Name (35 Responses)
Organization (35 Responses)
Group Name (17 Responses)
Lead Contact (17 Responses)
IF YOU WISH TO EXPRESS SUPPORT FOR ANOTHER ENTITY'S COMMENTS WITHOUT ENTERING ANY ADDITIONAL COMMENTS, YOU MAY DO SO HERE. (8 Responses)
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Group
Western Public Power Coalition
Eric Christensen
Yes
The Western Public Power Coalition strongly supports the Guidance Document and congratulates the SDT on providing an excellent first draft. The Coalition believes the Guidance Document will provide useful and detailed guidance to both regulators and the industry to help ensure consistent and fair application of the BES Definition. With respect to the discussion of inclusion I1, the Coalition believes the Guidance Document's discussion of this inclusion promotes clarity and consistency in application of the inclusion. While we support the discussion of Inclusion I1, we suggest several modifications of the discussion, which we believe will add substantially to its clarity. First, the discussion of Blackstart Resources (page 4, second paragraph) should make clear that "Blackstart Resources" refers to the NERC Glossary of Terms. Under the NERC definition, generators are defined as "Blackstart Resources" only if they are included in a Transmission Operator's restoration plan, and a generator therefore does not become a "Blackstart Resource" merely because it has blackstart capability. We therefore suggest the SDT either make clear that "Blackstart Resources" includes only generators "identified in the Transmission Operator's restoration plan" (as with the box on page 51 of the Guidance Document) or that the SDT incorporate the NERC Glossary definition directly into the Guidance Document (as with the "Element" definition on pages 24 and 44 of the Guidance Document). Second, we believe the use of black in the diagrams, both in the specific I1 inclusion, and in other parts of the Guidance Document, should be clarified. Where it intends black to represent an Element with indeterminate BES status, the SDT should make that intent clear by adding a notation to the color key preceding the diagrams explaining that black indicates an Element's status is not defined. The SDT should also use blue or green to indicate the status of connecting Elements where that usage might help clarify the Document. We point out examples where such clarification should be provided throughout our comments. For example, in Figure I1-3, the status of the lines coming out of the BES transformer cannot be determined from the information provided because it is not clear whether these lines are, for example, part of a Local Network or radial system. Similarly, because the status of the lines shown in Figure I1-4 cannot be determined from the information given, the BES status of the lines should be

clearly indicated by showing them in either blue or green. It is important to show the BES status of these lines because the BES status of the lines connecting to the high side of a transformer is the starting point for determining whether the transformer itself is part of the BES. If these connecting lines are excluded from the BES because, for example, they are embedded in a Radial or Local Network, the transformers would be non-BES regardless of operating voltage by applying the hierarchical approach embedded in the BES Definition. The assumption that the high-voltage line feeding the transformer is BES is therefore important and shading that line blue would clarify application of the diagrams. Similarly, marking the lines coming out of the low side of the transformer represented in Figure I1-4 as non-BES is important to illustrate one of the key principles embedded in the BES Definition -- that transmission Elements connecting to non-BES Elements, including the low side of a transformer marking the line between the BES and non-BES, are themselves non-BES.

Yes

The Western Public Power Coalition congratulates the SDT on providing an excellent first draft. The Coalition generally agrees that the discussion of Inclusion I2 in the Guidance Document is accurate and will promote clarity and consistency in application of the inclusion. We suggest certain clarifications to improve the readability and utility of the discussion. We believe that added clarity could be achieved if the SDT explicitly makes clear that the Elements depicted in black in the diagrams are of indeterminate BES status. Making this clarification is helpful because, in the case of generators, the critical determination under the BES Definition is whether the generator meets the 20 MVA capacity threshold (75 MVA for an aggregation of generators) and whether it is connected at voltages above 100 kV, rather than the BES status of the lines to which the generator connects. The Coalition also suggests that the discussion could be clarified by explaining the relationship between the term "[g]enerating resources," which is used in Inclusion I2, and "generation site," as that term is used in the explanatory text associated with diagrams illustrating Inclusion I2. As we understand it, the SDT is using the term "generator site" to indicate that multiple generators located on a single site are to be aggregated for purposes of determining whether the 75 MVA threshold specified in Inclusion I2 has been exceeded. We believe it would be helpful to make that usage clear, or to otherwise explain how the terms used in the diagrams relate back to the terms used in the Inclusion. The Coalition also believes that the SDT should provide additional clarity regarding the relevance of the location of a load as depicted in Figures I2-5 and I2-6. The narrative discussion at the top of Figure I2-6 suggests that the location of "off-site Load" is critical, but this is not reflected in the discussion in the box in the lower right side of the diagram, which makes reference only to the fact that the high side of the generator step-up transformer is less than 100 kV. We also believe that the location of the load is not critical because Inclusion I2 classifies generators meeting the 20 MVA/75 MVA threshold as BES if they are connected "through the high-side of the step-up transformer(s) connected at a voltage of 100 kV or above." Under Inclusion I2, then, the high-side voltage of the step-up transformer, rather than the location of the load served, seems to be the critical consideration. In any event, the term "off-site Load" requires further clarification because almost all generators (apart from customer-owned cogenerators, back-up generators, and the like) serve load that is off the generator site.

Yes

The Western Public Power Coalition appreciates the SDT's efforts and believes the SDT has produced an excellent first draft. The Coalition agrees that the discussion of Inclusion I4 in the Guidance Document is accurate and will promote clarity and consistency in application of the inclusion. We suggest two changes that we believe will increase the clarity of the discussion and diagrams. First, for the reasons explained in our answer to Question 2, we believe the SDT should make clear that the large transmission lines included in each of the diagrams are of indeterminate BES status. This could be achieved by including in the explanation of the color coding of the diagrams that Elements represented in black may be either BES or non-BES. Second, we believe the last sentence in the inititial discussion on page 14 (the sentence beginning "Inclusion I4 speaks towards") is awkward and should be replaced with the following: "Inclusion I4 is directed only toward determining whether generation resources themselves should be classified as BES or non-BES. The BES status of Elements of collector systems operated below 100 kV is not addressed by Inclusion I4."

Yes

The Western Public Power Coalition believes that the SDT has produced an excellent first draft of the Guidance Document. The Coalition further agrees that the discussion of Inclusion I5 in the Guidance Document is generally accurate and will promote clarity and consistency in application of the inclusion. We believe greater clarity could be achieved, however, by using blue or green, as

appropriate, in both diagrams used to illustration application of this inclusion, and explaining that, where an Element is represented in black, its BES status is indeterminate. We understand that, under Inclusion I5, a reactive device is considered to be part of the BES if: (1) it supplies or absorbs Reactive Power; and, (2) is connected at 100 kV or higher, through a dedicated transformer with a high-side voltage of 100-kV or higher, or through a transformer designated as BES by application of Inclusion 1. Hence, unlike Inclusion I1, it does not matter whether the line to which the reactive device is connected is BES or non-BES because, for example, it is part of a Local Network or a radial. Rather, the critical question for Inclusion I5 is the configuration of the device's connection. Accordingly, in Figures I5-1 and I5-2, the BES status of the large above-100-kV lines running through diagrams is not material to the analysis of the reactive devices attached to those lines. The SDT should therefore add a statement that these elements are represented in black because their BES status is indeterminate. On the other hand, several Elements depicted in Figures I5-1 and I5-2 are clearly either BES or non-BES and they should be color-coded accordingly rather than represented in black. For example, consistent with the discussion in the box in the upper, left-hand corner of Figure I5-1, the switching device connecting Reactive Element 2 to the BES is itself a BES Element, and therefore should be depicted in blue. Similarly, consistent with discussions in the remaining boxes, the remaining switching devices depicted in the diagram should be green because they are non-BES Elements.
The Western Public Power Coalition congratulates the SDT on producing an excellent first draft of the Guidance Document. The Coaliton agrees that the discussion of Exclusion E1 in the Guidance Document is generally accurate and will promote clarity and consistency in application of the exclusion. We suggest a number of changes to this discussion that we believe will add greater clarity. First, we believe the second paragraph in the discussion under "Single point of connection" on page 23 is confusing. We believe substantial clarity could be achieved by replacing the second sentence (beginning "Normally, open switching devices. . .") with the following: "One or more normally-open switching devices, operated at a voltage of 100 kV or higher, will not disqualify a radial system from this exclusion." Second, we suggest replacing the entire discussion of "transmission Element" at the top of page 24 with the following paragraph: As used in the Exclusion E1, the phrase "transmission Elements" refers only to Elements that are associated with transmission lines (the lines themselves, breakers, and protection systems designed to protect the lines) and does not refer to Elements that are associated with generators (generators themselves, GSUs, and associated protection systems). Hence, in referring to "a group of contiguous transmission Elements," Exclusion E1 is intended to identify groups of contiguous transmission lines, and related protection systems, that operate above 100 kV, and is not intended to apply when determining the BES status of generation and associated Elements. Third, as reflected in our discussion of other diagrams appearing in the draft document, the Coalition believes additional clarity could be achieved if the SDT explains how it intends the use of black shading to be interpreted in the diagrams accompanying the discussion of Exclusion E1. For example, in Figure E1-1, the BES status of the above-100-kV line at the top of the diagram cannot be determined from the information provided. However, we believe it would improve the clarity of the diagram to depict this line in blue, to make clear that it is a BES transmission line. This is particularly important in the context of the Radial exclusion because the single point of interconnection to the BES is key to the exclusion. And, under the hierarchical analysis required under the BES Definition, if the radial depicted in the diagram were connected to a non-BES transmission Element, the radial would be non-BES by operation of the hierarchical approach rather than by operation of Exclusion E1. Similarly, consistent with the discussion in the box at the bottom of the diagram, we understand that the substation transformers depicted in the diagram, as well as the lines serving load at the bottom of the diagram, are not BES and therefore should be depicted in green. Figure E1-4 could likewise be clarified by depicting the 15 MVA generator in green. Similar changes would be helpful on each of the diagrams in this section of the Guidance Document. Finally, we note that the box at the bottom of Figure E1-2 is ambiguous and should be clarified. The box states that "both (primary and secondary) terminals" of the depicted substation transformers are excluded from the BES because they are operated below 100 kV. The quoted phrase is ambiguous because it is not clear whether it refers to the low-side terminals on both the transformers represented in the diagram (we believe this is the intended meaning), or refers to both terminals on a single transformer.
The Western Public Power Coalition congratulates the SDT on producing an excellent first draft of the Guidance Document. The Coalition agrees that the discussion of Exclusion E2 in the Guidance Document is generally accurate and will promote clarity and consistency in application of the inclusion. Consistent with our comments on a number of the other diagrams in the Guidance

Document, we believe it would be helpful to more clearly define how the elements appearing in black in Figures E2-1 and E2-2 are classified with respect to the BES. For example, in Figure E2-1, it appears everything from the point of connection should be green because the industrial facility, including non-BES generator (as defined in the box in the lower right of the diagram), is non-BES. The above-100-kV transmission line at the top of the diagram should be blue because it is part of the BES. If the above-100-kV line were part of a Local Network or a radial, then all the Elements depicted in the diagram would be non-BES by operation of the hierarchical analysis required under the BES Definition, and Exclusion E2 would not be relevant to the analysis. Likewise in Figure E2-2, the SDT should make clear that the Elements represented in black are of indeterminate status because the connection of a BES generator to a non-BES transmission Element does not necessarily change the BES nature of the interconnected Elements. In both diagrams, it might also be helpful to explain that the boiler, factory, and other items depicted in gray would not be considered parts of the BES in any event, which appears to be the SDT's intent. In addition, the Coalition understands the net capacity determination, as explained on page 36, is based on the net flow when averaged over the year, so that temporary blips in the net flow for one or a few hours over the course of the year do not change the BES status of the customer-owned generation. We are concerned that any other approach could result in the BES status of the generator, and the resultant reliability obligations, changing based on random and unforeseeable events such as equipment failures associated with the industrial load served by the generator.

The Western Public Power Coalition strongly supports the Guidance Document and congratulates the SDT on producing an excellent first draft. The Coalition agrees that the discussion of Exclusion E3 in the Guidance Document is generally accurate and will promote clarity and consistency in application of the exclusion. We support two additions to the discussion of Exclusion E3 because we believe these additions will substantially clarify the discussion of Local Networks: (1) With respect to the discussion labeled "Power Flow at BES Interface" on page 40, we suggest that some discussion of the circumstances under which power flow is evaluated be added to the Guidance Document. Specifically, we believe net real power flows should be determined under normal and one element out ("N-1") contingencies, but should disregard flows out of an LN if they are the result of more remote contingencies. This approach is consistent with the treatment of contingencies under the NERC TPL Reliability Standards, which require that planning for the interconnected transmission system ensure that customers can be served without interruption or curtailment in heavy load conditions under normal "Category A" circumstances (Standard TPL-001-0.1) and under N-1 "Category B" contingencies (Standard TPL-002-0a). For N-2 and more remote "Category C" contingencies, however, system planners are allowed to assume that loads can be interrupted, generators removed, or power transfers curtailed, in order to prevent cascading outages or other uncontrolled events (Standard TPL-003-0a). The approach we recommend is also consistent with the recommendations under consideration by the NERC System Analysis and Modeling Subcommittee ("SAMS") in its September 2012 draft Technical Justification for Power Flow Out of Local Networks (http://www.nerc.com/docs/pc/sams/PC_SAMS_Power_Flow.pdf). Our approach is similarly consistent with NERC's definition of "Adequate Level of Reliability," which requires the BES to operate without separation, cascading, or voltage collapse under normal conditions and when "predefined Disturbances" occur, but it requires only that separation, cascading, and voltage collapse be "managed" and that restoration be coordinated and controlled after more extreme contingencies. See Definition: Adequate Level of Reliability for the Bulk Electric System (Oct. 3, 2012) (see http://www.nerc.com/docs/standards/10_04_12_ALR_Definition_clean.pdf). The Coalition is concerned that if the SDT takes a different approach, the BES status of a Local Network may change instantly and unpredictably where an extreme contingency occurs that reverses the normal flows on the network. The occurrence of extreme contingencies that result in power flowing onto the bulk interconnected grid for an hour or two should not change the BES classification of the Local Network, and the resulting reliability compliance burdens, where such flows do not occur under normal operating conditions and reasonably foreseeable N-1 contingencies. The Coalition also notes that, where a system is newly-designated as a Local Network (as where a new interconnection is added to a radial to improve customer levels of service or where a major new load may change the flow of power), an accurate two-year record of power flows may not exist. The Coalition requests that the SDT provide guidance as to how integrated hourly flow values will be evaluated in these circumstances. (2) Consistent with previous comments on the diagrams used in the Guidance Document, we believe added clarity could be achieved by clarifying the blue/green/black color scheme used in the diagrams. For example, in Figure E3-1, we believe the 345/230 kV line around the

perimeter of the diagram should be blue to reflect its status as backbone BES transmission. On the other hand, the customer-owned generator should be green to reflect its non-BES status, consistent with the text box, as should several of the other non-BES elements that are identified as non-BES but are portrayed in black rather than green.

The Western Public Power Coalition appreciates the efforts of the SDT in producing an excellent first draft of the Guidance Document. The hierarchical approach is critical to interpreting the definition, and the discussion of the approach in the Guidance Document is therefore extremely important to broaden understanding of the BES Definition and help ensure that it is applied accurately and consistently. The Coalition believes the Guidance Document is generally accurate and helpful in explaning the hierarchical approach. However, the Coalition suggests several changes that would make the Guidance Document clearer and more useful for its target audience. Because the hierarchical approach is the logical starting point for application of the BES definition, we believe that the approach should be discussed at the beginning of the document, just after the Introduction. Placing the discussion of the hierarchical approach at the beginning of the document will help clarify how the following discussions related to the Inclusions and Exclusions fits into the overarching logic of the definition. On the other hand, leaving the diagrams that illustrate application of the hierarchical approach at the end of the document may make sense because those diagrams (Figures S1-1 through S1-12) incorporate application of the Inclusions and Exclusions, as well as the hierarchical approach. The Coalition also believes Figures S1-1 through S1-12 are extremely helpful because they illustrate the integrated application of the BES Definition, and not just the application of specific elements of the Definition in isolation. However, we believe substantial additional clarity would be provided if the Guidance Document explains its use of black shading. Better yet, the SDT might consider the addition of one or two new colors. For example, Elements that are provisionally classified as BES under the first step of the hierarchical approach (that is, before consideration of the Exclusions) could be noted in, say, red. Then, after application of the Inclusions and Exclusions in the second and third steps, those Elements could then be depicted in either blue or green, whichever corresponds with their final status as either BES or non-BES. Whatever approach the SDT settles on, it should clearly spell out how readers should interpret Elements that are represented in black, both in the diagrams reflecting the hierarchical approach and in the diagrams reflecting specific Inclusions and Exclusions.

The Western Public Power Coalition is an ad hoc group of public power trade groups and agencies from across the West formed to support the BES Definition proposed by NERC in January 2012, which is currently under consideration by FERC. The Coalition comprises the following organizations: the Northern California Power Agency, the Northwest Public Power Association, Public Power Council, Northwest Requirements Utilities, PNGC Power, the Southwest Transmission Dependent Utility Group, and the Washington Public Utility District Association. Collectively, these groups represent approximately 200 individual utility systems from across the Western Interconnection. The Coalition strongly supports the BES Definition, and recently filed extensive comments with FERC urging that agency to approve the Definition as proposed by NERC. The Coalition believes the Guidance Document provides useful and detailed guidance to REs, utilities, and others in consistently and fairly applying the BES Definition. The Coalition therefore strongly supports the Guidance Document and we wish to express our appreciation to the SDT for the extensive effort required to produce the Document. Our comments are intended to clarify and improve the Guidance Document in a number of respects, but nothing in our comments should be read to suggest that we do not fully support issuing the Guidance Document. In addition to the comments provided in responses to Questions 1 through 8, we have the following suggestions to improve the readability and clarity of the document: (1) The document should include a complete recitation of the entire BES Definition in the introductory section. In its current form, the Guidance Document does not set forth the BES Definition in full in one place, and the reader is therefore constrained to read the entire document to piece together the whole definition. (2) The discussion of the Exception Process at the end should cross-reference the specific documents setting forth the Exceptions Process. This will allow readers to locate the relevant documents quickly and efficiently. (3) The Coalition is concerned that the broad disclaimer set forth at the beginning of the Guidance Document is unnecessarily broad and will undermine the value of the Guidance Document by discouraging utilities from relying on the Guidance Document when making decisions about the BES status of their systems that might later be subject to NERC audit and/or enforcement actions. Based on the “Disclaimer” and “Preamble” language contained in NERC’s “Security Guideline for Electric Sector: Identifying Critical Assets” (v. 1.0, Sept. 17, 2009), we suggest that the disclaimer language on page one of the Guidance Document be replaced with the following language: “It is in the public interest for NERC to develop guidelines that are useful for

improving the reliable operation of the interconnected bulk electric transmission system. Guidelines provide suggested guidance on a particular topic for use by users, owners and operators of the Bulk Electric System according to each entity's facts and circumstances and do not provide binding norms, establish mandatory reliability standards, or create parameters by which compliance to standards is monitored or enforced. The Guidance Document provides a methodology to identify Elements that are classified as BES or non-BES under the BES Definition. The results can then be used, as appropriate, as input to the NERC registration process and to determining the application of reliability standards where such standards apply to BES Elements." While we agree with the SDT's determination not to seek formal approval of the Guidance Document by the NERC Board of Trustees because of the delay involved in such a process, we believe the Guidance Document would carry more force if it contains a statement that the Document has been formally adopted by the SDT and the relevant NERC staff.
Individual
Michael Goggin
AWEA
No
No
Yes
AWEA's comments are limited to a small section of the draft BES definition that pertains to Inclusion I4 (Dispersed power producing resources), yet this section is of very serious concern to the wind industry as it could impose a major cost burden on the wind industry with little to no benefit for electric system reliability, and potentially even harm electric reliability by misallocating attention and resources away from concerns that are far more likely to negatively affect BES reliability. The draft Inclusion I4 encompasses the following as part of the BES: "Dispersed power producing resources with aggregate capacity greater than 75 MVA (gross aggregate nameplate rating) utilizing a system designed primarily for aggregating capacity, connected at a common point at a voltage of 100 kV or above." For the reasons explained below, AWEA strongly urges that NERC revise its interpretation of Inclusion I4 to not include the dispersed generators (wind turbines) within a wind plant. To our knowledge, a compelling rationale has not been provided for why including dispersed generators in the definition would significantly improve BES reliability. In addition to not including the dispersed generators within that definition, we request that the BES definition be interpreted as only including the electrical equipment at the Point-of-Interconnection (POI) with the BES, and not the main transformer's high-side terminal and the generator lead/tie line, unless and until another generator connects to the initial generator's facilities. Including dispersed generators in the definition of BES would be unduly burdensome and provide little to no reliability benefit. As of the end of 2011, there were approximately 38,000 utility-scale wind turbines operating in the U.S., many of which are aggregated in wind projects that exceed 75 MVA in aggregate and are connected at a common point of voltage of 100 kV or above. Including each of these wind turbines and their collector systems in the BES definition would impose a large and undue burden on wind project owners and operators by potentially forcing them to comply with a number of NERC compliance processes and reliability standards that were crafted with large central-station generators in mind and cannot reasonably be applied to each of the dispersed generators within a wind project. For example, the administrative burden and cost of complying with the GO/GOP standards at the individual generating unit level would be very substantial, potentially including such standards as PRC-005, R1, and R2, the application of which in this setting would call for regular relay and protection system testing at numerous places within the wind plant, potentially at each wind turbine. Including individual dispersed generators and their electrical collection system in the BES definition would pose an undue burden and cost on wind plants relative to large central-station generators, especially considering their relative reliability impacts. Many of the reliability standards and compliance processes that apply to BES elements were crafted with large central-station generators in mind, and thus would impose a far greater burden and cost on dispersed generators like wind plants, where many compliance and testing processes would likely have to be repeated many times over. Most importantly, no one has demonstrated that there would be any material reliability benefit from including individual dispersed generators and their collector systems in the BES definition. The nameplate capacity of an individual wind turbine

generator rarely exceeds 3 MW, and the average output of such a turbine is typically under 1 MW. Moreover, the capacity value contribution that grid operators typically assume for wind projects for meeting peak electricity demand is typically less than 20% of the nameplate capacity of the wind project. In the typical electrical layout of a wind plant, around a dozen wind turbines will be aggregated onto an electrical string of the collector array (which operates at voltages well below 100kV), so even losing a single electrical string or even multiple electrical strings will typically only result in the loss of a few dozen MW of generation at most. Such minimal impacts fall well below the 75 MVA threshold that Inclusion 4 seeks to establish for determining what should be included in the definition of the BES, as well as any reasonable threshold for determining which electrical components are likely to cause a reliability problem on the BES. In contrast, the electrical equipment at the Point-of-Interconnection (POI) with the BES (and not the individual generators, their collector system, the main transformer's high-side terminal, and the generator lead/tie line), is a far more appropriate point for delineating between the BES and non-BES electrical components, as the POI for a wind project comprised of more than 75 MVA of generation and operating at more than 100 kV is the only part of the wind project that could reasonably affect BES reliability. One of the only credible arguments for requiring that BES reliability standards apply to individual wind turbines is if one believed that wind turbines could be potentially susceptible to a common mode failure that would cause a large number of the generators within a wind plant to trip offline within a matter of seconds. Fortunately, all wind turbines installed in the U.S. in recent years and going forward are already compliant with the demanding voltage and frequency ride-through requirements of FERC Order 661A, which are far more stringent than the ride-through requirements placed on other types of generation. In the event of a system disturbance that causes a voltage or frequency deviation that would affect all generators nearly simultaneously, a wind plant would be more likely to remain online than almost all conventional generators, and the wind plant would likely only trip offline if the power system had collapsed to the point that nearly all other generation had already tripped offline. As a result, there is no compelling reliability reason for including individual wind generators and their electrical collector systems in the BES definition. Including individual dispersed generators and their collector systems in the BES definition not only fails to improve electric reliability, it could even potentially harm electric reliability by misallocating attention and resources away from concerns that are far more likely to negatively affect BES reliability. Finite resources exist for maintaining power system reliability, and devoting resources and attention to an issue that is unlikely to affect BES reliability, such as individual dispersed generators, can actually harm reliability by distracting attention from components that are more likely to cause a reliability problem.
No
Individual
Stanley Kroh
Tampa Electric Company- Energy Supply- EHS
No
No
No
No
I have no questions
No

No
No
No
Group
Southwest Power Pool Reliability Standards Development Team
Jonathan Hayes
No
No
Yes
There seems to be an inconsistency with how the Transformers are treated in I2 versus how they are treated in I4. The system step up for dispersed power producing resources should be included as part of the BES DEF I4. For the Multiple transformations example we would also suggest that the low side of the transformers have at least 20 MVA of aggregated capacity. If they do then those transformers would also be included under I4.
Yes
We suggest that I5-2 be removed due to the inconsistency with E1-1 talking about radial systems. If there is an exclusion given for a radial system then there is a disconnect between diagram I5-2 and E1-1.
E1-3 needs to be clarified. Is the an example of an unusually long lead line to the BES? Or is this a normal gen lead line? We feel like if the unit is important enough to include then you should also include the generator lead line as well. We also want to clarify that although the lead line would be included it does not require a generator owner to register that line as transmsission and become a transmission owner. If the generation is important enough to be included then the the Generator lead line should also be included. Furthermore, there is an issue with how a radial system is applied, do you apply it from the resource up or the single point down? This seems to be clarified by the tariff language that states of there are multiple qualified wholesale customers then the line they are connected to would be classified as Transmission and should be included. This would simplify the way radial is applied and give better consistency. We understand that there isn't a direct connection from the tariff to the BES DEF but this seems to clean up the concern.
While we understand the group has taken the approach of a net impact to the BES, there is still a problem with not limiting the amount of generation. For example if you had a 600 MW plant trip offline you now see 550 MWs of load or vice versa if the load trips you now have 600MWs of generation going back out onto the system. This would be a huge impact to the BES. If the generation meets the threshold set in I2 and or I4 then it should be included.
Looped systems even though power only flows into it will become transfer path under contingency situations. Using good engineering judgement there will be parallel flows on the other parts of the LAN. This exclusion should only be considered if power only flows in under contingency conditions. There is no reference to timing and how dynamic these examples are. Flows can change all the time and there needs to be a line of distinction on how this exclusion is applied. Right now there is no line of distinction. In E3-1 the only way to make the system operate in that manner is to have phase shifters that only allow flow in one direction. We feel like the team needs to take the approach of taking contingencies. The problem with this is we feel that by doing this you will never have an example of a system that doesn't experience parallel flows under contingency situations. We don't like the idea of being able to exclude major metropolitan areas.
We don't have particular issue with the hierarchy but do have issues listed above with the diagrams. This could have the potential to confuse if others have concerns with the earlier parts of the guidance document. Some of the examples given here are duplicative of the ones given above in the document. We like that the team walks you through the steps for how to apply the exclusions and inclusions but it has the same concerns in it that we had above.
Individual

Kelsi Oswald
Pinellas County Resource Recovery
No
No
No
No
The quoted text below seems to narrow the applicability of this exclusion to a very specific type of facility - Combined heat and power - and to a specific market sector - manufacturing. The diagrams also show power specifically being provided for manufacturing. There are facilities, such as a waste-to-energy facility, where the generation is used for various internal process uses and for powering site facilities (plant operations, water treatment, offices, showers, warehouse, etc.). The facility would meet the criteria in the exclusion and the balance of the explanation, with the exception of the specificity in the quoted text below. "These facilities—often referred to as combined heat and power (CHP) facilities—are commonly employed at petroleum refineries, chemical and food processing plants, pulp and paper mills, steel mills, and large commercial applications requiring both electrical and thermal energy. The primary purpose of retail customer owned generation in the context of Exclusion E2 is the integrity of steam production that supports a manufacturing process. The electrical Load of that host process does not exist without steam."
Group
PNGC Comment Group
Rick Paschall
Agree
PNGC Power Comment group agrees with the Western Public Power Coalition’s comments on the Bulk Electric System Definition Guidance Document.
Group
Southwest Power Pool Regional Entity
Emily Pennel
No
No
No
No
The use of the terms 'retail generation' and 'non-retail generation' seems counterintuitive. The use of these terms along with 'customer-owned generation' and 'behind the meter generation' is not consistent. Recommend using either 'customer-owned generation' or 'behind the meter generation' consistently throughout the document. Figure E1-7 includes a customer-owned generation element that is Excluded per Exclusion 2. Exclusion 2 has has not been discussed in the document prior to this figure, so we recommend that this element be removed from Figure E1-7 and included in one of the

figures that follow the Exclusion 2 introduction and discussion.
Recommend moving the Hierarchial Discussion Section (without system diagrams) ahead of Section 2 so that the user understands how the BES Definition is to be applied before reviewing each of the individual inclusions and exclusions. The system diagram examples can be left at the end and a short introduction added to indicate that these diagrams are meant to show the full application of the BES definition to a sample system.
Overall the Guidance Document is very well written and will be a very useful tool in applying the new BES definition. SPP RE has a few recommendations: 1)Include a Glossary of Terms used in the document. Some terms used in the figures are not defined such as site boundary, substation boundary and generation facility boundary. 2)Include the approved BES definition in its entirety in one location in the document. 3)Remove sentences and/or references to items that are not relevant, for instance: a.)Introduction, Page 1, Paragraph 1: "The SDT has not had the opportunity to develop such a document until now due to the deadlines imposed by FERC to deliver the revised Bulk Electric System definition." b.)Disclaimer; Section II Inclusions, Page 4, Paragraph 1; and Section III Exclusions, Page 22, Paragraph 1, "and simply reflect the professional opinion of the DBES SDT" 4)Since the BES definition is not given in the document, the user does not easily know what Exclusion E4 is based on these two sentences on page 22 of the document: “Each exclusion, with the exception of Exclusion E4, is shown below with both text and diagrams explaining how to apply the BES definition for the specific configuration shown. Exclusion E4 is not included in this document as there are no application configuration issues associated with it.” If the SDT decides not to include the definition in the Guidance Document, then would recommend that it be noted what Exclusion E4 is on Page 22. 5)The document must be printed in color to be useful. Not sure if anything can be done to aid with black and white printing, but if so, would recommend trying to make the document effective for black and white printing as well.
Group
Arizona Public Service Company
Janet Smith, Regulatory Affairs Supervisor
Yes
Please include the following example. It is not covered by the guide. Three units a in plant rated 19, 25, and 50 MVA, each connected to common 69 kV bus through their individual step up transformer with low side voltage of 12 kV. In the above example, the site MVA exceeds 75 but all generators are connected at less than 100 kV bus. Are there any part of this site which qualify as BES elements?
Individual
Angela P Gaines
Portland General Electric Company

Would it be possible to add the figure numbers to each section of the narrative portion of the Hierarchical Application of the Definition section. The figures are good and by additing the numbers to the narrative, the narrative will be easier to follow.
1) The BES definition does not allow an exemption for a radial wind farm that must include all of the generators, collector system, etc. In planning the system, the loss of a single element (i.e. the single line or transformer allowing the interconnection) must demonstrate that it has no impact on the reliability of the system. The main concern for impacts on the BES is the sudden loss of the plant, which is covered by the TPL standards covering the single line loss of transmission, which must demonstrate that the loss of the plant cannot affect the reliability of the system. If this is true, then not including the less than 100 kV systems should not have an impact on the reliability of the system. The need to model the impact of the generation at the point of interconnection is understandable, but there appears to be no validity in having to include all of the baggage that comes with having the BES definition include the low voltage equipment. 2)1. Clarify how the BES is or is not mutually exclusive of the other NERC standards such as the PRCs, VARs, and TPLs. There were several questions during the webinar trying to draw conclusions of applicability of the BES to these other standards. One of our employees points to TPL standards used to conduct contingency analysis of certain events at facilities that demonstrate no impact to the BES, yet these same facilities are technically part of the BES with the current definition.
Individual
Chris de Graffenried
Consolidated Edison Co. NY, Inc.
NPCC Regional Standards Committee (submitted by Guy Zito), with the following additions: Exclusions E1 and E3 and the Figure on page 56 - The wording referencing Black Start units unied Inclusion I3 needs to be clarified. Cranking paths were specifically deleted from Inclusion I3 by the BES drafting team. Yet, both Exclusions E1 and E3 have a somewhat vague reference to "not identified in Inclusion I3" which wording appears to have the same effect as identifying a cranking path. Our preference is that this reference be deleted from both E1 and E3. However, if deletion is deemed not possible, then clarifying this language to better alert entities to the true meaning of this "double negative," i.e., exclusion to these Exclusions, is necessary. Writing in positive terms is much preferred to using the "double negative" form.
NPCC Regional Standards Committee (submitted by Guy Zito), with the following additions: Exclusions E1 and E3 and the Figure on page 56 - The wording referencing Black Start units unied Inclusion I3 needs to be clarified. Cranking paths were specifically deleted from Inclusion I3 by the BES drafting team. Yet, both Exclusions E1 and E3 have a somewhat vague reference to "not identified in Inclusion I3" which wording appears to have the same effect as identifying a cranking path. Our preference is that this reference be deleted from both E1 and E3. However, if deletion is deemed not possible, then clarifying this language to better alert entities to the true meaning of this "double negative," i.e., exclusion to these Exclusions, is necessary. Writing in positive terms is much preferred to using the "double negative" form.
NPCC Regional Standards Committee (submitted by Guy Zito), with the following additions: Exclusions E1 and E3 and the Figure on page 56 - The wording referencing Black Start units unied Inclusion I3 needs to be clarified. Cranking paths were specifically deleted from Inclusion I3 by the BES drafting team. Yet, both Exclusions E1 and E3 have a somewhat vague reference to "not identified in Inclusion I3" which wording appears to have the same effect as identifying a cranking path. Our preference is that this reference be deleted from both E1 and E3. However, if deletion is deemed not possible, then clarifying this language to better alert entities to the true meaning of this "double negative," i.e., exclusion to these Exclusions, is necessary. Writing in positive terms is much preferred to using the "double negative" form.

We thank the BES drafting team for the truly extraordinary effort put into this Guidance Document.
Group
Black Hills Corporation Registered Entities
Bob Case
No
No
No
No
None
None
None
None
None
Individual
Thad Ness
American Electric Power
No
No
No
No
AEP has expressed its concerns during the previous comment periods regarding the definition itself of Bulk Electric System. Chief among our concerns was the lack of an obvious “order of operations” that would be applied to the definition. As it stands, the definition is essentially a list of inclusions and exclusions which gives the appearance of a simplistic approach which in reality, is not actually there. The application of the definition is actually more complex than what the list of inclusions and exclusions might infer. In previous comment periods, industry requested that the actual application of the inclusions and exclusions be more explicit within the definition itself. In other words, it should be clear within the definition exactly how that definition should be applied. The fact that a detailed guidance document is thought to be necessary to supplement the definition and “given in good faith for illustrative purposes only” illustrates this point. In addition, some of the examples provided in the proposed guidance document reference some examples which we would consider illogical at best. For example, does it make sense to include individual windfarm units as part of the BES, and yet not include the GSU to which they are connected? Another point that was made in earlier comments regarding the definition, is the question of an asset’s default BES status. That clarification was never provided within the definition, however, the guidance document infers, at least in some cases, that an asset is excluded by default by omission in the definition, and can only be potentially brought into

scope by meeting an inclusion. Whatever the correct interpretation is must be made explicit within the definition before any guidance document is needed. Though well intentioned, the proposed guidance document underscores the gaps of the BES definition, primarily that a clear methodology of applying the definition is not included within the definition itself.
Individual
Joe Tarantino
Sacramento Municipal Utility District
No, No
No
Yes
SMUD supports the general intention of the BES Definition. However, there are some concerns with the application of the BES definition described in the guidance document. We believe Inclusion I-4 should not be specifically applied it to the individual generation resources. [Inclusion I-4 should apply only to components at which the aggregated generation is 75 MVA or above.](Empahsis added) SMUD believes including individual wind/solar generation units will not significantly increase the reliability of the BES. The impact for a loss of any individual unit only removes from 0.5 MW to 2 MW of resources from the system, and this has not been demonstrated to represents a BES risk. The loss of a single component that aggregates 75 MVA poses a much greater potential impact to the BES, and the guidance document should consider these components only. Applying Inclusion I-4 to the individual generators (wind/solar units) imposes significant burden for Maintenance, Testing and Documentation with little to no increase in reliability to the BES. Additionally, the depiction of the current Guidance Document for Inclusion I-4 directly conflicts with Criteria A and several of the components of Criteria B of the Paragraph 81 Project.
No
SMUD supports the comment made during the information webinar where it was stated that Inclusion 4 does not address traditional generation. However, it remains a concern that a loose interpretation of I4 would allow a compliance enforcement authority to apply the term collector system to a string of ‘traditional’ generators. SMUD request that either a new Glossary Term be created to explicitly identify applicability of Dispersed Power Producing Resources as either wind or solar facilities or the I4 explicitly state its application to wind/solar. Again, SMUD supports the general intention and spirit of the BES Definition and this Guidance Document. However, we remain concerned that the issues identified through the graphical depictions may not be addressed in an expeditious manner. We urge the BES Drafting Team to champion those issues during the BES Phase 2 efforts. SMUD believes standards/guidance documents should be written to incentivize reliability and, where appropriate, allow expeditious corrections to identified shortcomings of the respective document.
Group
National Grid
Michael Jones
No
No

Yes
If retail load is served from the collector system shown in Figures I4-1, I4-2, and I4-3 does the generation and associated collector systems remain non-BES?
Yes
Figure I5-1, How does one handle synchronous condensers and the associated coupling transformers?
Figure E1-8, Taps to loads are shown as BES. We suggest that the text description that accompanies Figure E1-8 itself should indicate this figure shows only an interim step in the hierarchical application the BES description. Exclusion E1 in Figure S1-10, Two retail (behind the meter) generators (150 MVA & 250 MVA) are shown in Figure S1-10. a. A retail load is shown in the upper left hand corner with a net generation capacity of 100 MVA. We believe the radial transmission line supplying this load should be non-BES by application of E1b and E1c. Both E1b and E1c do not specifically address net capacity to the BES from behind the meter (retail) generation. b. Also, the BES status of the radial transmission line supplying the retail load with 150 MVA of behind the meter (retail) generation was determined by application of E1c. We believe net 25 MVA capacity (associated with the 150 MVA unit) to the system should not be aggregated with the non-retail generation (30 MVA & 15 MVA) units. Again E1c does not specifically address net capacity to the BES from behind the meter (retail) generation.
If a new retail customer may not yet have two years of operational data available. What would be the default assumption for this customer?
The guidance document proposes to use hourly data from the last two years to ensure that power only flow into the local network. How to evaluate new facilities, as well as existing local networks if there are significant system adjustments?
We would suggest that the Steps 3a, 3b, 3ci, and 3cii be referenced in the text on Pages 44 and 45 that outlines the hierarchical application. Figure S1-4 a. Why are the 69/13.8 kV banks circled since they do not meet the core BES definition? b. We suggest that dashed circles or a change circle color be used to indicate changes from diagram to diagram. Figure S1-8 We suggest the circles designating retail customers be re-drawn to encompass just the retail facilities themselves that are behind the meter. Figure S1-9 This figure indicates that a local network can be connected to elements being part of a flowgate or transfer path (as defined in Figure S1-2). Does this imply that a local network cannot be one of elements transferring power through a flowgate or transfer path, but could be connected to one or more elements being part of a flowgate or transfer path? Figure S1-10 & Figure S1-11 The order in which the components of Exclusion E1 is described on Page 30 appears different in which it is applied on Figures S1-10 and S1-11. We suggest that they be in the same order.
We would suggest that the Steps 3a, 3b, 3ci, and 3cii be referenced in the text on Pages 44 and 45 that outlines the hierarchical application. Figure S1-4 a. Why are the 69/13.8 kV banks circled since they do not meet the core BES definition? b. We suggest that dashed circles or a change circle color be used to indicate changes from diagram to diagram. Figure S1-8 We suggest the circles designating retail customers be re-drawn to encompass just the retail facilities themselves that are behind the meter. Figure S1-9 This figure indicates that a local network can be connected to elements being part of a flowgate or transfer path (as defined in Figure S1-2). Does this imply that a local network cannot be one of elements transferring power through a flowgate or transfer path, but could be connected to one or more elements being part of a flowgate or transfer path? Figure S1-10 & Figure S1-11 The order in which the components of Exclusion E1 is described on Page 30 appears different in which it is applied on Figures S1-10 and S1-11. We suggest that they be in the same order.
During Phase Two of the BES project please consider the following: a. Please consider re-numbering the exclusions in accordance with sequence proposed in the hierarchical application of the BES definition provided in Section IV. b. Please consider re-writing inclusion I1 into an exclusion, with the following wording: “Transformers where only the primary terminal operated at 100 kV or higher.” Suggest placing this exclusion ahead of exclusions E1 and E3 in the sequence of hierarchical application for the BES definition. c. Is there an NERC definition of non-retail generation?
Individual
Nazra Gladu
Manitoba Hydro
No

None.
Yes
In I2, please include an explicit statement regarding the BES or non-BES status of the generator circuit breakers. The examples for the inclusions I4 and I5 explicitly show and explain the BES or non-BES status of the associated circuit breakers. The examples for inclusion I2 do not show any circuit breakers, and a statement in the text on page 7 would add clarity. Figure I2-6: Manitoba Hydro would like clarification on: (1) how the presence of the load leads to the exclusion of the 25MVA generator. (2) why the generation site (which is > 75MVA) is not included. Please give details on the process for determining this.
Yes
Why is the step-up transformer excluded for dispersed generation when it is included under I2 for non-dispersed generation. It appears that the transformer in all these example is treated under I1 rather than as a step-up transformer, when it serves the role of a step-up transformer. Additionally, with the the transmission system excluded, there will now be isolated BES elements (i.e. the generating units) on the system. This will make it difficult for entities to apply certain standards, including the protection maintenance standards. NERC will need to provide additional clarification on which protection is considered generation protection versus transmission protection. We feel that it would be easier to apply the standards if there were no isolated BES elements.
Yes
If step-up transformers are included for generaton, then they should also be included for reactive resources. It does not make sense to have isolated BES elements not connected to any other BES elements. Figure I5-1: Manitoba Hydro would like clarification on why the capacitor #4 is excluded. Is it excluded because it is providing power factor correction for the attached load? If this is the case, the language has to be clearer.
This exclusion will lead to isolated BES elements (i.e. BES elements not connected to other BES elements), which will make it difficult and challenging to apply and manage the protection maintenance standards. NERC will need to provide additional clarification on this issue. Figures E1-4 and E1-5: The 15MVA units should be coloured green since they are excluded. Leaving them black makes the diagrams confusing. Figure E1-6: The actual generation indicated in the green text box should be 25 MVA, not 70 MVA as shown. Figure E1-8: Let us assume that there is generation off a radial line totalling <75MVA owned by multiple owners, which makes the line excluded. If now one of these owners increases their generation so that the tolal is >75MVA this will make the line included. Who will be responsible for the compliance costs associated with this line? It does not seem fair that the TO's compliance is affected by the GO's behavior. Figure E1-9: Manitoba Hydro would like clarification on why a "normally open" element is not included in the BES. Figure E1-10: This type of set-up will make it very difficult to decipher which protection maintenance is included and which is not included.
Figure E2-1: The diagram indicates that the customer load is 100MVA. Manitoba Hydro would like clarification on the type of load (e.g. peak, average) depicted in the diagram and in the calculation of E2. Additionally, what happens if the plant load is reduced or the plant is shut down for whatever reason. Does the 150MVA generation need to be reduced to maintain a net capacity <75MVA? Figures E2-1 and E2-2: Manitoba Hydro believes that at any given time, a customer could be in either configuration E2-1 or E2-2. How would we determine which case is applicable?
Figures E3-1 and E3-3: If the local network is excluded because it does not affect the BES, then why should any elements in the local network be included? Additionally, it will be difficult to apply certain standards to these stranded BES elements.
None.
Bulk Electric System Guidance Document Industry Webinar October 18 2012: We have some concerns arising from the discussion during the industry webinar. In several instances, industry participants requested clarification on how the BES definition would be applied to existing NERC standards, such as PRC-005. For example, it is unclear how the BES definition and accompanying guidance would be applied to a Protection System that includes components which are BES and non-BES. The repeated response from the SDT indicated that the individual standards would need to be revised to state the components in and out of scope, which may be more expansive than the BOT approved BES definition. The definition of the Bulk Electric System is the fundamental tenet which defines the scope of the NERC Reliability Standards, and should not be augmented in individual standards. The guidance

document is highlighting some of the flaws with the current BES definition. One of the main flaws is the existence of isolated BES elements which are not connected to any other BES elements. In general, if an element is part of the BES then so should all the elements up-stream from it. The guidance document did not get into the level of detail where is was easy to determine what elements were included/not included in the BES.
Group
MRO NSRF
WILL SMITH
Yes
For Figures I1-2 and I1-4, change the color of the Load and tertiary winding connection from black to green to reflect, and better illustrate, the comments in the text box and to be similar to the I4 figures
Yes
For Figure I2-6, change the color of the black transformer and Load to green to better illustrate BES versus non-BES elements, similar to the I4 figures.
Yes
In all I4 diagrams, the interpretation in the guidance document shows individual variable wind or solar resource generators as BES elements when grouped by 75 MVA or more blocks, while the single point of interconnection element where a single contingency can knock off 75 MVA is out of scope. This appears to be backwards, creates gaps in system coverage, and causes serious unnecessary NERC standards complications. The drafting team should consider reversing its diagrams to show individual resource generation as “green” and out of scope, with a single point of interconnection element (such as a 34.5 kV to 100 kV and greater generator step-up transformer) as “blue” or in scope. This concept is more consistent with the existing NERC registration criteria. Although the I4 Figures correctly reflect the proposed BES Definition, the illustrations call attention to a flaw in the proposed BES definition that should be corrected in Phase 2 of the BES Definition development. The flaw is that interconnection facilities, such as GSU transformers and lines that deliver 75 MW or more to the BES point of interconnection should also be classified as BES elements, (as exemplified in Figure E1-4 compared to Figure E1-5). It appears contradictory to not include the generator step-up transformer at the Interconnection Point to the BES as out of scope as is apparent in other figures (ie; figure I2-6). We look forward to Phase II of this project. In a recent NERC webinar, the drafting team felt it was important to address the reliability impacts of aggregate generation. It is statistically provable that the loss of a single generator step-up transformer is much more probable and would have a greater probable MW impact (probability * MW) on system reliability than the loss of one or several individual variable resources. The probability of the loss of several individual 1 MW wind turbines is the probability multiplied by itself however many times which makes the probable loss of 3 or more variable resources relatively remote. How did the drafting team reconcile their vision of the probable MW loss impact of individual resources versus the probable MW loss impact of a single generator step-up transformer with 20 to 75 MW of power. During the recent webinar regarding the BES guidance document, the presenter in response to a question on how the BES definition would be applied to a wind facility for PRC-005-2, indicated that the provisions of PRC-005-2 itself would need to be checked. The following is the generator applicability section of PRC-005-2: 4.2.5 Protection Systems for generator Facilities that are part of the BES, including: 4.2.5.1 Protection Systems that act to trip the generator either directly or via lockout or auxiliary tripping relays. 4.2.5.2 Protection Systems for generator step-up transformers for generators that are part of the BES. 4.2.5.3 Protection Systems for transformers connecting aggregated generation, where the aggregated generation is part of the BES (e.g., transformers connecting facilities such as wind-farms to the BES). 4.2.5.4 Protection Systems for station service or excitation transformers connected to the generator bus of generators which are part of the BES, that act to trip the generator either directly or via lockout or tripping auxiliary relays. From the new BES definition, 4.2.5.1 would result in inclusion of protection systems for each individual generator, 4.2.5.2 might result in inclusion of the transformers at each wind turbine, 4.2.5.3 would include the transformers in the substations that step-up to transmission voltage (e.g. 34.5kV to 161kV). In addition, 4.2.5.1 could be interpreted to include protection systems that trip feeder circuit breakers as these breakers act to “trip generators either directly” as they would trip a number of individual generators. Using similar logic relaying for the 34.5 kV bus would be included. The result then would be all protection associated with a wind farm would

be included under PRC-005-2. It was the expressed intent of the BES definition drafting team to exclude the collector system from the BES but at least with respect to PRC-005-2 this objective would not be met. In Figure I4-3 please clarify what is meant by “Photovoltaic Cells & Inverters”. It is not clear what is included in scope.
Yes
For Figure I5-1, change the color of the Cap 1 switching device; the Cap 3 switching device and associated transformer; and the Cap 4 switching device, associated transformer, and associated Load (as well as the associated wording in the text boxes) to green to reflect, and better illustrate, the comments in the text box and to be similar to the I4 figures. Change the color of the Cap 2 switching devicefrom black to green to reflect, and better illustrate, the comments in the text box and to be similar to the I4 figures. For Figure I5-2 change the color of the Cap 1 switching device, associated transformer and associated load (as well as the associated wording in the text boxes) to green to better illustrate the comments in the text box and to be similar to the I4 figures. Change the color of the Cap 2 switching device, associated transformer, and associated Load to green to reflect, and better illustrate, the comments in the text box and to be similar to the I4 figures.
Yes: For Figures E1-1, E1-2, E1-6, E1-9, and E1-10, change the color of the substation elements (as well as the associated wording in the text boxes) to green to reflect, and better illustrate, the comments in the text box and to be similar to the I4 figures. For Figures E1-4 and E1-5, change the color of the 15 MVA generation facility (as well as the associated wording in the text boxes) to green to reflect, and better illustrate, the comments in the text box and to be similar to the I4 figures. For Figures E1-7, change the color of the substation elements and customer owned generation elements (as well as the associated wording in the text boxes) to green to reflect, and better illustrate, the comments in the text box and to be similar to the I4 figures. For Figures E1-8, change the color of the substation elements and 15 MVA generation facility (as well as the associated wording in the text boxes) to green to reflect, and better illustrate, the comments in the text box and to be similar to the I4 figures.
Yes: For Figure E2-1, change the color of the customer owned generation elements to green to reflect, and better illustrate, the comments in the text box. For Figure E2-2, change the color of the transformer serving the industrial process generation elements to green to reflect, and better illustrate, the non-BES classification.
Yes: For Figures E3-1, E3-2, and E3-3, change the color of the non-BES substation elements and customer owned generation elements (as well as the associated wording in the text boxes) to green to reflect, and better illustrate, the comments in the text box.
No: For Figures E3-1, E3-2, and E3-3, change the color of the non-BES substation elements and customer owned generation elements (as well as the associated wording in the text boxes) to green to reflect, and better illustrate, the comments in the text box.
Individual
David Jendras
Ameren
No
No
Thanks to the SDT for Figure I2-6 which clearly shows that generation greater than 20 MVA connected to a subtransmission system is not part of the BES.
Yes
Why is the step-up transformer (<100 kV/>=100 kV) not part of the BES in Figures I4-1, I4-2, I4-3, and I4-4? This transformer performs the same function as the GSU transformer at a traditional generation site, and similar to the GSU transformer it should be considered as part of the BES.
No
(Yes-The Yes/No Selection is Missing) Radial lead lines operated 100 kV or above from generators 20 MVA or greater should also be part of the BES. The outage of the radial lead line impacts the BES in

the same way as the outage of the generator or the GSU transformer (see Figures E1-3 and E1-4). The 75 MVA threshold for exclusion established by E1.b is too high, and should be reduced to 20 MVA to be consistent with the Compliance Registry Criteria for individual generating units.
(Yes-The Yes/No Selection is Missing) If the “behind the meter” generation injects >20 MVA to the BES at time of system peak, then the “behind the meter” generation should be considered as part of the BES.
(Yes-The Yes/No Selection is Missing) Depending on the model used to evaluate BES facilities, power flow may be into the local area network for peak load conditions and out of the local area network for off-peak conditions. It would seem that more than one model should be reviewed to make the determination. In this example, it is suggested that there should not be any exclusion for local area network. Who has the ultimate responsibility for making the determination of BES facilities?
(No-The Yes/No Selection is Missing) The step by step process demonstrated is cumbersome, but it works.
(1) The SDT needs to consider non-traditional generation resources (i.e. dispersed and “behind the meter”) on the same level playing field as traditional generation. If the outage of these non-traditional resources has the same impact on the BES as a traditional resource of the same magnitude, and if these resources are greater than 20 MVA, then the lead lines and the step-up transformers from these non-traditional resources should also be part of the BES. (2) It is our position that all black-start resources should not be part of the BES. Only those black-start resources that are part of a restoration plan and connected to the transmission system 100 kV and above should be considered as BES facilities.
Individual
Martin Kaufman
ExxonMobil Research and Engineering
No
No
No
No
In many cases, cogeneration facilities are connected to two or more transmission lines. If a facility exports less than 75 MVA and has two or more connections to its transmission provider, are the facilities still excluded per Exclusion E2 consistent with figure E2-1?
Group
Dominion
Louis Slade
No
Yes
We suggest that the generating resource(s) in the figures be color coded to indicate the BES threshold of < 75 MVA or equal to > 75 MVA. We further suggest that text boxes only state whether the generating resource(s) are included or not included in the BES and that the determination as to whether or not the transformer is included in the BES only be addressed figures in I1 (as done in I5).
Yes

We appreciate the fact that the Dispersed power producing resources in the figures are color coded to indicate the BES threshold of < 75 MVA or equal to > 75 MVA.
Yes
We suggest that diagrams be color coded to indicate whether the Static or dynamic devices is 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 (blue) or is connected in a manner that would not include it in the BES (green).
We suggest that the determination as to whether or not the transformer is included in the BES only be addressed in figures in I1. We suggest that diagrams be color coded to indicate whether the generating resource(s) in the figures be color coded to indicate the BES threshold of < 75 MVA or equal to > 75 MVA.
We suggest that diagrams be color coded to indicate whether the generating resource(s) in the figures be color coded to indicate the BES threshold of < 75 MVA or equal to > 75 MVA.
We suggest that diagrams be color coded to indicate whether the generating resource(s) meet the BES threshold of < 75 MVA or equal to > 75 MVA. Figure E3-3; there is not an associated blue text box in reference to the inclusion of the 30 MVA generator.
Dominion appreciates the efforts of the drafting team in producing this Guidance Document.
Individual
Timothy Brown
Idaho Power Co.
No
No
Yes
Yes, the Idaho Power - Power Production group does not believe that the examples in Figure I4-1, I4-2, I4-3 and I4-4 are consistant with the language nor the intent of BES Inclusion I4. The exclusion of the collector system from the BES in these dispersed generation site examples is not consistant with the Inclusions for other generation resources. The collector system is essential for delivering the resource to the BES transmission system in the same way the bus and GSU does for a traditional generation resource. Idaho Power - Power Production Group understands the desire for the SDT to want to exclude tradition distributed generation from this definition, but Idaho Power-Power Production Group believes the language of Inclusion I4 does that as stated in this document.
No
The Idaho Power - Power Production Group found it suprising that the BES definition was written or interpreted to include BES generators that are not directly connected to the BES (beside blackstart units).
Individual
Steve Alexanderson P.E.
Central Lincoln
Agree
Western Public Power Coalition
Group
Bonneville Power Administration

Denise Koehn
No
Yes
The numbers, 20 MVA and 75 MVA seem arbitrary. Should studies be conducted for each individual instance to determine the appropriate values of the individual nameplate rating and gross aggregate nameplate rating of the generation? Figure I2-6. If the load consumes 19 MVA or less, this generation site has generation with a gross nameplate rating greater than 75 MVA. In this case, should all the step-up transformers be included in the BES?
No
No
Figures E1-4, E1-5 & E1-8. Should these 15 MVA generators and associated step-up transformers be green? If the generators are operated as synchronous condensers, should they be considered non-BES, or at least considered under applicable standards for reactive support devices?
Figure E2-1. The Industrial Process consumes 75 MVA or less, therefore the cogeneration operation is resulting in a net capacity to the BES of 75 MVA or higher. Under these circumtances, should the customer owned generation and associated step-up transformer automatically be included in the BES?
As the result of the September 8th San Diego blackout, both NERC and FERC recommended that utilities monitor for thermal overloads as well as voltage stability on the sub-100 KV facilities. Is this recommendation going to have any impact on the definition of Bulk Electric System? BPA is convinced that a 300 KV ceiling is not appropriate for the application of exclusion since unplanned outages for certain critical 230 KV lines or 230/115 KV transformers have the potential to create cascading outages for underlying systems (69 KV and below) and post-transient voltage instability may occur on transfer paths.
Group
Tri-State G&T Transmission
Tracy Sliman
No
No
No
No
1. If, as explained on pages 4 and 22, the “document is not an official position of NERC and will not be binding on enforcement decisions of the NERC Compliance Program,” then what is the purpose of the Guidance Document? 2. While we don’t have any questions or comments on the text or diagrams referenced in Questions Q1-Q8 with regard to their adherence to the BES definition, the diagrams seem to indicate flaws or deficiencies in the definition. Examples are: I2 – If the load on the 25 MVA generator bus in Figure I2-6 is ever less than 5 MVA, shouldn’t that generator be a part of the BES just as if it were a generator > 20 MVA generating through two dedicated transformers, as in Figure

I2-5? I3 – It seems illogical to include each individual 2 MVA generator as a BES element but to exclude the aggregating system or the final transformer. Loss of a section of aggregating line or the main transformer will cause a larger reliability issue than the loss of any single generating resource. These low voltage aggregation systems are not the same as a distribution system that also serves individual customer loads and the reasoning to exclude the aggregation system is not justified. See also Figure E1-5 that excludes a 15 MVA generator from the BES. I4 – It seems illogical for a reactive device as shown in the lower left-hand side of bus in Figure I5-1 to be necessarily a BES element, yet a generator of potentially the same size or larger (lower left-hand side of bus in Figure I2-4) is not included. E1 - It seems illogical to exclude transmission lines that connect BES generation elements to other elements of the BES (E1-4, et al). If the generator is important to the reliability of the BES, then why isn't its interconnecting transmission system at least equally important? E2 – If the generation source (a boiler in this case) is not directly related to the plant process, then there could be times of light or no load at the plant when every generator with a capacity greater than 75 MVA should be included as a BES element. E3 – It seems very likely that an outage of the 345/230 kV transformer on the right-hand side of the system will result in power flow from the 138 kV system into the 230 kV system. Would that scenario result in the network failing the exclusion E3 test? This is why Tri-State has previously commented that the power flow direction requirement needs to be based on normal conditions or that some percentage of time, such as 95% of the time the flows are all into the network.
Individual
Gail Shaw
Tillamook PUD
Agree
Western Public Power Coalition
Individual
David C Kahly
Kootenai Electric Cooperative
Agree
Western Public Power Coalition
Group
Imperial Irrigation District
Jesus Sammy Alcaraz
No
No
No
No
Individual
Kathleen Goodman
ISO New England Inc
No

Yes
Pg. 9, Figure I2-3, the term “Site Boundary” is utilized. This term should be defined. As an example, if you have multiple generator owners with generators that sit adjacent to each other, is the entire complex one “site” or is it owner dependent? Does the existence of a fence between each owner constitute a different site? Pgs. 11-12, Figures I2-5 and I2-6 imply that a generator whose GSU high-side voltage is below 100 kV is only BES if there is no load or other equipment connected to the high side of the GSU. This can be seen by the difference in treatment of the 25 MVA generator on the right hand side of each figure. This distinction is never made in the actual text of I2. Furthermore, the load in figure I2-6 on page 12 is shown as leaving the site boundary.
Yes
Pg. 14-18, section on “Common Point of Connection” and the red notes on Figures I4-1 through I4-4 state that the common point of connection should be stated in the respective Transmission Owner and Generator Operator Interconnection Agreements. This language should be deleted. It is not necessary in applying the definition and may lead to confusion in cases where there are multiple owners on a radial line. Interconnection agreements should have no bearing on determining what equipment is important to the reliability and operation of the interconnected power system. This guidance document cannot prescribe what should be in Interconnection Agreements. Pg. 14, The section on I4 (section II.3) does not explain where the BES/non-BES boundary should be drawn in situations where a dispersed generation site connects to an existing radial line operated at 100 kV or above. Is the “common point of interconnection” the point where power is first stepped up to 100 kV, or at the point when this radial line meets the remainder of the networked (non-radial) BES system? Pgs. 15-18, Figures I4-1 through I4-4, in all drawings the “lead” between the generator and the first circuit breaker is shown as BES. However, the definition does not mention the lead being BES, nor does this Guidance document. This is especially important for distributed resources which may use multiple step-up transformers between the generator and the collection system. ISO New England believes that this should be shown as non-BES, or green. It would be helpful to have more details regarding which elements of the generator equipment are included. Most wind turbines include a generating unit, a converter and a gsu (this is spelled out a little better for the solar examples).
Yes
1. The text box for Reactive Resource 2 states that “The associated switching device operates at a voltage >= 100 kV and is therefore considered to be a BES element”. ISO New England is not able to find this rule anywhere in I5. Nowhere does I5 discuss the switching device or the lead connecting the device, nor is there any discussion of this in the Guidance Document text, other than in figure I5-1 and I5-2. Additionally, the drawing itself shows the switch and the lead for Reactive Resource 2 to be black rather than blue. If it was intended to be BES, then it should have been blue. 2. Similarly, the text boxes for Reactive Resources 1, 3, and 4 state that the switching device is non-BES because it operates below 100 kV. ISO New England is not able to find this rule anywhere in I5. Nowhere does I5 discuss the switching device or the lead connecting the device, nor is there any discussion of this in the Guidance Document text, other than in figure I5-1. 3. All three windings of the transformer that connects Reactive Resource 1 should have been blue (BES) due to I1, although this may have been intentionally left black for an I5 example. Pg 21, Figure I5-2, again states that the switching device is BES because it operates at greater than 100 kV. ISO New England is not able to find this rule anywhere in I5. Nowhere does I5 discuss the switching device or the lead connecting the device, nor is there any discussion of this in the Guidance Document text, other than in figure I5-1 and I5-2. Additionally, figure I5-2 has stated the switch is non-BES due to the radial nature of the system, however it is not shown as green. Again, nowhere in the definition or document can one find a discussion of I5 that the switching equipment would be non-BES if is radial. This is further confused by the fact that every shunt device is radial, so then all switching devices should be considered non-BES, independent of their operating voltage.
Pgs. 23 and 26, ISO New England appreciates the clarity provided by the explanation of single point of connection. Prior to seeing this document, ISO New England would have considered the two interconnection points in Figure E1-2 to be a single point since they are fed from the same substation at the same voltage. ISO New England notes that the guidance document is more specific than the definition itself by stating that there is no limit to the amount of load within a radial system Pgs. 29, Figure E1-5, what distinguishes this arrangement from a dispersed generation arrangement such as in Figure I4-1? Pg 31, Figure E1-7 and pg. 44. The figure shows that the 45 MVA retail generator is non-

BES through E2. However, when looking at pg 44 this generator would have been classified as BES under I2 and there is no mention that E2 supersedes I2. Following this process, the 45 MVA retail generator would be BES. It appears that pg 44 needs to be modified to reflect that E1 can supersede I2. Pg 32, Figure E1-8 and pg 23. The last paragraph on pg 23 states "However, further evaluation of the underlying Elements with the original radial system may be appropriate". Therefore, ISO New England believes that the lead between the two load serving transformers and the main trunk line should be non-BES (green), the lead between the high side of the GSU and the main trunk line each of the generators should be non-BES (green). Furthermore, the trunk line below the tap to the 35 MVA generator should also be green, since this portion of the line radially serves load and an amount of generation less than 75 MVA.

Pg. 35 states that "the primary purpose of retail customer owned generation in the context of Exclusion E2 is the integrity of steam production that supports a manufacturing process. The electrical Load of that host process does not exist without steam." These statements infer that if the load continues to exist after the loss of the generation, then E2 is not applicable. If this is correct, this should be made much more clear. If this is not correct, then this information should be deleted as it is not providing useful information in understanding E2. Additionally, it is confusing as to how this guidance is to be utilized in cases where there is customer-owned retail generation which is unrelated to steam processes. Pg. 37, figure E2-1 – The ISO would like to once again note its concern that significant generation which can have a significant impact on the reliability of the interconnected power system can be excluded. The ISO understands that this is a concern with the BES Definition itself and not with the Guidance Document.

: Pg. 40, section on "Power Flow at BES Interface" states that power flow must "always" be into the local network "at all times". However, the document provides no guidance on whether or not this is following a single contingency, multiple contingencies, Category D events, or during maintenance conditions. This needs clarification. The document goes on to state that providing 2 years worth of meter data is sufficient to demonstrate this. ISO New England notes that if the limiting contingency or system condition (such as load level) did not occur with those two years, the metered data may be of little relevance. Pg. 41, Figure E3-1 – ISO New England believes the 345 kV and 230 kV elements should have been indicated as BES on this figure. Additionally, the lead between the 345 kV winding of each 345/138 kV transformer should be marked BES, since any element above 300 kV cannot be part of an excluded Local Network. Similar to our concerns noted on pg. 40, if one were to simulate a first contingency on the line heading south from the bus the 30 MVA generator interconnects to the next bus south and then simulates a contingency on the line between the bus interconnecting the 10/15 MVA generators and the bus to the right, all power from these generators would be sent out the transformer. This does not agree with pg. 40 which says that power must flow into all points on the LDN at all times. Therefore, this should be disqualified from being considered under E3. Pg. 42, Figure E3-2 – The figure shows the leads between the 138 kV buses and the high sides of all of the GSUs shown as being BES. However, under E1b, these are radial elements and should be non-BES. The same is true of all radial lines leading to load, and of the radial line leading to the customer facility with the 25 MVA generator.

Pg. 48, Figure S1-3 – Since the core definition does not include generation, no generators on this page should be shown as BES. Additionally, since the GSUs are below 100 kV, none of the GSUs on this page should be shown as BES. For each of the retail gen/load customers, the BPS stops at the meter, yet there is no language in E2 to support this. E2 specifically excludes the generator and nothing else. Since this is shown as 138 kV past the meter, it should be BES. Pg. 51, Figure S1-6 – the figure shows that the lead between the 15 MVA blackstart resource and the low side of the transformer is BES. ISO New England believes this should be non-BES as I3 does not include the cranking path. Pg. 52, Figure S1-7 – there should be figures that include examples of the evaluation of I4 and I5. Pg. 53, Figure S1-8 – the figure starts with E2. It is unclear as to why E1 has been skipped until later. Pg. 54, Figure S1-9 – If the line between the bus the 25 MVA generator interconnects to and the next bus to the south is lost, and the line between the interconnection bus and the load to the north is lost, all of the power from the generator will flow out of the LDN. Therefore, this cannot be considered as an LDN. Pg. 57, Figure S1-12 – The portion of the system inside the meter for the two retail gens/load is not listed as BES or non-BES. Some decision as to what this equipment is needs to be made. There can be no equipment which is not classified.

Pg. 4 states that "Inclusion I3 is not included in this document, as there are no application configuration issues associated with it." As later comments will indicate, since the extent of Inclusion

I3 is unclear (with regards to the cranking path between a blackstart resource and the rest of the BES system), it should be included in this document. Missing from the document – This document provides no indication on how HVDC facilities and their associated interconnection equipment (transformers, filters, etc.) are to be handled. This is a significant oversight in the document that needs to be addressed. Pgs 1, 4, and 22 – There is a disclaimer on each of these pages with states that the document is not an official position of NERC and will not be binding on enforcement decisions of the NERC Compliance Program. ISO New England notes its concern with the BES definition itself, where a 58 page document is needed to provide guidance on how to interpret it. With this disclaimer in place, it leaves the industry open to subjective interpretations, potentially differing from person to person. This is unacceptable, especially when it comes to enforcement. The rules on something as basic as the definition and application of that definition need to be clear and consistent and there should be no need for such a disclaimer. Pg 44, the ISO is concerned that this document states that certain exclusions supersede certain inclusions, yet this document has disclaimers which state that this document does not represent an official NERC position. There is no mention of one item superseding another in the definition itself, so having an unofficial document which makes statements like this is unacceptable. As noted previously, it appears that there needs to be a description that E2 supersedes I2. Overall, ISO New England appreciates the time and effort that went into creating this document and finds it extremely helpful, but the need for the existence of such a document solidifies ISO New England's concerns about the lack of clarity in the BES Definition itself.
Individual
Dean Ahlsten
Eugene Water & Electric Board
Agree
Western Public Power Coalition (WPPC)
Individual
Brian J Murphy
NextEra Energy Ince
Yes
NextEra Energy, Inc (NextEra) believes the inclusion of the individual wind turbine generators as part of the Bulk Electric System (BES) is unnecessary and counterproductive. Standards will be applied to the wind turbine generators that were never intended to be applied at that low a level in the electric system. The guidance document shows maintenance must be performed on the individual wind turbines, but not the collector bus. The loss of an individual wind turbine (2MVA) will not affect the BES. To include in the definition of BES each individual generator in an aggregate system is neither cost effective nor logical. Aggregate systems, such as wind have generators rated at <2 MW, generate at <2 kV, have to step up to medium collector system voltage via transformers in the base of each tower and then run through cable collector systems to get to the generation step up (GSU). The loss of a 2MW generator does not affect the BES. Conversely, the loss of a collector bus with an aggregate of greater than 75MVA may affect the BES. Thus, rather than defining the wind turbine generator as BES, it would be more appropriate to define the I-4 Inclusion as the aggregating system carrying > 75 MVA of dispersed power production or generation and connected at a common point with a voltage of 100kV and above. Further, the inclusion of wind turbines under BES Definition Inclusion I4 and as detailed in the attached Guidance Figure I4-2 creates unnecessary protection system maintenance under PRC-005 and creates unnecessary protection system misoperation reporting under PRC-004. The purpose of PRC-005-1b is "To ensure all transmission and generation Protection Systems affecting the reliability of the Bulk Electric System (BES) are maintained and tested." Also, the purpose of PRC-004-2 is "Ensure all transmission and generation Protection System Misoperations affecting the reliability of the Bulk Electric System (BES) are analyzed and mitigated." Misoperations of individual wind turbines (2MVA) must be reported and misoperations of the collector bus protection system of greater than 75MVA need not be reported because they are not part of the BES. In addition, PRC-005-2 addresses generators with the assumption that wind turbines (<20MVA) are not part of the BES, but does address the transformer of an aggregated (>75MVA) generation

plant. This appears to be in direct conflict with the proposed definition as illustrated in I4.
NextEra is concerned that the BES Definition Exclusion E1 may not be in agreement with Project 2010-07, Generator Requirements at the Transmission Interface. Project 2010-07 includes FAC-001-1, FAC-003-3, PRC-004-2.1a, and PRC-005-1.1b, has been approved by the NERC Board of Trustees. Thus, NextEra requests the Standards Drafting Team to consider whether its Exclusion E1 is consistent with Project 2010-07, and, if not, to please conform Exclusion E1 to the filing in Project 2010-07.
Individual
Eric Salsbury
Consumers Energy
No
No
There are no examples of dispersed generation with long leads greater than 100 kV in the section S diagrams. Such examples should be added.
Individual
Andrew Z. Pusztai
American Transmission Company
Yes
For Figures I1-2 and Figure I1-4, ATC recommends changing the color of the Load and tertiary winding connection from black to green to reflect, and better illustrate, the comments in the text box and to be similar to the I4 figures.
Yes
For Figures I2-3 through I2-6, ATC recommends the SDT include the designation of the point(s) of interconnection as in other Figures of a generation interconnection (e.g. Figure I4-1 and Figure E1-3). ATC encourages the use of disconnect switches as examples of where points of interconnection demarcation may occur and how their location affects classification of line between the high side of the GSU transformer and the BES network bus (see comments for Q9). For Figure I2-6, ATC recommends changing the color of the black transformer and Load to green to better illustrate BES versus non-BES elements, similar to the I4 figures.
Yes
In all I4 diagrams (Pgs. 14-18 of the Guidance Document), the interpretation includes aggregated individual variable wind or solar resource generators adding up to 75 MVA or more and does not include the single point of interconnection where a single contingency can knock off 75 MVA is backwards, creates gaps in system coverage, and causes serious unnecessary NERC standards complications. The drafting team should consider reversing its diagrams to show individual resource generation as “green” and out of scope and the single point of interconnection (such as a 34.5 kV to 100 kV and greater generator step-up transformer) only with source generation as “blue” or in scope.

This concept is more consistent with the existing NERC registration criteria.
Yes
For Figure I5-1, ATC recommends changing the color of the Cap 1 switching device; the Cap 3 switching device and associated transformer; and the Cap 4 switching device, associated transformer, and associated Load (as well as the associated wording in the text boxes) to green to reflect, and better illustrate, the comments in the text box, similar to the I4 figures. ATC also recommends changing the color of the Cap 2 switching device from black to green to reflect, and better illustrate, the comments in the text box, similar to the I4 figures. The illustration for Cap 3 calls attention in the text box that the dedicated transformer, which serves the function of only delivering reactive resources to the BES, is classified as a non-BES element, and therefore should be changed from blue to green to reflect it is a non-BES element. For Figure I5-2, ATC recommends changing the color of the Cap 1 switching device, associated transformer and associated load (as well as the associated wording in the text boxes) to green to better illustrate the comments in the text box , similar to the I4 figures. ATC also recommends changing the color of the Cap 2 switching device, associated transformer, and associated Load to green to reflect, and better illustrate, the comments in the text box, similar to the I4 figures.
For Figures E1-1, E1-2, E1-6, E1-9, and E1-10, ATC recommends changing the color of the substation elements (as well as the associated wording in the text boxes) to green to reflect, and better illustrate, the comments in the text box, similar to the I4 figures. For Figures E1-4 and E1-5, ATC recommends changing the color of the 15 MVA generation facility (as well as the associated wording in the text boxes) to green to reflect, and better illustrate, the comments in the text box, similar to the I4 figures. For Figures E1-7, ATC recommends changing the color of the substation elements and customer owned generation elements (as well as the associated wording in the text boxes) to green to reflect, and better illustrate the comments in the text box, similar to the I4 figures. For Figures E1-8, ATC recommends changing the color of the substation elements and 15 MVA generation facilities (as well as the associated wording in the text boxes) to green to reflect, and better illustrate, the comments in the text box, similar to the I4 figures.
For Figure E2-1, ATC recommends changing the color of the customer owned generation elements to green to reflect, and better illustrate, the comments in the text box. Based on the comments in the text box, ATC expects the line to the BES bus, the lines from the generating unit to the load, the transformers, and the meter to be judged as excluded from the BES and green in color. Another example and associated figure which would be beneficial in adding is the situation where the point of interconnection is far away from at the BES bus at a disconnect switch near the meter. In this example, ATC would expect the line between the BES bus and disconnect switch to be judged as BES by the baseline portion of the definition, and the remainder of the elements to be excluded from the BES and green in color, as proposed for Figure E2-1. For Figure E2-2, ATC recommends changing the color of the transformer serving the industrial process generation elements to green to reflect, and better illustrate, the non-BES classification. Based on the comments in the text box, we expect the tap (transformer and line) to the industrial process to be judged as excluded from the BES and green in color. However, we expect the path from the generating unit to the BES bus (line from generating unit to industrial process tap and line from the industrial process tap to the BES bus) to be judged as BES and blue in color.
For Figures E3-1, E3-2, and E3-3, ATC recommends changing the color of the non-BES substation elements and customer owned generation elements (as well as the associated wording in the text boxes) to green, to reflect and better illustrate the comments in the text box.
In all of the hierarchical Figures, ATC recommends that the lines connecting various generators throughout the model include a disconnect switch (which would serve as an indication of the point of interconnect location) either near the GSU transformer or near the transmission network bus. Does the classification of the line depend on its ownership or length? (e.g. 100s of feet versus several miles) In Figure S1-9, a local network was identified and classified as non-BES. This illustration calls attention whether local networks beyond some amount of aggregate load (e.g. more the 300 MW) do or do not qualify for Exclusion E3. This issue should be considered and addressed in Phase 2 of the BES Definition.
The first draft of the BES guidelines is a great document and ATC believes the comments provided should help make it even better. ATC recommends adding a Section that covers the “core” BES definition prior to the sections on Inclusions and Exclusions. This section should provide guidance regarding the classification of transmission lines, particularly non-network lines that connect to

generation, load, or both, to the BES. The discussions and illustrations elsewhere in the guide focus on the inclusion and exclusion elements of transformers, generation resources, reactive resources, and local networks. ATC recommends making more use of disconnect switches in the examples, particularly illustrations that include generation resources. Disconnect switches are often the elements used to delineate the point of interconnection, and therefore transitions between BES and nonBES elements. The examples and Figures highlight inconsistences regarding the classification of elements that serve as the path for power delivery for generating units greater than 20 MVA, aggregate generation greater than 75 MVA (including dispersed generation), and net non-retail power delivery to the BES. These inconsistences should be considered and addressed in Phase 2 of the BES Definition development.
Group
Duke Energy
Greg Rowland
No
No
No
No
No
No
No
No
We believe that the Guidance Document accurately reflects the revised BES definition. However we have a comment for the drafting team to consider in Phase 2 of their work on the definition. I4 includes dispersed power producing resources with aggregate capacity greater than 75 MVA (gross aggregate nameplate rating) utilizing a system designed primarily for aggregating capacity, connected at a common point at a voltage of 100 kV or higher. In the case of a solar farm that has a single plant-level controller, Inclusion I4 should perhaps include aggregate capacity greater than 20 MVA, because the farm acts as a single unit.
Individual
Gary Kruempel
MidAmerican Energy Company
Support comments submitted by the MRO NSRF and in addition submit the attached comments for consideration.
No
No
Yes
Wind and Solar facilities because of the energy source for their operation being variable need special consideration for some of the requirements of the standards that apply to generator operators and generator owners. If the standards as currently written were applied literally to these facilities, generator owners and operators and transmission operators and reliability coordinators might be required to report and receive frequent reports regarding change in capability purely due to the change in wind speed or solar intensity. Reporting of this type would be unduly burdensome on generator owners/operators and would not be useful to transmission operators and reliability coordinators particularly since it would be after the fact as the wind and solar resources cannot be accurately forecast.In addition to generator output being unpredictable, these types of facilities are

sometimes not available at all due to the energy source (e.g. too high or low wind, or too low solar intensity). Wind and solar facilities are different from other generating facilities in that rather than controlling output in response to a set point from a dispatcher as individual units, the set point is often provided at the facility level and control equipment at that level in turn sends commands to the individual units based on their current capability (e.g. wind or solar energy available) to provide the desired output. In addition due to the variable resource this facility set point is typically an output limit rather than a set point which is controlled to. In a similar way reactive level is controlled at the facility level with a facility controller providing commands to the individual units.
No
Individual
Russ Schneider
Flathead electric cooperative
Agree
Western public power coalition
Individual
Don Schmit
Nebraska Public Power District
No
Yes
Figure I2-6 shows black color for the lowside bus that includes the load and the transformer connecting to the >100kV bus. Is the black color non BES? The black color may be confusing for this diagram as well as other diagrams such as E1-2. Perhaps only blue or green should be used as designations in the diagrams.
Yes
In figure I4-1 is it correct in assuming the protection system for the main transformer, collector lines, turbine step up transformers and, high side turbine transformer breaker is not under the purview of PRC-005? The same question could be asked for all figures in the I4 section. What is the benefit of designating the individual wind turbines BES yet not the lines to the turbines? This seems odd and seems to contradict PRC-005 if looking at protection systems.
Yes
Is it correct for figure I5-1 in assuming the tertiary reactive resource protection system is BES and falls under PRC-005 purview since the reactive device is BES? Would tertiary bus protection and DC circuitry to the tertiary breaker not fall under PRC-005 since they are non BES? Would this be considered a proper use of this guide document to evaluate a protection system?
There are cases where the black color appears to designate BES and non BES elements such as figure E1-2. Perhaps only blue or green should be used as designations and update the color codes under the headers II Inclusions and III Exclusions. Is it correct to assume the protection system for breaker D and E over to the transformer is under the purview of PRC-005 due to the black BES bus between breakers D and E? This is a good diagram showing breaker and a half. Would the SDT consider it beneficial to explore scenarios where some legs of the breaker and a half or perhaps one of the buses might not be BES or would the SDT not want to have BES and non BES in the same breaker and a half substation? It is noted that that figures in E1 don't show breakers. Is it safe to assume the BES status of the line also represents the status of a breaker on the line? For example, in figure E1-4 would a breaker on the high side of the 55MVA generator transformer be BES or non BES?

On page 41 there is the following statement: “An entity who determines that all or a portion of its Facilities meet the local network exclusion should be able to demonstrate, by inspection of actual system data, that flow of power is always into the local network at each point of interface with the BES at all times. The SDT’s intent was that hourly integrated power flow values over the course of the most recent two-year period would be sufficient to make such a demonstration.” The Local Network Exclusion technical paper indicated planning or load flow studies? Should this also be included in that paper so these documents are aligned. Would there be a requirement to run such a study or collect data at regular intervals to continue to meet exclusions? LDN are not really specified in the PRC-005 documentation but only in the BES documents so it would seem more clarity on designating and maintaining the LDN status may be needed in this definition.

Would there be any benefit if breakers were included in the diagrams since they are elements?

The guidance document is very detailed and it appears the SDT team provided great effort to create this document to help the industry understand where the BES bright line exists. This is appreciated. There are concerns with some statements in the document such as the disclaimer on page 3: “This document is not an official position of NERC and will not be binding on enforcement decisions of the NERC Compliance Program. This guidance reflects the professional opinion of the DBES SDT, given in good faith for illustrative purposes only” and on page 4 “This document is not an official position of NERC and will not be binding on enforcement decisions of the NERC Compliance Program.” This creates concerns when trying to apply the BES definition to other standards such as PRC-005 if this document is not supported by NERC. NERC should stand behind this document so that Regional Entities and the Registered Entities alike are assured of a common basis to evaluate applicable BES. Note the use of the black color can be confusing for several of the diagrams. There are cases where black is BES such as on figure I2-3 and not BES such as figure E1-2. Perhaps only blue or green should be used as designations and the color codes under the headers for II Inclusions and III Exclusions could be updated. Is it the SDT opinion that designating a bright line for protection systems must be done using the PRC-005 documentation in conjunction with this guidebook or not using this guidebook at all? Are there any issues with this guidebook being in alignment with the PRC-005-2 supplemental reference documents and standard since BES is referenced in PRC-005-2 documents? It would be good to insure there are no conflicts or perhaps minimize any confusion.

Group

Western Area Power Administration

Brandy A. Dunn

No

No

No

Yes

The text and diagrams for Inclusion I5 do not clarify whether protection systems would be included by standards that address the BES. For example, if a reactive resource is part of the BES but its switching device is not, then would all or part of the protection system for that reactive resource by applicable under PRC-005? Also not addressed are specialized reactive resources such as those that are found at DC Converter Stations. Those reactive resources are utilized for proper commutation of the converters and are typically not connected when the DC system is not in service. These reactive resources should not be considered as part of the BES and need to be addressed by the guidance document.

Western Area Power Administration continues to disagree with the verbiage used for Inclusion I5. Not all reactive resources connected to the transmission system are essential to the reliability of the BES.

Some sort of qualifying requirements should be applied including MVAR limits and/or identification of critical resources by a Planning Coordinator.
Individual
John D.Martinsen
Public Utility District No. 1 of Snohomish County
Agree
Snohomish' supports the comments filed by the Western Public Power Coalition.
Individual
Si Truc PHAN
Hydro-Quebec TransEnergie
No
Yes
Comments: In figure I2-5, the 25 MVA generator is BES because it is connected through the two step-up transformers dedicated to generation, but the text does not specify that both transformers are included. The text could be read as meaning that Generating resources and generator terminals are included, but not the transformers. The phrase "high-side of the step-up transformer(s) connected at a voltage of 100 kV and above" could be interpreted as a qualifier that identifies the generator.
No
No
In figure E1-5, the radial part of the line connecting the 15 MVA generator should be excluded, as detailed in the explanation (p. 23) specifying "[when a radial system does not qualify for exclusion] further evaluation of the underlying Elements within the original radial system may be appropriate." Figure S1-12 for the blackstart generator (blue) confirms this as the radial 138 kV line is excluded from the BES.
The SDT interpretation goes beyond the text (p. 40) when they consider that the flow measure is in the LN at all times. The text says "power flows only into the LN" but doesn't specify any time base.
Group
Pepco Holdings Inc and Affiliates
David Thorne
No
No
No
No
1) On Figure E1-1 it would be extremely helpful to show a breaker (also colored green) where the radial system taps the BES in order to illustrate that the breaker itself is part of the radial system and would also be excluded from the BES. 2) Figure E1-2 shows two radial lines emanating from separate bus positions in a ring bus arrangement. The diagram illustrates (in green) that the radial exclusion apparently does not include the small bus sections between breakers B and C as well as between

breakers D and E (which are shown in black). When a ring bus, or breaker and a half, arrangement is applied, no BES through-path continuity is interrupted when one of these small bus sections serving radial load is removed from service. As such, we feel that these small bus sections should also be colored green. This would be similar to the clarification made in Appendix A of the current ReliabilityFirst BES definition. If the SDT is swayed by this argument, or by the comments of others, then these bus sections should be colored green. However, if the SDT disagrees, then at the very least a note should be added to Figure E1-2 indicating that "the E1 exclusion does not apply to the small bus section between the breakers from which the radial system emanates." 3) In Figure E1-8 the two radial spurs from the main line that connect to the transformers serving just radial load should be colored green. Those portions of the line meet the E1 exclusion as being radial and emanating from a single point tap on a BES line. This is consistent with the interpretation illustrated in Figure S1-12. 4) There are no examples in the series of E1 drawings which illustrate the case where a blackstart resource is connected downstream of the radial system. This is an extremely important scenario to evaluate and illustrate. Cases where the blackstart resource is directly connected to the BES line, as well as when the blackstart resource is connected below 100kV, should be illustrated. Cases where the blackstart resource is connected to a network below 100kv are the most confusing and difficult to interpret and therefore illustrations should definitely be provided. For one example, consider Figure E1-6. There should be a companion drawing E1-6a where the 25MVA unit is replaced with a 15MVA blackstart unit connected directly to the radial line operating above 100kV. In this case the main line from the GSU transformer to the tap point would not be exempt under E1 and would therefore be considered BES (colored blue). However, the two radial spurs serving radial load of the main line would still meet the E1 radial exclusion and should be colored green. For a second example, take Figure E-9. Suppose a blackstart unit was connected to the low voltage bus on the right hand side in place of the capacitor bank. Presumably, because there is a blackstart unit downstream of the radial tap point the line on the right would not meet exemption E1 and would be part of the BES and should be colored blue. However, the substation transformer is not a dedicated GSU transformer and therefore would not be part of the BES. The blackstart resource itself would be part of the BES. The real question is whether the radial line on the left hand side would also loose the E1 exemption, since the blackstart unit is downstream of that radial line as well, due to the nature of the two low voltage busses being networked through a low voltage tie. Since blackstart "paths" have been removed from the BES definition it is very confusing whether this alternate lower voltage path causes both radial lines to lose the E1 exemption. An illustrative example for this case would be extremely helpful.

no comments

1) In the section on Exclusion E1, Figure E1-2 was used to describe the point in a ring bus or breaker and a half arrangement where the E1 exclusion begins. In that diagram it is implied that the small bus section between the breakers is still part of the BES and not part of the E1 exclusion. (See comments on Question #5) It would be helpful to have a similar illustration, or at the very least some verbiage, for Exclusion E3, to define where in these types of bus arrangement the E3 exclusion begins. 2) There are no examples in the series of E3 drawings which illustrate the case where a blackstart resource is connected downstream of the local network system. This is an extremely important scenario to evaluate and illustrate. Cases where the blackstart resource is directly connected to the network at or above 100kV, as well as when the blackstart resource is connected below 100kV, should be illustrated. Cases where the blackstart resource is connected to a network below 100kV are the most confusing and difficult to interpret and therefore illustrations should definitely be provided. One example should reflect the case where the 10MVA unit in Figure E3-1 is declared a blackstart resource. Does every 138kV line in the loop become BES, since they would lose the E3 exclusion, even though all flows are into the network? Suppose only a few of the 138kV lines were designated as the cranking path back to 345kV generation remote from this network. It would make sense that only those lines which constitute the cranking path be considered BES. However, since blackstart "paths" were removed from the BES definition the presence of a single blackstart unit would appear to cause "all" the local network lines to lose the E3 exemption. This issue should be specifically illustrated and emphasized in the document. A second example should demonstrate the situation where the blackstart unit is connected below 100kV. For example, a single blackstart unit connected to one of the load busses shown in Figure E3-3 instead of the #2 capacitor bank. The blackstart resource itself is included by Inclusion I3. However, how much of the upstream path, including the load serving transformer becomes BES? Again does every line in the 138kV loop become BES and loose its E3 exclusion even though all imports are into the network? Examples of how the

presence of blackstart units affect the designation of BES elements needs to be both illustrated and explained in this document. 3) In figure E3-2 the short radial 138kV lines connecting the two 138 - <100kV transformers to the network should not be part of the BES (and should be colored green) since they serve radial load and therefore satisfy the E1 Exclusion.
The inclusion of blackstart resources downstream of radial systems, or local networks, significantly alters what facilities will be classified as BES. The system diagrams in Figure S1-1 through S1-12 are the only examples currently in the document which illustrate the effect that a blackstart unit would have on the selection of BES facilities. However, the blackstart location chosen was rather trivial in nature. The blackstart unit was connected via a GSU transformer directly to the 138kV line, which resulted in the main 138kV radial line from the blackstart unit back to the source substation being included in the BES. However, the presence of blackstart units connected into the system at voltages below 100kV is much more common and is more controversial to assess. Rather than the blackstart example that was chosen, it would be much more helpful to see the impact of blackstart resources that were connected below 100kV in this system. For example how would the BES facilities in Figure S1-12 change if the 5 MVA generator shown connected below 69kV in the local network on the left hand side of the drawing was declared a blackstart resource? Also, what would be the impact to each of the two radial lines shown on the right hand side of the drawing if the blackstart unit was instead connected to the common load bus operated below 100kV which is tied together to form a low voltage network between these two radial lines. These two examples could be illustrated with one additional drawing, say Figure S1-12a showing the difference between the two drawings of having these blackstart resources connected in the manner described above. This would be extremely helpful in illustrating how to account for blackstart resources connected below 100kV downstream of both radial and local networks.
1) The drafting team should be commended for their contribution in providing helpful examples to assist in understanding the new BES Definition. However, because of the disclaimer language contained within the document, the actual value to the industry is significantly reduced. The industry desperately needs a document like this, but unless the examples and interpretations presented within are considered authoritative interpretations from a compliance standpoint, then it has little value to the industry. It merely represents “the opinion” of the DBES drafting team. We would strongly suggest that this document be submitted to and approved by NERC as an official and proper application of the BES definition, whether it be as a sanctioned interpretation of the new BES Definition, or as a Compliance Application Notice, or via some other mechanism which would add authoritative approval of these examples of applications of the BES Definition. Perhaps making the document an appendix or attachement to the definition and deleting the disclaimer language. 2) With the exception of Figure E1-2 there are no fault interrupting devices (i.e. breakers, circuit switchers, etc.) shown on any of the diagrams. Could the presence, or absence, of a breaker at the interconnection point between BES and non-BES facilities impact the decision as to whether a facility is BES, or not? For example, consider Figure S1-12. The 138kV radial line feeding the 15MVA blackstart unit is clearly BES. However, as correctly shown in Figure S1-12, the two radial spurs off of that main line that feed radial load clearly meet exclusion E1 and therefore are not considered BES. But suppose there are no fault interrupting devices at the tap points where these two radial spurs join the main line. In that event, a fault on these non-BES spurs will result in an outage to the entire line and all connected BES facilities. That being the case, would the absence of an interrupting device make these spurs also BES facilities? Since the present BES Definition is silent on the presence, or absence, of interrupting devices at the interface point, we agree that Figure S1-12 correctly represents a proper application of the BES Definition, despite the apparent reliability concern raised by the absence of an interrupting device at the interface point. This issue and clarification should be emphasized in the Guidance Document. 3) Although the BES Definition is silent on interrupting devices, this Guidance Document should not be. These devices, such as circuit breakers, are considered Elements operating at, or above, 100kV. As such, this document needs to address whether these interrupting devices, when used at the interface between BES and non-BES facilities are considered part of the BES, or whether they are excluded. Also, they should be shown on the varous Figures. For example, consider Figure E1-4. If a breaker is located at the point where the non-BES line taps to the main BES line, then the breaker would be downstream of the single point of radial connection and therefore should be excluded. Also, if there were a breaker on the high side of the 55MVA GSU transformer, then it would also be excluded since the BES definition only extends up through the high side of the step-up transformer. Although to some these points may seem obvious, to others they are not. A simple illustration to demonstrate these points would eliminate any possible

confusion and would reinforce the intent of the definition. The figures are of limited use without showing the associated interrupting devices (breakers). Breakers >100kV would be the most numerous Element of the BES and should be specifically addressed in this Guidance Document. 4) We urge the Drafting Team to give serious consideration to all the comments offered here, as well as by all the other industry commenters. Expanding the document to fully address all the industry comments and concerns will only serve to provide better clarity on how to apply the BES Definition and will eliminate the need for countless requests for future interpretations.
Individual
Aaron Staley
Orlando Utilities Commission
No
No
No
No
Exclusion E3 refers to a historical record of flows showing that power consistently flows into the network only and that is shown in Figure E3-1. What is the consequence if the TPL 002 Category B contingency outage of the 345/230 Kv Transformer resulted in flows crossing from the 345 kV System to the 230 kv System? Or put another way if the historical records shows that during 2 hours in the last 2 years power flowed out of the 138kV System due to an outage on the surrounding 230 or 345 kV System, would that exclude the application of Exclusion E3?
This is excellent work, good job.
Group
ACES Power Marketing Standards Collaborators
Ben Engelby
No
No
No
Yes
We disagree with Figure I5-2. Static and dynamic reactive devices (excluding generators) are part of the transmission system and are transmission Elements. Thus, the reactive device on a radial system would meet the criteria for exclusion per E1. NERC defines Transmission as an interconnected group of lines and associated equipment for the movement or transfer of electric energy between points of supply and points at which it is transformed for delivery to customers or is delivered to other electric systems. A reactive device such as capacitor bank would clearly fit the “associated equipment” portion of the definition. Reactive devices exist to support voltage for the delivery of energy. Since E1 uses lowercase transmission, we know that the NERC definition does not apply per se. However, what else could be intended by transmission? Webster’s does not provide a satisfactory or applicable definition. If a reactive device is not transmission, what else would it be classified as? Certainly not generation.
(1) We agree with the SDT’s application of normally open switching devices between radial systems that do not affect the exclusion E1. Thank you for clarifying that issue. (2) Page 23 states that the

owner always has the option to seek an exclusion. Please expand this to state that the operator can also seek an exclusion. (3) We disagree with the statement on page 24 that reactive resources cannot be excluded if they meet criteria I5. We disagree because they are transmission Elements. Exclusion E1 applies specifically to transmission Elements. Please see our comments in Q4 for more supporting rationale.
While we understand the three-step process of applying the BES definition, we are still unsure of when an inclusion or exclusion would trump another. The way the steps are set up, it seems like the core definition is the first step of the analysis, then any inclusions, and finally the exclusions to determine if the Element is out of jurisdiction. We appreciate clarification of which exclusions supercede the inclusions, but the way that the steps are set up, all exclusions should supercede the inclusions. Finally, E1 does not allow for the exclusion of generation resources that meet the criteria in Inclusions I2, I3, and I4, so it would seem that inclusions trump the exclusions in that instance. What appears at first to be a straight forward process with three easy steps is significantly complicated exceptions to each of the inclusions and exclusions. We believe that the process should be more simple to apply and are concerned for inconsistent application in the Regions. Please provide more clarification regarding the order of precedence and the weight of each inclusion and exclusion. Perhaps a separate procedure document could be applied.
(1) We appreciate the DBES SDT's efforts in drafting a thorough and detailed application of the BES definition. While we understand the separation between standard development and compliance, we urge the drafting team and appropriate NERC and regional compliance personnel to coordinate the applications of this guidance document. The guidance document should be adopted as an official position of NERC and should be used as supplemental information for enforcement decisions of the NERC Compliance Program. Otherwise, the guidance document will become irrelevant if compliance staff can ignore the intent of the drafting team and disregard the inclusions and exclusions of the definition. We recommend removing the associated disclaimer that appears on pages 1, 4 and 22 (2) We also recommend coordination with NERC and Regional registration and certification departments to ensure that the functional model is being applied consistently and modified where appropriate to line up with the new definition. (3) We have concerns that the BES definition's applicability is for Elements, yet the standards apply to registered functions. This conundrum will continue to cause problems in the industry without proper guidance. We would like to see the DBES SDT consider adding a statement in its guidance document on how to use the BES definition in conjunction with applying Reliability Standards. (4) The final statement in the guidance document should either include the NERC Rules of Procedure language or specific sections to reference the exception procedure. (5) Thank you for the opportunity to comment.
Individual
Russell Noble
Cowlitz PUD
Agree
The Western Public Power Coalition.
Individual
Reggie Wallace
Public Works Commission of the City of Fayetteville, NC
No
No
No
No

On p. 24, under the subheading "Generation and Reactive Resources", the initial statement reads "Exclusion E1 does not allow for the exclusion of generation reasources that meet the criteria described in Inclusions I2, I3, and I4." However, the statement as written does not make it clear that generation resources which do not meet any of the Inclusion I2, I3, or I4 criteria can be excluded. This is particularly important in the determination that must be made with respect to criterion E1.b. or E1.c. Revise the statement to be more specific. Suggested language is: "Generation resources that do not meet any of the Inclusion I2, I3, or I4 criteria may be excluded from consideration as a part of the aggregate capacity limitation."
Individual
RoLynda Shumpert
South Carolina Electric and Gas
No
No
No
No
Individual
Derek Miller
Benton Rural Electric Association
NWPPA
No
No
No
Yes
Pg 20, Fig I5-1, Within the Blue box of Reactive Resource ‘1’ and ‘3’, change the color of the text from Blue to Green when identifying a Non-BES portion. Will provide clarity. Pg 21, Fig I5-2, Within the Blue box of Reactive Resource ‘1’, change the color of the text from Blue to Green when identifying a Non-BES portion. Will provide clarity.
Document will be a benefit!
Individual

Michael Moltane
ITC Holdings
In Figure E1-6 on Page 30 of the Guide, the language in the green-outlined box does not seem to fit the scenario. The term “gross aggregate” is not applicable to only one generator and the parenthetical incorrectly references “70 MVA” instead of 25 MVA
Switching device and circuit breaker operation under contingency events are not taken into account. It is possible for an initially defined non-BES Element to morph into a BES Element during a contingency-driven network topology reconfiguration and, conversely, a topology reconfiguration from normal can change an initially defined BES Element to a non-BES Element. The first paragraph under the section entitled Power Flow at BES Interface on Page 40 of the Guide states: An entity who determines that all or a portion of its Facilities meet the local network exclusion should be able to demonstrate, by inspection of actual system data, that flow of power is always into the local network at each point of interface with the BES at all times. The SDT’s intent was that hourly integrated power flow values over the course of the most recent two-year period would be sufficient to make such a demonstration. This demonstration does not promote reliability as it contains no consideration of contingent flows on the system. [Additionally, hourly integrated power flow values may not detect power flows out of the local network when averaged over the sixty minute interval.] Fundamental concepts for planning and operating the system are to withstand contingent events as outlined in the TPL and TOP standards. The operating standards require the ability to withstand a single contingency at all times without exceeding SOLs and the planning standards go further by requiring certain performance levels for Cat C and D events. Excluding the impact of contingent events on the definition of the BES essentially indicates that these events aren’t that important for reliable operation of the interconnected system. Figure S1-9 provides a good visualization of this concept. Should the line between the stations where the Local Networks are shown to interconnect to the BES trip, there will be a change in the flows on the 138 kV lines shown in green (e.g. the “Local Network”). Depending on the overall strength of the interconnected system, number of parallel paths, etc., flows very likely will increase at one of the interconnection points and reverse at the other. In the case of a generating facility changing from a non-BES Element to a BES Element illustrated in Figures E2-1 and E2-2 on Pages 37 and 38 of the Guide, does the generator now become subject to the requirements of the VAR standards? How does the GOP and TOP know when they apply? These facilities should be BES and subjected to the NERC reliability standards to reasonably ensure reliable operation of the interconnected system.
Individual
Jason Snodgrass
Georgia Transmission Corporation
No
No
No
No
There seems to be an error in the following sentence on page 32 of the guidance document when

explaining how to evaluate underlying radial systems: The current sentence states: Each underlying Element must meet criteria established by Exclusion E1, including parts a, b, and c, to qualify for exclusion from the BES. Per the summary on page 23, GTC recommends this statement to be corrected as follows: Each underlying Element must meet criteria established by Exclusion E1, including parts a, b, or c, to qualify for exclusion from the BES. This subtle difference changes the meaning of the sentence.

1. Consider adding the BES 'core' definition near the front of the document and prior to discussion of Inclusion I1 as a point of reference within the document. This seems to be a logical order which compliments the Hierarchical Application described within and prevents the need to "look up" the actual definition in a seperate document. 2. Consider adding a section for Inclusion I3 (between I2 and I4) within the document and relocating the description (identified on page 4, of why there aren't any application configuration issues associated with it, and thus no diagrams). This would be helpful to those that want to reference the document later and would typically attempt to access between I2 and I4 (they could then see why there aren't any diagrams and wouldn't prematurely think that the team failed to capture it).

Group

Iberdrola USA

David Conroy

Yes

The text indicates, “only the windings of the transformers are shown as being included in the BES. The lines coming out of the transformer are not delineated as BES or non-BES…” Unless specifically determined to be otherwise, all series parts of a circuit, breaker-to-breaker, should be included in the classification.

Yes

Based on Figures I2-5 & I2-6, if a >20 MVA generator has two step-up transformers (GSUs) without intervening load, it is BES; but if load is served from the bus between the two step-up transformers, it is not BES. This intervening load on the 3rd unit GSUs also changes the classification of the 2nd unit to non-BES, even though the entire 3-unit plant is > 75 MVA.

Yes

Based on Figure I4-1, the 80 MVA GSU transformer for the wind farm connected to > 100 kV is not BES. Also, reference Figure I4-2: What if load is served between the two step-up transformers, similar to FigureI2-6? Would the dispersed generation then be non BES?

Yes

Classifying the capacitor as BES, but the capacitor breaker not BES, does not seem right. Would the NERC PRC Reliability Standards then not apply to the breaker?

Based on Figure E1-2, the two radial systems are between the same two substations, but they are radial because there is no high-side (> 100 kV) bus at the load substation. If there were a high-side bus, then this exclusion would not apply. Is that so? What if the high-side bus were part of a breaker-and-a-half configuration, as is the switchyard shown above? Based on Figure E1-3, since the transmission exclusion applies to generation less than 75 MVA, but the resource inclusion applies to a generator unit > 20 MVA; this is an odd case of a >100 kV non-BES transmission generator lead for a BES generator. Reference Figure E1-10: What if the upper 2 “straight” buses were a single “straight” bus, with 2 lines >100 kV going to the same substation?

For Exclusion E2, the “behind the meter generation” exclusion is determined by net flow based on historical integrated hourly metering over a calendar year (note inconsistency with E3, which includes metering over a 2-year period) for each customer with behind-the-meter generation. For this exclusion to apply, flow into the system must be < 75 MVA for all hours of the year. In Figure E2-2: Note that the >100 kV line carrying 100 MVA is not BES because it is customer-owned, even though the 150 MVA customer-owned generator is BES.

For Exclusion E3, the “Local Network” exclusion is determined by historical integrated hourly metering

over a 2-year period for each interconnection point for the postulated local network with the BES. For each interconnection point, flow must always be into the local network at every hour. In cases where integrated hourly metering is not available at all possible interconnection points, would hourly instantaneous values be acceptable? In Figure E3-2, in the left-most text box, the last bullet should be restated, “Power only flows out of the networked system at least once (E3b.).” Based on Figure E3-3, a >100 kV capacitor embedded within an excluded Local Network is BES; no matter how small the capacitor bank is, nor how large the excluded network it is within.
Individual
Christina Carter
Big Bend Electric Cooperative
No
No
No
No
No questions.
No questions.
No questions.
No questions.
This is a helpful document.
Individual
Cairo Vanegas
Fort Pierce Utilities Authority
No
No
No
No
NERC filed comments in response to the Notice of Proposed Rulemaking on Revisions to the ERO Definition of Bulk Electric System and Rules of Procedure, on September 4, 2012 with FERC in Docket Nos. RM12-6-000 and RM12-7-000. In page 18 of those comments, NERC provided an illustration of a networked configuration with a 69kV loop system. Fort Pierce Utilities Authority (FPUA) agrees with NERC’s assertion that the elements between the 230kV lines and transformers 1 and 2 are subject to Exclusion E1(a). FPUA believes this illustration is very important because so many smaller systems in the U.S. are designed in a similar fashion, which is a subtransmission system designed to serve only load and is looped to provide redundancy at the subtransmission level but is connected at multiple points to the BES to increase reliability. FPUA believes the BES Definition Guidance Document should reflect this important clarification that has a very extensive application. The point I am trying to make, which is in accordance with NERC’s own comments, could be illustrated by modifying Figure E1-2 on Page 26 of the Guidance Document so that the >100kV lines providing the connections to the BES are terminated at different non-BES substations, which are networked at the <100kV level.

No
No
No
No
Individual
Patrick Farrell
Southern California Edison Company
No
No
No
No
SCE is concerned that the E1 Exclusion clarification provided in the guidance document takes the most “literal” definition possible to describe the concept of “single point of connection”. The text accompanying Figure E1-2 suggests that every tap point within a single bus creats a distinct radial system, which would effectively eliminate the use of the E1 Exclusion. As written, the clarification of the E1 Exclusion does not take into consideration a system that is electrically radial, consisting of multiple lines emanating from the same voltage bus down into a radial system. It is common industry practice to utilize switchracks with multiple operating buses (i.e., operating transfer, or double bus, via either double breaker or breaker-and-a-half configurations) for radial systems with multiple points of connection from the same source switchrack. This definition in the guidance trickles down to the low voltage switchrack which typically have multiple operating buses. SCE’s transmission modeling and power flow studies, as well as those performed by many other utilities, consider a switchrack to be a single point of connection for all study purposes, as the specific line-and-bus arrangements vary by substation, but serve the common purpose of protecting the transmission elements within the substation. Modeling a switchrack as only one bus is a common practice from a grid system planning/operational studies perspective because the lines and breakers in the substation effectively have no impedance. Recognition of this nuance needs to be included and clarified in the text and diagrams for the E1 Exclusion.
SCE appreciates the SDT’s efforts in providing this guidance document. However, in earlier stages of the BES effort there was discussion of an effort to perform a technical analysis of the proper percentage limits that could be applied to the Local Network exclusion for flow back onto the BES. At one point, consideration was given to a 10% threshold. SCE encourages the SDT to consider revising Section III.3 BES Exclusion E3 to provide for the possibility of limited and infrequent power flow from a Local Network onto the BES. SCE recommends an addition to Exclusion E3 that would allow a Local Network to retain its exclusion from the BES so long as the “net outflow” to the BES is always less than 75 MW.
Individual
Tracy Richardson
Springfield Utility Board
No
No

No
No
SUB believes there are still differing opinions regarding "normally open" versus "closed" switching devices. In the October 2012 WECC Compliance User Group Meeting, it was explained that even normall-open switches, if they can be closed, are considered closed. However, during recent NERC webinars, this was not understood to be the case. With regards to the E1.b generation exclusion, SUB is concerned with how this will work with any Demand Response Reliability Standards currently being developed. Will the DR Standards be linked to the current BES Definition process? If so, will that be in conflict with this E1 generation exclusion?
One of the characterizations of Local Networks is “power flows only into the LN and the LN does not transfere energy originating outside the LN for delivery through the LN.” What amount of flow is considered; all flow or are intervals? SUB would like to see more language about flow. In order for the exclusion regarding flows out of a local network to work there must be a description that includes: 1)A threshold for an amount of transfer (e.g. > 10MW) 2)A duration of the transfer (more than 24 hours) 3)And language that refers to normal operations (an abnormal event would that results in power flow would not trigger a violation). Ideally, if a Local Network is not on a critical path it would be excluded outright. If it is on a critical path, then 1, 2, and 3, would apply.
SUB supports the re-ordering of the specific situations for exlusion from the BES to match the Hierarchical Application of the Definition, and appreciates the effort to have a consistent application of the process.