

Project 2010-17 Phase 2 - Definition of BES

Please **DO NOT** use this form for submitting comments. Please use the [electronic form](#) to submit comments on the SAR. The electronic comment form must be completed by **February 3, 2012**.

If you have questions please contact Ed Dobrowolski at ed.dobrowolski@nerc.net or by telephone at 1.609.947.3673.

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Background Information

This posting is for soliciting comment.

This SAR is a direct result of the industry comment periods for Project 2010-17 Definition of BES Phase 1 where the industry indicated a need for further detailed examination of the technical concepts underlying the BES definition. Due to time constraints in Phase 1 brought about by the FERC Orders driving the revised definition, any expansion of the scope of Phase 1 was deferred to Phase 2 where time deadlines would be less of an issue. The language of the SAR is such that any and all aspects of the Phase 1 definition are open to discussion and possible revision. However, the SDT outlined some of the major points that were brought up in Phase 1 by bulleting them in the SAR description. The SDT does not consider this list to be an all exclusive one – it is simply a brief listing of those issues that were identified in Phase 1.

You do not have to answer all questions. Enter all comments in simple text format. Bullets, numbers, and special formatting will not be retained.

Insert a “check” mark in the appropriate boxes by double-clicking the gray areas.

The scope of this project includes:

Collect and analyze information needed to support revisions to the definition of BES developed in Phase 1 of this project to provide a technically justifiable definition that identifies the appropriate electrical components necessary for the reliable operation of the interconnected transmission network. The definition development will include an analysis of the following issues which were identified during the development of Phase 1 of Project 2010-17 Definition of the BES. Clarification of these issues will appropriately define which Elements are necessary for the reliable operation of the interconnected transmission network.

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- Develop a technical justification to set the appropriate threshold for Real and Reactive Resources used in the operation of the Bulk Electric System (BES)
- Determine if there is a technical justification to support the assumption that there is a reliability benefit of a contiguous BES
- Determine if there is a technical justification for the equipment which “supports” the reliable operation of the BES but is installed on the distribution system
- Determine if there is a technical justification to support an automatic interrupting device in Exclusions E1 and E3
- Determine if there is a technical justification to support the inclusion of Cranking Paths and Blackstart Resources
- Determine if there is a technical justification for selection of 100 kV as the bright-line voltage level
- Determine if there is a technical justification to support allowing power flow out of the local network under certain conditions and if so, what the maximum allowable flow should be

Provide improved clarity to the following:

- The relationship between the BES definition and the ERO Statement of Compliance Registry Criteria established in FERC Order 693
- The use of the term “non-retail generation”
- The language for Inclusion I4 on dispersed power resources
- The appropriate ‘points of demarcation’ between Transmission, Generation, and Distribution

Phase 2 of the definition development may include other improvements to the definition as deemed appropriate by the drafting team, with the consensus of stakeholders, consistent with establishing a high quality and technically justifiable definition of the Bulk Electric System (BES).

Based on the potential revisions to the definition of the Bulk Electric System (BES) and an analysis of the application of, and the results from, the exception process, the drafting team will review and if necessary propose revisions to the ‘Technical Principles’ associated with the Rules of Procedure Exception Process to ensure consistency in the application of the definition and the exception process.

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1. Do you agree with this scope? If not, please explain.

Yes

No

Comments: NESCOE supports the effort to develop specific technical justifications for the BES definition. The description of the scope provided above states that the continued development of the BES definition in Phase 2 may include improvements to the definition and, later, contemplates potential revisions to the BES. However, to avoid any misunderstanding, the scope should explicitly state that the Phase 2 work is sufficiently broad such that the language developed in Phase 1 remains open and subject to restructuring and revision based on the technical analysis being undertaken. In other words, the scope should clarify that the analysis in Phase 2 is not being undertaken simply to provide technical justifications for the BES language already approved by the NERC Board of Trustees in conjunction with Phase 1.

NESCOE continues to believe, as it stated in previous comments, that reliance on the bright-line threshold may impose substantial costs on New England ratepayers without achieving meaningful reliability benefits. Additionally, NESCOE repeats its comment on the 2nd Draft Definition of the BES that separating the BES definition into two phases is problematic for both procedural and substantive reasons. NESCOE's concerns with this approach are described in more detail in those earlier comments.

The SDT has identified several issues that are included in the scope of Phase 2 of the project that are associated with the technical aspects of the definition and require technical justification to drive a revision to the definition. Compelling technical justification is an essential component in moving any revision forward that addresses the technical nature of the BES definition. The SDT is seeking to identify existing technical justifications (i.e., completed studies, technical papers, etc.) and requests your assistance to properly identify resources available to the SDT which will facilitate the SDT's work in prioritizing its efforts.

Note: The SDT does not intend to respond to all responses associated with an entity's knowledge of existing technical justification (i.e. analysis methodologies, completed studies, technical papers, etc.). The SDT is collecting potential resources that could assist in the development of compelling technical justification.

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2. Do you agree that the SDT should pursue the development of technical justification to set thresholds for Real and Reactive Power Resources used in the reliable operation of the BES different from those presently existing in the BES definition?

Yes

No

Comments: In response to this and other questions below regarding whether a technical justification should be pursued to support inclusions/exclusions and the core BES definition itself, NESCOE strongly answers in the affirmative. No proposed reliability standard should move forward absent a technical justification demonstrating that the standard is neither underinclusive (leaving reliability issues unaddressed) nor overinclusive (imposing costs disproportionate to the reliability benefit). A technical justification is particularly critical for the core BES definition and its related inclusions and exclusions given the sweeping changes and resulting costs that the final language could impose. For the same reasons, NESCOE urges the SDT to develop a sound technical justification to support setting thresholds for including real and reactive power resources in the BES.

- a. Are you aware of existing technical justification (i.e., analysis methodologies, completed studies, technical papers, etc.) that would assist the SDT in the development of technical justification for this issue? If so, please provide details in the 'Comments' field.

X Yes

No

Comments: Loss of real power resources in Northeastern North America is covered by regional requirements through the NPCC as well as requirements implemented in New England by ISO-NE planning and operating rules and in New York by NYISO's planning and operating rules. ISO-NE and NYISO planning and operating studies demonstrate that losses of 1200 MW and higher, depending on operating conditions, are generally tolerable with no adverse reliability impact on the bulk electric system in the region. Assuming that the aggregate of generation connected to a local contiguous network is less than 300 MW, then loss of the entire local network and the connected generation will result in a real power loss to the bulk system far below 1200 MW. Therefore, NESCOE suggests there is evidence in these planning and operating studies that the 75 MVA provided in the core definition is overly restrictive with regard to loss of real power. NESCOE believes that an appropriate standard for either radial connections or connections to a local network should be based on technical criteria relating to impact of "loss of source" on the

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regional bulk network, recognizing local area considerations. NESCOE is not aware of any technical justification for including reactive power resources on local networks in the BES as long as the local network can be separated from the BES by protection and control devices with appropriate local redundancy and speed of operation; in the Northeast, these are already required per NPCC Directory 4.

3. Do you agree that the SDT should pursue technical justification that supports the assumption that there is a reliability benefit of a contiguous BES?

Yes

No

Comments: As stated in our response to question 2, NESCOE believes the definition and scope of the BES should be supported by technical justifications. However, we check “no” above because the phraseology of this question is problematic. The words “supports the assumption” and “benefit” bias the issue of whether the BES should be contiguous or not. The statement should simply read: “Do you agree that the SDT should determine if there is a technical justification for a contiguous BES?”

The inclusion of facilities under an assumption that there is a reliability benefit to a contiguous BES creates significant risk of imposing excessive costs on ratepayers. As NESCOE stated in its comments on the 1st BES draft, NESCOE believes the BES definition should include only those facilities having a direct impact on the reliability of the interconnected network, to ensure that costs imposed have attendant reliability benefits. The imperative to identify such benefits drives the need for technical justifications.

- a. Are you aware of existing technical justification (i.e., analysis methodologies, completed studies, technical papers, etc.) that would assist the SDT in the development of technical justification for this issue? If so, please provide details in the ‘Comments’ field.

Yes

No

Comments:

4. Do you agree that the SDT should pursue technical justification for including in the BES definition the equipment which “supports” the reliable operation of the BES?

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 Yes No

Comments: NESCOE believes the definition of the BES should cover the elements “necessary to the reliable operation of the interconnected transmission network.” It is not clear how the STD would distinguish a “supporting” from a “necessary” element; NESCOE does not believe the BES should include a subcategory of facilities that only “support” reliable operation and do not meet the definition as “necessary.” Expanding the BES reliability requirements to such a subcategory would impose significant and unjustified costs on consumers.

1) Are you aware of existing technical justification (i.e. analysis methodologies, completed studies, technical papers, etc.) that would assist the SDT in the development of technical justification for this issue? If so, please provide details in the ‘Comments’ field.

 Yes No

Comments:

5. Do you agree that the SDT should pursue technical justification to support including an automatic interrupting device in Exclusions E1 and E3?

 Yes No

Comments: See general comments in number 2 above. Additionally, NESCOE believes that incorporating appropriate automatic interrupting devices in the BES network and at the interfaces between the BES and non BES networks is appropriate.

a. Are you aware of existing technical justification (i.e., analysis methodologies, completed studies, technical papers, etc.) that would assist the SDT in the development of technical justification for this issue? If so, please provide details in the ‘Comments’ field.

 Yes No

Comments: NPCC system protection design criteria embodied in NPCC Directory 4.

6. Do you agree that the SDT should pursue technical justification to support the inclusion of Cranking Paths in the BES definition and to retain Blackstart Resources as part of the BES definition?

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 Yes No

Comments: See general comments in number 2 above.

Additionally, NESCOE reiterates its comments on the 1st Draft Definition of the BES that it is not appropriate to include black start units in the BES. These units and associated cranking paths are used only for restoration and not system operation. Further, black start units are already covered by existing reliability standards.

However, to the extent there is a technical justification for including blackstart resources in the BES, NESCOE believes that a technical analysis based on probabilistic analysis is required to determine if cranking paths should be included in the BES definition. (Again, the word “support” should be replaced by a neutral term such as “determine”.) Loss of a cranking path during the relatively brief time that the black start unit is in operation has a much lower probability of occurrence than the failure of the black start resource itself. For example, a transmission path connected to a black start unit may have an availability exceeding 0.999 while a black start unit may have an availability of 0.900 or less. The technical analysis being undertaken should consider availability of the transmission path, availability of the unit, the number of parallel blackstart units capable of supporting a network reenergization as well as the probability, extent, and duration of a blackout.

- a. Are you aware of existing technical justification (i.e., analysis methodologies, completed studies, technical papers, etc.) that would assist the SDT in the development of technical justification for this issue? If so, please provide details in the ‘Comments’ field.

 Yes No

Comments:

7. Do you agree that the SDT should pursue technical justification for selection of 100 kV as the bright-line voltage level?

 Yes No

Comments: See general comments in number 2 above.

The development of a technical justification for the selection of 100 kV as an “across the board” bright-line voltage level, which the drafting process has so far failed to provide, is essential. The BES is a complex system which can be adversely impacted by disturbance situations and/or

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contingencies at a variety of voltage levels. The response of an electrical network depends on factors including the location of resources and the location of faults as well as the impedance of a given network path. It can be shown that behavior of the network is not simply a function of voltage level. For example in some areas, delayed cleared faults at 230 kV may have no adverse impact on the BES while in other areas such faults at 115 kV may have adverse impact. Accordingly, absent a technical justification for a bright-line voltage level, NESCOE supports the performance-based classification of BES elements as described in NPCC Document A10.

- a. Are you aware of existing technical justification (i.e. analysis methodologies, completed studies, technical papers, etc.) that would assist the SDT in the development of technical justification for this issue? If so, please provide details in the 'Comments' field.

X Yes

No

Comments: NPCC Directory 1 provides criteria for the design and operation of the bulk power system. As stated in this document *“The objective of these criteria is to provide a “design-based approach” to ensure the **bulk power system** is designed and operated to a level of reliability such that the loss of a major portion of the system, or unintentional separation of a major portion of the system, will not result from any design **contingencies** referenced in Sections 5.4.1 and 5.4.2. In NPCC the technique for assuring the reliability of the **bulk power system** is to require that it be designed and operated to withstand representative **contingencies** as specified in this Directory. Analyses of simulations of these **contingencies** include assessment of the potential for widespread cascading outages due to overloads, instability or voltage collapse. Loss of small portions of a system (such as radial portions) may be tolerated provided these do not jeopardize the reliability of the remaining **bulk power system** (emphases added).”*

Those elements that constitute the bulk power system are determined by a performance based testing methodology prescribed in NPCC document A10. From the introduction of this document:

*“The methodology in this document is used to classify **elements** of the **bulk power system** and may result in **elements** being added to or removed from the NPCC **Bulk Power System** List. The methodology in this document is based on the following:*

- *Results of an analysis done on a bus basis can be applied to identify which **elements**, or portions thereof, connected to the bus are part of the **bulk power system**.*

- ***Elements** shall not automatically be included or excluded from the **bulk power system** based on voltage class. Application of this methodology may be omitted at buses that can be logically excluded from the **bulk power system** based on study results at other buses tested using this methodology. If a bus is determined to be **bulk power system**, all other buses with elements connected to that bus must be tested.*

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- **Elements** shall be evaluated based on this methodology when significant changes occur on the system that could change an **element's bulk power system** status; the evaluation may be limited to the affected part of the system.
- **Areas** and facility owners may adopt methodologies that exceed the requirements set forth in this document for their own purposes. However, only **elements** classified as **bulk power system** as a result of testing described in this document shall be included on the NPCC's list of **bulk power system elements**. NPCC criteria and compliance monitoring shall consider only the system **elements** listed on NPCC's list of **bulk power system elements (emphases added)**."

Note in particular that the second bullet states that elements shall not be included or excluded based on voltage class. The document prescribes specific testing that determines elements that can have significant adverse impact and those elements that will not have significant adverse impact. This classification testing methodology is presently used by all planning authorities in northeastern North America. NESCOE strongly supports this methodology and notes that a vast majority of 115 kV facilities in New England are not classified as BPS because testing has shown they have no adverse impact on the reliability of the bulk electric system.

8. Do you agree that the SDT should pursue technical justification to support allowing power flow out of the local network under certain conditions and if so, what the maximum allowable flow should be?

Yes

No

Comments: See general comments in number 2 above. In its comments on the 2nd Draft BES Definition SAR, NESCOE commented that "NERC's draft technical network exclusions document should be amended such that local networks would be permitted to qualify for network exclusions under E3 if power flowing out of the network is minimal and would not likely adversely impact the BES. For example, transfers of less than or equal to 100 MVA should not have any adverse impact on the BES. The draft technical network exclusions document should be amended to state that transfers of 100 MVA from the local network into the BES are acceptable." NESCOE suggested 100 MVA as a starting point. NESCOE encourages the SDT to explore this matter further and provide a technically based justification for limiting flows into the BPS from the local network. With due consideration to the threshold of real power discussed in NESCOE's response to Question 2, NESCOE believes that outflows from the local network within some threshold level should not be restricted at any time.

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- a. Are you aware of existing technical justification (i.e., analysis methodologies, completed studies, technical papers, etc.) that would assist the SDT in the development of technical justification for this issue? If so, please provide details in the 'Comments' field.

Yes

No

Comments:

9. Do you have any other issues that require technical justification that you feel need to be added to the SAR? If so, please provide a detailed explanation of the issue and why it should be included.

Yes

No

Comments:

10. Do you have any other issues that are associated with improving the clarity of the definition created in Phase 1 that will assist the Registered Entity in the identification of BES Elements without altering the intent or scope of the definition? If so, please provide a detailed explanation of the issue and why it should be included.

Yes

No

Comments: The intent of this question is not clear. NESCOE expects that the STD's efforts to clarify definitions by seeking technical justifications will necessarily lead to revisions to some of those terms, including the base BES definition itself. For this reason, NESCOE repeats its comment in question 1 that to avoid any misunderstanding, the scope should explicitly state the Phase 2 work is sufficiently broad such that the language developed in Phase 1 remains open and subject to restructuring and revision based on the technical analysis being undertaken. In other words, the scope should clarify that the analysis in Phase 2 is not being undertaken simply to provide technical justifications for the BES language already approved by the NERC Board of Trustees in conjunction with Phase 1.

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11. Are you aware of any regional variances associated with approved NERC Reliability Standards that will be needed as a result of this project? If yes, please identify the Regional Variance.

Yes

No

Comments: Again, NESCOE believes this question is unclear. Following clarification of the issue, NESCOE may provide comments at a future time on regional variances required in the New England region.

12. Are you aware of any business practice that will be needed or that will need to be modified as a result of this project? If yes, please identify the business practice:

Yes

No

Comments: NESCOE anticipates that the results of this project will entail multiple changes to numerous existing business practices, including impacts related to maintenance and operation as well as construction of new facilities required to comply with the approved BES definition. Maintenance will likely be impacted due to the frequency and extent of maintenance required. Operations may be impacted in several ways. For example, there may be increased outages scheduled to enable new construction of upgrades required to meet BES requirements. Indeed, extensive construction outages to comply with the BES could ironically reduce reliability due to extending exposure periods of a weakened system and could impose increased costs by leading to “must run” units dispatched out of economic merit. Construction could be extensive.

13. If you have any other comments on this SAR that you haven’t already mentioned above, please provide them here:

Comments: