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November 29, 2019

The Task Force on Coordination of Planning (TFCP) Response to Comments Received in the Open Process posting of revised A-10 *Classification of Bulk Power System Elements*.

The TFCP would like to thank those who provided comments during the second Open Process posting of the revised A-10 draft which was posted from August 23, 2019 to October 9, 2019.

TFCP responses to individual comments are provided below.

Comments from Avangrid:

1. AVANGRID, in conjunction with Eversource and National Grid, respectfully submits the attached comments as part of the Open Process review of the revised Criteria A-10.

We are grateful for TFCP's response to our concerns submitted during the first round of Open Process but we feel that these responses did not address the underlying concerns we have with the study-based exclusion testing introduced in the proposed A-10 revision.

AVANGRID, Eversource, and National Grid believe that enhancements have been made to the base A-10 methodology, however, we are considering opposing it due to the complexity of the proposed study-based exclusion methodology and its optional nature, both of which undermine the goal of improved consistency and study efficiency.

Our understanding is that the proposed study-based exclusion methodology cannot be applied at 345kV or above and when applied to lower voltage levels, it may result in a reduction of the number of 115kV elements from Directory #1 applicability.

The following is a summary of our concerns:

- The study-based exclusion test is listed as "optional". On the basis that the NPCC members may or may not choose to exercise the proposed study-based exclusions, it invites inconsistency between Areas, even if it may be manageable by each Planning Authority within their respective Area.
- If the proposed study-based exclusion methodology remains, we do not achieve one of the stated objectives of the A-10 revision, specifically to improve study efficiency. Instead the A-10 analysis will become more complex to implement.

TFCP responses to Open Process comments on A-10

- Joint TFCO and TFCP discussions have indicated that changes to Directory #1 applicability will not materially affect Operation's monitored contingencies or operating procedures. This causes us to further question the need or value of relaxing NPCC planning criteria during a time of significant change to the transmission system.

TFCP Response: With regards to the first point raised, the ability to choose whether or not to exercise the study-based exclusion from Directory 1 applicability was added as a way to improve the efficiency of the overall study processes affected by Directory 1 applicability, while not negatively impacting the reliability of the NPCC-wide power system. By opting not to exclude elements from Directory 1 applicability, an entity is not causing an adverse impact to NPCC-wide reliability. The exclusion of elements from Directory 1 results in a refined list of critical elements in a consistent way, while still ensuring no adverse impact to NPCC-wide reliability. Differences between NPCC Areas may exist in the process (for example, whether ISOs or transmission owners run the exclusion test), but those differences are not expected to negatively impact inter-Area reliability.

In regards to the second bullet point, the primary priority for the A-10 revision effort was to designate the elements where NPCC criteria should apply; the study-based exclusion process offers a refinement to the identification of critical elements. CP-11 has prioritized this focus over study efficiency. For some NPCC Areas, it is expected that the savings in study time in Directory 1 related planning and operational studies will offset any additional study effort required for the Directory 1 exclusion process. In NPCC Areas where this is not the case, the Directory 1 exclusion process is not mandatory; it is possible to continue designating elements as BPS, and continue studying them in Directory 1 related studies. Further, where power system conditions do not change significantly, it will be possible to rely on previous Directory 1 exclusion results (as described in Section 5 of the proposed revised Document A-10), rather than re-evaluating every exclusion.

With regards to the third concern raised, it is true that, in some NPCC Areas, the operating practices may not significantly change. In other NPCC Areas, the CP-11 working group has found that these changes would be beneficial by simplifying and removing operational constraints which are not necessary for the reliability of the NPCC-wide system. In the Areas where operating practices will not materially change, other clauses in NPCC criteria (such as the Directory 1, Table 3 performance requirement that "contingencies and conditions applied can be withstood without causing significant adverse impact on other Reliability Coordinator Areas") are already providing results similar to the Directory 1 exclusion test. As well, a study-based exclusion process, as proposed, does not preclude the re-evaluation of an element's bulk power system status or Directory 1 applicability as system conditions change (for example, reductions in synchronous inertia or proliferation of distributed energy resources).

Following discussion at the CP-11 working group regarding the responsibility for exclusion determinations, additional language has been added to Section 5 of Document A-10 to provide a requirement for all entities that own or operate the equipment in question to be consulted before

an exclusion is brought to TFSS for review. A consensus was not reached as to whether this language is sufficient.

Comments from Connecticut Municipal Electric Energy Cooperative (CMEEC)

2. Our colleagues at EVERSOURCE have made us aware of their underlying concerns with the study-based exclusion testing introduced in the proposed A-10 revision. CMEEC shares those concerns, specifically:
 - The study-based exclusion test is listed as “optional”. On the basis that the NPCC members may or may not choose to exercise the proposed study-based exclusions, it invites inconsistency between areas, even if it may be manageable by each Planning Authority within their respective areas.
 - If the proposed study-based exclusion methodology remains, we do not achieve one of the stated objectives of the A-10 revision, specifically to improve study efficiency. Instead the A-10 analysis will become more complex to implement.
 - We understand Joint TFCO and TFCP discussions have indicated that changes to Directory #1 applicability will not materially affect Operation’s monitored contingencies or operating procedures. This causes us to further question the need or value of relaxing NPCC planning criteria during a time of significant change to the transmission system.

CMEEC further opposes the proposed changes because they go against the level of reliability that is needed (and not yet achieved in many instances) in the region. Reclassifying as non-BPS key substations and consequently their elements from the NPCC Directory compromise the reliability needed and expected by customers in our member utility service territories.

Changing NPCC criteria, for example, so as not to recognize constraints arising from DCT and circuit breaker failures introduces intra-regional reliability differences between those issues previously addressed with these criteria in place, and those issues addressed after removal of the criteria. We view as unacceptable the resulting service reliability discrimination among customers subject to like cost incurrence.

TFCP Response: With regards to the first point raised, the ability to choose whether or not to exercise the study-based exclusion from Directory 1 applicability was added as a way to improve the efficiency of the overall study processes affected by Directory 1 applicability, while not negatively impacting the reliability of the NPCC-wide power system. By opting not to exclude elements from Directory 1 applicability, an entity is not causing an adverse impact to NPCC-wide reliability. The exclusion of elements from Directory 1 results in a refined list of critical

elements in a consistent way, while still ensuring no adverse impact to NPCC-wide reliability. Differences between NPCC Areas may exist in the process (for example, whether ISOs or transmission owners run the exclusion test), but those differences are not expected to negatively impact inter-Area reliability.

In regards to the second bullet point, the primary priority for the A-10 revision effort was to designate the elements where NPCC criteria should apply; the study-based exclusion process offers a refinement to the identification of critical elements. CP-11 has prioritized this focus over study efficiency. For some NPCC Areas, it is expected that the savings in study time in Directory 1 related planning and operational studies will offset any additional study effort required for the Directory 1 exclusion process. In NPCC Areas where this is not the case, the Directory 1 exclusion process is not mandatory; it is possible to continue designating elements as BPS, and continue studying them in Directory 1 related studies. Further, where power system conditions do not change significantly, it will be possible to rely on previous Directory 1 exclusion results (as described in Section 5 of the proposed revised Document A-10), rather than re-evaluating every exclusion.

With regards to the third concern raised, it is true that, in some NPCC Areas, the operating practices may not significantly change. In other NPCC Areas, the CP-11 working group has found that these changes would be beneficial by simplifying and removing operational constraints which are not necessary for the reliability of the NPCC-wide system. In the Areas where operating practices will not materially change, other clauses in NPCC criteria (such as the Directory 1, Table 3 performance requirement that “contingencies and conditions applied can be withstood without causing significant adverse impact on other Reliability Coordinator Areas”) are already providing results similar to the Directory 1 exclusion test. As well, a study-based exclusion process, as proposed, does not preclude the re-evaluation of an element’s bulk power system status or Directory 1 applicability as system conditions change (for example, reductions in synchronous inertia or proliferation of distributed energy resources).

Following discussion at the CP-11 working group regarding the responsibility for exclusion determinations, additional language has been added to Section 5 of Document A-10 to provide a requirement for all entities that own or operate the equipment in question to be consulted before an exclusion is brought to TFSS for review. A consensus was not reached as to whether this language is sufficient.

The reliability of service to local customers is not intended to be addressed by document A-10 because the primary focus of Document A-10 is on NPCC-wide, inter-Area reliability. Additional criteria for reliability of service to customers may be implemented through local criteria by any entity. NPCC criteria is not intended to address intra-Area reliability.

Comments from Consolidated Edison:

3. Con Edison appreciates the opportunity to comment toward the draft of NPCC Document A-10 “Classification of Bulk Power System Elements” and thanks the Task Force on Coordination of Planning (TFCP) and the CP-11 Working Group for the consideration of Con Edison’s concerns and suggestions during the extensive revision process which started in 2017.

Given that the proposed revisions do significantly improve NPCC Document A-10 Classification of Bulk Power System Elements, Con Edison supports the adoption of this draft.

In particular, Con Edison is in full support of the automatic exclusion of radial and single-terminal elements from Directory 1 applicability and the study based exclusion of networked transmission elements from Directory 1 applicability.

The exclusions were technically justified and as such the revised NPCC Document A-10 “Classification of Bulk Power System Elements” identifies only the critical facilities for the applicability of the NPCC Directories

TFCP Response: Thank you for your comment in support of Document A-10, and in support of the Directory 1 applicability process.

Comments from Eversource Energy:

4. AVANGRID, Eversource and National Grid’s Comment on the Proposed A-10 Revision 10/2/2019

We are grateful for TFCP’s response to our concerns submitted during the first round of Open Process but we feel that these responses did not address the underlying concerns we have with the study-based exclusion testing introduced in the proposed A-10 revision.

AVANGRID, Eversource, and National Grid believe that enhancements have been made to the base A-10 methodology, however, we are considering opposing it due to the complexity of the proposed study-based exclusion methodology and its optional nature, both of which undermine the goal of improved consistency and study efficiency.

Our understanding is that the proposed study-based exclusion methodology cannot be applied at 345kV or above and when applied to lower voltage levels, it may result in a reduction of the number of 115kV elements from Directory #1 applicability.

TFCP responses to Open Process comments on A-10

The following is a summary of our concerns:

- The study-based exclusion test is listed as “optional”. On the basis that the NPCC members may or may not choose to exercise the proposed study-based exclusions, it invites inconsistency between Areas, even if it may be manageable by each Planning Authority within their respective Area.
- If the proposed study-based exclusion methodology remains, we do not achieve one of the stated objectives of the A-10 revision, specifically to improve study efficiency. Instead the A-10 analysis will become more complex to implement.
- Joint TFCO and TFCP discussions have indicated that changes to Directory #1 applicability will not materially affect Operation’s monitored contingencies or operating procedures. This causes us to further question the need or value of relaxing NPCC planning criteria during a time of significant change to the transmission system

TFCP Response: With regards to the first point raised, the ability to choose whether or not to exercise the study-based exclusion from Directory 1 applicability was added as a way to improve the efficiency of the overall study processes affected by Directory 1 applicability, while not negatively impacting the reliability of the NPCC-wide power system. By opting not to exclude elements from Directory 1 applicability, an entity is not causing an adverse impact to NPCC-wide reliability. The exclusion of elements from Directory 1 results in a refined list of critical elements in a consistent way, while still ensuring no adverse impact to NPCC-wide reliability. Differences between NPCC Areas may exist in the process (for example, whether ISOs or transmission owners run the exclusion test), but those differences are not expected to negatively impact inter-Area reliability.

In regards to the second bullet point, the primary priority for the A-10 revision effort was to designate the elements where NPCC criteria should apply; the study-based exclusion process offers a refinement to the identification of critical elements. CP-11 has prioritized this focus over study efficiency. For some NPCC Areas, it is expected that the savings in study time in Directory 1 related planning and operational studies will offset any additional study effort required for the Directory 1 exclusion process. In NPCC Areas where this is not the case, the Directory 1 exclusion process is not mandatory; it is possible to continue designating elements as BPS, and continue studying them in Directory 1 related studies. Further, where power system conditions do not change significantly, it will be possible to rely on previous Directory 1 exclusion results (as described in Section 5 of the proposed revised Document A-10), rather than re-evaluating every exclusion.

With regards to the third concern raised, it is true that, in some NPCC Areas, the operating practices may not significantly change. In other NPCC Areas, the CP-11 working group has found that these changes would be beneficial by simplifying and removing operational constraints which are not necessary for the reliability of the NPCC-wide system. In the Areas where operating practices will not materially change, other clauses in NPCC criteria (such as the

Directory 1, Table 3 performance requirement that “contingencies and conditions applied can be withstood without causing significant adverse impact on other Reliability Coordinator Areas”) are already providing results similar to the Directory 1 exclusion test. As well, a study-based exclusion process, as proposed, does not preclude the re-evaluation of an element’s bulk power system status or Directory 1 applicability as system conditions change (for example, reductions in synchronous inertia or proliferation of distributed energy resources).

Following discussion at the CP-11 working group regarding the responsibility for exclusion determinations, additional language has been added to Section 5 of Document A-10 to provide a requirement for all entities that own or operate the equipment in question to be consulted before an exclusion is brought to TFSS for review. A consensus was not reached as to whether this language is sufficient.

Comments from Hydro One:

5. Hydro One would like to thank TFCP and CP-11 for addressing comments submitted during the 1st Open Process. Below are some additional comments for this 2nd Open Process.

Hydro One is pleased with the outcome of this periodic review of Document A-10. The review and subsequent modification of the A-10 methodology continues to identify and classify critical facilities as NPCC BPS while reducing the overall resources required for testing. As well, the additional supporting language helps to clarify several aspects of the methodology and its consistent application across the region. The new rationale section is very useful to understand the major changes between revisions. Hydro One encourages developing rationale sections as part of all document reviews to help tracking the reasons for technical changes. This is beneficial due to the transitional nature of task force and working group members.

TFCP Response: Thank you for your comment. Technical rationale sections will be considered for future NPCC Directory revisions.

#	Section	Comment
6. 1	Section 3.1 System Conditions	<p>What does “non-Area wide” mean? We believe the intent is to study only a portion of an Area where a change is being proposed and the study engineer does not need to perform assessments for the entire Area.</p> <p>Proposal: To avoid confusion, consider replacing the phrase with “Subsequent, <u>sub-Area</u>, bulk power system classification assessments may use...”.</p>

		<p>TFCP Response:</p> <p>Comment accepted. “Non-Area wide... assessments” has been replaced with “...assessments of a portion of an Area” in order to better clarify the intent of the language.</p>
7. 2	Section 3.1.2 Major Interface Transfer Levels, <i>footnote</i>	<p>Missing an end quote after the word August.</p> <p>TFCP Response: Comment accepted.</p>
8. 3	Section 3.4 Testing Strategy	<p>In number 2, the phrase “... it is permitted to forgo testing of connected buses <u>unless one of the following considerations shows a need</u> to test these buses:” signifies that an Area has discretion whether to test further however two specific technical reasons are given to test further; specifically (1) slower clearing times and (2) higher short-circuit levels. If these are the only two considerations then make the statement more decisive.</p> <p>Proposal to replace the underlined section with: “...unless one the following is true:”</p> <p>TFCP Response:</p> <p>Thank you for the comment. The language is not intended to be overly prescriptive since small changes in clearing times and short circuit levels may not justify further testing. This approach reduces testing while not jeopardizing reliability.</p>
9. 4	Section 3.5 Bus-Based Test Methodology	<p>The last sentence, “A non-converged power flow solution does not automatically qualify a bus as part of the bulk power system” is a very good statement to prevent over-classification of BPS elements.</p> <p>TFCP Response: Thank you for your comment.</p>
10. 5	Section 4.1 Subsection: Multi-Terminal BPS Elements Where One Or More Terminals	<p>“The transient stability test must be applied at <u>various locations</u> between the terminals of the element to identify those portions of the element where a fault with no protection system action <u>at the bus under test</u> would result in violation of the performance requirements in Section 3.3”</p>

	<p>are Non-BPS Buses (b)</p>	<p>Do the underlined words refer to the same thing? Must the various locations of where you are placing the 3-phase fault be at a <i>bus</i> as defined in Section 2.1; specifically a location having “... with sensing or protection equipment within a substation or ...”?</p> <p>TFCP Response: The two underlined phrases are not referring to the same point. In this portion of the test, it is still assumed that no protection systems act at the bus under test. The fault is located at various points along a BPS-to-non-BPS line, which may not necessarily be the locations of any specific equipment. This test will determine what portion of the line is considered BPS for Directory 4 applicability (for example, 80% of a line could be designated BPS with 20% designated non-BPS). To clarify this, the phrase “bus under test” has been replaced with “bulk power system terminal of the element.”</p>
<p>11. 6</p>	<p>Section 4.2 Identification of Elements for Directory 1 Applicability</p>	<p>The allowance of both automatic element exclusions and study-based element exclusions are a major improvement to the BPS classification methodology. These greatly improve the balance of reliability with the cost-effectiveness of NPCC criteria.</p> <p>The outcome of the exclusions isolates the more stringent NPCC reliability criteria to only those portions of the system that could have a significant negative impact to the interconnected NPCC Region. Specifically, the study-based exclusions provide confidence that the candidate elements are not required to support the performance of the interconnected NPCC Region once redundant protection systems are employed.</p> <p>There are several benefits to this outcome, namely:</p> <ol style="list-style-type: none"> 1. The ability to clearly identify those most critical elements early in the planning and operating processes; <ol style="list-style-type: none"> a. This early identification will directly translate to where Directory 1 criteria shall be applied. As a result, this will facilitate a more consistent application of Directory 1 requirements among various entities (when studying the same system) due to the pre-determine list of elements. 2. Reduced reliance on the debatable qualifier in Directory 1, Table 1 & 3, Performance Requirement ii) “Loss of small or radial portions of the system is acceptable provided the performance requirements are not violated for the remaining bulk power system.”; 3. A refined and pre-determined list of BPS elements for

		<p>measure of NPCC Directory 1 compliance;</p> <ol style="list-style-type: none"> 4. A refined and pre-determined list of BPS elements for transparent, efficient, and cost-effective infrastructure planning to ensure customer needs are economically met. <ol style="list-style-type: none"> a. Those excluded elements will be studied by utilizing intra-Area (local) planning criteria which typically outlines different system conditions, contingencies and associated performance criteria than what is required in Directory 1 studies. 5. The periodic requirement to study the impact of excluded elements with respect to changes in the power system provides confidence that any significant negative impact to the interconnected NPCC region is captured. <p>TFCP Response: Thank you for your comment in support of the Directory 1 applicability process.</p>
12. 7	Section 4.2 Identification of Elements for Directory 1 Applicability	<p>The phrase “<u>In consultation with system operations</u>, additional testing of events as defined in Directory 1 Table 3 shall be utilized for specific outage conditions that may result in a violation of performance requirements in Section 3.3.”</p> <p>The underlined phrase is not specific whether violation of performance requirements in 3.3 is the determining factor. Outage conditions for the determination of BPS status were not included in the methodology thus far. The phrase implies a requirement to study outage conditions in order to make the final BPS determination.</p> <p>TFCP Response: Thank you for the comment. To address this concern, the word “credible” has been added to “specific outage conditions,” to keep the study focused on outage conditions that are reasonably likely to occur. Additionally, the word “may” has been removed from the sentence to maintain focus on outage conditions that do cause violations of performance requirements, and to limit the scope of analysis.</p>
13. 8	Technical Rationale 1 – Performance Requirements	<p>2nd Performance Requirement does not require brackets around “within the Area or a predefined/established portion of the system.” In addition, this phrase does not match the similar phrase used in the main body of the methodology.</p> <p>TFCP Response:</p>

		<p>Comment accepted.</p> <p>Recommended changes to the document have been made.</p>
14. 9	Technical Rationale 1 – Performance Requirements	<p>In the 4th paragraph where System instability is described, it is recommended to use the term “<u>system-wide</u>” at the end to clarify the point being made in the last sentence; specifically “...will remain stable), are not considered <u>system-wide</u> instability.”</p> <p>TFCP Response:</p> <p>Thank you for the comment.</p> <p>Existing language already differentiates what is system instability and what is not.</p>
15. 10	Technical Rationale 2 – Directional Comparison Blocking Scheme Assumptions	<p>The sentence before Figure 4 has an extra “the”: “...may be more severe than a complete failure of <u>the</u> all protection systems at a <i>bus</i> under test.”</p> <p>TFCP Response: Comment accepted.</p>
16. 11	Technical Rationale 2 – Directional Comparison Blocking Scheme Assumptions	<p>The summary of the second last paragraph should be stated as “these studies were difficult and do not result in a more conservative outcome.”</p> <p>TFCP Response: Comment accepted. A sentence has been added to the second-to-last paragraph to reflect this sentiment.</p>
17. 12	Technical Rationale 5 – Directory 4 Applicability	<p>The third paragraph is difficult to understand where the language refers to back to the “<i>bus</i> under test” in the sentence, “Without testing to show otherwise, there is no guarantee that faults near the non-bulk power system terminal of a line would be cleared at all by other <i>buses</i> remote to the <i>bus</i> under test.”</p> <p>Does this “<i>bus</i> under test” really mean a point somewhere along the element that signifies the boundary between the BPS portion and the non-BPS portion? The point that test b) would accurately identify but in a) we are assuming?</p>

		<p>When reading this paragraph, it is confusing; consider clarifying and/or using sample diagram.</p> <p>TFCP Response: Comment accepted. The “bus under test” was meant to refer to the BPS terminal of the element in question. The phrase has been replaced with “BPS terminal of the element” to provide better clarity.</p>
<p>18. 13</p>	<p>Technical Rationale 6 – Directory 1 Applicability and Exclusions Subsection: Study- based Exclusion of Networked Multi- Terminal Elements</p>	<p>The logic of the second rationale for no system adjustments is questionable: “System adjustments are not allowed after the critical facility is taken out of service because operators would not have awareness of system adjustments needed to prepare for the next contingency and/or resolve violations on the excluded elements. This I because it is possible that the excluded element will not be monitored once excluded from Directory 1 applicability.”</p> <p>The logic is circular, as we must first assume the “critical facility” is not critical and hence Operators may not be monitoring it to then have awareness to adjust the system post-contingency. However we are already referring to the element as a “critical facility”. If it is critical then we are already monitoring it and its N-1 loss must be very clear in the control room. In addition, nearly all transmission elements, in these modern times, are monitored regardless of their NPCC BPS status.</p> <p>Proposal: replace “element may not be monitored” with “contingency combinations involving the excluded element may not be modeled in real time simulators and/or studied during operation planning timeframes once the element is excluded.”</p> <p>We acknowledge that the circular nature of the instruction may be unavoidable and necessary for the purpose of the study.</p> <p>TFCP Response: Comment accepted. The sentence in question has been modified to clarify the use of contingencies on excluded elements. With regards to the use of the word “critical,” it is initially assumed that the element is critical because it is connected to a BPS bus. It is only after the exclusion test is applied that the element can be designated as BPS or non-BPS with regard to Directory 1 applicability.</p>

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Comments from Hydro Québec Trans Énergie:

19. General Comments

Hydro-Québec welcomes CP-11's proposed modifications and believes they will provide significant improvements and clarity to the performance-based BPS methodology. Hydro-Québec believes that this methodology is the only valid approach in identifying critical facilities that impact the reliability of a system while taking into account the diversity of systems characteristics and design.

CP-11's proposed revisions to the methodology alleviate some of our concerns regarding the identification of critical facilities particularly in regards to elements on the fringe of the BPS system. Hydro-Québec supports the changes proposed as part of this revision process, and believes that these modifications will be beneficial to the NPCC entities using the criteria to insure the reliability of the both the Quebec Interconnection and the Eastern Interconnection.

We specifically believe that the currently proposed study-based exclusion process will provide clarity and the flexibility to demonstrate the true criticality of the facilities identified by the methodology. In our view the exclusion process will provide the necessary flexibility to right size Directory 1 applicability by sorting out non-critical facilities and by focusing on those that really do impact the reliability of the Bulk Power System. Officialising a practice currently allowed under the Directory 1 Table 1 (footnote ii) will be beneficial for the following reasons:

- Improve consistency across the Areas;
- Achieve efficiency gains in planning as it will remove the need to perform recurring assessments on non-critical facilities;
- Achieve efficiency gains in operations as it will remove the need to operate non-critical facilities at an unnecessarily higher standard (Directory 1 contingencies and monitoring).

TFCP Response: Thank you for your comment in support of Document A-10, and in support of the Directory 1 applicability process.

Specific Comments:

We would like to bring the following points to the attention of CP-11:

TFCP responses to Open Process comments on A-10

20. 1. There are several terms used throughout the document that are part of NPCC'S Glossary of Terms which are not bolded. (bulk power system, element, component, fault, protection, contingency, etc.)

TFCP Response:

Comment accepted. Document will be updated accordingly.

21. 2. On page 7, footnote 2 “..... clearly positively damped”, Is “clearly” necessary or redundant in this formulation?

TFCP Response:

Thank you for your comment.

The use of the term “clearly positively damped” is consistent with the NPCC Glossary of Terms.

22. 3. On page 11, under Steady State Test section second sentence “..... The steady-state test may be performed ...” should use shall be used instead of may?

TFCP Response:

Comment accepted.

That specific sentence was determined to be not required and hence deleted, and language in the preceding paragraph was modified to provide the necessary clarity.

23. 4. From Section 4.1 and onward. The acronym BPS is used but not yet defined, we suggest to either use Bulk Power System or define the acronym. (Single-Terminal BPS Elements, Multi-Terminal BPS Elements, etc.)

TFCP Response: Comment accepted.

24. 5. In section 4.2, p.14 formatting, page break prior to “For example:”

TFCP Response: Comment accepted.

25. 6. In section 4.2 on the identification of Elements for Directory 1 Applicability, the categorization of elements introduces the “considered to be a transmission path” wording for the radial and network multi-elements. We think the proposed wording for the Networked elements gives room for the evaluation of what is considered to be a transmission path and does not make a clear statement on what constitutes a transmission path (except for the 50 kV exclusion for radial elements). Is there an opportunity for engineers performing the study to determine that a > 50 kV element is not considered a viable transmission path (e.g. very weak system) and would therefore fall under the radial definition?

TFCP Response: Comment accepted. The intent is not to provide an opportunity for a networked path to be considered “radial” due to the strength or weakness of a networked link. The words “considered to be” have been removed from the proposed language in order to clarify this point. If a point on the transmission system is normally open, then the elements on either side may be treated as radial elements; a sentence to this effect has been added to the technical rationale section.

26. 7. In section 4.2, a paragraph was added: Where all elements connected to a bulk power system bus have been excluded from Directory 1 applicability, the bus is also excluded from Directory 1 applicability. Although we totally agree with the intent of this statement, we think that further clarification is needed on the topic. First, the paragraph on p. 26, “All breaker failure contingencies at the bulk power system bus to which the excluded element is connected will continue to be evaluated as a part of Directory 1 analyses” should include a provision for the excluded buses (... except for buses excluded by the process in 4.2). Second, for a scenario where all elements going “out” of a bus to a local non-BPS subsystem are excluded, but not the elements coming “in”, is it clear that, although contingencies need

to be monitored at the BPS bus, contingencies strictly affecting the excluded elements and/or the associated performance requirements on the excluded elements can be ignored?

TFCP Response: Comment accepted. To address the first concern expressed, the language in the paragraph on page 26 has been modified. In response to the second concern, contingencies strictly affecting excluded elements can be ignored. This has also been clarified by the language added on page 26. For clarity, a conforming change will be recommended for Directory 1.

27. 8. Although we support the new performance requirements, including the removal of terms “local area”, we think moving from the “adverse impact outside of the local area” concept to a much broader “Area” is a big step on the intention of the performance requirements. We support the language “demonstrably contained” when associated with “a predefined/established portion of the system” as consistent with the previous “significant adverse impact outside the local area” concept while reducing ambiguity on what constitutes a local area. However, we don’t see the rationale or need for using the term Area in the first two bullets of the performance requirement. We recommend that the wording “predefined/established portion of the system” be preferred to “the Area” for those performance requirements. At the very least, the “System Instability” bullet should include the notion of “predefined/established portion of the system” in a way similar to the “Cascading” Bullet.

TFCP Response: Thank you for the comment. The intent of Bulk Power System classification is to examine impacts on neighboring NPCC Areas, rather than to dictate a level of reliability within any given Area. The performance requirements on net loss of load and net loss of source, in addition to the “demonstrably contained” requirement, will also provide a boundary on the size of the portion of the system that is lost.

Comments from the IESO:

28. The IESO respectfully submits its comments on the second posting of the revised version of the NPCC Document A-10 “Classification of Bulk Power System Elements”. We are pleased that the CP-11 Working Group has adequately addressed our comments to the initial

draft. We support the methodology illustrated in Figure 3 that identifies elements for Directory 1 and Directory 4 applicability. This methodology will contribute to a more reliable and cost-effective Eastern Interconnection.

TFCP Response: Thank you for your comment in support of Document A-10.

Please find below a few minor comments for your consideration:

29.

1. Section 3.1 System Conditions

Given the potential for EIPC stepping into the role of the of the Designated Entity described in NERC standard MOD-032 for interconnection-wide network model building, which is currently held by ERAG, we suggest that ERAG is removed from the line “Modeling of neighboring systems should be based on the latest information available at the time of study, such as ERAG Multi-regional Modeling Working Group base cases.”

TFCP Response: Comment accepted. ERAG has been removed from the sentence in question.

30.

2. Section 3.4 Testing Strategy.

This section lists the minimum buses that shall be tested (i.e., mandatory). As a result, bullet 4 which is an additional test and not necessarily mandatory, should be removed from the list of minimum testing and added as a separate line:

“4. Other buses not contiguous to the bulk power system may also be tested.”

TFCP Response:

Comment accepted.
Language modified as recommended.

31.

3. Section 4.2 Identification of Elements for Directory 1 Applicability

Please consider if clarity would be improved if “system operations” in the bullet “In consultation with system operations, additional testing of events as defined in Directory 1

Table 3 shall be utilized for specific outage conditions that may result in a violation of performance requirements in Section 3.3.” is replaced by the applicable reliability functional roles (e.g., Reliability Coordinator, Transmission Operator...)

TFCP Response: Thank you for your comment. The term “system operations” was purposely used in lieu of more specific language, as the applicable functional entity role was found to vary from one NPCC Area to another. The intent is that any entities operating the equipment in question would be consulted.

Comments from ISO-NE:

32.

ISO New England appreciates the second opportunity to comment on the draft revisions to NPCC Document A-10. We would like to thank CP-11 for the consideration of our first set of comments; most of our concerns or suggestions on the specific language in the draft A-10 document have now been addressed.

While ISO New England’s position is that a simpler option for BPS classification and/or determining the applicability of Directory 1 may exist, such as a bright-line-voltage or topology based test, the revisions made to the A-10 document address several of ISO New England’s concerns including the sensitivity of test outcomes, inconsistencies in outcomes between NPCC Areas, the amount of time and analysis required to perform the test, and the appropriate applicability of Directory 1.

In particular:

- The new requirements on system conditions for BPS classification testing will provide a greater degree of consistency in application of the test between the five NPCC Areas, consistent with Principle No.2 of the A-10 Selection Criteria. The introduction of requirements for interface transfer levels ensure that each Area is meeting a minimum level of system stresses when performing BPS classification tests.
- The automatic exclusion of radial and single-terminal elements from Directory 1 applicability and the study based exclusion of networked transmission elements from Directory 1 applicability meets Principle No. 2 of the A-10 Selection Criteria.

The exclusion processes provide a documented method with technical justification for assessing the critical facilities to which Directory 1 criteria apply, that is, where the effects of contingencies are not localized and could affect the interconnected NPCC transmission system. This will help better align the planning criteria for localized portions of the system with planning criteria for the rest of the country, and avoid

unnecessary spending on infrastructure that will not significantly improve NPCC-wide transmission system reliability.

Given that the proposed revisions do significantly improve Document A-10, ISO New England supports the adoption of this draft of the A-10 document.

TFCP Response: Thank you for your comment in support of Document A-10, and in support of the Directory 1 applicability process.

Comments from the Maine Public Utilities Commission and the Massachusetts Attorney General:

33.

The Massachusetts Attorney General (MA AG) and the Maine Public Utilities Commission (MPUC) support the August 23, 2019 revisions to the NPCC Document A-10 “Classification of Bulk Power System Elements.”

Specifically, the MA AG and the MPUC support the automatic exclusion of radial and single-terminal elements from Directory 1 applicability as well as the study-based exclusion.

We agree with ISO-NE’s comments that the revised exclusion process will be helpful in ensuring local facilities that do not affect the Bulk Power System are excluded from consideration of Bulk Power System elements.

We further agree with ISO-NE that this revision helps to align identification of localized portions of the system with the identification methodology in rest of the country and also helps to avoid unnecessary spending on transmission upgrades that do not significantly improve regional transmission system reliability.

TFCP Response: Thank you for your comment in support of Document A-10, and in support of the Directory 1 applicability process.

34.

Comments from National Grid:

AVANGRID, Eversource and National Grid’s Comment on the Proposed A-10 Revision 10/2/2019

We are grateful for TFCP's response to our concerns submitted during the first round of Open Process but we feel that these responses did not address the underlying concerns we have with the study-based exclusion testing introduced in the proposed A-10 revision.

AVANGRID, Eversource, and National Grid believe that enhancements have been made to the base A-10 methodology, however, we are considering opposing it due to the complexity of the proposed study-based exclusion methodology and its optional nature, both of which undermine the goal of improved consistency and study efficiency.

Our understanding is that the proposed study-based exclusion methodology cannot be applied at 345kV or above and when applied to lower voltage levels, it may result in a reduction of the number of 115kV elements from Directory #1 applicability.

The following is a summary of our concerns:

- The study-based exclusion test is listed as "optional". On the basis that the NPCC members may or may not choose to exercise the proposed study-based exclusions, it invites inconsistency between Areas, even if it may be manageable by each Planning Authority within their respective Area.
- If the proposed study-based exclusion methodology remains, we do not achieve one of the stated objectives of the A-10 revision, specifically to improve study efficiency. Instead the A-10 analysis will become more complex to implement.
- Joint TFCO and TFCP discussions have indicated that changes to Directory #1 applicability will not materially affect Operation's monitored contingencies or operating procedures. This causes us to further question the need or value of relaxing NPCC planning criteria during a time of significant change to the transmission system.

TFCP Response: With regards to the first point raised, the ability to choose whether or not to exercise the study-based exclusion from Directory 1 applicability was added as a way to improve the efficiency of the overall study processes affected by Directory 1 applicability, while not negatively impacting the reliability of the NPCC-wide power system. By opting not to exclude elements from Directory 1 applicability, an entity is not causing an adverse impact to NPCC-wide reliability. The exclusion of elements from Directory 1 results in a refined list of critical elements in a consistent way, while still ensuring no adverse impact to NPCC-wide reliability. Differences between NPCC Areas may exist in the process (for example, whether ISOs or transmission owners run the exclusion test), but those differences are not expected to negatively impact inter-Area reliability.

In regards to the second bullet point, the primary priority for the A-10 revision effort was to designate the elements where NPCC criteria should apply; the study-based exclusion process offers a refinement to the identification of critical elements. CP-11 has prioritized this focus over study efficiency. For some NPCC Areas, it is expected that the savings in study time in Directory 1 related planning and operational studies will offset any additional study effort required for the Directory 1 exclusion process. In NPCC Areas where this is not the case, the Directory 1 exclusion process is not mandatory; it is possible to continue designating elements as BPS, and

continue studying them in Directory 1 related studies. Further, where power system conditions do not change significantly, it will be possible to rely on previous Directory 1 exclusion results (as described in Section 5 of the proposed revised Document A-10), rather than re-evaluating every exclusion.

With regards to the third concern raised, it is true that, in some NPCC Areas, the operating practices may not significantly change. In other NPCC Areas, the CP-11 working group has found that these changes would be beneficial by simplifying and removing operational constraints which are not necessary for the reliability of the NPCC-wide system. In the Areas where operating practices will not materially change, other clauses in NPCC criteria (such as the Directory 1, Table 3 performance requirement that “contingencies and conditions applied can be withstood without causing significant adverse impact on other Reliability Coordinator Areas”) are already providing results similar to the Directory 1 exclusion test. As well, a study-based exclusion process, as proposed, does not preclude the re-evaluation of an element’s bulk power system status or Directory 1 applicability as system conditions change (for example, reductions in synchronous inertia or proliferation of distributed energy resources).

Following discussion at the CP-11 working group regarding the responsibility for exclusion determinations, additional language has been added to Section 5 of Document A-10 to provide a requirement for all entities that own or operate the equipment in question to be consulted before an exclusion is brought to TFSS for review. A consensus was not reached as to whether this language is sufficient.

Comments from Nova Scotia:

35.

Nova Scotia Power Inc. supports the proposed revisions to the A-10 methodology, including the proposal to make the study based exclusion test optional.

TFCP Response: Thank you for your comment in support of Document A-10, and in support of the Directory 1 applicability process.

Comments from Vermont Transco:

36.

The A-10 testing methodology flows nicely into the Directory 4 applicability determination. We have utilized the BPS determination from the A-10 testing for Directory 1 applicability, but this

may have been too broad if the intent was to identify parts of the system that are critical to "big A" Area performance. This affects both operations and planning of the system.

Speaking to the planning requirements, I think it is appropriate to identify those parts/elements that are BPS from a Directory 4 applicability, but not from an Area performance perspective.

However, I am not entirely convinced that performing a Directory 1 test to determine Directory 1 applicability is the best approach. There may in fact be a simpler test, which may emerge eventually as we gain experience with this exclusion process. We also need to agree on what we mean by sufficient experience and the amount of time horizon needed to reconsider the exclusion process.

TFCP Response: TFCP acknowledges the ongoing concerns expressed in the comment and will consider further improvements upon the next review of Document A-10. TFCP also acknowledges that the proposed methodology for Directory 1 applicability may be transitional, and the experience gained through it will inform the next review of Document A-10 as per the review frequency (every four years) listed in the document.