



## ISO New England Open Process Comments on Draft Document A-10

ISO New England appreciates the opportunity to comment on the draft revisions to NPCC Document A-10.

### Comments on Overall Approach to BPS Classification

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1. ISO-NE has previously expressed concerns with the performance-based approach to BPS testing, both before and during CP-11's most recent efforts to update the A-10 methodology and process. These concerns included the extreme sensitivity of the test's outcomes to small changes in system conditions, inconsistencies between testing assumptions and outcomes in different NPCC Areas, and the amount of time and analysis required to perform the classification tests. While the core of the BPS classification process (the three-phase fault, uncleared locally) has not changed in the draft revision to A-10, we acknowledge that the changes proposed as part of this revision help to address many of those concerns. Our concerns regarding the identification of critical facilities to which specific criteria should be applicable have been partially addressed by the new approach to Directory 1 applicability. In addition, the consistency of test application has been partially addressed through the revisions to system conditions used for testing. We feel that better and simpler options for classification may exist, such as bright-line voltage-based determinations. However, the proposals for revisions to the three-phase locally uncleared fault test are an improvement to the existing A-10 methodology and process for identifying facilities for NPCC Directory applicability.

### Comments on Section 3.1, System Conditions

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2. ISO-NE strongly supports the addition of the specific requirements in this draft of A-10 for system conditions simulated in BPS classification testing. The requirements in this section help to address the concerns brought up, by ISO-NE and by others, regarding the lack of consistency of application of the BPS classification test.
3. In particular, ISO-NE supports the requirement for stressing interfaces to the 98<sup>th</sup> percentile of historical flows. ISO-NE's experience has shown that the system conditions simulated can have major effects on the BPS test results. By specifying system conditions based on a percentile of historical flows, the A-10 procedure will ensure that each Area is applying a consistent but reasonable minimum level of conservatism in BPS classification.

Additionally, the use of historical data rather than interface limits in stressing cases will lead to more reasonable outcomes and less over-classification of BPS buses. In New England, many major interfaces are rarely operated at or near their limits. Testing interfaces at excessively high levels of flow would lead to BPS classification, and expenditures on protection system design and system planning, to protect for system conditions that rarely

occur. Finally, analysis has shown a significant decrease in the sensitivity of results to small changes in system conditions when testing at the proposed interface transfer levels, rather than testing at interface limits.

4. ISO-NE supports the requirement to test for BPS classification at multiple load levels, including a light load level. With the growth of distributed energy resources and energy efficiency programs, lower load levels are already becoming more and more common. Testing for BPS classification only at peak load levels, as has been the practice in some NPCC Areas in the past, concentrates on a system condition that occurs very rarely and neglects other system conditions that are far more likely to occur. Additionally, this examines the system's performance with fewer synchronous resources online, which (in some cases) can be a more severe condition for stability performance.
5. ISO-NE suggests that the voluntary recommendation concerning the use of the 98<sup>th</sup> percentile of flows during light load hours in the light load cases, and the 98<sup>th</sup> percentile of flows during peak load hours in the peak load cases, be stated as a requirement rather than a recommendation. For interfaces in generation- or load-heavy areas, it may be impossible to reach the year-round 98<sup>th</sup> percentile of flow under light load or peak load conditions. The language that allows for adjustments to the 98<sup>th</sup> percentile of flow for known future changes should remain, in order to keep prevent unrealistic dispatches from being required.
6. Section 3.1.3 refers to "more conservative dispatches." It would be helpful to provide more guidance on what this phrase means. For example, it may be more conservative to fully load a smaller number of generating units (especially in light load cases), rather than keeping a larger number of units online and partially loading each one.

### **Comments on Section 3.3, Performance Requirements**

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7. It is unclear whether a system separation that is contained entirely within an Area, but affects other NPCC Areas, is considered a failure of the performance requirements (even if another NPCC Area is completely islanded). To address this, ISO-NE suggests an addition to footnote 3, reading "When cascading crosses to a neighboring Area, or results in a neighboring Area being isolated from the rest of its interconnection, the affected Area...."
8. In footnote 2, the mere presence of an undamped oscillatory response should not be considered to have a significant impact on other NPCC Areas, and thus should not be considered to be a failure of the BPS performance requirements. For example, oscillations at a single generating facility with a size much smaller than an Area's loss of source threshold would likely not have any impact on other NPCC Areas. The performance requirements should allow for this, rather than considering any undamped oscillation as an automatic failure.
9. The wording of the third bullet, in combination with footnote 4, would suggest that an Area that claims to have no limit on allowable loss of source or loss of load would have no requirement to review this determination with its neighbors. Even if a threshold truly does not exist, there must be an opportunity for that determination to be reviewed by neighboring areas (both inside and outside of NPCC) who may be impacted by large source or load losses inside the Area in question.

10. A requirement for TFSS approval of loss of source and loss of load thresholds is not the most effective way to guarantee inter-area coordination. A disagreement at TFSS that is unable to be resolved should not stand in the way of an Area performing BPS classification tests. Additionally, impacts on neighboring areas outside of NPCC need to be considered. TFSS includes representation only from companies within NPCC, and thus is not the appropriate body to review impacts on systems outside of NPCC. ISO-NE suggests a requirement for the values to be "... presented to and reviewed by neighboring and other impacted systems, both within and outside of NPCC." This requirement could be partially satisfied by TFSS review, but may also need to include coordination with non-NPCC entities. (The capitalized and bolded term "Area" in this footnote should be used carefully, as some neighboring entities may not be a part of an NPCC Area as defined in the NPCC Glossary of Terms.)
11. There is an inconsistency in the requirements for Task Force approval of the loss of source/loss of load limits. Footnote 4 in section 3.3 requires TFSS approval, while the last paragraph of Technical Rationale 1 states that both TFSS and TFCP approval are required.

### **Comments on Section 3.4, Testing Strategy**

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12. The use of the word "downstream" throughout this section is unclear for networked systems, as the direction of flow could be variable depending on system conditions. This is especially true with the growth of distributed energy resources, where "downstream" may not be clear even for radial portions of the power system. ISO-NE suggests replacing "downstream buses" with "buses beyond the first observed non-BPS bus" or "buses not adjacent to BPS buses."
13. As currently written, Section 3.4 requires testing of buses that are not adjacent to BPS buses if they have slower clearing times, higher short-circuit current levels, or "any other factors that may produce a non-contiguous bulk power system result." The use of "any other factors" in this sub-bullet is unclear, and a requirement to test certain buses should not be based on a vague statement like this one. This language also undermines efforts to bring more consistency to the BPS classification process.

### **Comments on the Directory 1 Applicability and Exclusion Process**

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14. ISO-NE supports the use of a separate process to identify specific elements that are or are not critical for Directory 1 applicability. ISO-NE can understand the use of the three-phase locally uncleared fault test for the application of Directory 4. However, as TFCP identified and communicated to CP-11, there is no reason that Directory 1 should automatically apply to every element at a bus identified by that stability test (whether radial or networked). Other methodologies may exist for the identification of critical facilities for Directory 1 applicability. While the element-by-element exclusion test appears to be the consensus position at this point in time, ISO-NE and others have suggested other methods, such as a bright-line approach to Directory 1 applicability. ISO-NE would encourage a re-examination of Directory 1 applicability during the next review of A-10, after the exclusion process has been applied and used in all NPCC Areas. The use of this process may reveal other less labor-intensive and more consistent approaches to Directory 1 applicability.

## Comments on Other Changes to Document A-10

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15. ISO-NE supports the requirement in section 5 for a periodic re-assessment of BPS bus statuses at least once every five years. We have observed many instances of buses being added or removed from the BPS list based on the cumulative impacts of many small changes, including changes outside of the Area containing the bus under test. A lack of periodic review could lead entities to overlook certain buses which have become more critical without any large changes in the immediate vicinity of the bus.
16. ISO-NE supports the removal of the use of fast clearing due to DCB schemes. It is possible for a single component failure at the bus under test to disable fast clearing for a DCB scheme, by sending a blocking signal to the remote terminal without clearing the fault locally. The testing currently required for buses where DCB schemes are present is very labor-intensive and complex, both for the individuals running the test and for protection engineers providing the relay reach and clearing time data. Prohibiting the use of fast clearing by DCB schemes entirely avoids the reliability risk associated with a lack of high-speed fault clearing and the risk associated with any misinterpretations or misuse of protection system data.
17. In section 4.2, all single-terminal elements are stated to be excluded from Directory 1 applicability provided that their protection is consistent with section 4.1. Rather than a reference to section 4.1 (which mentions high-speed fault clearing but does not explicitly require it), it is suggested that there be an explicit requirement for high-speed fault clearing on single-terminal elements in order for them to be excluded from Directory 1 applicability. Without this, there is no guarantee that a slow-clearing fault on a single-terminal element would not have widespread impacts.

## Editorial Comments

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18. The first paragraph of section 2.2 reads "... failure of the protection systems... for the bus under test." The word "for" should be changed to "at," as all protection systems at the bus under test must be assumed to fail regardless of what equipment they are protecting. Additionally, this language could be interpreted to mean that protection systems that are located remotely but provide protection for the bus under test (for example, zone 2 protection at a remote station) would be assumed to have failed. This would lead to no remote clearing at all for the bus under test, which is far more conservative than intended. This change also should be made in the second paragraph of section 3.5.
19. In the third paragraph of section 2.2, the reference to bus A in Figure 2 is unclear (due to the addition of other examples in Figure 2).
20. Section 3.1 reads "Subsequent, non-Area wide, bulk power system classification assessments may use the same system conditions previously approved by TFSS." This section only requires TFSS review of the original system conditions, rather than approval. Additionally, system conditions may need to be changed to reflect upcoming system changes that are driving the need for the testing (for example, the addition of a new generator). The wording in this sentence should be changed to read "... previously presented to TFSS, with any changes required to reflect the changes driving the need for the re-assessment."

21. In section 3.2.2, ISO-NE suggests that the second bullet point read “...models based on actual system testing (taking load-serving tap-changing transformers into account).” Without this addition, it is not clear that the parenthetical does not refer to networked transmission transformers.
22. In section 5, the list of the items that should be documented and included in a presentation to TFSS should include the assumptions on system conditions in the scope (as described in section 3.1).
23. Technical Rationale 6 states (both near the bottom and the top of page 26) that all breaker failures at BPS buses would continue to be tested as part of Directory 1 analysis, even if all elements tripped by the breaker failure contingency are excluded from Directory 1 applicability. This may technically be true due to the requirement to test a bus section (for example, the bus section connecting an excluded element to the rest of the substation) with a breaker failure, but this is not immediately obvious or clear. It should be explicitly stated, either in Document A-10 or Directory 1, that these breaker failure contingencies shall still be tested even if the elements that they trip have been excluded from Directory 1 applicability.

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