

157 FERC 61,003  
UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Norman C. Bay, Chairman;  
Cheryl A. LaFleur, and Colette D. Honorable.

Reactive Power Requirements for Non-Synchronous  
Generation

Docket No. RM16-1-001

ORDER ON CLARIFICATION AND REHEARING

(Issued October 3, 2016)

1. This order addresses the California Independent System Operator Corp.'s (CAISO) request for clarification and, in the alternative, rehearing of the Commission's Final Rule issued on June 16, 2016, in the above-captioned proceeding (Order No. 827).<sup>1</sup> For the reasons discussed below, we grant in part, and deny in part, the request for clarification and, in the alternative, rehearing.

**I. Background**

2. On June 16, 2016, the Commission issued Order No. 827, a Final Rule establishing reactive power requirements for non-synchronous generators. The Commission stated that Order No. 827 will apply to "all newly interconnecting non-synchronous generators that have not yet executed a Facilities Study Agreement as of the effective date" of the Final Rule.<sup>2</sup> The Commission did not apply Order No. 827 to "existing non-synchronous generators making upgrades to their Generating Facilities that require new interconnection requests" because generators making upgrades may not be installing equipment capable of providing reactive power and adding such a requirement could result in substantial costs.<sup>3</sup> Instead, for those generators, the Commission maintained the existing approach in Appendix G to the *pro forma* Large Generator Interconnection Agreement (LGIA), "meaning that those upgrades will be exempt from

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<sup>1</sup> *Reactive Power Requirements for Non-Synchronous Generation*, Order No. 827, 81 Fed. Reg. 40,793 (June 23, 2016), FERC Stats. & Regs. ¶ 31,385 (2016) (cross-referenced at 155 FERC ¶ 61,277).

<sup>2</sup> *Id.* P 59.

<sup>3</sup> *Id.* at PP 59, 65.

the requirement to provide reactive power unless the transmission provider's System Impact Study shows the provision of reactive power by that generator is necessary to ensure safety or reliability.”<sup>4</sup>

## II. Request for Clarification and, in the Alternative, Rehearing

3. On July 18, 2016, CAISO filed a request for clarification and, in the alternative, rehearing of Order No. 827. CAISO seeks clarification that a repowering of an existing generator that requires new inverters and an interconnection study constitutes a “newly interconnecting non-synchronous generator” subject to Order No. 827. Absent this clarification, CAISO requests rehearing of the Commission's determination not to apply Order No. 827 to these generators.<sup>5</sup>

4. CAISO argues that installing new inverters is a much more significant upgrade than a software upgrade and requires a new interconnection study; therefore, according to CAISO, repowering of an existing generator that requires new inverters is not an upgrade to an existing generator, but, rather, constitutes a newly interconnecting non-synchronous generator. CAISO gives the example of a natural gas-fired generator converting its plant to a solar photovoltaic generator.<sup>6</sup> Moreover, CAISO states that the Commission recognized in Order No. 827 that modern inverters can be designed to provide reactive power capability at all levels of real power output. As a result, CAISO contends that it should not have to conduct a System Impact Study in the detail necessary to evaluate the need for reactive power from these repowering projects under all circumstances because the generator should be able to configure the new inverters to provide reactive power capability.<sup>7</sup>

5. CAISO asserts that, by treating these repowering projects as “newly interconnecting non-synchronous generators” subject to Order No. 827, the Commission will: (1) promote voltage stability; (2) mitigate the possibility that the System Impact Study will not identify a reactive power need; (3) send a regulatory signal that repowering projects that involve inverter-based technologies should use modern inverters to ensure they can provide essential reliability services; (4) facilitate more effective and

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<sup>4</sup> *Id.* P 65.

<sup>5</sup> CAISO Request for Clarification/Rehearing at 2–3.

<sup>6</sup> *Id.* at 3, 5.

<sup>7</sup> *Id.* at 4–6.

efficient system operations and planning; and (5) treat all projects using modern inverters in a comparable manner.<sup>8</sup>

### **III. Discussion**

6. We grant in part, and deny in part, CAISO's request for clarification and, in the alternative, rehearing. We clarify that Order No. 827 does not preclude a public utility transmission provider from seeking to adopt a tariff provision defining "newly interconnecting non-synchronous generator" as including a repowering of an existing generator. However, we decline to grant CAISO's request to clarify that any repowering of an existing generator that requires new inverters and an interconnection study constitutes a "newly interconnecting non-synchronous generator" subject to Order No. 827. Rather, we require public utility transmission providers seeking to define "newly interconnecting non-synchronous generator" as including a repowering of an existing generator to file tariff revisions for Commission review and approval, as discussed below.

7. In deciding not to apply Order No. 827 to existing non-synchronous generators making upgrades that require new interconnection requests, the Commission stated that "most upgrades that require new interconnection requests do not involve fundamental changes to the original technology, or to the hardware, but instead simply involve software upgrades."<sup>9</sup> The Commission recognized the "variety of triggering points for a new interconnection request in the various transmission provider regions," that existing non-synchronous generators making upgrades "may not be installing new equipment," and that "not all existing wind generators are capable of providing reactive power without incurring substantial costs to install new equipment."<sup>10</sup> The Commission was concerned about the burden on existing generators making upgrades that do not require the installation of new equipment, and that, as a result of the upgrade, are still not capable of providing reactive power without making a substantial investment. The Commission also recognized, however, that "modern inverters can be designed" to "maintain reactive power capability at all levels of real power output."<sup>11</sup>

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<sup>8</sup> *Id.* at 5–6.

<sup>9</sup> Order No. 827, FERC Stats. & Regs. ¶ 31,385 at P 64.

<sup>10</sup> *Id.* P 65.

<sup>11</sup> *Id.* P 48.

8. Consistent with the Commission’s reasoning in Order No. 827, we continue to find that the requirements of Order No. 827 should not apply to any and all existing non-synchronous generators making upgrades that require new interconnection requests, but we recognize that some repowering of existing generators might involve installation of new equipment that substantially alters the existing facility. Accordingly, we clarify that Order No. 827 does not preclude public utility transmission providers from seeking to define “newly interconnecting non-synchronous generator” as including repowering of an existing generator. Any such tariff revisions must be sufficiently detailed and narrow to clearly define what constitutes a repowering of an existing generator capable of providing reactive power. Public utility transmission providers may file such tariff revisions as part of their filing to comply with Order No. 827,<sup>12</sup> with a justification for the tariff revisions in their transmittal letter, or in a separate filing pursuant to section 205 of the Federal Power Act.<sup>13</sup>

The Commission orders:

The request for clarification and, in the alternative, rehearing is hereby granted in part, and denied in part, as discussed in the body of this order.

By the Commission.

( S E A L )

Kimberly D. Bose,  
Secretary.

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<sup>12</sup> *Reactive Power Requirements for Non-Synchronous Generation; Requirements for Frequency and Voltage Ride Through Capability of Small Generating Facilities*, Notice of Extension of Compliance Dates, Docket Nos. RM16-1-000, RM16-8-000 (issued Aug. 8, 2016) (extending the dates for compliance with Order Nos. 827 and 828 to October 14, 2016).

<sup>13</sup> 16 U.S.C. § 824d (2012).