

NPCC Document A-10 Update

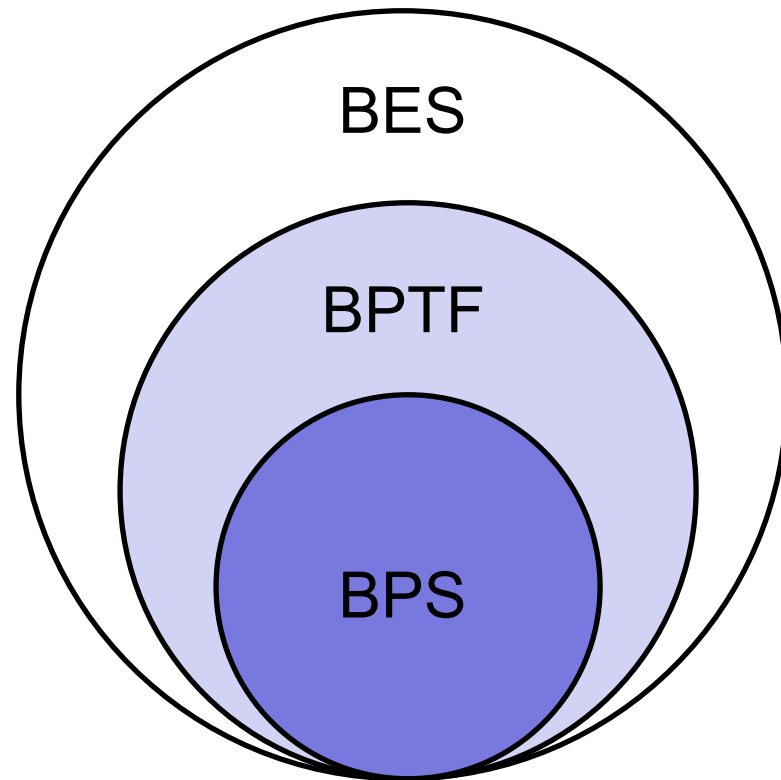
Bulk, Bulk, and Bulk

(Zach Smith's Presentation)

- Bulk Electric System (BES)
 - NERC Glossary
- Bulk Power System (BPS)
 - NPCC Glossary (NPCC A-10 Document)
 - NYSRC Reliability Rules
- Bulk Power Transmission Facilities (BPTF)
 - NYISO OATT, Attachment Y::: “The facilities identified as the New York State Bulk Power Transmission Facilities in the annual Area Transmission Review submitted to NPCC by the NYISO pursuant to NPCC requirements.”

Bulk, Bulk, and Bulk

(Zach Smith's Presentation)



NYSRC

Current Definition OF BPS

The portion of the Bulk Power System within the New York Control Area, generally comprising generating units 300 MW and larger, and generally comprising transmission facilities 230 kV and above. However, smaller generating units and lower voltage transmission facilities on which faults and disturbances can have a significant adverse impact outside of the local area are also part of the NYS Bulk Power System.

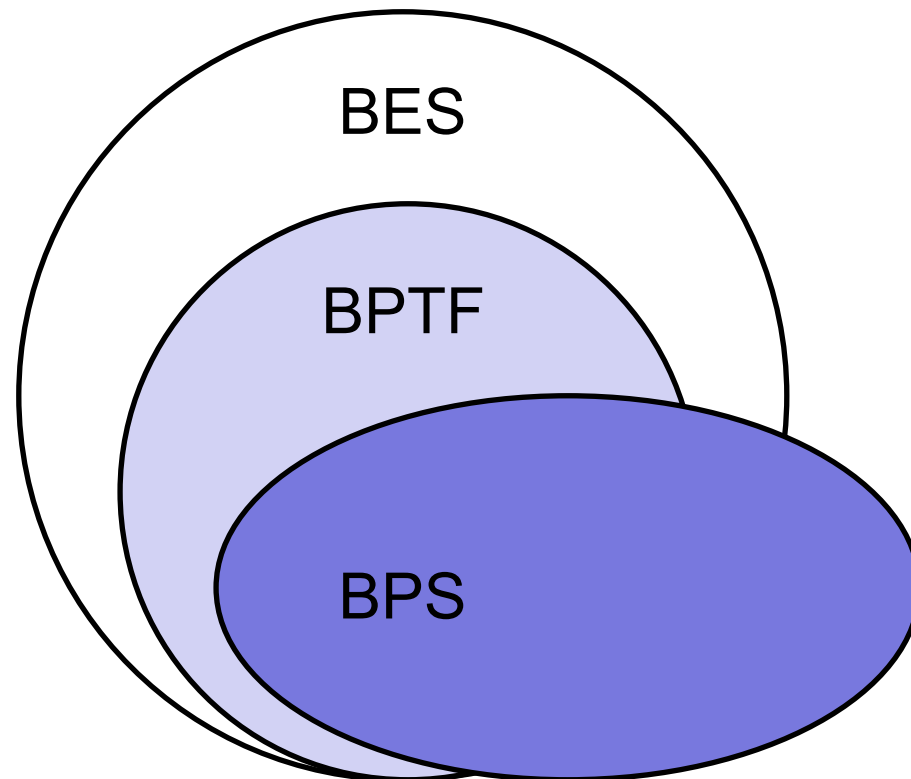
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Proposed Reliability Rule #128

- January 2015::: RRS starts working toward revising NYSRC definition of the BPS
 - PRR 128 Definition of New York State Bulk Power System (NYS Bulk Power System)
 - In order to address an issue of radial elements connected to a BPS substation
- October 2015::: RRS tables PRR 128 until NPCC revises its NPCC Document A-10 *Classification of Bulk Power System Elements*

NYSRC

Radial Elements Connected to BPS (Under existing Definitions)



NPCC Document A-10

Classification of Bulk Power System Elements

NPCC Document A-10

NPCC Bulk Power System (BPS)

- NPCC Document A-10 *Classification of Bulk Power System Elements* establishes a Performance Based Methodology
 - A-10 was adopted in 2007 and revised in 2009
 - *Prior BPS: “important facilities” as identified by Transmission Owners*
- NPCC maintains BPS Bus list
 - NYISO maintains BPS Bus list and BPS Element list

Prior NPCC Document A-10

NPCC Bulk Power System (BPS)

- The Performance Based Methodology
 - Two Tests are conducted
 - Transient Stability Test
 - Steady State Test
 - On a high level:
 - A three phase fault is simulated at a bus that is un-cleared locally
 - *“Remote clearing times shall be based on design fault clearing times, assuming no communications from the station under test to the remote terminals”*
 - If the fault has a significant adverse impact outside the local area, the bus is classified as part of the BPS

Prior NPCC Document A-10

NPCC Bulk Power System (BPS)

- If a bus (station) is identified as BPS then it is subject to
 - NPCC Directory 1 (D1) *Design and Operation of the Bulk Power System*
 - *Ex. N-1/-1*
 - NPCC Directory 4 (D4) *Bulk Power System Protection Criteria*
 - *Ex. “all elements of the bulk power system shall be protected by two protection groups, each of which is independently capable of performing the specified protective function for that element”*

Prior NPCC Document A-10

NPCC Document A-10 Challenge

- A-10 / Section 3.3 *Utilization of Test Results to Classify on an Element-by-Element Basis* states:
 - An **element** with multiple terminals such as a transformer or transmission line is classified as part of the **bulk power system** if any terminal of the **element** is connected to a *bus* that is classified as part of the **bulk power system**. The **bulk power system** classification may be limited to only a portion of the **element** if all of the following conditions are met:
 - At least one terminal is connected to a *bus* that is not part of the **bulk power system**.
 - The Steady State Test has been applied at the *buses* connected to all terminals of the **element** and none of these *buses* have been classified as part of the **bulk power system** based on results of the Steady State Test.
 - The **Transient Stability** Test has been applied between the terminals of the **element** to identify those portions of the **element** for which the **Transient Stability** Test will not result in a **significant adverse impact** outside of the **local area**.

NPCC Glossary: Element — Any electric device with terminals that may be connected to other electric devices, such as a generator, transformer, circuit, circuit breaker, or bus section.

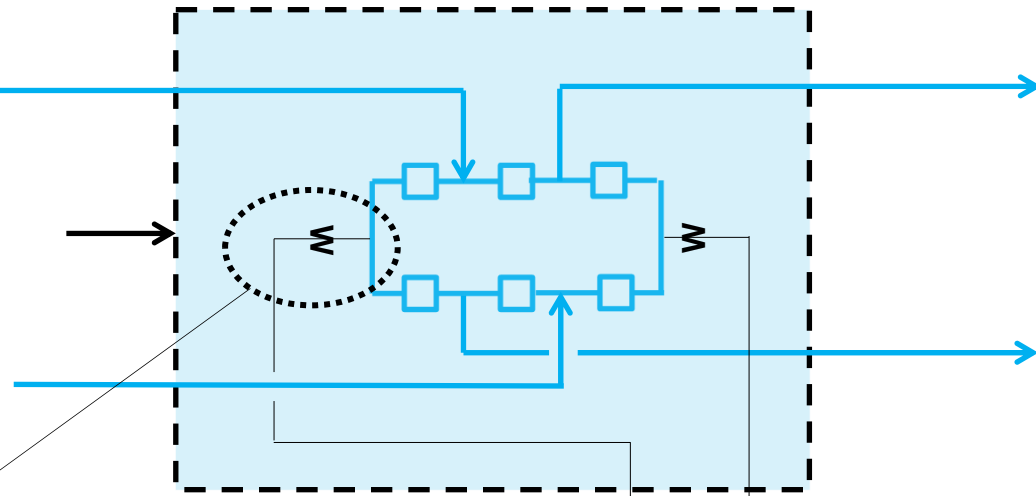
Prior NPCC Document A-10

NPCC Document A-10 Challenge

BPS Substation

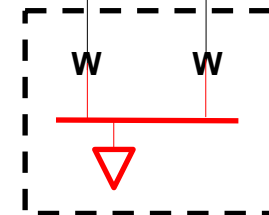
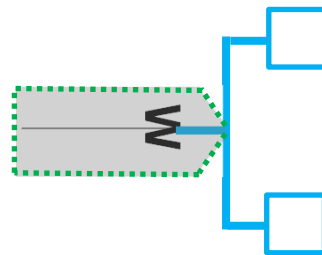
All elements within the 'fence' of the BPS Substation are protected by "System A" protection and by 'System B' protection.

Elements that feed Radial Load are included in this protection.



Element that feed Radial Load
A-10 Definition, a portion of this element is BPS.

What does this mean from the application of other NPCC Directories perspective ?



NPCC Review of Document A-10

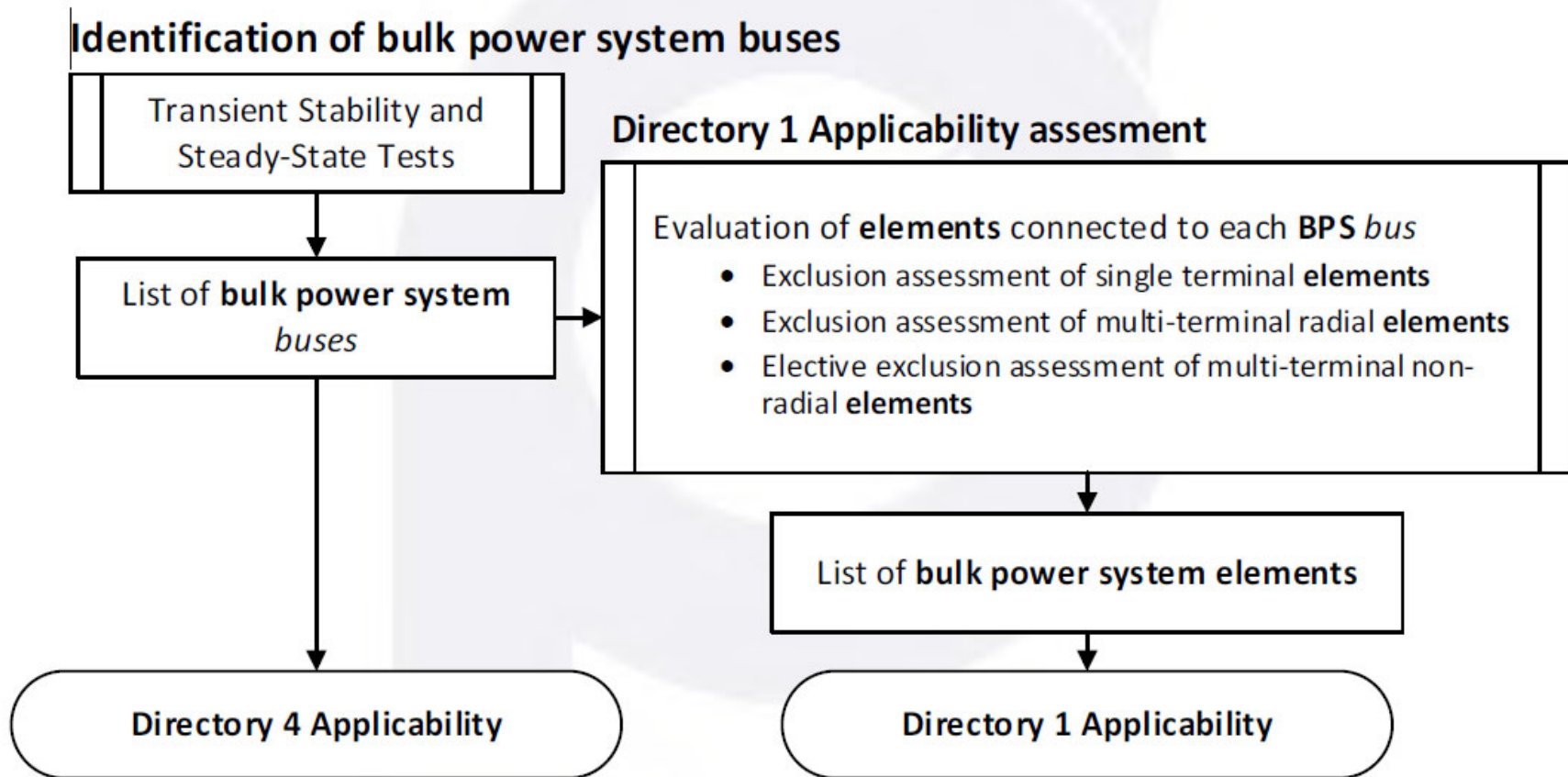
NPCC Task Force/Working Group

- Con Edison raised this issue at NPCC committees which triggered the current review of A-10
 - Task Force of System Studies (TFSS) / Task Force of Coordination of Planning (TFCP)
- CP-11 Working Group was established to review A-10
 - Timeline:
 - Phase I: Propose methodology(s) by end of 2017
 - Phase II: Test the methodology(s) in 2018 and recommend methodology
 - Phase II: Revise Document A-10 based on recommendations

Updated NPCC Document A-10

CP-11 Working Group Slides

Methodology

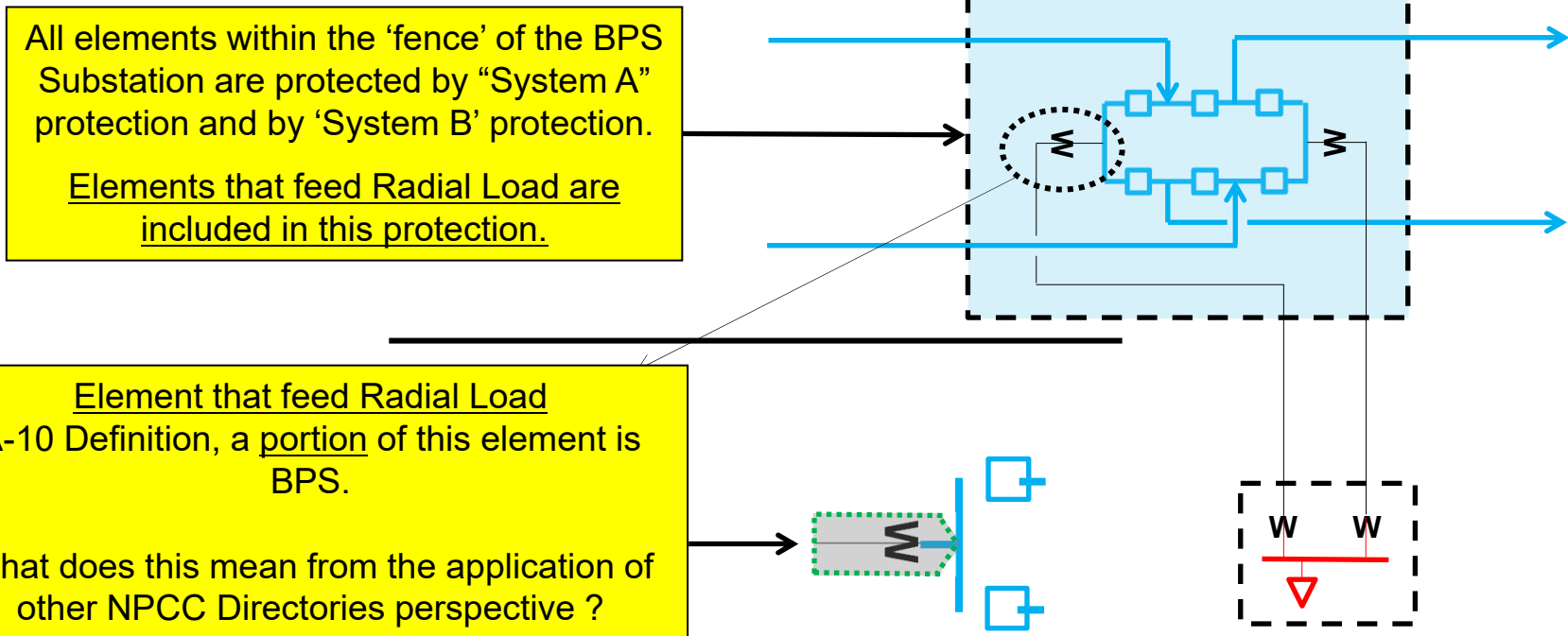


Updated NPCC Document A-10

Exclusion(s)

- “All single-terminal and all radial multi-terminal elements that are connected to bulk power system buses are automatically excluded from Directory 1 applicability
 - provided that the element has two independent protection groups with high speed fault clearing for close-in faults at the bulk power system bus”

BPS Substation



Updated NPCC Document A-10

Exclusion(s)

- “All networked multi-terminal elements that are connected to bulk power system *buses* are considered bulk power system elements for Directory 1 applicability,
 - unless the element is excluded following the study-based exclusion process”
 - Exclusion process: “loss of a critical facility with no system adjustments followed by a Category 1 event as defined in Directory 1 Table 1”

Updated NPCC Document A-10

CP-11 Working Group Slides

New Format of BPS List - *Sample*

AREA	Owner	Substation Name	Voltage (kV)	Exclusions for Directory 1 Applicability	BPS Status	Comments
Québec	Transmitter Inc.	Anytown	735	None	1/1/2007	
New York	Load Inc.	Smallville	345	<ul style="list-style-type: none">• Shunt R1• Radial Line RL5	1/1/2010	
Ontario	Generator Inc.	Hamlet	230	<ul style="list-style-type: none">• Line A123• Line B456• Line C789• Transformer T1• Shunt C1	1/1/2021	

Updated NPCC Document A-10

Vote

- On February 27, 2020 the RCC approved the revised version of the A-10 along with an Implementation Plan that will govern testing timelines and reporting
- NPCC Full Member Committee approved the A-10 effective March 27, 2020

Updated NPCC Document A-10

Implementation Plan

- This Implementation Plan provides for testing in accordance with the revised NPCC Document A-10, Classification of the Bulk Power System Elements, to be completed as follows:
 - Testing in accordance with the revised A-10 methodology shall be performed on all facilities within five years from the date the revised A-10 is approved
 - Prior to an Area's A-10 full system review, the new system conditions in accordance with Section 3.1 shall be used no later than six months after approval of A-10
 - No later than six months after the approval date of A-10, system conditions for any new BPS classification to be approved by NPCC are to be presented to TFSS
- Each Area shall ensure that this Implementation Plan is followed within its Area

NYSRC

Proposed Reliability Rule #128 – Next Steps

- NYSRC RRS to revise PRR 128 to comply with the approved NPCC A-10 Document

Thank you !