

Definition of Bulk Electric System – Phase 2

NERC Industry Webinar

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RELIABILITY | ACCOUNTABILITY



- Project 2010-17: Definition of Bulk Electric System (BES) – Phase 2
- Definition Clarification Items
 - Dispersed Power Producing Resources
- Remaining Order No. 773 & 773-A Directives
 - Sub - 100 kV Loops
 - Technical Justification
 - What “Is” and What “Is Not” BES
- Implementation Plan
- Project Milestones – Phase 2
- Questions

- Purpose:
 - To develop technical justification to support refinements to the definition
 - Necessary revisions to improve clarity
 - Address the directives from Orders 773 & 773-A

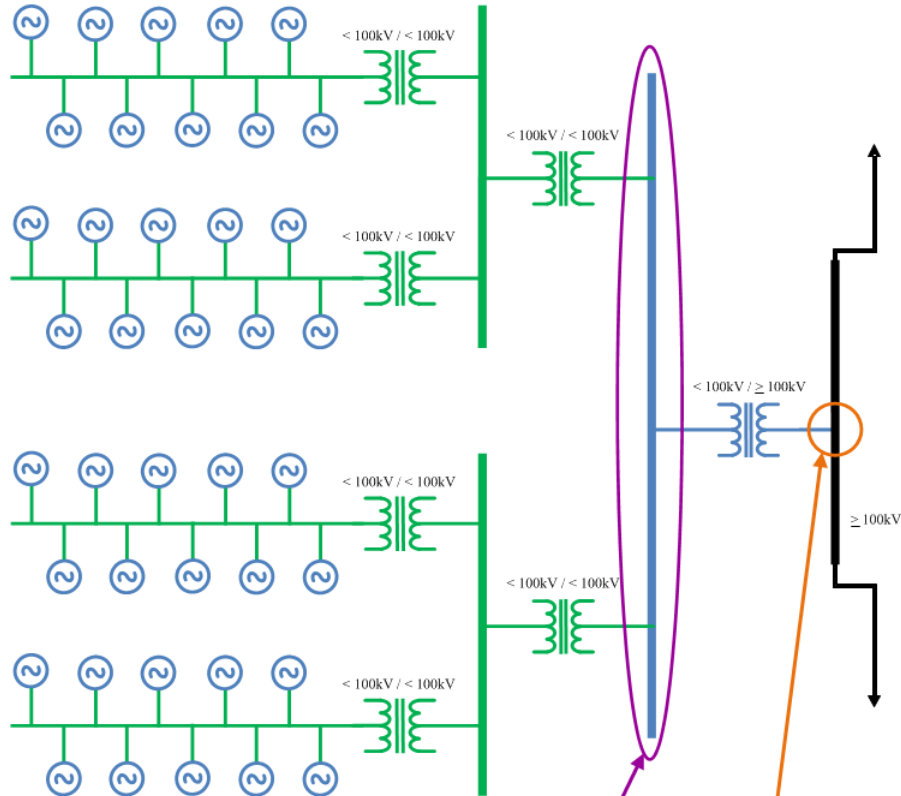
- 12 – Generating resource(s) ~~and dispersed power producing resources~~, including the generator terminals through the high-side of the step-up transformer(s) connected at a voltage of 100 kV or above with:*
- a) Gross individual nameplate rating greater than 20 MVA.*
Or,
 - b) Gross plant/facility aggregate nameplate rating greater than 75 MVA.*
- Dispersed power producing resources have been taken out of Inclusion I2 and returned to a separate inclusion (I4).
 - Prompted by industry confusion on how to address the generator terminal issue for dispersed power producing resources and “collector systems”.

- 14 – Dispersed power producing resources consisting of:*
- a) Individual resources that aggregate to a total capacity greater than 75 MVA (gross nameplate rating), 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.*
- Addresses industry concerns on the inclusion of “collector systems” to address the true reliability concern for loss of 75 MVA aggregated generation.

Definition Clarification Items: Dispersed Power Producing Resources Continued

Typical dispersed generation site and substation design (single transformation of voltage level) with a gross aggregate nameplate rating of 80 MVA (Individual Generator Unit Rating: 2 MVA). By application of Inclusion 14 the dispersed power producing resources and the Elements from the point of aggregation to the common point connection are BES Elements.

Green identifies non-BES portions of the Collector System.
Blue identifies the dispersed power producing resources and BES Elements between the point of aggregation and the common point of connection.



The point of aggregation is where the individual generator name plate ratings of the dispersed generation total > 75 MVA (actual 80 MVA) and a single point failure would result in loss of all generation contained on the dispersed generation site.

The common point of connection is where the individual transmission Element(s) of the collector system is connected to the 100 kV or higher Transmission system. (Note: This point is typically specified in the respective Transmission Owner and Generator Operator Interconnection Agreements.)

E1 – Radial systems:

- b) Only includes generation resources, not identified in Inclusions I2, ~~or 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, ~~or I3~~, or I4, with an aggregate capacity of non-retail generation less than or equal to 75 MVA (gross nameplate rating).*
- Necessary revision to accommodate Inclusion I4.

E3 – Local networks (LN):

- a) Limits on connected generation: The LN and its underlying Elements do not include generation resources identified in Inclusions 12, ~~or 13~~, or 14 and do not have an aggregate capacity of non-retail generation greater than 75 MVA (gross nameplate rating);*
- Necessary revision to accommodate Inclusion 14.

E3 – Local networks (LN):

*b) **Real** Power flows only into the LN and the LN does not transfer energy originating outside the LN for delivery through the LN;*

- “Real” has been added to Exclusion E3b to clarify the SDT’s intent.

E4 – Reactive Power devices installed for the sole benefit of a retail customer(s).

- Pluralized the term “customer” in response to industry comments.

- Order 773
 - Issued on Dec. 20, 2012
 - Commission approved:
 - Modifications to the definition of BES
 - Revisions to the Rules of Procedure (BES Exception Process)
 - Detailed Information to Support an Exception Request
 - Implementation Plan
 - Published in Federal Register on Jan. 4, 2013
- Order 773-A
 - Issued April 18, 2013
 - Reaffirmed Order No. 773

- Commission established several directives:
 - Directed how the definition will be implemented in regards to embedded generation within radial systems and local networks.
 - *Commission provided clarification in Order 773-A.*
 - **Requiring looped networks operating below 100 kV to be analyzed in conjunction with the evaluation of local networks (Exclusion E3).**
 - *Phase 2 “first” posting presented an alternative to the directive to address the reliability concern.*
 - *Phase 2 “second” posting has refined the proposal.*

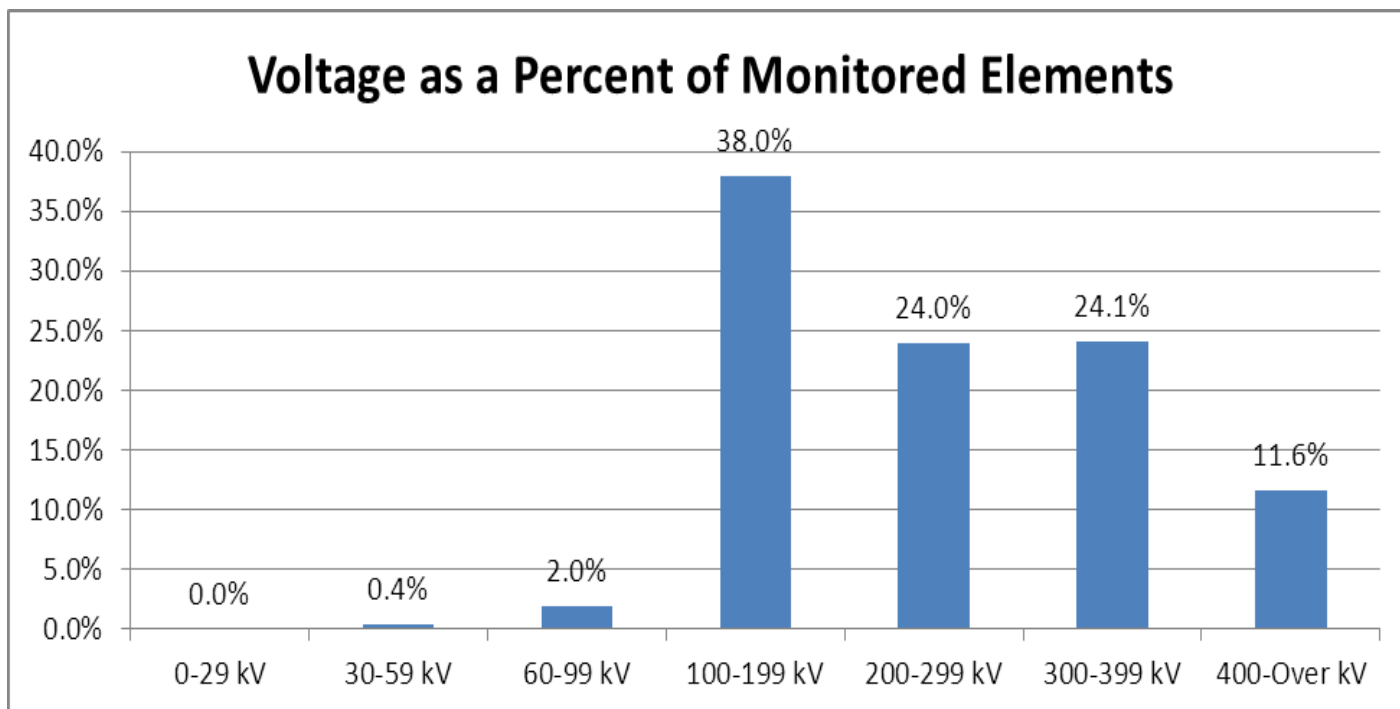
- Commission established directive:
 - Directed revisions to Exclusions E1 (radial systems) and E3 (local networks) to address concerns with embedded generation (BES designated generation by application of Inclusion I2)
 - *Phase 2 “first” posting addressed directive.*

- The Project 2010-17 Standard Drafting Team (SDT) is proposing an equally effective and efficient alternative to address the Commission's (FERC's) directives expressed in Orders 773 and 773-A by establishing a 50 kV threshold below which sub-100 kV loops do not affect the application of Exclusion E1.

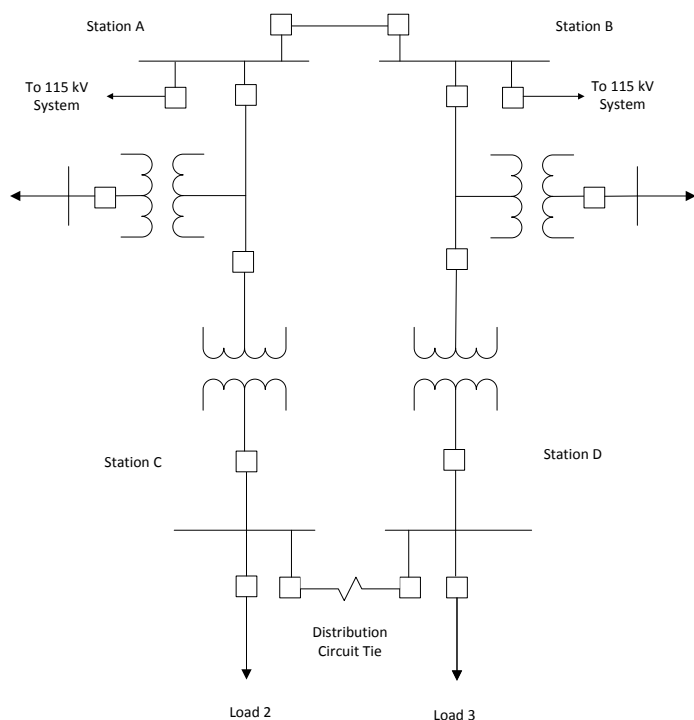
Exclusion E1 – Radial Systems:

Note 2 – The presence of a contiguous loop, operated at a voltage level of ~~30~~ 50 kV or less, between configurations being considered as radial systems, does not affect this exclusion.

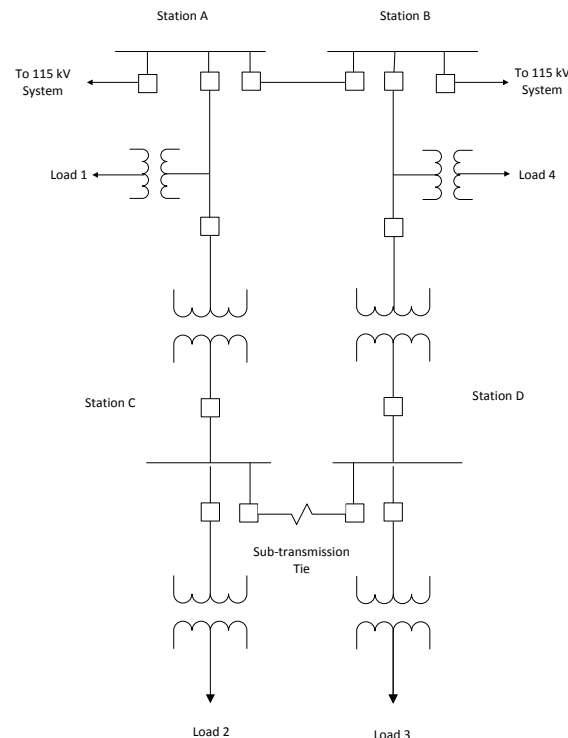
1. Regional voltage levels that are monitored on major interfaces, paths, and monitored elements to ensure the reliable operation of the interconnected transmission system were examined to determine the lowest monitored voltage level.



2. Power system analyses determined the maximum amount of power that can be transferred through the low voltage systems, when looped, under a worst case scenario at various voltage levels.



Radial Systems with Low Voltage Distribution Loop



Radial Systems with Sub-transmission Loop

The analysis of sub-100 kV loops associated with the evaluation of Elements under the E1 and E3 exclusions is used as a “qualifier” for the potential exclusion of the Elements that operate at or above 100 kV.

- Failure to not meet the “bright-line” criteria established by Exclusions E1 and E3 does not result in the inclusion of the sub-100 kV loops in the BES.
- Order 773, paragraph 155 states:
“Thus, the Commission, while disagreeing with NERC’s interpretation, does not propose to include the below 100 kV elements in figure 3 in the bulk electric system, unless determined otherwise in the exception process.”
- Order No. 773-A, paragraph 36 states:
“Moreover, as noted in the Final Rule, the sub-100 kV elements comprising radial systems and local networks will not be included in the bulk electric system, unless determined otherwise in the exception process.”

- **Effective Date:**

- This definition shall become effective on the first day of the second calendar quarter after applicable regulatory approval.
- In those jurisdictions where no regulatory approval is required the definition shall ~~go into effect~~ **become effective** on the first day of the second calendar quarter after Board of Trustees adoption **or as otherwise made effective pursuant to the laws of applicable governmental authorities.**
- Anticipated U.S. Effective Date: July 1, 2014.

- **Compliance Obligations:**

- 24 months after the applicable effective date of the definition for newly identified Elements.
- Anticipated U.S. Compliance Date: July 1, 2016.

Note: If a longer timeframe is needed for an entity to be fully compliant with all standards applicable to an Element or group of Elements that are newly identified as BES when the Phase 2 definition is applied, the appropriate timeframe may be determined on a case-by-case basis by mutual agreement between the Regional Entity and the Element owner/operator, and subject to review by the ERO.

- BES Definition 30-day Concurrent Posting
 - Formal Comment Period ends September 4, 2013
 - Additional Ballot Period August 26 – September 4, 2013
- Additional/Final Ballot Posting – September 2013
- Board Delivery – November 7, 2013
- Filing with the Commission (FERC) – November/December 2013



Questions and Answers

Website: http://www.nerc.com/pa/Stand/Pages/Project2010-17_BES.aspx