



Category 1a Criteria

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Category 1a Criteria Question

Determine reporting of the brief reports for the loss of small generators and their class of BES elements.

Category 1a Definition

Category 1: An event that results in one or more of the following:

- a. An unexpected outage, that is contrary to design, of three or more BES Facilities caused by a common disturbance
 - i. The outage of a combination of three or more BES Facilities (excluding successful automatic reclosing)
 - ii. The outage of an entire generation station of three or more generators (aggregate generation of 500 MW to 1,999 MW); each combined-cycle unit is counted as one generator.

Three key parts to a Cat 1a—

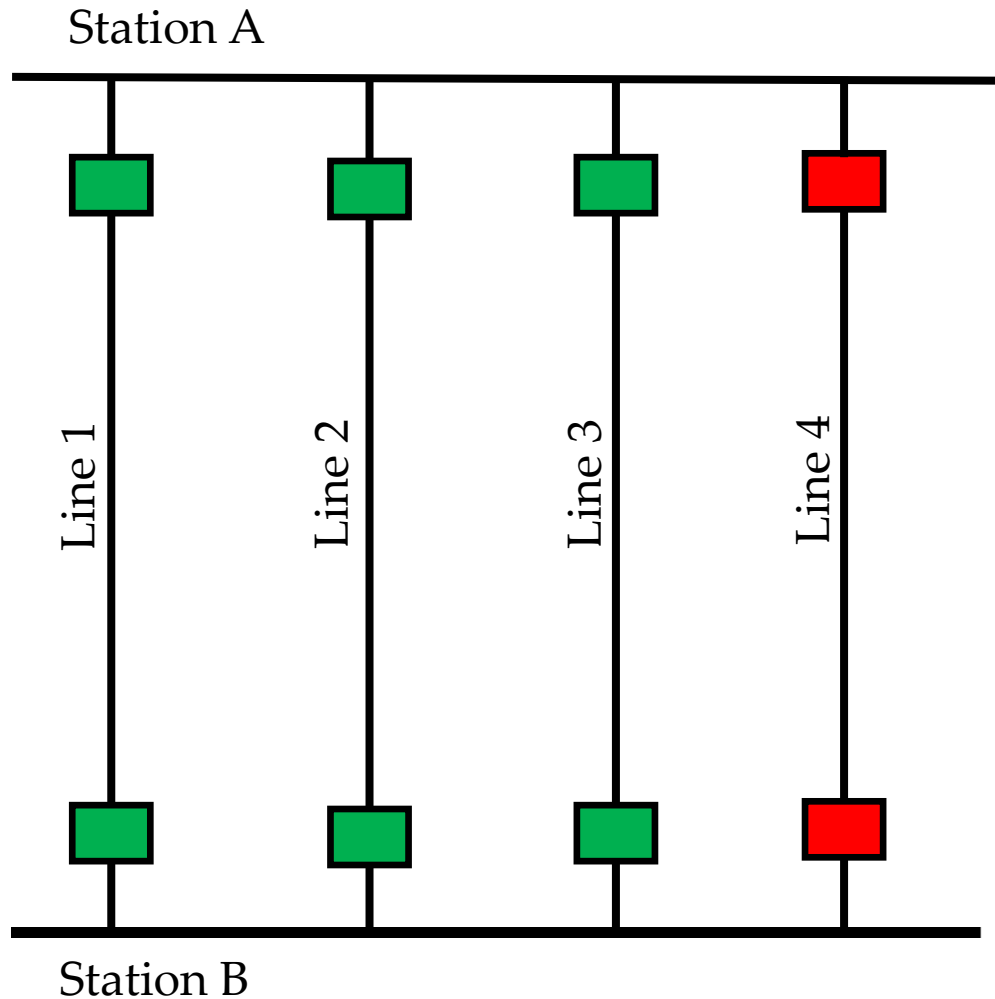
- Three or more BES Facilities with outages
- Caused by a common disturbance
- There is an unexpected component to the event (Misoperation, Human Performance error, etc.)

Contrary to Design

Contrary to design does not apply to each individual element but rather to the three elements as a whole. If a scheme is designed to trip three elements for a single fault, that is as designed. If a single line fault results in the faulted line tripping along with two other lines misoperating and tripping, that is three elements outaged due to a common disturbance, contrary to design. That would be a qualified event.

Examples of Contrary to Design

- Protection system misoperations
- Human error
- Breaker failures
 - The AC Substation Equipment Task Force (ACSETF) report identified substation circuit breaker failures as a leading cause of multiple outages. The report recommended that circuit breaker failure data be collected through the EA process to help identify trends regarding circuit breaker failures.



There are four BES lines in the transmission corridor between stations A and B.

Lines 1 and 2 are positioned on a double circuit tower, while Lines 3 and 4 are a single circuit construction.

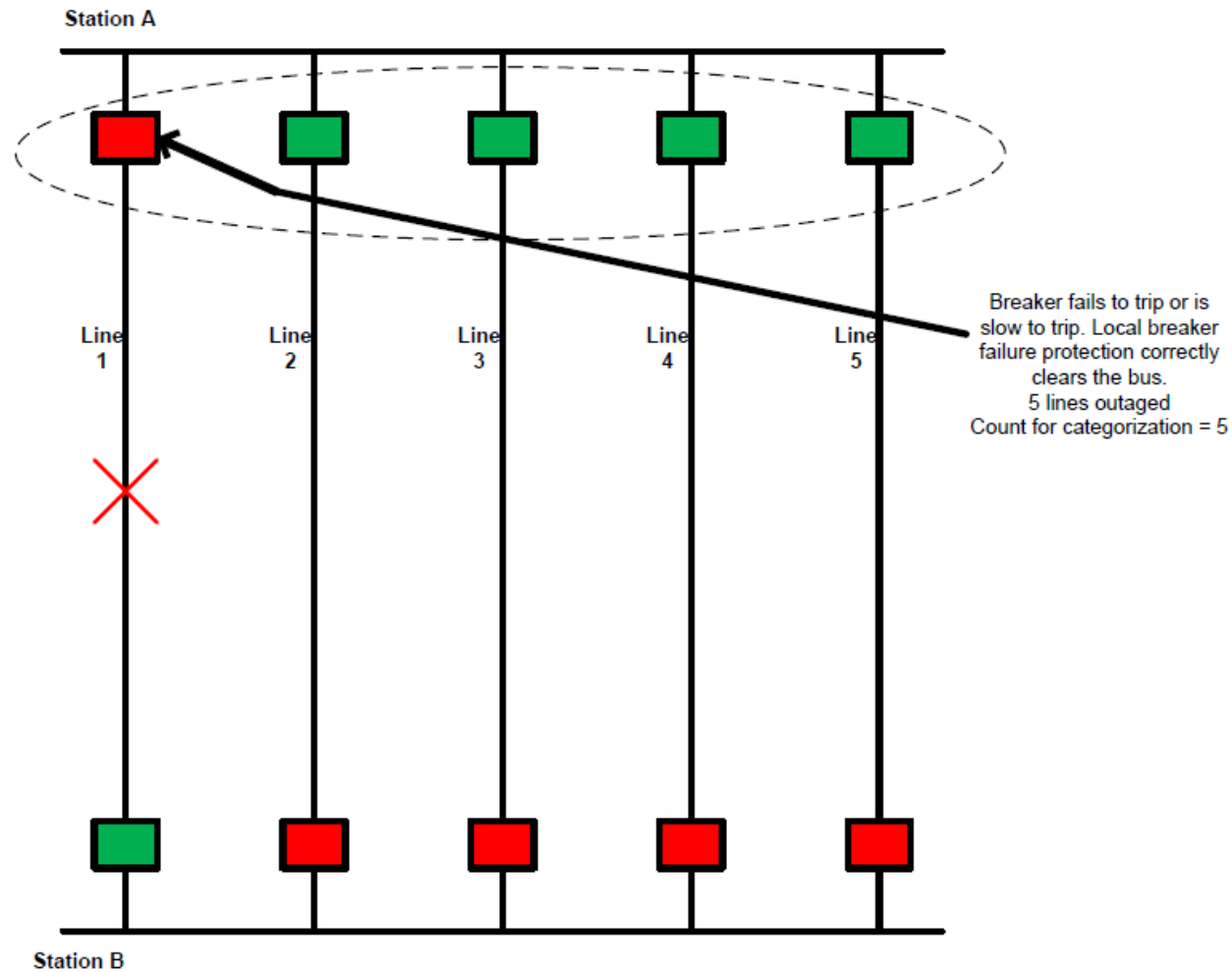
A failed static wire on the double circuit line contacts both circuits, and protection properly removes lines 1 and 2 from service.

The protection settings for line 3 does not take mutual coupling into consideration and incorrectly trips for the fault on lines 1 and 2.

This scenario results in 3 outaged BES elements for a common disturbance with at least one aspect of the disturbance being contrary to design.

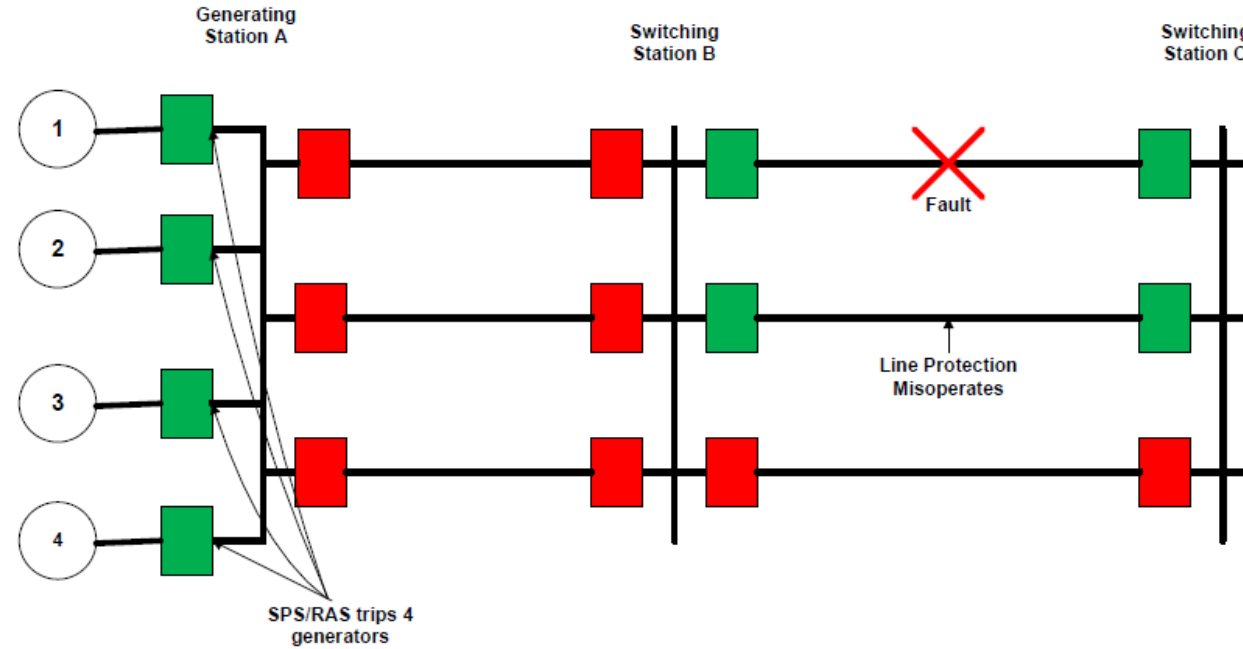
This scenario meets the criteria for box 23 of the OE-417 form and the criteria of a Category 1a event in the NERC Event Analysis Program.

Example of 1a



Example 6 – Qualified Event

Example of 1a



Example 9 – Qualified Event

- Breakers open at Switching Station B and C for initial line fault. RAS correctly trips 2 generators for single line trip. Second line misoperates. RAS correctly trips 2 additional generators for 2 lines out.
- Two lines outaged
- Four generators outaged
- Count for categorization = six
- Event consists of a single line fault resulting in six elements being outaged. It was not intended by design for 6 elements (> 3) to be outaged for a single fault (common disturbance). Therefore, this would be a qualified event. (for reference see footnote 2)

References

- Addendum for determining event category—
[https://www.nerc.com/pa/rrm/ea/EA%20Program%20Document%20Library/Addendum for Determining Event Category.pdf](https://www.nerc.com/pa/rrm/ea/EA%20Program%20Document%20Library/Addendum%20for%20Determining%20Event%20Category.pdf)
- ERO Event Analysis Process Document—
[https://www.nerc.com/pa/rrm/ea/ERO EAP Documents%20DL/ERO EAP v4.0 final.pdf](https://www.nerc.com/pa/rrm/ea/ERO%20EAP%20Documents%20DL/ERO%20EAP%20v4.0%20final.pdf)

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