

146 FERC ¶ 61,199  
UNITED STATES OF AMERICA  
FEDERAL ENERGY REGULATORY COMMISSION

Before Commissioners: Cheryl A. LaFleur, Acting Chairman;  
Philip D. Moeller, John R. Norris,  
and Tony Clark.

North American Electric Reliability Corporation

Docket No. RD14-2-000

ORDER APPROVING REVISED DEFINITION

(Issued March 20, 2014)

1. The North American Electric Reliability Corporation (NERC), the Commission-certified Electric Reliability Organization (ERO), filed a petition requesting approval, pursuant to section 215(d) of the Federal Power Act (FPA) and section 39.5 of the Commission's regulations,<sup>1</sup> of revisions to the definition of "bulk electric system" in the NERC Glossary of Terms Used in Reliability Standards (NERC Glossary). NERC also requests approval of the associated implementation plan and expedited Commission action on the proposed definition by March 31, 2014. As discussed in this order, we approve NERC's revisions to the definition of bulk electric system. The revised definition will become effective on the first day of the second calendar quarter after issuance of this order, as requested by NERC.

**I. Background**

**A. EPAct 2005 and Mandatory Reliability Standards**

2. Section 215 of the FPA requires a Commission-certified ERO to develop mandatory and enforceable Reliability Standards, subject to Commission review and approval. Once approved, the Reliability Standards may be enforced by the ERO, subject to Commission oversight, or by the Commission independently.<sup>2</sup> The Commission

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<sup>1</sup> 16 U.S.C. § 824o(d)(2012) and 18 C.F.R. § 39.5 (2013).

<sup>2</sup> See 16 U.S.C. § 824o(e)(3) (2012).

established a process to select and certify an ERO<sup>3</sup> and, subsequently, certified NERC as the ERO.<sup>4</sup>

3. On March 16, 2007, in Order No. 693, pursuant to section 215(d) of the FPA, the Commission approved 83 of 107 proposed Reliability Standards, six of the eight proposed regional differences, and the NERC Glossary, which includes NERC's definition of bulk electric system.<sup>5</sup> In approving NERC's definition of bulk electric system, the Commission stated that "at least for an initial period, the Commission will rely on the NERC definition of bulk electric system and NERC's registration process to provide as much certainty as possible regarding the applicability to and the responsibility of specific entities to comply with the Reliability Standards."<sup>6</sup> The Commission also stated that "[it] remains concerned about the need to address the potential for gaps in coverage of facilities."<sup>7</sup>

4. On November 18, 2010, in Order No. 743, the Commission directed NERC to develop modifications to the then-effective definition of the term "bulk electric system" to ensure that the definition encompasses all facilities necessary for operating the interconnected transmission network.<sup>8</sup> The Commission also directed NERC to address

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<sup>3</sup> *Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of Electric Reliability Standards*, Order No. 672, FERC Stats. & Regs. ¶ 31,204, *order on reh'g*, Order No. 672-A, FERC Stats. & Regs. ¶ 31,212 (2006).

<sup>4</sup> *North American Electric Reliability Corp.*, 116 FERC ¶ 61,062 (2006), *order on reh'g and compliance*, 117 FERC ¶ 61,126 (2006) (certifying NERC as the ERO responsible for the development and enforcement of mandatory Reliability Standards), *aff'd sub nom. Alcoa Inc. v. FERC*, 564 F.3d 1342 (D.C. Cir. 2009).

<sup>5</sup> *Mandatory Reliability Standards for the Bulk-Power System*, Order No. 693, FERC Stats. & Regs. ¶ 31,242, *order on reh'g*, Order No. 693-A, 120 FERC ¶ 61,053 (2007).

<sup>6</sup> *Id.* P 75; *see also* Order No. 693-A, 120 FERC ¶ 61,053 at P 19 ("the Commission will continue to rely on NERC's definition of bulk electric system, with the appropriate regional differences, and the registration process until the Commission determines in future proceedings the extent of the Bulk-Power System").

<sup>7</sup> Order No. 693, FERC Stats. & Regs. ¶ 31,242 at P 77.

<sup>8</sup> *Revision to Electric Reliability Organization Definition of Bulk Electric System*, Order No. 743, 133 FERC ¶ 61,150, at P 16 (2010), *order on reh'g*, Order No. 743-A, 134 FERC ¶ 61,210 (2011).

the Commission's technical and policy concerns, including inconsistencies in the application of the definition and a lack of oversight and exclusion of facilities from the bulk electric system required for the operation of the interconnected transmission network. In Order No. 743, the Commission concluded that the best way to address these concerns was to eliminate the Regional Entity discretion to define the bulk electric system without NERC or Commission review, maintain a bright-line threshold that includes all facilities operated at or above 100 kV except defined radial facilities, and adopt an exemption process and criteria for removing from the bulk electric system facilities that are not necessary for operating the interconnected transmission network. In Order No. 743, the Commission allowed NERC to "propose a different solution that is as effective as, or superior to, the Commission's proposed approach in addressing the Commission's technical and other concerns so as to ensure that all necessary facilities are included within the scope of the definition."<sup>9</sup>

5. On January 25, 2012, NERC filed proposed revisions to the definition of bulk electric system which included provisions to include and exclude facilities from the "core" definition. NERC's proposed definition consisted of a "core" definition and a list of configurations of facilities that will be included or excluded from the "core" definition, i.e., inclusions and exclusions.<sup>10</sup> On December 20, 2012, the Commission issued Order No. 773, a final rule approving NERC's modifications to the definition of "bulk electric system" and the Rules of Procedure exception process to be effective July 1, 2013.<sup>11</sup> The Commission also directed NERC to (1) implement the exclusions for radial systems

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<sup>9</sup> Order No. 743, 133 FERC ¶ 61,150 at P 16.

<sup>10</sup> The inclusions address five specific facilities configurations to provide clarity that the facilities described in these configurations are included in the bulk electric system, and the exclusions address four specific facilities configurations that are *not* included in the bulk electric system.

<sup>11</sup> *Revisions to Electric Reliability Organization Definition of Bulk Electric System and Rules of Procedure*, Order No. 773, 141 FERC ¶ 61,236 (2012); *order on reh'g*, Order No. 773-A, 143 FERC ¶ 61,053 (2013), *order on reh'g and clarification*, 144 FERC ¶ 61,174 (2013), *appeal pending sub nom., People of the State of New York and the Pub. Serv. Comm'n of New York v. FERC*, No. 13-2316 (2d. Cir. filed June 12, 2013). On June 13, 2013, the Commission granted NERC's request for extension of time and extended the effective date for the revised definition of bulk electric system and the Rules of Procedure exception process to July 1, 2014. *Revisions to Electric Reliability Organization Definition of Bulk Electric System and Rules of Procedure*, 143 FERC ¶ 61,231, at P 13 (2013).

(exclusion E1) and local networks (exclusion E3) so that they do not apply to generator interconnection facilities for bulk electric system generators identified in inclusion I2; and (2) modify the local network exclusion to remove the 100 kV minimum operating voltage to allow systems that include one or more looped configurations connected below 100 kV to be eligible for the local network exclusion.<sup>12</sup> On April 18, 2013, in Order No. 773-A the Commission largely affirmed its findings in Order No. 773. However, the Commission determined that, rather than direct NERC to implement exclusions E1 and E3 so that they do not apply to generator interconnection facilities, NERC must modify the exclusions to ensure that generator interconnection facilities at or above 100 kV connected to bulk electric system generators identified in inclusion I2 are not excluded from the bulk electric system.<sup>13</sup>

### **B. NERC Filing**

6. On December 13, 2013, NERC filed proposed revisions to the definition of bulk electric system. NERC states that the proposed revisions address the Commission's directives in Order Nos. 773 and 773-A, and respond to industry concerns raised during the initial development of the revisions to the definition (Phase 1).<sup>14</sup> NERC requests expedited Commission action for the Commission to issue an order on the proposed Phase 2 definition by March 31, 2014. NERC states that the implementation plan for the proposed definition will become effective "on the first day of the second calendar quarter after the date that the definition is approved..."<sup>15</sup> NERC proposes that the revised definition will supersede in its entirety the version approved in Order Nos. 773 and 773-A. NERC explains that Commission action by March 31, 2014 will allow the proposed definition to go into effect on July 1, 2014, and fully replace the Phase 1 definition.

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<sup>12</sup> Order No. 773, 141 FERC ¶ 61,236 at PP 155, 164-169.

<sup>13</sup> Order No. 773-A, 143 FERC ¶ 61,053 at P 50.

<sup>14</sup> According to NERC, due to time constraints in meeting the compliance deadline set in Order No. 743, NERC separated the development of the revised definition into two phases. NERC stated that Phase 1 culminated in the language of the proposed modified definition that is the primary subject of Order Nos. 773 and 773-A. Phase 2 focused on other industry concerns raised during Phase 1 as well as the Order Nos. 773 and 773-A directives. *See* NERC Petition at 2 and Exh. E.

<sup>15</sup> NERC Petition at 5.

7. NERC states that the proposed revisions should result in minimal changes to the elements included in the bulk electric system. NERC explains that the proposed revisions add clarity and granularity that will allow for greater transparency and consistency in the identification of elements and facilities that make up the bulk electric system and are responsive to the technical and policy concerns discussed in Order Nos. 773 and 773-A. NERC states that the proposed revisions improve upon the Phase 1 definition approved by the Commission in Order Nos. 773 and 773-A and provide a “technically grounded and legally supportable foundation” for identifying elements and facilities that make up the bulk electric system.<sup>16</sup> According to NERC, the proposed definition is consistent, repeatable, and verifiable and will provide clarity that will assist NERC and affected entities in implementing Reliability Standards.

8. NERC explains that its primary revisions are to inclusion I4 (dispersed power producing resources) and exclusions E1 (radial systems), E3 (local networks) and E4 (reactive power devices). NERC proposes minor clarifying changes to inclusion I1 (transformers), inclusion I2 (generating resources), and inclusion I5 (static or dynamic reactive power devices). NERC does not propose any changes to the core definition, inclusion I3 (blackstart resources) or exclusion E2 (behind the meter generation).

**1. Revisions in Response to Commission Directives**

**a. Radial Systems (Exclusion E1)**

9. Exclusion E1 as approved in Order No. 773 provides for the exclusion of elements operating at 100 kV and above captured in configurations classified as radial systems. Radial systems must meet the specific criteria identified in the exclusion language, otherwise these 100 kV and above elements would be included in the bulk electric system per the core definition.<sup>17</sup> NERC proposes two revisions to exclusion E1: (1) the addition of note 2; and (2) the addition of inclusions I2 and I4 in parts (b) and (c). NERC explains that, under the definition approved in Order No. 773, the presence of a loop meant that a configuration would be ineligible for consideration under exclusion E1 and instead would have to be considered under exclusion E3. According to NERC, note 2 allows for a configuration with a loop of 50 kV or less to qualify for exclusion E1.

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<sup>16</sup> *Id.*

<sup>17</sup> Order No. 773-A, 143 FERC ¶ 61,053 at P 36 (“sub-100kV elements comprising radial systems and local networks will not be included in the bulk electric system, unless deemed otherwise in the exception process”). *See also* Order No. 773, 141 FERC ¶ 61,236 at P 155.

10. With regard to the second revision, NERC notes that in Order No. 773, the Commission stated that, if the generator is necessary for the operation of the interconnected transmission network, it is appropriate to also include the generator interconnection facility operating at or above 100 kV that delivers the generation to the bulk electric system. In response, NERC proposes that the parts (b) and (c) of exclusion E1 refer to inclusions I2 and I4 to satisfy the Commission's directive to modify exclusions E1 and E3 to ensure that generator interconnection facilities at or above 100 kV connected to bulk electric system generators identified in inclusion I2 are not excluded from the bulk electric system. Thus, as proposed by NERC, exclusion E1 would be revised as follows:

A group of contiguous transmission Elements that emanates from a single point of connection of 100 kV or higher and:

- a) Only serves Load. Or,
- b) Only includes generation resources, not identified in Inclusions I2, I3, or I4, with an aggregate capacity less than or equal to 75 MVA (gross nameplate rating). Or,
- c) Where the radial system serves Load and includes generation resources, not identified in Inclusions I2, I3 or I4, with an aggregate capacity of non-retail generation less than or equal to 75 MVA (gross nameplate rating).

Note 1 – A normally open switching device between radial systems, as depicted on prints or one-line diagrams for example, does not affect this exclusion.

Note 2 – The presence of a contiguous loop, operated at a voltage level of 50 kV or less, between configurations being considered as radial systems, does not affect this exclusion.

11. According to NERC, the standard drafting team developed note 2 by first conducting a technical analysis including modeling the physics of loop flows through sub-100 kV systems, in order to determine an appropriate threshold.<sup>18</sup> The standard

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<sup>18</sup> See NERC Petition, Exhibit D (White Paper on Bulk Electric System Radial Exclusion (E1) Low Voltage Loop Threshold – Public Version (White Paper)).

drafting team conducted a two-step process to establish a technical justification for a voltage threshold below which sub-100 kV loops do not preclude the application of exclusion E1. Specifically, the standard drafting team reviewed the minimum voltage levels that are monitored by various functional entities for interfaces, paths, and monitored elements, which reflect a value that industry experts consider necessary to monitor and facilitate the operation of the bulk electric system.<sup>19</sup> NERC explains that this step provided a technically sound approach to screen for a minimum voltage limit that served as a starting point for its subsequent technical analysis.<sup>20</sup> Next, NERC states that it performed technical studies modeling the physics of loop flows through sub-100 kV systems to establish which voltage level, while less than 100 kV, should be considered in the evaluation of exclusion E1.

12. NERC states that it obtained the key groupings of elements that the eight regions monitor to ensure reliable operation of the interconnected transmission system. NERC identified the lowest voltage element in the major element groupings, which it used as a starting point to examine the voltage level where the presence of a contiguous loop should not preclude the evaluation of radial systems.<sup>21</sup> NERC established a 30 kV threshold as a reasonable starting point. NERC explains that if the resulting voltage threshold was deemed appropriate through technical study efforts, then contiguous loop connections operated at voltages below this value would not preclude the application of exclusion E1. According to NERC, it then evaluated a range of voltages for the loop and the parallel transmission system, included sensitivity analysis varying the loads and impedances, variations in loop and transmission system impedances account for a range of physical parameters such as conductor length, conductor type, system configuration, and proximity of the loop to the transmission system. NERC explains that, based on the above analysis, it concluded that a 50 kV threshold for sub-100 kV loops does not preclude the application of exclusion E1. NERC contends that the proposed revisions to exclusion E1 are an equally effective and efficient solution to addressing the Commission's concerns in Order Nos. 773 and 773-A. NERC also states that this approach should ease the administrative burden on entities to prove that they qualify for an exclusion.

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<sup>19</sup> *Id.* at 2, 17.

<sup>20</sup> NERC Petition at 23.

<sup>21</sup> *Id.*

**b. Local Networks (Exclusion E3)**

13. Exclusion E3 as approved in Order No. 773 provides for the exclusion of elements operating at 100 kV to 300 kV captured in configurations classified as local networks. Local networks must meet the specific criteria identified in the exclusion language otherwise these 100 kV to 300 kV elements would be included in the bulk electric system per the core definition.<sup>22</sup>

14. In Order Nos. 773 and 773-A, the Commission directed NERC to modify exclusion E3 to remove the 100 kV minimum operating voltage in the local network definition. In Order No. 773-A, the Commission clarified that removing the phrase “or above 100 kV but” from the definition of local networks in the first sentence of exclusion E3 is an appropriate way to meet the Commission’s directive to remove the 100 kV minimum operating voltage in the local network definition. In its petition, NERC states that, consistent with the Commission’s directive, it removed the phrase “or above 100 kV but” from exclusion E3.

15. In addition, NERC proposes to revise exclusion E3 similar to exclusion E1 by adding reference to inclusions I2 and I4 in part (a) of exclusion E3 to satisfy the Commission’s directive to modify exclusion E3 to ensure that generator interconnection facilities at or above 100 kV connected to bulk electric system generators identified in inclusion I2 are not excluded from the bulk electric system.

16. NERC also proposes several clarifying changes to exclusion E3. NERC proposes a modification to part (c) to include any part of a permanent flowgate. NERC states that the standard drafting team believes that the reliable operation of the interconnected transmission system requires operator situational awareness of any and all parts of permanent flowgates. According to NERC, the presence of any part of a flowgate should preclude the application of exclusion E3. Finally, NERC proposes the following revisions to “clarify the plain words” of the definition: (1) changed the term “retail customer Load” to “retail customers”; and (2) in part (b) to clarify that the term “Power” refers to “Real Power,” rather than Reactive Power. NERC states that “Real Power” is defined in the NERC Glossary as “[t]he portion of electricity that supplies energy to the load.” Thus, as proposed by NERC, exclusion E3 would be revised as follows:

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<sup>22</sup> Order No. 773-A, 143 FERC ¶ 61,053 at P 36 (“sub-100kV elements comprising radial systems and local networks will not be included in the bulk electric system, unless deemed otherwise in the exception process”). *See also* Order No. 773, 141 FERC ¶ 61,236 at P 155.

Local networks (LN): A group of contiguous transmission Elements operated at ~~or above 100 kV but~~ less than 300 kV that distribute power to Load rather than transfer bulk power across the interconnected system. LN's emanate from multiple points of connection at 100 kV or higher to improve the level of service to retail customers Load and not to accommodate bulk power transfer across the interconnected system. The LN is characterized by all of the following:

- a) Limits on connected generation: The LN and its underlying Elements do not include generation resources identified in Inclusions I2, I3, or I4 and do not have an aggregate capacity of non-retail generation greater than 75 MVA (gross nameplate rating);
- b) Real Power flows only into the LN and the LN does not transfer energy originating outside the LN for delivery through the LN; and
- c) Not part of a Flowgate or transfer path: The LN does not contain any part of a permanent Flowgate in the Eastern Interconnection, a major transfer path within the Western Interconnection, or a comparable monitored Facility in the ERCOT or Quebec Interconnections, and is not a monitored Facility included in an Interconnection Reliability Operating Limit (IROL).

## 2. Phase 2 Revisions

### a. Dispersed Power Producing Resources (Inclusion I4)

17. As noted above, NERC separated the development of the revised definition of bulk electric system into two phases. Phase 1 culminated in the language of the proposed modified definition that is the primary subject of Order Nos. 773 and 773-A. According to NERC, Phase 2 focused on other industry concerns raised during Phase 1, as well as the Order Nos. 773 and 773-A directives. Thus, to address industry concerns, NERC revised inclusion I4 in two respects: (1) clarifying the facilities designated as part of the bulk electric system by application of this inclusion; and (2) including the collector system at the point of aggregation, i.e., “[t]he system designed primarily for delivering capacity from the point where those resources aggregate to greater than 75 MVA to a

common point of connection at a voltage of 100 kV or above.”<sup>23</sup> Thus, NERC proposes inclusion I4 to read as follows:

Dispersed power producing resources with aggregate capacity greater than that aggregate to a total capacity greater than 75 MVA (gross aggregate nameplate rating), ~~utilizing and that are connected through a system~~ designed primarily for ~~aggregating~~ delivering such capacity connected at to a common point of connection at a voltage of 100 kV or above. Thus, the facilities designated as BES are:

a) The individual resources, and

b) The system designed primarily for delivering capacity from the point where those resources aggregate to greater than 75 MVA to a common point of connection at a voltage of 100 kV or above.

18. NERC states that all forms of generation resources, including variable generation resources, continue to be included in the proposed revisions to the definition. NERC states that this conclusion is consistent with the Commission’s recognition in Order No. 773 that the purpose of inclusion I4 is to include variable generation. Thus, NERC revised inclusion I4 to clarify its original intent and to reflect the Commission’s statements in Order No. 773 regarding its scope. NERC observes that the Commission in Order No. 773 noted that, “owners and operators of these resources that meet the 75 MVA gross aggregate nameplate rating threshold are, in some cases, already registered and have compliance responsibilities as generator owners and generator operators.”<sup>24</sup> According to NERC, given the increasing use of wind, solar, and other non-traditional forms of generation, NERC believes that “continuing the inclusion of individual variable generation units within the scope of the definition is appropriate to ensure that, where necessary to support reliability, these units may be subject to Reliability Standards.”<sup>25</sup>

19. With regard to the proposed revision in connection with collector systems, NERC states that, while the Commission did not direct NERC to categorically include collector systems pursuant to inclusion I4, the Commission stated in Order No. 773 that it “disagrees that collector systems described in inclusion I4 that solely deliver aggregated

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<sup>23</sup> NERC Petition at 15-16.

<sup>24</sup> NERC Petition at 18, *quoting* Order No. 773, 141 FERC ¶ 61,236 at P 115.

<sup>25</sup> NERC Petition at 18.

generation to the bulk electric system contain local distribution facilities because power is delivered from the collector system to the bulk electric system.”<sup>26</sup> Consequently, NERC revised inclusion I4 to include collector systems from the point where the generation aggregates to greater than 75 MVA to a common point of connection at a voltage of 100 kV or above.

20. NERC states that it did not establish a continent-wide bright-line determination for such elements because there are significant differences in collector system configurations. Rather, NERC identified the portions of the collector system which provide a reliability benefit to the interconnected transmission network and are easily identified within collector systems. According to NERC, the result identifies the point of aggregation of 75 MVA and above and the interconnecting facilities to the interconnected transmission network. NERC states that the aggregation threshold is consistent with the aggregation of capacity in inclusion I2 and recognizes that the loss of those facilities would represent a loss of 75 MVA capacity to the bulk electric system and thus a potential reliability impact on the operation of the interconnected transmission network.<sup>27</sup> Furthermore, NERC states that where collector systems support the reliable operation of the surrounding interconnected transmission system and do not have a distribution function, those excluded facilities may be candidates for inclusion through the exception process.<sup>28</sup>

**b. Reactive Power Devices (Exclusion E4)**

21. NERC proposes the following revisions to exclusion E4:

Reactive Power devices ~~owned and operated by~~ installed for the sole benefit of a retail customer ~~solely for its own use(s).~~

NERC states that it revised exclusion E4 to “remove ownership implications” as the definition “is a component-based definition and does not take into account the ownership of the actual equipment” but is focused on which components should be included or excluded.<sup>29</sup> NERC explains that exclusion E4 is the technical equivalent of exclusion E2

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<sup>26</sup> *Id.*

<sup>27</sup> NERC Petition at 16-17.

<sup>28</sup> See NERC Rules of Procedure, Appendix 5C, *Procedure for Requesting and Receiving an Exception from the Application of the NERC Definition of Bulk Electric System*, effective July 1, 2014.

<sup>29</sup> NERC Petition at 29-30.

(behind the meter generation) for reactive power devices. NERC further explains that the proposed revision to exclusion E4 is responsive to concerns raised by industry, which noted that exclusion E4 should not be confined to devices that are owned and operated by a retail customer solely for its own use.<sup>30</sup>

**c. Clarifying Revisions**

22. In the course of responding to the Commission directives and Phase 2 issues, NERC concluded that several minor, clarifying changes were appropriate to further clarify the definition. NERC proposes that in inclusion I1 (transformers), the phrase “under Exclusion E1 or E3” be changed to “by application of Exclusion E1 or E3.” NERC explains that this clarification is necessary because transformers have windings operating at different voltages and multiple windings in some circumstances. NERC states that the proposed change to inclusion I1 does not impact the original intent of the inclusion that was approved in Order No. 773.

23. Inclusion I2 (generating resources) includes generators, based on individual or aggregate gross nameplate rating, in the bulk electric system and the generator terminals through the high-side of the step-up transformers connected at a voltage of 100 kV or above. NERC separated inclusion I2 into sub-parts (a) and (b) which mirrors the text of the NERC Statement of Compliance Registry Criteria (Appendix 5B of the NERC Rules of Procedure) for generating units.

24. Inclusion I5 (static or dynamic reactive power devices) includes as part of the bulk electric system “static or dynamic devices (excluding generators) dedicated to supplying or absorbing reactive power that are connected at 100 kV or higher, or through a dedicated transformer with a high-side voltage of 100 kV or higher, or through a transformer that is designated in inclusion I1.” NERC modified inclusion I5 by adding the phrase “unless excluded by application of Exclusion E4” at the end to clarify that exclusion E4 “would exclude elements identified for inclusion in inclusion I5.”<sup>31</sup> NERC states that this is consistent with Order No. 773, where the Commission stated that exclusions E1 and E3 would not override inclusion I5 because exclusions E1 and E3 exclude transmission elements only and not resources. NERC explains that exclusion E4, which is specific to resources (i.e., reactive power devices), “would override inclusion

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<sup>30</sup> In Order No. 773, rather than directing such a change, the Commission noted that this issue could be explored by NERC in the development of Phase 2. Order No. 773, 141 FERC ¶ 61,236 at P 237.

<sup>31</sup> NERC Petition at 18.

15.”<sup>32</sup> NERC states that this clarification improves the definition by making the relationship between related inclusions and exclusions transparent, which will facilitate consistent application of the definition.

## **II. Notice of Filing and Comments**

25. Notice of the NERC petition was published in the *Federal Register*, 78 Fed. Reg. 79,429 (2014), with comments, protests and motions to intervene due on or before January 17, 2014. The following entities filed motions to intervene: City of Alameda, California, City of Redding, California, Edison Electric Institute, EDP Renewables North America LLC, Modesto Irrigation District, National Rural Electric Cooperative Association, PSEG Companies, and Wisconsin Electric Power Company. The following entities filed motions to intervene and comments: American Public Power Association and Public Utility District No. 1 of Snohomish County Washington (APPA and Snohomish), American Wind Energy Association (AWEA), Electricity Consumers Resource Council together with American Forest & Paper Association, Council of Industrial Boiler Owners and American Fuel & Petrochemical Manufacturers (ELCON), Exelon Corporation (Exelon), First Wind Holdings, LLC (First Wind), and Transmission Access Policy Study Group (TAPS). Xcel Energy Services Inc. (Xcel Energy) and Southern California Edison Company each filed motions to intervene out-of-time.

26. Exelon, TAPS, APPA and Snohomish support NERC’s filing. APPA and Snohomish state that the revised bulk electric system definition substantially improves reliability by focusing on core facilities that present the greatest risks of reliability failure. TAPS states that the revisions satisfy the Commission’s directives and improve the clarity of the definition.

27. Exelon expresses support for the changes to exclusions E1 and E3. Exelon states the Commission should accept exclusion E1, including note 2, without any modifications. Exelon references its comments on the June 22, 2012 Notice of Proposed Rulemaking (NOPR) in Docket Nos. RM12-6-000 and RM12-7-000 where Exelon argued that the configuration in Figure 3 of the NOPR should be treated as a radial network under exclusion E1 and explained that due to the high impedance connection between the lower voltage buses, little energy flows. Exelon explains that NERC’s technical analysis to support note 2 of exclusion E1 considered a number of factors – a range of voltages, variations of the impedance of the low voltage connection and the transmission system which account for a multitude of physical parameters such as conductor length, conductor type, system configuration and proximity of the low voltage loop to the transmission system. Exelon states these are the same factors the Commission expressed concern

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<sup>32</sup> *Id.*

about in Order No. 773.<sup>33</sup> Exelon explains that the analysis found that, for a 12.5 kV distribution system tie, the power flow direction was radial from the transmission substations to the distribution substations and “no flow reversal was seen in any of the contingency cases.”<sup>34</sup>

28. ELCON states that it supports NERC’s petition except for the revision to exclusion E1. ELCON requests that the Commission remand to NERC the issue of note 2 and direct NERC to “consider replacing its proposed 50 kV threshold with a 70 kV threshold for loops that are inside the fence of industrial or manufacturing facilities.”<sup>35</sup> ELCON disagrees that the threshold is properly set at 50 kV, at least for loops that are inside the fence of industrial or manufacturing facilities. Specifically, ELCON states that its members commonly have “looped, inside-the-fence conductors rated 69 kV and higher,” including industrial or manufacturing facilities that do not cogenerate electricity and steam, and are not NERC registered entities.<sup>36</sup> ELCON claims that these facilities were not designed or intended to be inside-the-fence extensions of the interconnected transmission network. According to ELCON, they are retail customers with the expectation that they will receive load following services from their host public utility regardless of the direction of flows at the interconnection. ELCON states that, absent a change to NERC’s proposal, these facilities could be brought under the revised definition contrary to reliability needs and to their expectations as retail customers.

29. In addition, ELCON argues that NERC has not properly determined that 50 kV is the maximum threshold that would allow for reliability of the interconnected transmission network or that a 70 kV threshold would not allow for such reliability. According to ELCON, the data presented in NERC’s technical analysis show that a 70 kV threshold would not pose significant reliability risk and also support a 70 kV threshold, as only a very small percentage of elements at voltages below that level have been deemed to raise a potential reliability issue that warrants monitoring. ELCON states that the 50 kV threshold would needlessly sweep many more industrial facilities than would be appropriate into the exception process.

30. ELCON argues that a more balanced and risk-based assessment of the findings in the report would be that, at loop voltages of less than 70 kV, NERC identified the

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<sup>33</sup> Exelon Comments at 3.

<sup>34</sup> *Id.*, quoting NERC Petition, Exh. D at 11.

<sup>35</sup> ELCON Protest at 2.

<sup>36</sup> ELCON Protest at 6.

potential for a small amount of “power flow reversal only under this configuration that would not be conceivable inside the fence of an industrial facility....”<sup>37</sup> According to ELCON, the simulations confirm the practice that the regional entities have found it necessary to monitor less than 70 kV elements only in rare cases. ELCON also states that a 70 kV threshold would substantially ease the administrative burden on a number of entities seeking to qualify for an exclusion. ELCON contends that, if the exclusion does not fully capture the impact of a particular situation, NERC and the regional entities could utilize the exception process seeking its inclusion. ELCON adds that NERC ignored the proper functioning of the exception process.

31. AWEA urges the Commission to clarify that inclusion I4 does not include individual dispersed generators, but rather only applies to components of the dispersed generation facility that aggregate more than 75 MVA of nameplate capacity. AWEA claims that this could be achieved by removing the words “the individual resources” from inclusion I4, sub-bullet “a.” AWEA contends that this would be consistent with the NERC’s reasoning that dispersed generation collector facilities that aggregate less than 75 MVA should not be included because they do not “consistently provide a reliability benefit to the interconnected transmission network.”<sup>38</sup>

32. Alternatively, AWEA requests that the Commission remove sub-bullet “a” from inclusion I4 and convene a technical conference to discuss the reliability and cost implications of including or not including individual dispersed generators in the bulk electric system. AWEA states that, at a minimum, the Commission should interpret that inclusion I4 does not require all standards to apply to individual dispersed generators, but allow NERC to petition for the applicability of individual standards to dispersed generators on a case-by-case basis by demonstrating that such groups of generators must be covered by the standard to maintain reliability. According to AWEA, this would ensure that only standards “that were written with dispersed generators in mind...are applied to individual dispersed generators.”<sup>39</sup>

33. AWEA also argues that the NERC standard drafting team did not justify why individual dispersed generators should be included in the definition, but not the collector facilities that aggregate those individual generators. In addition, AWEA claims that wind plant owners will likely be forced to seek relief for tens of thousands of wind turbines through the exception process.

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<sup>37</sup> ELCON Protest at 10.

<sup>38</sup> AWEA Protest at 1-2.

<sup>39</sup> AWEA Protest at 10-11.

34. First Wind states that its concern is limited to inclusion I4 and the Commission's decision to include individual generation resources within the definition. First Wind is concerned about the Commission's decision to include individual generation resources in the bulk electric system definition because of the substantial impact that such decision will have on the financial viability of wind generators. First Wind recognizes that the Commission addressed the question of whether individual resources should be included in the bulk electric system in Order Nos. 773 and 773-A, and concluded that individual wind turbine generators should be included.<sup>40</sup> However, First Wind is concerned that the Commission did not have the information necessary to fully appreciate the substantial impact that this decision could have on wind generation and that its decision would not result in improving, ensuring or protecting reliability. In the alternative, First Wind requests that the Commission direct NERC to expedite consideration of the stakeholder proposal to change the applicability of certain reliability standards applicable to generator owners and generator operators to provide that such standards should not be applied at the individual generating resource as opposed to just the facilities operated at 100 kV or more, and require NERC to regularly report to the Commission on these efforts.

### **Reply Comments**

35. In reply comments, NERC states that ELCON mischaracterizes the purpose of the 50 kV threshold. NERC states that the 50 kV threshold was adopted as an associated component of exclusion E1 based on the scenarios and configurations used in its technical analysis and represents the vast majority of configurations that will be encountered in the industry. NERC also argues that its technical analysis resulted from extensive simulations which demonstrated that power flow reversal into the bulk electric system is unlikely when circuit loop operating voltages are below 50 kV.

36. NERC explains that the technical analysis notes that there may be actual cases that deviate from modeled scenarios, and that such deviations are expected to be rare and can be processed through the companion exception process. NERC states that the 50 kV threshold recognizes that there may be cases in which power flows to the bulk electric system through facilities operated below 50 kV, or that power does not flow through facilities operated above 50 kV. NERC states that in the former, the exception process is available to include facilities if this power flow affects reliability. Similarly, in the latter case, NERC states that if the facilities are included by application of the core definition and do not qualify for application of exclusion E3, the exception process is available to exclude such facilities. Contrary to ELCON's assertion, NERC states that the threshold results in proper use of the exception process by achieving a balance to minimize the

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<sup>40</sup> First Wind Protest at 2-3.

need for entities to use the process, while permitting its use to either include or exclude facilities.<sup>41</sup>

37. Further, NERC disagrees with First Wind's argument that an individual wind turbine generator does not impact reliability. Rather, NERC states that a 2009 NERC Special Report provides support that individual variable generators can impact system operations.<sup>42</sup> NERC adds that it is currently developing Project 2014-01, Standards Applicability for Dispersed Generation Resources, to review the applicability of Reliability Standards with requirements that apply to generator owners and generator operators, in which NERC will develop any necessary revisions to Reliability Standards relative to non-traditional generation sources. NERC states that First Wind and AWEA can participate in the process by attending standard drafting team meetings and through the submission of written comments.

38. In addition, NERC argues that First Wind's and AWEA's requests for the Commission to reconsider inclusion of individual dispersed power producing resources is an impermissible collateral attack because this issue was decided on the merits in Order Nos. 773 and 773-A. NERC states that Commission policy precludes relitigation of issues previously decided.

39. Exelon also filed reply comments. Exelon requests that the Commission deny ELCON's request to remand note 2 of exclusion E1. Exelon states that a remand will require more time than can be completed prior to July 1, 2014. However, if the Commission grants ELCON's request to remand, Exelon requests that the Commission approve note 2 as filed but direct NERC to consider changing the threshold in note 2.<sup>43</sup> AWEA and First Wind each filed motions for leave to answer and answers to the NERC reply comments. AWEA states NERC has failed to offer any evidence that individual wind turbines can affect the reliability of the bulk electric system and that the 2009 report that NERC cites to deals with a different set of generators and reliability issues. AWEA also states that Project 2014-01 will take too long to avoid the costs and confusion that the proposed definition will create. In its reply, First Wind states that NERC's reply comments took First Wind's statement, that an individual wind generator does not impact bulk electric system reliability, out of context. First Wind states that individual wind generators behind the point at which its output is aggregated with other wind generators

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<sup>41</sup> NERC Reply Comments at 6-7.

<sup>42</sup> NERC Reply Comments at 8, citing 2009 NERC Special Report: *Accommodating High Levels of Variable Generation* at 52.

<sup>43</sup> Exelon Reply Comments at 3-4.

up to 75 MVA, does not individually affect reliability because a wind generation facility is designed with a single point of interconnection to the grid and with a protection system that will disconnect the entire facility from the grid in the event of a disturbance significant to affect grid reliability. On March 10, 2014, Xcel Energy filed comments in support of AWEA and First Wind regarding the applicability of the definition to dispersed generation resources.

### **III. Discussion**

#### **A. Procedural Matters**

40. Pursuant to Rule 214 of the Commission's Rules of Practice and Procedure, 18 C.F.R. § 385.214 (2013), the timely, unopposed motions to intervene serve to make the entities that filed them parties to this proceeding. We will also accept the motions to intervene out-of-time. Granting late interventions at this stage of the proceeding will not disrupt the proceeding or place additional burdens on existing parties. Rule 213(a)(2) prohibits an answer to a protest or to answer unless otherwise ordered by the decisional authority.<sup>44</sup> We will treat the reply comments of NERC, Exelon and Xcel Energy as answers and accept them because they have provided information that assisted us in our decision-making process. We also accept the AWEA and First Wind motions for leave to answer and answers.

#### **B. Commission Determination**

41. Pursuant to section 215(d)(2) of the FPA, we approve the revisions to the definition of bulk electric system as just, reasonable, not unduly discriminatory or preferential, and in the public interest. As discussed below, we find that the proposed revisions to the definition of bulk electric system either adequately address the Commission's Order Nos. 773 and 773-A directives or provide an equally effective and efficient approach. We agree with NERC, APPA, Snohomish and TAPS that the revised definition improves reliability by focusing on core facilities that present the greatest risks of reliability failure. In addition, commenters raised no objections or concerns with NERC's clarifying revisions to inclusions I1, I2, I5 or the substantive revisions to exclusion E4. We find that these changes add clarity to the definition and, therefore, approve them. Below, we discuss the remaining revisions to exclusions E1 and E3 in response to the Commission's directives, and the revisions to inclusion I4 developed during the Phase 2 process.

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<sup>44</sup> 18 C.F.R. § 385.213(a)(2) (2013).

1. **Radial Systems (Exclusion E1) and Local Networks (Exclusion E3)**

42. We find that NERC's modification to exclusion E1, to add a 50 kV threshold for excluding certain radial loops, is reasonable. We find that NERC's technical justification based on the scenarios and configurations utilized in its analysis supports the selection of a 50 kV threshold and represents the vast majority of configurations that will be encountered in the industry. As explained by NERC, "[t]he standard drafting team conducted technical analysis including modeling the physics of loop flows through sub-100 kV systems, in order to determine an appropriate threshold."<sup>45</sup> Further, the NERC White Paper explains that "the Standard Drafting Team conducted extensive simulations of power flows which demonstrated that there is no power reversal into the BES when circuit loop operating voltages are [50 kV or less]. Therefore the study concludes that low voltage circuit loops operated [at 50 kV or less] should not affect the application of Exclusion E1."<sup>46</sup> Accordingly, we conclude that NERC's technical analysis for including a 50 kV threshold for excluding certain looped facilities is well supported. Moreover, NERC's approach is also consistent with the bright-line threshold concept in the definition which is designed to eliminate ambiguity.

43. We are not persuaded by ELCON's argument to remand the selection of the 50 kV threshold. NERC's technical analysis demonstrates that 50 kV is an appropriate level for determining whether a portion of the system is considered radial and is therefore a candidate for exclusion from the bulk electric system by application of exclusion E1 or is considered a networked system and therefore a candidate for exclusion by application of exclusion E3. We find that the technical justification resulted from NERC's extensive simulations which demonstrate that power flow reversal into the bulk electric system is unlikely when circuit loop operating voltages are below 50 kV.<sup>47</sup> We also conclude that using power flow reversal as the criterion to establish this threshold is reasonable and

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<sup>45</sup> NERC Petition at 22.

<sup>46</sup> NERC Petition, Exh. D at 17.

<sup>47</sup> *See id.* at 16-17. In addition, NERC states that "[t]he scenarios and configurations utilized in this analysis represent the majority of cases that will be encountered in the industry. The models used in this analysis establish reasonable bounds and use conservative parameters in the scenarios. However, there may be actual cases that deviate from these modeled scenarios, and therefore, results could be somewhat different than the ranges of results from this analysis. Such deviations are expected to be rare and can be processed through the companion BES Exception Process." *Id.* at 17.

consistent with exclusion E3, which precludes exclusion of facilities when power flows into the bulk electric system.<sup>48</sup> Also, while ELCON focuses its arguments on “inside-the-fence” loops, ELCON has not explained adequately how such configurations differ for reliability purposes from similar loops through small communities, military bases or other locations.

44. Furthermore, we disagree with ELCON that NERC has ignored the proper functioning of the exception process. We agree with NERC that the 50 kV threshold results in proper use of the exception process by achieving a balance to minimize the need for entities to utilize the process, while permitting its use to either include or exclude facilities, as appropriate. As NERC explains, the exception process is available to include facilities if power flow of facilities below 50 kV affects reliability and, in the same vein, exclude them if facilities are included by application of the core definition and do not qualify for application of exclusion E3.

45. In addition, we approve the revisions to exclusions E1 and E3 to ensure that generator interconnection facilities at or above 100 kV connected to bulk electric system generators identified in inclusion I2 are not excluded from the bulk electric system. We also approve the removal of the phrase “or above 100 kV but” from exclusion E3. In Order No. 773, the Commission concluded that removing the 100 kV floor in exclusion E3 will decrease the burden for some entities that would have otherwise been included in the bulk electric system because these entities may now apply exclusion E3. As noted above, NERC requested clarification that it should remove the phrase “or above 100 kV but” in the first sentence of exclusion E3. In Order No. 773-A the Commission agreed that removing the phrase in the first sentence of exclusion E3 is an appropriate way to meet the Commission’s directive.<sup>49</sup>

## **2. Dispersed Power Producing Resources (Inclusion I4)**

46. We approve NERC’s revision to inclusion I4 to include collector systems from the point where the gross nameplate capacity aggregates to greater than 75 MVA to a common point of connection at a voltage of 100 kV or above. We agree with NERC that

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<sup>48</sup> NERC concluded that “[s]imulations of power flows for the cases modeled in this study show there is no power flow reversal into the BES when circuit loop operating voltages are below 50 kV. This study also finds, for loop voltages above 50 kV, certain cases result in power flow toward the BES. Therefore, the study concludes that low voltage circuit loops operated below 50 kV should not affect the application of Exclusion E1.” NERC Petition, Exh. D at 17.

<sup>49</sup> See Order No. 773, 141 FERC ¶ 61,236 at P 199

the inclusion of the collector system is appropriate and consistent with the overall concept of applying the definition to identify elements that provide a reliability benefit to the interconnected transmission network. NERC only included those portions of the collector system that are used for delivering the aggregated gross nameplate capacity of the dispersed power producing resources to the interconnected transmission network. NERC states that the intervening equipment is being treated in a similar fashion to cranking paths. Furthermore, as NERC states, where collector systems support the reliable operation of the surrounding interconnected transmission system and do not have a distribution function, those excluded facilities may be candidates for inclusion through the exception process.<sup>50</sup> We agree with NERC that the identified portions of the collector system provide a reliability benefit to the interconnected transmission network and are easily identified within collector systems. We also agree that the aggregation threshold is consistent with the aggregation of capacity in inclusion I2 and recognize that the loss of those facilities would represent a loss of 75 MVA capacity to the bulk electric system and thus have a potential reliability impact on the operation of the interconnected transmission network.

47. We also approve NERC's clarification to inclusion I4 that all forms of generation resources, including variable generation resources, are included in the bulk electric system. We recognized that individual resources were part of this inclusion in Order No. 773, and NERC's proposed changes to inclusion I4 clarify this inclusion.<sup>51</sup> We agree with NERC that, given the increasing presence of wind, solar, and other non-traditional forms of generation, continuing the inclusion of individual variable generation units within the scope of the definition is appropriate to ensure that, where necessary to support reliability, these units may be subject to Reliability Standards. Moreover, inclusion I4 is limited to individual resources that aggregate to a total capacity greater than 75 MVA, the same threshold applicable to other types of generating resources.

48. We are not persuaded by AWEA's and First Wind's requests with regard to clarifying or modifying inclusion I4 to exclude individual power producing resources. The purpose of inclusion I4 is to include all forms of variable generation resources. As we noted in Order No. 773, there are geographical areas that depend on these types of generation resources for the reliable operation of the interconnected transmission network.<sup>52</sup> In any event, as First Wind acknowledges, the Commission addressed the question of whether individual resources should be included in the bulk electric system

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<sup>50</sup> See NERC Petition at 17.

<sup>51</sup> See Order No. 773, 141 FERC ¶ 61,236 at P 115.

<sup>52</sup> *Id.*

definition in Order Nos. 773 and 773-A, and concluded that individual wind turbine generators should be included. Nothing in the AWEA and First Wind pleadings have convinced us that our determinations in Order No. 773 need to be revisited. As NERC noted in a 2009 report on variable generation, “[d]istributed variable generators, individually or in aggregate (e.g. small scale photovoltaic), can impact the bulk power system and need to be treated, where appropriate, in a similar manner to transmission connected variable generation. The issues of note are forecasting, restoration, voltage ride-through, safety, reactive power, observability and controllability.”<sup>53</sup> For example, a wind farm larger than 75 MVA can affect reliability if all of its wind turbines trip offline simultaneously after just a slight fluctuation in voltage or frequency. Therefore, because variable generation can impact the interconnected transmission network, we anticipate that wind plant owners whose facilities meet the inclusion I4 criteria who seek to exclude individual wind turbines from the bulk electric system through the exception process will be infrequent.

49. Both AWEA and First Wind raise concerns regarding the potential costs of dispersed generation facilities having to comply with a full array of NERC Reliability Standards that apply to generator owners and operators, arguing that many such standards were drafted with conventional generation in mind. First Wind specifically requests, as alternative relief, that the Commission direct NERC to expedite consideration of a NERC project to revise the applicability of certain Reliability Standards that apply to generator owners and operators. In reply comments, NERC states that it is currently reviewing the applicability of Reliability Standards with requirements that apply to generator owners and generator operators of dispersed generation resources and invites interested persons, including AWEA and First Wind, to participate in the project.<sup>54</sup> We believe that it is appropriate for NERC and its stakeholders to address AWEA’s and First Wind’s concerns in this manner. For example, while individual wind turbines are part of the bulk electric system if their gross nameplate capacity aggregates to greater than 75 MVA, it may be appropriate that owners of these wind turbines be responsible for only a subset of

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<sup>53</sup> NERC Reply Comments at 8, *quoting* 2009 NERC Special Report: *Accommodating High Levels of Variable Generation*, at 52.

<sup>54</sup> NERC Project 2014-01, Standards Applicability for Dispersed Generation Resources. See the NERC project web page at: <http://www.nerc.com/pa/Stand/Pages/Project-2014-01-Standards-Applicability-for-Dispersed-Generation-Resources.aspx>.

the requirements applicable to other generator owners.<sup>55</sup> As noted above, NERC has initiated Project 2014-01 to consider applicability of standards for dispersed generation resources and, accordingly, we will not direct NERC to expedite consideration as requested by First Wind but would encourage First Wind's and AWEA's participation in NERC's standard development process.

The Commission orders:

The Commission hereby approves the revisions to the definition of bulk electric system as discussed in the body of this order.

By the Commission.

( S E A L )

Nathaniel J. Davis, Sr.,  
Deputy Secretary.

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<sup>55</sup> Cf., *Generator Requirements at the Transmission Interface*, Order No. 785, 144 FERC ¶ 61,221 (2013) (approving NERC proposal addressing applicability of Reliability Standards to interconnection facilities).

Document Content(s)

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