Interconnection System Impact]*Cluster Study*), the cost of those facilities, and the time required to interconnect the Generating Facility with [the] Transmission Provider's Transmission System. The scope of the study is defined in Section 8 of the *LGIP*[Standard Large Generator Interconnection Procedures].

***

[**Interconnection Feasibility Study** shall mean a preliminary evaluation of the system impact and cost of interconnecting the Generating Facility to the Transmission Provider's Transmission System, the scope of which is described in Section 6 of the Standard Large Generator Interconnection Procedures.]

[**Interconnection Feasibility Study Agreement** shall mean the form of agreement contained in Appendix 2 of the Standard Large Generator Interconnection Procedures for conducting the Interconnection Feasibility Study.]

***

Interconnection Study shall mean any of the following studies: the *Informational* Interconnection [Feasibility]Study, *the Cluster Study,* [the Interconnection System Impact Study,]*the Surplus Interconnection Service System Impact Study,* and the Interconnection Facilities Study described in the Standard Large Generator Interconnection Procedures.

[**Interconnection System Impact Study** shall mean an engineering study that evaluates the impact of the proposed interconnection on the safety and reliability of Transmission Provider's Transmission System and, if applicable, an Affected System. The study shall identify and detail the system impacts that would result if the Generating Facility were interconnected without project modifications or system modifications, focusing on the Adverse System Impacts identified in the Interconnection Feasibility Study, or to study potential impacts, including but not limited to those identified in the Scoping Meeting as described in the Standard Large Generator Interconnection Procedures.]

[**Interconnection System Impact Study Agreement** shall mean the form of agreement contained in Appendix 3 of the Standard Large Generator Interconnection Procedures for conducting the Interconnection System Impact Study.]

***

Material Modification shall mean those modifications that have a material impact on the cost or timing of any Interconnection Request with a later *or equal Queue Position*[queue priority date].

***

Queue Position shall mean the order of a valid Interconnection Request, relative to all other pending valid Interconnection Requests, that is established based upon the date and time [of receipt of the valid] *that* Interconnection[Request by the Transmission Provider] *Customer satisfies all of the requirements of Sections 3.4 of the LGIP to enter the Cluster Study. All Interconnection Requests within a Cluster are considered equally queued.*

***

Scoping Meeting shall mean the meeting between representatives of[the] Interconnection Customer*(s)* and Transmission Provider conducted for the purpose of discussing *the proposed interconnection request,* alternative interconnection options, to exchange information including any transmission data and earlier study evaluations that would be reasonably expected to [impact] *affect* such interconnection options, to analyze such information, and to determine the potential feasible Points of Interconnection.

Shared Network Upgrade *shall mean a Network Upgrade that has been assigned to an Interconnection Customer(s) and is subsequently identified as necessary to accommodate the interconnection of the Large Generating Facility of an Interconnection Customer(s) in a later Cluster and meets the requirements pursuant to the process outlined in Section 3.10 of the LGIP.*

Site Control shall mean [documentation reasonably demonstrating]*the exclusive land right to develop, construct, operate, and maintain the Generating Facility over the term of expected operation of the Generating Facility. Site Control may be demonstrated by documentation establishing:* (1) ownership of, a leasehold interest in, or a right to develop a site [for the purpose of constructing]*of sufficient size to construct and operate* the Generating Facility *or multiple Generating Facilities on a shared site behind one*

Point of Interconnection; (2) an option to purchase or acquire a leasehold[site for such purpose; or (3) an exclusivity or other business relationship between] *site of sufficient size to construct and operate the Generating Facility;* or (3) *any other documentation that clearly demonstrates the right of Interconnection Customer*[and the entity having the right to sell, lease or grant Interconnection Customer the right to possess or] to exclusively occupy a site [for such purpose.]*of sufficient size to construct and operate the Generating Facility. Site Control for any Co-Located Resource is demonstrated by a contract or other agreement demonstrating shared land use for all Co-Located Resources that meet the aforementioned provisions of this Site Control definition.*

***

Stand Alone Network Upgrades shall mean Network Upgrades that are not part of an Affected System that an Interconnection Customer may construct without affecting day-to-day operations of the Transmission System during their construction *and, as indicated under proportional impact analysis, are only required for a single Interconnection Request*. Both [the]Transmission Provider and [the]Interconnection Customer must agree as to what constitutes Stand Alone Network Upgrades and identify them in Appendix A to the Standard Large Generator Interconnection Agreement. If[the] Transmission Provider and Interconnection Customer disagree about whether a particular Network Upgrade is a Stand Alone Network Upgrade, [the]Transmission Provider must provide [the]Interconnection Customer a written technical explanation outlining why [the]Transmission Provider does not consider the Network Upgrade to be a Stand Alone Network Upgrade within 15 days of its determination.

***

Transmission Provider's Interconnection Facilities shall mean all facilities and equipment owned, controlled, or operated by [the]Transmission Provider from the Point of Change of Ownership to the Point of Interconnection as identified in Appendix A to the Standard Large Generator Interconnection Agreement, including any modifications, additions or upgrades to such facilities and equipment. Transmission Provider's Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades. *Transmission Provider's Interconnection Facilities may be shared by more than one Generating Facility in a given Cluster Study or by Generating Facilities that are part of a Co-Located resource.*

* * *

Article 5. Interconnection Facilities Engineering, Procurement, & Construction

* * *

5.4 Power System Stabilizers. [The]Interconnection Customer shall procure, install, maintain and operate Power System Stabilizers in accordance with the guidelines and procedures established by the [Applicable Reliability Council]*Electric Reliability Organization*. Transmission Provider reserves the right to reasonably

establish minimum acceptable settings for any installed Power System Stabilizers, subject to the design and operating limitations of the [Large]Generating Facility. If the [Large]Generating Facility's Power System Stabilizers are removed from service or not capable of automatic operation, Interconnection Customer shall immediately notify Transmission Provider's system operator, or its designated representative. The requirements of this paragraph shall not apply to wind generators.

* * *

Article 7. Metering

7.1 General. Each Party shall comply with the[Applicable Reliability Council] *Electric Reliability Organization* requirements. Unless otherwise agreed by the Parties, Transmission Provider shall install Metering Equipment at the Point of Interconnection prior to any operation of the [Large]Generating Facility and shall own, operate, test and maintain such Metering Equipment. Power flows to and from the [Large]Generating Facility shall be measured at or, at Transmission Provider's option, compensated to, the Point of Interconnection. Transmission Provider shall provide metering quantities, in analog and/or digital form, to Interconnection Customer upon request. Interconnection Customer shall bear all reasonable documented costs associated with the purchase, installation, operation, testing and maintenance of the Metering Equipment.

* * *

Article 9. Operations

9.1 General. Each Party shall comply with the[Applicable Reliability Council] *Electric Reliability Organization* requirements. Each Party shall provide to the other Party all information that may reasonably be required by the other Party to comply with Applicable Laws and Regulations and Applicable Reliability Standards.

9.2 [Control Area]*Balancing Authority Area* Notification. At least three months before Initial Synchronization Date, Interconnection Customer shall notify Transmission Provider in writing of the [Control Area]*Balancing Authority Area* in which the [Large]Generating Facility will be located. If Interconnection Customer elects to locate the [Large]Generating Facility in a[Control Area] *Balancing Authority Area* other than the [Control Area]*Balancing Authority Area* in which the [Large]Generating Facility is physically located, and if permitted to do so by the relevant transmission tariffs, all necessary arrangements, including but not limited to those set forth in Article 7 and Article 8 of this LGIA, and remote [Control Area]*Balancing Authority Area* generator interchange agreements, if applicable, and the appropriate measures under such agreements, shall be executed and implemented prior to the placement of the[Large] Generating Facility in the other [Control Area]*Balancing Authority Area*.

* * *

9.4 Interconnection Customer Obligations. Interconnection Customer shall at its own expense operate, maintain and control the [Large]Generating Facility and Interconnection Customer's Interconnection Facilities in a safe and reliable manner and in accordance with this LGIA. Interconnection Customer shall operate the [Large]Generating Facility and Interconnection Customer's Interconnection Facilities in accordance with all applicable requirements of the [Control Area]*Balancing Authority Area* of which it is part, as such requirements are set forth in Appendix C, Interconnection Details, of this LGIA. Appendix C, Interconnection Details, will be modified to reflect changes to the requirements as they may change from time to time. Either Party may request that the other Party provide copies of the requirements set forth in Appendix C, Interconnection Details, of this LGIA.

* * *

9.6 Reactive Power and Primary Frequency Response.

9.6.1 Power Factor Design Criteria.

9.6.1.1 Synchronous Generation. Interconnection Customer shall design the [Large]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, unless [the]Transmission Provider has established different requirements that apply to all synchronous generators in the [Control Area]*Balancing Authority Area* on a comparable basis.

9.6.1.2 Non-Synchronous Generation. Interconnection Customer shall design the [Large]Generating Facility to maintain a composite power delivery at continuous rated power output at the high-side of the generator substation at a power factor within the range of 0.95 leading to 0.95 lagging, unless[the] Transmission Provider has established a different power factor range that applies to all non-synchronous generators in the [Control Area]*Balancing Authority Area* on a comparable basis. This power factor range standard shall be dynamic and can be met using, for example, power electronics designed to supply this level of reactive capability (taking into account any limitations due to voltage level, real power output, etc.) or fixed and switched capacitors, or a combination of the two. This requirement shall only apply to newly interconnecting non-synchronous generators that have not yet executed a Facilities Study Agreement as of the effective date of the Final Rule establishing this requirement (Order No. 827).

9.6.2 Voltage Schedules. Once Interconnection Customer has synchronized the [Large]Generating Facility with the Transmission System, Transmission Provider shall require Interconnection Customer to operate the[Large] Generating Facility to produce or absorb reactive power within the design limitations of the [Large]Generating Facility set forth in Article 9.6.1 (Power Factor Design Criteria). Transmission Provider's voltage schedules shall treat all sources of reactive power in the [Control Area]*Balancing Authority Area* in an equitable and not unduly discriminatory manner. Transmission Provider shall exercise Reasonable Efforts to provide Interconnection Customer with such schedules at least one (1) day in advance, and may make changes to such schedules as necessary to maintain the reliability of the Transmission System. Interconnection Customer shall operate the [Large]Generating Facility to maintain the specified output voltage or power factor at the Point of Interconnection within the design limitations of the [Large]Generating Facility set forth in Article 9.6.1 (Power Factor Design Criteria). If Interconnection Customer is unable to maintain the specified voltage or power factor, it shall promptly notify the System Operator.

9.6.2.1 Voltage Regulators. Whenever the [Large]Generating Facility is operated in parallel with the Transmission System and voltage regulators are capable of operation, Interconnection Customer shall operate the[Large] Generating Facility with its voltage regulators in automatic operation. If the [Large]Generating Facility's voltage regulators are not capable of such automatic operation, Interconnection Customer shall immediately notify Transmission Provider's system operator, or its designated representative, and ensure that such [Large]Generating Facility's reactive power production or absorption (measured in MVARs) are within the design capability of the [Large]Generating Facility's generating unit(s) and steady state stability limits. Interconnection Customer shall not cause its[Large] Generating Facility to disconnect automatically or instantaneously from the Transmission System or trip any generating unit comprising the [Large]Generating Facility for an under or over frequency condition unless the abnormal frequency condition persists for a time period beyond the limits set forth in ANSI/IEEE Standard C37.106, or such other standard as applied to other generators in the [Control Area]*Balancing Authority Area* on a comparable basis.

* * *

9.7.3 [Under-Frequency and Over Frequency Conditions]*Ride Through Capability and Performance.* The Transmission System is designed to automatically activate a load-shed program as required by the [Applicable Reliability Council]*Electric Reliability Organization* in the event of an

underfrequency system disturbance. Interconnection Customer shall implement under-frequency and over-frequency relay set points for the [Large]Generating Facility as required by the[Applicable Reliability Council] *Electric Reliability Organization* to ensure *frequency* "ride through" capability of the Transmission System. [Large]Generating Facility response to frequency deviations of pre-determined magnitudes, both under-frequency and over-frequency deviations, shall be studied and coordinated with Transmission Provider in accordance with Good Utility Practice. *Interconnection Customer shall also implement under-voltage and over-voltage relay set points, or equivalent electronic controls, to ensure voltage "ride through" capability of the Transmission System.* The term "ride through" as used herein shall mean the ability of a Generating Facility to stay connected to and synchronized with the Transmission System during system disturbances within a range of under-frequency*,* [and]over-frequency*, under-voltage, and over-voltage* conditions, in accordance with Good Utility Practice *and consistent with any standards and guidelines that are applied to other Generating Facilities in the Balancing Authority Area on a comparable basis. During abnormal frequency conditions and voltage conditions within the "no trip zone" defined by Reliability Standard PRC-024-2 or its successor standards, non-synchronous Generating Facilities must maintain real power production at pre-disturbance levels unless providing primary frequency response or fast frequency response and must provide dynamic reactive power to maintain system voltage in accordance with the Generating Facility's voltage schedule.*

* * *

Article 11. Performance Obligation

11.3 Network Upgrades and Distribution Upgrades. Transmission Provider or Transmission Owner shall design, procure, construct, install, and own the Network Upgrades and Distribution Upgrades described in Appendix A, Interconnection Facilities, Network Upgrades and Distribution Upgrades. [The]Interconnection Customer shall be responsible for all costs related to Distribution Upgrades. Unless Transmission Provider or Transmission Owner elects to fund the capital for the Network Upgrades, they shall be solely funded by Interconnection Customer.

11.3.1 Shared Network Upgrades. *Interconnection Customer shall pay Transmission Provider or Transmission Owner in a one-time lump sum payment for Shared Network Upgrade(s) identified pursuant to section 3.10 of the LGIP and memorialized in Appendix A of the LGIA. Transmission Provider or Transmission Owner subsequently shall disburse the one-time lump sum payment to appropriate Interconnection Customer(s) from an earlier Cluster(s) with previously assigned costs associated with the Shared Network Upgrade(s) in accordance with Appendix 17 to the LGIP. Where applicable, Interconnection Customer(s) from an earlier Cluster with previously assigned costs associated with the Shared Network Upgrades*

shall assign any transmission credits associated with the portion of the Shared Network Upgrade that new Interconnection Customer reimbursed to the new Interconnection Customer, pursuant to Article 11.4.1 of the LGIA. If the Shared Network Upgrade is not in service, Interconnection Customer shall not be required to make a payment under Appendix 17 to the LGIP until the Shared Network Upgrade is in service. In the event that Interconnection Customer fails to meet its obligation to fund Shared Network Upgrades, Transmission Provider or Transmission Owner shall not be responsible for Interconnection Customer's funding obligation.

* * *

Article 13. Emergencies

* * *

13.2 Obligations. Each Party shall comply with the Emergency Condition procedures of the applicable ISO/RTO, NERC, the [Applicable Reliability Council]*Electric Reliability Organization*, Applicable Laws and Regulations, and any emergency procedures agreed to by the Joint Operating Committee.

* * *

Article 22. Confidentiality

* * *

22.1.11 Subject to the exception in Article 22.1.10, any information that a Party claims is competitively sensitive, commercial or financial information under this LGIA ("Confidential Information") shall not be disclosed by the other Party to any person not employed or retained by the other Party, except to the extent disclosure is (i) required by law; (ii) reasonably deemed by the disclosing Party to be required to be disclosed in connection with a dispute between or among the Parties, or the defense of litigation or dispute; (iii) otherwise permitted by consent of the other Party, such consent not to be unreasonably withheld; or (iv) necessary to fulfill its obligations under this LGIA or as a transmission service provider or a [Control Area] *Balancing Authority Area* operator including disclosing the Confidential Information to an RTO or ISO or to a regional or national reliability organization. The Party asserting confidentiality shall notify the other Party in writing of the information it claims is confidential. Prior to any disclosures of the other Party's Confidential Information under this subparagraph, or if any third party or Governmental Authority makes any request or demand for any of the information described in this subparagraph, the disclosing Party agrees to promptly notify the other Party in writing and agrees to assert confidentiality and cooperate with the

other Party in seeking to protect the Confidential Information from public disclosure by confidentiality agreement, protective order or other reasonable measures.

* * *

Article 24. Information Requirements

* * *

24.3 Updated Information Submission by Interconnection Customer. The updated information submission by Interconnection Customer, including manufacturer information, shall occur no later than one hundred eighty (180) Calendar Days prior to the Trial Operation. Interconnection Customer shall submit a completed copy of the [Large]Generating Facility data requirements contained in Appendix 1 to the LGIP. It shall also include any additional information provided to Transmission Provider for the [Feasibility]*Cluster Study* and Facilities Study. Information in this submission shall be the most current [Large]Generating Facility design or expected performance data. Information submitted for stability models shall be compatible with Transmission Provider standard models. If there is no compatible model, Interconnection Customer will work with a consultant mutually agreed to by the Parties to develop and supply a standard model and associated information.

If Interconnection Customer's data is materially different from what was originally provided to Transmission Provider pursuant to the Interconnection Study Agreement between Transmission Provider and Interconnection Customer, then Transmission Provider will conduct appropriate studies to determine the impact on Transmission Provider Transmission System based on the actual data submitted pursuant to this Article 24.3. [The]Interconnection Customer shall not begin Trial Operation until such studies are completed.

* * *

Appendix A to LGIA

Interconnection Facilities, Network Upgrades and Distribution Upgrades

1. Interconnection Facilities:

(a) {insert Interconnection Customer's Interconnection Facilities}:

(b) {insert Transmission Provider's Interconnection Facilities}:

2. Network Upgrades:

(a) {insert Stand Alone Network Upgrades}:

(b) {insert Other Network Upgrades}:

(c) {Insert Shared Network Upgrades}:

***

Appendix E: Compilation of proposed changes to the *pro forma* SGIA

Note: Proposed deletions are in brackets and proposed additions are in italics.

Article 1. Scope and Limitations of Agreement.

* * *

1.5 Responsibilities of the Parties

* * *

1.5.7 [The]Interconnection Customer shall ensure "frequency ride through" capability and "voltage ride through" capability of its Small Generating Facility. [The]Interconnection Customer shall enable these capabilities such that its Small Generating Facility shall not disconnect automatically or instantaneously from the system or equipment of [the]Transmission Provider and any Affected Systems for a defined under-frequency or over-frequency condition, or an under-voltage or over-voltage condition, as tested pursuant to section 2.1 of this agreement. The defined conditions shall be in accordance with Good Utility Practice and consistent with any standards and guidelines that are applied to other generating facilities in the Balancing Authority Area on a comparable basis. The Small Generating Facility's protective equipment settings shall comply with[the] Transmission Provider's automatic load-shed program. [The]Transmission Provider shall review the protective equipment settings to confirm compliance with the automatic load-shed program. The term "ride through" as used herein shall mean the ability of a Small Generating Facility to stay connected to and synchronized with the system or equipment of [the]Transmission Provider and any Affected Systems during system disturbances within a range of conditions, in accordance with Good Utility Practice and consistent with any standards and guidelines that are applied to other generating facilities in the Balancing Authority Area on a comparable basis. The term "frequency ride through" as used herein shall mean the ability of a Small Generating Facility to stay connected to and synchronized with the system or equipment of [the]Transmission Provider and any Affected Systems during system disturbances within a range of under-frequency and over-frequency conditions, in accordance with Good Utility Practice and consistent with any standards and guidelines that are applied to other generating facilities in the Balancing Authority Area on a comparable basis. The term "voltage ride through" as used herein shall mean the ability of a Small Generating Facility to stay connected to and synchronized with the system or equipment of [the]Transmission Provider and any Affected Systems during system disturbances within a range of under-voltage and over-voltage conditions, in accordance with Good Utility Practice and consistent with any standards and guidelines that are applied to other generating facilities in the Balancing Authority Area on a comparable basis. *During abnormal frequency conditions and voltage conditions*

within the "no trip zone" defined by Reliability Standard PRC-024-2 or its successor standards, non-synchronous Small Generating Facilities must maintain real power production at pre-disturbance levels unless providing primary frequency response or fast frequency response and must provide dynamic reactive power to maintain system voltage in accordance with the Small Generating Facility's voltage schedule.

1.6 Parallel Operation Obligations. Once the Small Generating Facility has been authorized to commence parallel operation, [the]Interconnection Customer shall abide by all rules and procedures pertaining to the parallel operation of the Small Generating Facility in the applicable [control area]*Balancing Authority Area*, including, but not limited to; 1) the rules and procedures concerning the operation of generation set forth in the Tariff or by the applicable system operator(s) for [the] Transmission Provider's Transmission System and; 2) the Operating Requirements set forth in Attachment 5 of this Agreement.

* * *

1.8 Reactive Power and Primary Frequency Response

1.8.1 Power Factor Design Criteria

1.8.1.1 Synchronous Generation. [The]Interconnection Customer shall design its Small 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, unless [the]Transmission Provider has established different requirements that apply to all similarly situated synchronous generators in the [control area]*Balancing Authority Area* on a comparable basis.

1.8.1.2 Non-Synchronous Generation. [The]Interconnection Customer shall design its Small Generating Facility to maintain a composite power delivery at continuous rated power output at the high-side of the generator substation at a power factor within the range of 0.95 leading to 0.95 lagging, unless [the]Transmission Provider has established a different power factor range that applies to all similarly situated non-synchronous generators in the [control area]*Balancing Authority Area* on a comparable basis. This power factor range standard shall be dynamic and can be met using, for example, power electronics designed to supply this level of reactive capability (taking into account any limitations due to voltage level, real power output, etc.) or fixed and switched capacitors, or a combination of the two. This requirement shall only apply to newly interconnecting non-synchronous generators that have not yet executed a Facilities Study Agreement as of the effective date of the Final Rule establishing this requirement (Order No. 827).

* * *

1.8.4.1 Governor or Equivalent Controls. Whenever the Small Generating Facility is operated in parallel with the Transmission System, Interconnection Customer shall operate the Small Generating Facility with its governor or equivalent controls in service and responsive to frequency. Interconnection Customer shall: (1) in coordination with Transmission Provider and/or the relevant [b]*B*alancing [a]*A*uthority, set the deadband parameter to: (1) a maximum of ±0.036 Hz and set the droop parameter to a maximum of 5 percent; or (2) implement the relevant droop and deadband settings from an approved NERC Reliability Standard that provides for equivalent or more stringent parameters. Interconnection Customer shall be required to provide the status and settings of the governor or equivalent controls to Transmission Provider and/or the relevant [b]*B*alancing [a]*A*uthority upon request. If Interconnection Customer needs to operate the Small Generating Facility with its governor or equivalent controls not in service, Interconnection Customer shall immediately notify Transmission Provider and the relevant [b]*B*alancing [a]*A*uthority, and provide both with the following information: (1) the operating status of the governor or equivalent controls (i.e., whether it is currently out of service or when it will be taken out of service); (2) the reasons for removing the governor or equivalent controls from service; and (3) a reasonable estimate of when the governor or equivalent controls will be returned to service. Interconnection Customer shall make Reasonable Efforts to return its governor or equivalent controls into service as soon as practicable. Interconnection Customer shall make Reasonable Efforts to keep outages of the Small Generating Facility's governor or equivalent controls to a minimum whenever the Small Generating Facility is operated in parallel with the Transmission System.

* * *

1.8.4.4 Electric Storage Resources. Interconnection Customer interconnecting an electric storage resource shall establish an operating range in Attachment 5 of its SGIA that specifies a minimum state of charge and a maximum state of charge between which the electric storage resource will be required to provide primary frequency response consistent with the conditions set forth in Sections 1.8.4, 1.8.4.1, 1.8.4.2 and 1.8.4.3 of this Agreement. Attachment 5 shall specify whether the operating range is static or dynamic, and shall

consider: (1) the expected magnitude of frequency deviations in the interconnection; (2) the expected duration that system frequency will remain outside of the deadband parameter in the interconnection; (3) the expected incidence of frequency deviations outside of the deadband parameter in the interconnection; (4) the physical capabilities of the electric storage resource; (5) operational limitations of the electric storage resource due to manufacturer specifications; and (6) any other relevant factors agreed to by Transmission Provider and Interconnection Customer, and in consultation with the relevant transmission owner or [b]*B*alancing [a]*A*uthority as appropriate. If the operating range is dynamic, then Attachment 5 must establish how frequently the operating range will be reevaluated and the factors that may be considered during its reevaluation.

* * *

Attachment 1

Glossary of Terms

* * *

Balancing Authority *shall mean an entity that integrates resource plans ahead of time, maintains load interchange-generation balance within a Balancing Authority Area, and supports interconnection frequency in real time.*

Balancing Authority Area *shall mean the collection of generation, transmission, and loads within the metered boundaries of the Balancing Authority. The Balancing Authority maintains load-resource balance within this area.*

* * *

Operating Requirements – Any operating and technical requirements that may be applicable due to Regional Transmission Organization, Independent System Operator, [control area]*Balancing Authority Area*, or [the]Transmission Providers requirements, including those set forth in the Small Generator Interconnection Agreement.

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Improvements to Generator Interconnection Procedures and Agreements — Docket No. RM22-14-000

(Issued June 16, 2022)

DANLY, Commissioner, *concurring*:

1. I welcome improvements to existing generator interconnection procedures. I would prefer that Regional Transmission Organizations (RTOs) and other interested public utilities simply file their own proposals under section 205 of the Federal Power Act (FPA).[1] They are fully capable of proposing rate changes and reforms on their own.[2]

2. If this sounds familiar, it is because I wrote the same thing in response to the Commission's recent Notice of Proposed Rulemaking (NOPR) on transmission planning.[3] There, however, I dissented from the NOPR because I think it highly unlikely that the Commission can make the required section 206 finding that existing transmission planning regimes across the United States—in RTO and non-RTO regions alike—are so comprehensively unjust and unreasonable as to justify scrapping them, and I likewise strongly doubt that the Commission can justify the pervasive, micro-managing "reforms" we propose to make mandatory.[4] That entire exercise appears to be primarily an effort to socialize the massive costs of the transmission network build-out required to rush the development of renewable generation.[5] We await the record evidence in that proceeding and we shall see what the record supports.

3. In contrast to the transmission planning NOPR, I concur with the issuance of this NOPR[6] because I think it is far more likely that the record evidence will support a section 206[7] step-one finding that at least *some* aspects of current interconnection rules are unjust

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[1] 16 U.S.C. § 824d.

[2] *See, e.g.*, PJM Interconnection, L.L.C., Filing, Docket No. ER22-2110 (filed June 14, 2022).

[3] *See Building for the Future Through Elec. Reg'l Transmission Planning & Cost Allocation & Generator Interconnection*, 179 FERC ¶ 61,028 (2022) (Danly, Comm'r, dissenting).

[4] *See id.* (Danly, Comm'r, dissenting).

[5] *Id*. (Danly, Comm'r, dissenting at P 3).

[6] *Improvements to Generator Interconnection Procedures & Agreements*, 179 FERC ¶ 61,194 (2022).

[7] 16 U.S.C. § 824e.

and unreasonable. The hallmarks of the current regime are easy access and lengthy, unmanageable queues—particularly in RTOs. Meanwhile, the Commission regularly grants unlawful retroactive waivers when favored resources miss binding tariff deadlines. This undermines the RTOs' ability to manage their queues. Reforms (and greater Commission self-discipline) are desperately needed.

4. I would prefer RTOs and transmission providers come up with their own reforms through section 205 filings, rather than have the Commission issue omnibus proposals covering lists of every little thing commissioners would like to see done differently. Proposals have a propensity to turn into rules. The FPA, however, only allows the Commission to impose its own rates when the requisite section 206 showings have been made: that each existing interconnection tariff subject to revision in this NOPR is unjust and unreasonable, and that each aspect of the proposed replacement rate is just and reasonable. I am suspicious whether the record will support such showings in every region of the country, including in non-RTO regions, particularly when it comes to imposing the extremely broad replacement rates contemplated by this NOPR. I welcome detailed evidence on these points from all parties: identify the aspects of the existing rates that are unjust and unreasonable, or not, with supporting, or opposing, legal argument and factual evidence, and identify the aspects of the proposed replacement rates that are unjust and unreasonable, or not, with supporting, or opposing, legal argument and factual evidence. In each case, the more specific the arguments and evidence submitted, the better. In the transmission planning NOPR, I detailed the types of specific arguments and evidence that I wished to see, and I solicit the same here.[8] This information is crucial to determine whether the Commission's exercise of its remedial rate making authority under section 206 is warranted.

5. My preliminary view is that while some elements of the proposed replacement rates could be justified, others very likely might not. I suspect we might be able to require first-ready, first-served clustering, more robust milestone deposits and showings (site control and commercial readiness), more binding RTO and transmission provider deadlines, and elimination of the Commission's routine practice of granting unlawful retroactive waivers to every favored resource that misses a deadline. If we did this, we could be well on our way to solving existing interconnection problems. This NOPR includes what I think are likely reasonable proposals in many of these areas, subject to the actual evidence submitted in the record.

6. In other areas, I think the NOPR goes too far. Like the transmission expansion planning NOPR, many of the ideas floated in this NOPR seem intended to further prop up renewable resources and may be unduly discriminatory. I specifically seek comment on the following aspects of the proposal:

7. *First*, does the "shared network upgrade" cost proposal, where subsequent interconnecting resources pay a share of earlier interconnecting resources' previously allocated network upgrade costs, eliminate a true "barrier to entry" for all types of

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[8] *See Building for the Future Through Elec. Reg'l Transmission Planning & Cost Allocation & Generator Interconnection*, 179 FERC ¶ 61,028 (Danly, Comm'r, dissenting at PP 22-26).

resources or only for favored, small, renewable resources?[9] Is it effective to reduce existing incentives to submit multiple speculative requests?[10]

8. *Second*, does the proposed "resource solicitation study" process, which grants state-favored resources a "dedicated studies" process, give renewable resources undue preference in the development or queue process?[11] Would it be less unduly discriminatory if it were resource neutral, meaning that it would apply if a state adopts *any* portfolio standard, regardless of the type of resource supported?

9. *Third*, the NOPR blurs the lines between generation and transmission facilities, proposing to require study of several "alternative transmission technologies," and "seek[ing] comment on whether storage that performs a transmission function, synchronous condensers, and voltage source converters should be included in the list."[12] The FPA, however, distinguishes between "Federal regulation of matters relating to generation" and "that part of such [utility] business which consists of the transmission of electric energy in interstate commerce."[13] As I have previously explained with respect to storage that performs a transmission function, I disagree that the Commission can mix and mingle the two different types of facilities, and the different regulatory regimes associated with each, according to the most favorable treatment for a preferred resource, because the FPA does not contemplate such treatment and it likely is unduly discriminatory.[14]

10. Other than storage that can serve a transmission function, what equipment on our list also blurs the lines?[15] Is a traditional "generation" resource unduly discriminated against when it is denied full cost-of-service treatment if it can also perform a "transmission" function? I seek legal argument regarding these statutory distinctions, and factual evidence on when a facility is "generation," or "transmission," and how to (and whether we must) distinguish between the two.

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[9] *Improvements to Generator Interconnection Procedures & Agreements*, 179 FERC ¶ 61,194 at PP 90, 97.

[10] *See id*. P 88.

[11] *Id*. P 221.

[12] *Id*. P 300.

[13] 16 U.S.C. § 824(a).

[14] *See Midcontinent Indep. Sys. Operator, Inc.*, 172 FERC ¶ 61,132 (2020) (Danly, Comm'r, dissenting) (outlining jurisdictional arguments against treating storage as transmission).

[15] *See Improvements to Generator Interconnection Procedures & Agreements*, 179 FERC ¶ 61,194 at P 298.

11. *Fourth*, which of the interconnection and queue problems described in this NOPR, if any, apply to small generator interconnection procedures?[16] Are any of the proposed reforms outlined in the NOPR for large generator interconnection procedures required to ensure just and reasonable rates for small generators? I think the answer likely is no.

12. I look forward to reviewing the record evidence.

For these reasons, I respectfully concur.

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James P. Danly
Commissioner

[16] *See id*. P 5.

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Improvements to Generator Interconnection Procedures and Agreements Docket No. RM22-14-000

(Issued June 16, 2022)

CHRISTIE, Commissioner, *concurring*:

1. Today's Notice of Proposed Rulemaking (NOPR) includes a number of significant revisions to the Commission's *pro forma* interconnection queue requirements that appear to be based on robust evidence and to address real problems ailing the interconnection queues. I have long favored many of these proposals, which have been discussed in various technical conferences and in the Joint NARUC-FERC Task Force. These include (to name a few): (i) requiring transmission providers to adopt generally a "first-ready, first served" process for managing their interconnection queues;[1] (ii) requiring transmission providers to provide more information to potential interconnecting generators earlier in the process to facilitate greater cost certainty;[2] (iii) requiring generators in a later cluster to share the costs of previously identified network upgrades to the extent they directly benefit from them;[3] (iv) requiring stricter showings of readiness to enter into and stay in the queue;[4] (v) requiring an affected system study process and related *pro forma* study and construction agreements;[5] and (vi) requiring greater flexibility for co-located resources and for the use of surplus interconnection service.[6]

2. While I concur in issuing this NOPR and I support the queue reform provisions noted above, I also have to note that there are a few additional proposals in this NOPR that are not yet ready for prime time, either because they are potentially good ideas that have simply not been fully developed, or may not be a good ideas at all. I am willing, however, to put this NOPR out for comment on them. I thus encourage all interested parties to use the comment period to identify areas in which these proposals either need

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[1] NOPR at PP 64-79.

[2] *Id*. PP 42-52.

[3] *Id*. PP 98-101.

[4] *Id*. PP 115-123, 128-137, and 140-148.

[5] *Id*. PP 183-193 and 197-204.

[6] *Id*. PP 242-245 and 264.

additional detail or may simply not be well-conceived, particularly those that may raise reliability concerns or engage in unhelpful or unnecessary micromanagement.

3. For example, I am wary of any Commission requirement that would replace the operating assumptions developed and used by transmission providers, whose primary job it is to ensure system reliability, with those requested by self-interested generators or resources seeking to interconnect to the grid.[7] So, to the extent allowing storage (or hybrid) resources to elect whether to be studied as charging at peak load (and/or extending greater flexibility to the operating assumptions used to other variable resources) would come at the risk of system reliability,[8] I want to hear those concerns. There are also a number of unanswered questions regarding the NOPR's monetary penalty proposal, such as how it will work (or not work) in RTO/ISO regions, and whether or not it will actually incentivize timelier completion of interconnection studies.[9] I am conceptually in favor of imposing guidelines for completion of studies, but the penalty provisions do not answer definitively the most important question of all: Who will pay these penalties in an RTO or ISO which has no stockholders? Consumers certainly should not pay, directly or indirectly. Also, while I am in favor of requiring transmission providers to consider seriously alternative solutions to new transmission build that could be less costly, I could have supported a simple requirement to do so without proposing a mandatory list of specific technologies or commercial products and, in doing so, replacing the judgment and expertise of grid experts with our own.[10]

4. Finally, with regard to the queue reforms described in P 1 above, while I support them, I also caution strongly that we should avoid undermining through this NOPR what the RTOs/ISOs, working through their stakeholder processes, are already doing to fix their own queue problems. We should recognize that each RTO/ISO is different and faces unique local challenges and needs. The queue reforms proposed in today's NOPR should be seen more as guideposts or general standards rather than unyielding mandates that refuse to take local solutions into consideration. I would allow RTOs/ISOs the opportunity to demonstrate that if their own efforts to enact queue reforms achieve the same goals in a different, but equally effective manner, their individual reform may be acceptable in complying with any final rule. While this NOPR currently recognizes the

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[7] *Id.* PP 280-288.

[8] *Id*. P 286 (seeking comment "on whether the Commission should expand this reform to address operating assumptions for additional generating facility technologies that may currently be inaccurately modeled, such as variable energy resources").

[9] *Id*. P 172 (seeking comment on "whether there is a more appropriate method for assigning [] penalties in RTOs/ISOs" and "whether monetary penalties may have adverse consequences [such as] incenting timeliness over accuracy").

[10] *Id*. PP 298-301. Much of this NOPR's long descriptions of the various specific proposed mandatory alternative technologies read more like a college seminar term paper than a serious exercise of this Commission's legal authority. *See, e.g.*, *id*. P 298. Engineers and planners who work in the field every day know well what these technologies are and which ones may be feasible or not.

potential for regional flexibility,[11] I hope the need for such flexibility is explicitly memorialized in any final rule.

5. I look forward to reading the comments submitted in this proceeding and greatly appreciate the time and effort taken by all to provide the Commission with this important feedback.

For these reasons, I respectfully concur.

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Mark C. Christie
Commissioner

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[11] *Id.* P 6.